PROCEEDINGS OF THE SOCIETY OF ANTIQUARIES OF SCOTLAND

ISSN: 0081-1564 • e-ISSN: 2056-743X

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How to cite:
Wickham-Jones, Caroline R, Kenworthy, James B, Gould, A, MacGregor, G and Noble, G 2017 'Archaeological excavations at Nethermills Farm, Deeside, 1978–81', *Proceedings of the Society of Antiquaries of Scotland* 146: 7-55.

DOI link:
https://doi.org/10.9750/PSAS.146.198535

Proc Soc Antiq Scot 146 (2016), 7–55
DOI: https://doi.org/10.9750/PSAS.146.198535

Archaeological excavations at Nethermills Farm, Deeside, 1978–81

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ABSTRACT

The Mesolithic site of Nethermills Farm, Crathes, Banchory, was identified from fieldwalking that took place between 1973 and 1977 and it was excavated between 1978 and 1981 under the direction of James Kenworthy. Kenworthy interpreted the site as a 'hunter-gatherer camp' with probable evidence for a circular structure, but publication of the excavation was never completed. This paper draws on specialist work undertaken immediately after excavation, together with new analyses and radiocarbon determinations from original samples. It focuses on the results of excavation: material from the fieldwalking is briefly considered towards the end of the discussion, but detailed analysis of the lithics from fieldwalking is left for future research.

A number of stratified features were excavated and recorded, together with a lithic assemblage of over 30,000 pieces, which includes many narrow blade microliths. It is not possible to uphold the interpretation that the cut features represent the remains of a specific structure but it is clear that Mesolithic activity took place here, probably comprising repeated visits over a considerable period of time. The radiocarbon determinations cover a wide spread of activity from the Mesolithic to the Bronze Age – though there are no clear chronological indicators of later prehistoric activity in the finds from the site.

Kenworthy chose to excavate only a tiny proportion of the site at Nethermills, which extends some 2km along the River Dee. The likelihood that stratified features may survive elsewhere makes this a Mesolithic site of considerable significance – especially when considered in the context of the many other Mesolithic sites along the River Dee, from its source to the sea.

INTRODUCTION

Excavation at Nethermills Farm, Crathes, Banchory, took place between 1978 and 1981 under the direction of James Kenworthy, who was at the time employed by the University of St Andrews. The site had been identified as Mesolithic from the lithics collected during fieldwalking and Kenworthy selected his

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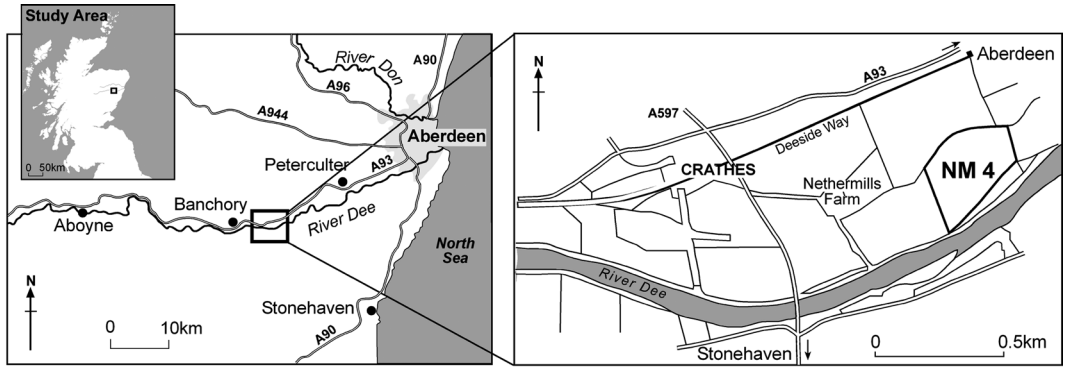
excavation site on the grounds of on-going erosion due to plough damage and the density of the lithic scatter, with a specific focus on concentrations of burnt flint. Kenworthy quickly interpreted the site as a 'hunter-gatherer camp' with probable evidence for a circular structure similar to that excavated at Mount Sandel, Ireland, in the mid-1970s (Woodman 1985). Excavation at Nethermills was meticulous: 84 features were planned and recorded, and around 30,000 lithics (including microliths) were recovered, together with a small number of clay pipes and one prehistoric potsherd.

Although many artefacts were found in the topsoil, the presence of stratified material and cut features suggested that this was a Mesolithic site of some significance. Nevertheless, the amount of data recovered was daunting and the final analysis was never completed, with the result that despite regular entries in *Discovery and Excavation in Scotland* (Kenworthy 1978; 1979; 1980) and the rapid production of an interim report (Kenworthy 1981), a full report of the site has never been published. For this reason, Nethermills lingers in the archaeological record as a Mesolithic structure of uncertain detail. Given the paucity of Mesolithic structures in Scotland this has not detracted from its significance, but the lack of analysis has certainly detracted from the value of the site.

Sadly, James Kenworthy passed away in 2011, but in recent years the archive from Nethermills has been re-examined and the evidence from the site has been re-analysed. This report aims to set out the results of this work and has had to operate within all the limitations that might be expected of a backlog project where the original analysis is somewhat dated and where samples, records and artefacts have been moved several times over a period of more than three decades. At this chronological remove it has proved impossible to provide the detailed substantiation of the Mesolithic structure that might once have been expected, but it is clear that Nethermills comprises a Mesolithic site of some significance and retains the potential for further investigation.

The lithic assemblage provides strong evidence for Mesolithic activity. Stylistically, most pieces fall into the Narrow Blade microlith category, generally dated in Scotland to the period between the mid-9th millennium and the late 5th millennium cal BC. The excavated remains include a number of cut features, interpreted as post-holes and stake-holes as well as pits. Several of these posts appear to have been replaced, evidenced by a number of recuts. At the time of excavation, organic material was recovered from many of these and included evidence for oak, with oak bark, as well as hazelnut shells and a small amount



Illus 1 Nethermills, location of the excavation site which lies in field NM4 on the north bank of the River Dee

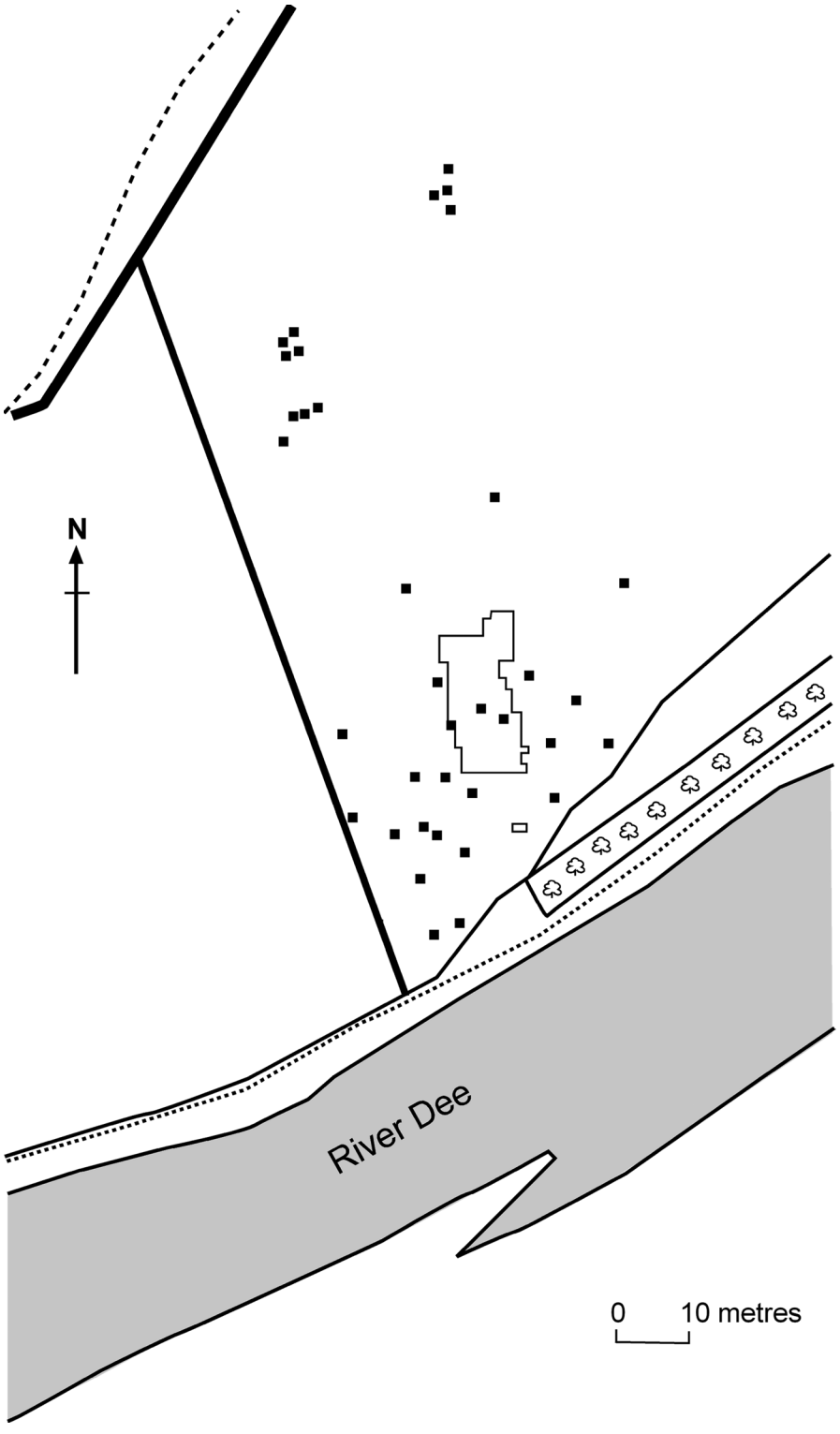
ILLUS 2 Nethermills, excavation taking place in 1981. This photograph gives a good idea of the site location, looking north-east away from the river. Courtesy of HES (James Kenworthy Collection)

of birch and willow, though the surviving samples did not offer the potential for further environmental investigation that might have been hoped. Sixteen radiocarbon determinations have been obtained from the site: four on bulk samples at the end of excavation in 1981 and 12 from stored samples in 2014 and 2015. These indicate a spread of activity from the late 6th millennium to the 1st millennium cal BC. While they do not demonstrate the coherence that would be necessary to validate the presence of a Mesolithic roundhouse, they do suggest a spread of activity from the Mesolithic to the Bronze Age, though it should be remembered that indications of animal disturbance were rife across the site.

GEOGRAPHICAL LOCATION

The site at Nethermills lies on the north bank of the River Dee (NGR: NO 7583 9615), on the second river terrace, *c* 36m OD, and about 3m above the mean river level (Illus 1). The site is located in an arable field (known archaeologically as NM4) that is regularly ploughed. The slightly undulating surface of the field drops to the River Dee, which is roughly 76m wide at this point.

The superficial geology of the site is undifferentiated river terrace deposits of gravel, sand and silt, with alluvium of clay, sand, silt and gravel immediately to the south, on a lower terrace (BGS 2015). The underlying geology consists of igneous rocks: Crathes Pluton – Granodiorite of the north-east Grampian granitic suite (ibid). A sub-stratum of water-laid cobbles and boulders, below the upper gravels and sands, was noted during excavation (Kenworthy 1981: 1). The area today is one of fertile farmland, a mix of arable and pasture, interspersed with tracts of woodland. Although all of this is a modern construct, it suggests



ILLUS 3 Nethermills, location of test pits and main excavation trench in field NM4

that the location would have been favourable for both early farmers and Mesolithic hunter-gatherer-fishers.

HISTORY OF ARCHAEOLOGICAL WORK AT NETHERMILLS

The flint scatter at Nethermills was first recognised in the surface of a freshly ploughed field after heavy rainfall. Initial fieldwalking was undertaken by Dr John Grieve, who lived locally (*DES* 1975; CANMORE 2015). Extended fieldwalking along the fields of the north bank of the River Dee at this point uncovered a lithic scatter, of generally Mesolithic aspect, that extends for some 2km, of which the excavated field forms the easternmost part (see below). Within the excavated field, Grieve's work identified the precise location of a lithic concentration with an unusually high volume of finds. The presence of microliths indicative of Mesolithic activity was also noted. In-line with the then-current developments in archaeological theory, the lithic assemblage from Nethermills was tentatively identified by Kenworthy as relating to a 'base camp' (Kenworthy 1981, drawing on works such as Clark 1954; Mellars 1976; Binford 1978) and thus of considerable archaeological potential. Excavation was initiated when it was discovered that the site was undergoing severe plough damage, with the following aims:

- To assess the degree of plough damage;
- To test the possibility of recovering spatial patterning from the considerable amount of flint in the topsoil and its relation to underlying features, and to delimit the area of the site;
- To recover structural information if present;
- To assess the degree of correlation between the material collected during fieldwalking by Dr Grieve and that recovered from excavation;
- To determine the existence of stratigraphic, economic, and environmental evidence.

(Kenworthy 1981: 1)

EXCAVATION

Excavation started in 1978 and was undertaken over four years. Volunteers were drawn mainly from the Universities of St Andrews and Edinburgh (Illus 2). Initially, 30 randomly placed test pits of 1m square were excavated across the lower south-eastern portion of the field (towards the river), where Grieve had identified the lithic scatter, and 13 test pits were dug towards the northern end of the field, adjacent to a peaty hollow at the back of the terrace. Subsequently, two larger trenches were opened at the lower end of the site: Trench 1: 5m × 5m to the south and Trench 2: 2m × 2m to the north, based on the results of test pitting (in terms of the potential survival of features and the density of flaked lithic material) (Illus 3).

In 1979, the northernmost trench was extended by 2m and the southernmost was extended to 7m × 8m. Work in 1980 and 1981 focused on the area joining the two trenches. In all, the main trench measured 110 square metres and examined slightly less than 7% of the lithic scatter across the field. All topsoil was removed by hand; down to the level of the subsoil or archaeological features, whichever was encountered first. Individual features were excavated by quadrant where possible, and larger contexts were divided into spits. Topsoil and subsequent contexts were wet-sieved through a 3mm mesh (Illus 4). In the first year, finds were individually recorded by metre square but in subsequent years they were block-bagged by quarter metre square within each context. All features and contexts were recorded by drawing and photograph. Environmental samples were taken where visible organic remains (eg charcoal) were noted; some of these were analysed and sent for radiocarbon assay at the time. Some samples survive and have been processed for plant identification and radiocarbon assay more recently. A report on the charcoal was published by Boyd and Kenworthy in 1992 and the results are incorporated into this text. It should be noted that, in view of the date of the excavation and initial post-excavation work, analysis that might be taken for granted today, such as geochemical and sedimentary analysis of feature fills, was not

ILLUS 4 Nethermills, wet sieving at the edge of the River Dee in 1980. Courtesy of HES (James Kenworthy Collection)

undertaken, and the surviving samples were not deemed suitable for detailed investigation as part of the publication process.

EXCAVATION RESULTS

During excavation, active erosion from recent ploughing was clearly visible in the form of fresh plough marks that had cut into the surface of the subsoil, compounded by the damage from previous ridge and furrow cultivation to a depth of about 0.4m. Excavation was therefore timely. The results of test pitting revealed that lithic density across the ploughsoil rose to over 80 pieces per square metre and this was used to define the main concentration, which measured around 1,600 square metres. At the heart of this, a density of as much as 300 pieces per square metre was recorded. Excavation was targeted at this area and revealed a number of negative features, identified as pits, post-holes, stake-holes and natural hollows. Away from the excavation trench, lithic density in the northern half of the field was lower, never more than 30 pieces per square metre, and at the time of excavation, Kenworthy thought that this material was quite different to that elsewhere, though it has not been possible to test this in the present work.

The ploughsoil was recorded as topsoil and Layers 001–002; it was between 0.3m and 0.5m thick (Illus 5). Below this, Layers 003–005 were interpreted as an occupation horizon up to 0.15m thick; the extent of this occupation horizon across the excavated site is not fully recorded, but Kenworthy considered that it coincided with the main structural evidence (Illus 6). He noted that it was discoloured and drew similarities between it and occupation horizons recorded on other Mesolithic sites, such as Mount Sandel (Woodman 1987).

In all, 84 features were recorded. These may be divided by specific type, added to which some groups of features were felt by Kenworthy to have contextual integrity as a possible structure. It is worth noting that no listing to correlate contexts with finds has been found, so it is not possible to be certain as to the lithic content of specific

features. Nevertheless, given the importance of some of the post-holes to validation (or not) of the putative structure, these particular post-holes have been discussed in more detail than the stake-holes.

STAKE-HOLES

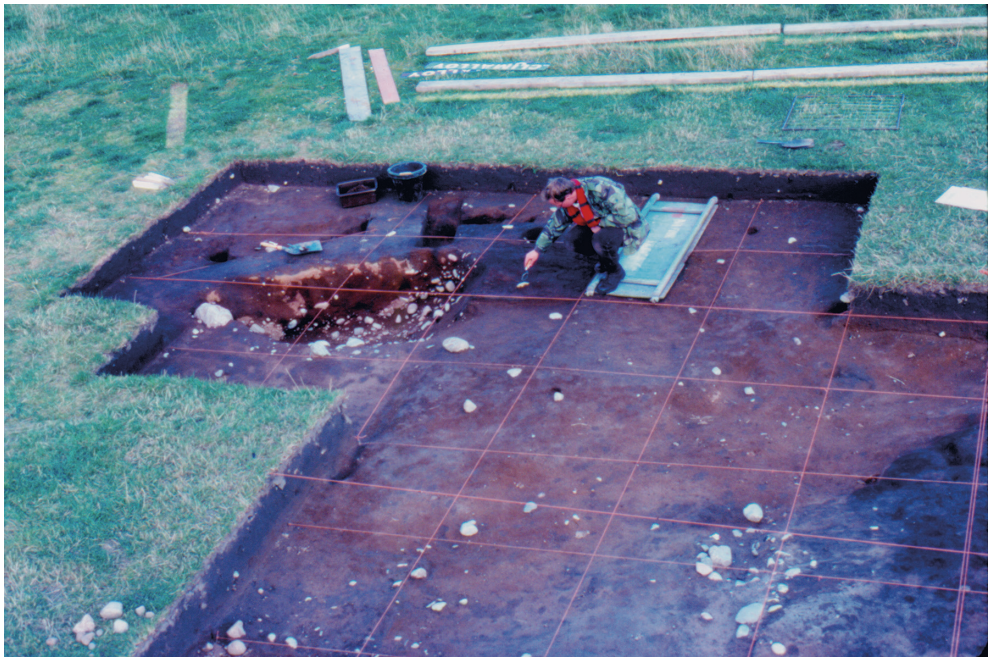
Ten stake-holes were identified, generally described as small sub-circular features with pointed bases and dark brown fills (Table 1). All but one (GG) lay in the southern half of the main trench. They were largely distinguished from post-holes on the basis of their small size. It has not been possible to verify contextual links between them, or between them and other features.

POST-HOLES

(Radiocarbon determinations are listed in Table 9 which is located with the discussion of Radiocarbon.)

Twenty-three post-holes and post-pipes were recorded in the main trench. Those in the mid-section lay neatly between the remains of two furrows resulting from broad rig (EG; CE; EH; CS/CT; CX; L; EK; B; DA; DC; EA; BS; CK; EF; CN) (Illus 6). This group of features apparently included evidence for associated small pits within which the post-holes often sat. There was plenty of evidence for recuts and replacement of the posts and in general they were larger than those to the south. These features ascribe a roughly sub-circular form and at the time of excavation they were interpreted as providing evidence for a structure that may have been rebuilt and repaired on several occasions. Unfortunately, most had evidence of animal burrows and other disturbance just below the ploughsoil and it has proven hard to reconcile the feature and context descriptions with the plans and sections, but all are described below.

Complex EG comprised two intersecting post-holes, EG001 cutting into EG002, which



ILLUS 5 Nethermills, excavation in 1981, view across the northern half of the trench from the east. The thin covering of ploughsoil may be seen. Courtesy of HES (James Kenworthy Collection)

TABLE 1
Nethermills, stake-holes

Stake-hole	*Size*	*Fill*	*Notes*
AN	0.08m diam; 0.06m deep	Dark brown fill	Tapers at base
M	0.04m diam; 0.03m deep	Dark brown fill	
AL	0.06m diam; 0.05m deep	Dark brown, soft fill	Inclined to south
AH	0.08m × 0.06m; 0.04m deep	Dark fill	Wider at top, inclined to south-west
AF	0.06m diam; 0.07m deep	Dark brown, soft fill	Tapers at base, inclined to north
AG	0.04m diam; 0.04m deep	Dark brown, soft fill	Tapers at base
N	0.13m diam; 0.08m deep	Dark brown fill	
Z	0.12m × 0.06m; 0.09m deep		
AC	0.12m diam; 0.034m deep		Inclined to north-west
GG	0.36m × 0.26m; 0.06m deep	Grey/brown silt with central dark grey fill	

were 0.25m wide by 0.2m deep and 0.27m wide by 0.06m deep respectively. Both were filled with grey silt containing visible charcoal, later identified as oak. Hazelnut shell is recorded from these features by Boyd and Kenworthy (1992). Charcoal from EG001 has yielded a radiocarbon determination of 1008–838 cal BC (Table 9).

Post-holes CE and EH lay immediately to the south of complex EG and also comprised a pair of intersecting post-holes within a shallow cut. EH measured 0.25m in diameter and an unknown depth (the depth was recorded erroneously as 1.71m). CE measured 0.36m×0.23m and was 0.15m deep. Both contained visible amounts of charcoal (oak), and hazelnut shell within a grey silt. The charcoal within CE has yielded a date of 2568–2346 cal BC (Table 9).

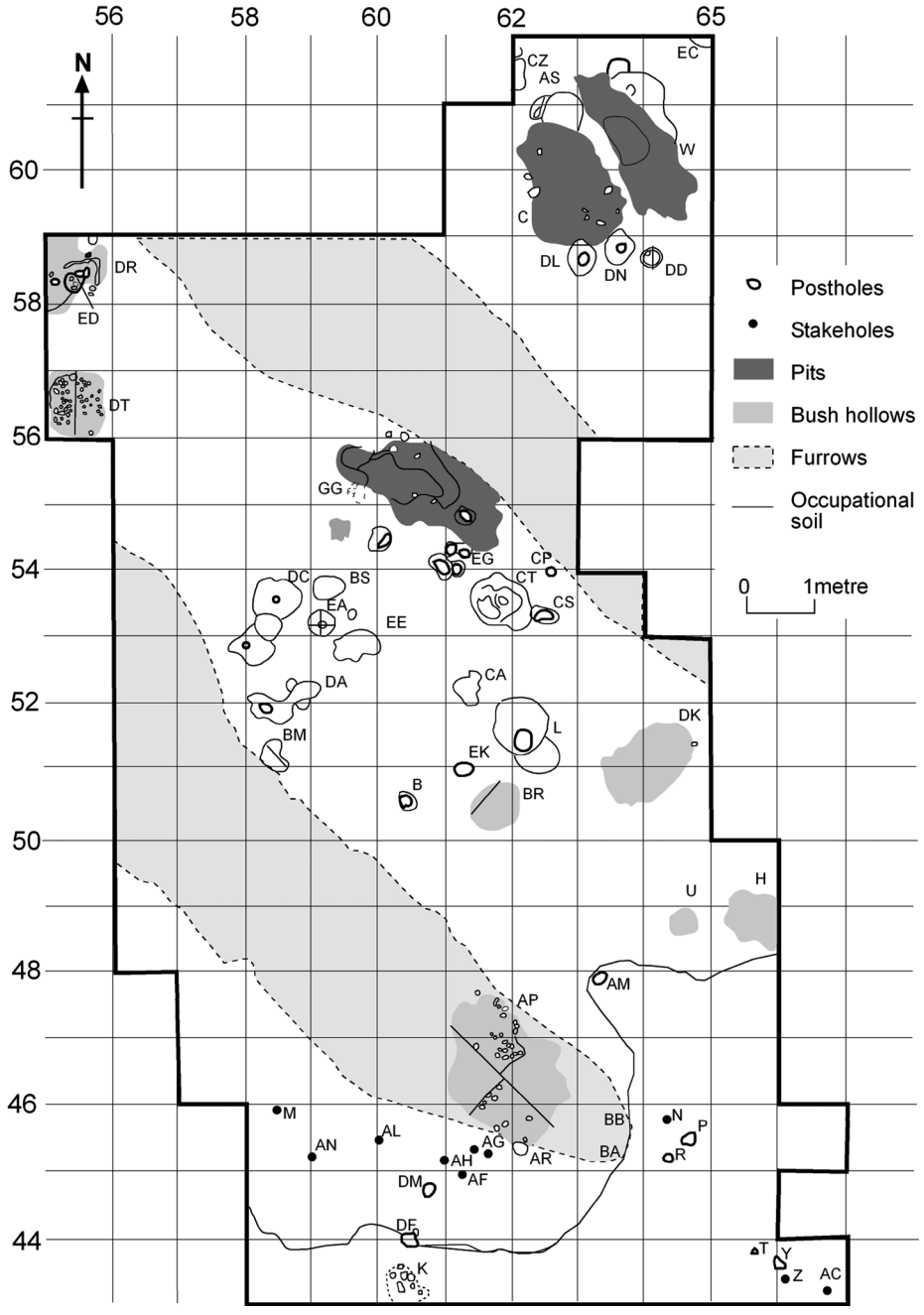
CT comprised a pit measuring 1.04m×0.77m and 0.35m deep, possibly containing two post-holes. Immediately to the east lay CS, a post-hole (0.46m×0.26m and 0.25m deep) set within feature CX, a pit that may represent post packing. Hazelnut shell was recorded from both CT and CS and the charcoal samples comprised solely oak. A radiocarbon determination of 4327–4055 cal BC was obtained from CS (Table 9).

To the south of CS lay feature L, a larger pit (0.55m×0.36m and 0.27 deep), which contained at least one post-hole 0.3m wide. There was evidence of animal disturbance in the upper layers, but there was also plenty of charcoal (oak, birch and hazel), together with some spruce (an indication of later disturbance) as well as hazelnut shell. Charcoal from L has failed to yield enough organic material for a radiocarbon determination.

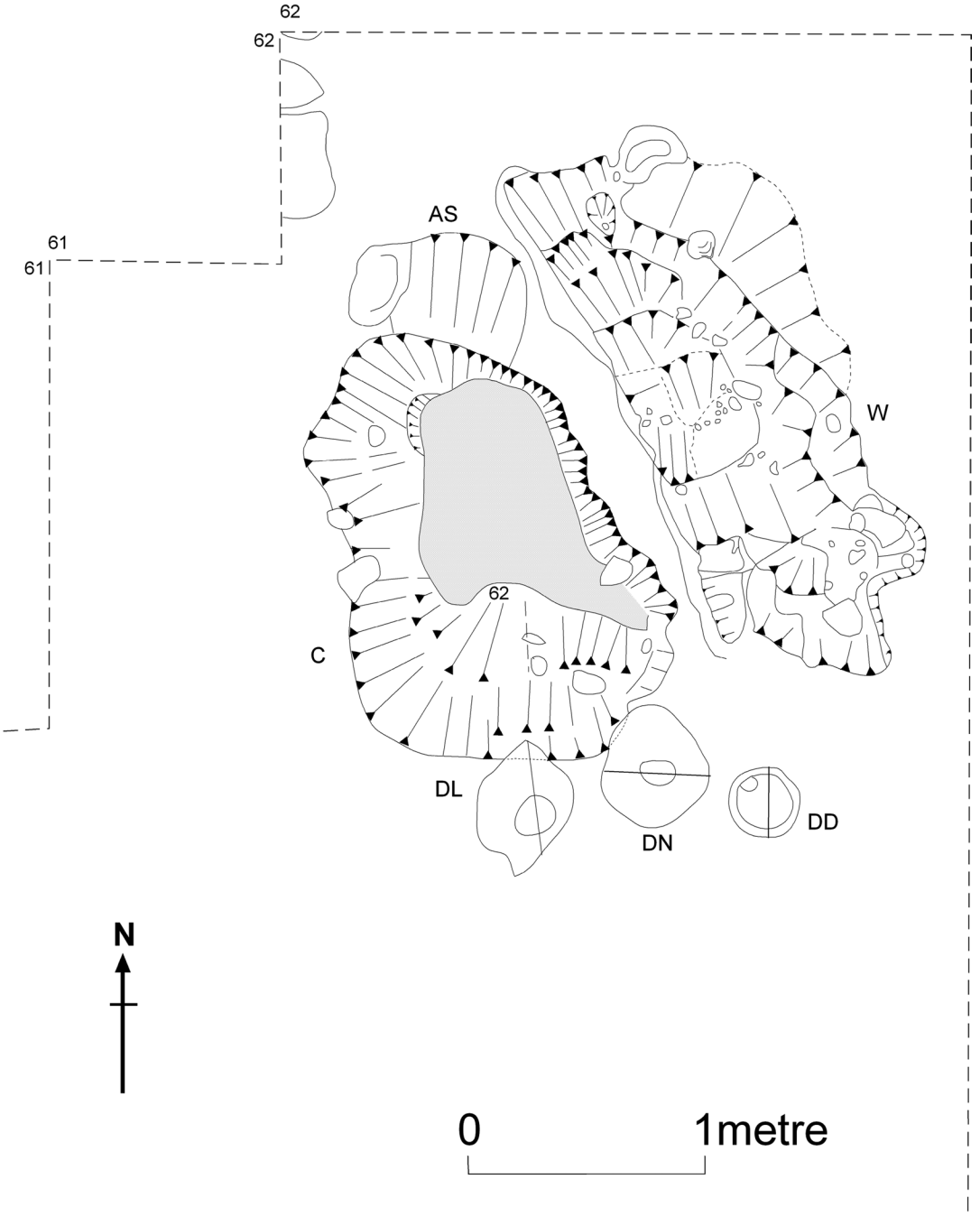
A smaller, more clearly defined post-hole, EK, lay to the south-west of L. The post-pipe measured 0.25m×0.18m and there was no evidence of packing. Feature B farther to the south-west also comprises a single post-hole measuring 0.24m in diameter and 0.26m deep.

Another post feature lay to the north-west and comprises a larger pit, DA (1.15m×0.35m), within which at least one post-hole (0.2m×0.13m and 0.2m deep) was recorded. Later analysis suggests that there was evidence for several posts with packing and post-pipes within the pit. Charcoal samples were identified after excavation as oak, and there was also hazelnut shell present. A radiocarbon determination of 5355–5217 cal BC has been recorded from this feature (Table 9).

Feature DC comprises another amorphous pit (0.9m×0.7m and 0.22m deep) lying to the north



ILLUS 6 Nethermills, interpretive plan of the main features based on that drawn by Kenworthy in 1981



ILLUS 7 Nethermills, Pits C and W at the north end of the trench

of DA, and with evidence for several small posts. Hazelnut shell remains were recorded and there were charcoal samples comprising oak, which yielded a radiocarbon determination of 2866–2500 cal BC.

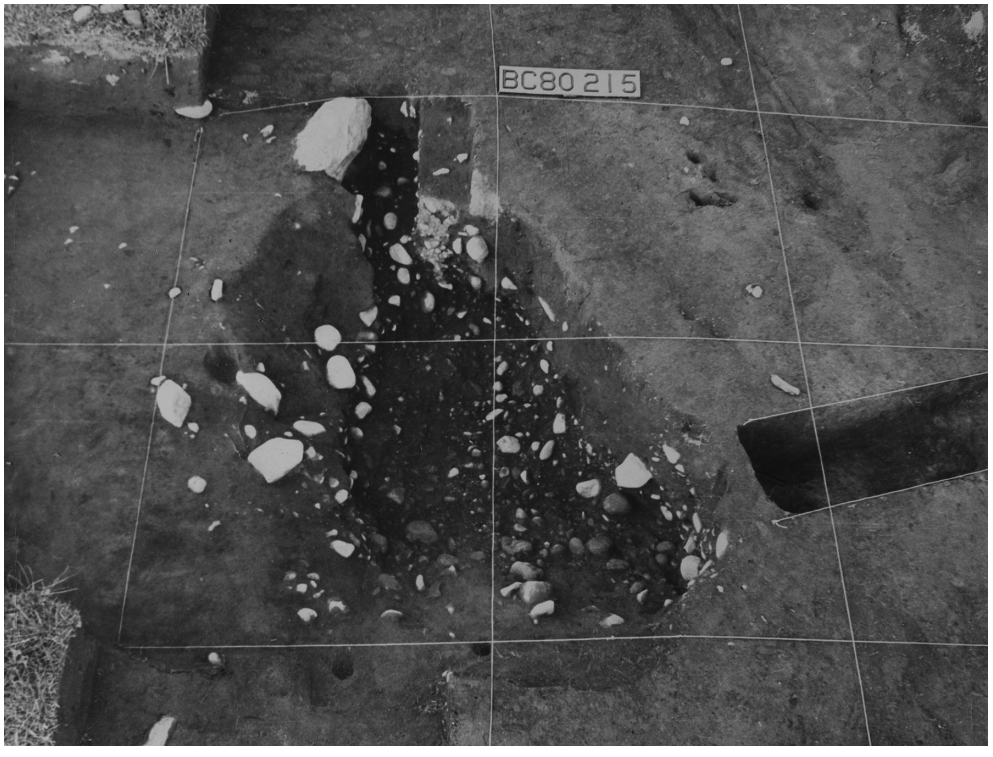
EA is set slightly to the east, within the apparent perimeter of the circle. It comprised a neat post-hole, 0.43m×0.38m and 0.15m deep. There was a clear post-pipe at the centre. Boyd and Kenworthy (1992) recorded oak charcoal from this feature.

Slightly to the north of EA and still inside the outer perimeter lies feature BS, 0.47m×0.33m and 0.25m deep; probably a post-hole. When first recorded, this feature merged into EA, but it was possible to separate them at lower levels; the lower levels were also disturbed by an animal burrow. Oak charcoal was recorded in the original samples here, and there was some hazelnut shell.

Feature CK was recorded as an amorphous feature with a U-shaped base, but has been interpreted in post-excavation as a post-hole, indicated by darker and finer material set within a pit which measured 0.4m×0.3m and was 0.09m deep. The charcoal sample contained solely oak.

To the east of CK lay feature EF measuring 0.37m×0.33m and 0.27m deep, which was recognised during excavation as a clear post-hole.

The final point in the putative circle of the roundhouse was made up of features CH, CM and CN. CM was recognised as a clear post-hole and lay within CN, which comprised a larger, disturbed pit lying within an amorphous pit, CH, which was interpreted as a fire spot, at the time of excavation. This is a complex feature that appears to be cut by the northern plough furrow and it is difficult to untangle the history of the different cuts. CN measured 2.7m×1.3m and was 0.45m deep; it may have contained more than one post-hole. The charcoal sample contained oak, birch and hazelnut shell. CN005 has yielded a



ILLUS 8 Pit C during excavation

radiocarbon determination of 5628–5527 cal BC and there is also a determination of 2905–2710 cal BC, highlighting that this feature was either disturbed or represents a palimpsest of different features of different dates (Table 9). The four determinations taken in 1981 all relate to batch samples taken from this feature (2600–1500 BC, 2340–1950 BC, 2900–2350 BC and 2700–2200 BC (Table 9)) and support the interpretation that it was either disturbed or the result of activities at different times.

In the south of the trench, a number of other post-holes were recorded, all of which are described in Table 11. In general, these were smaller features than those of the central area, and it is harder to interpret possible associations between them, though the possibility remains that they may represent evidence for a coherent structure. Hazelnut shell was recorded from three of them: AC; P and AR, and most had oak charcoal within. These post-holes lie alongside a number of stake-holes; the palimpsest of structural elements obscures interpretation of the site here. There are no dates from this section of the site.

In the north of the trench, only five post-holes were recorded: CZ; DE; DL; DN and DD. Two of these, DL and DN, may have been associated with Pit C and DE was associated with Pit W. Interpretation of these pits was not possible and the functional nature of the post-holes remains obscure.

PITS

The pits include two elongated features, C and W in the north of the trench and another CH/CN towards the centre.

The excavation of pit CN recorded a variety of contexts within the pit and it is difficult to disentangle them (as noted above). The overall feature measured 2.7m × 1.3m and was 0.45m deep. At least one post-hole (CM) lay towards the eastern end. The relationship between CH and CN is unclear and the site notes indicate that there was much animal disturbance here. CH measured 0.41m × 0.2m and was 0.11m deep; it contained hazelnut shell and was interpreted at the time of excavation as a possible fire or storage pit. The overall site plan suggests that this feature was cut by the northern plough furrow, though there is no mention of this in the daybook. A range of radiocarbon determinations have been recovered from CH/CN: in 1981 Kenworthy obtained four dates with an overall range of 2900–1500 cal BC and, more recently, dates of 5628–5527 and 2905–2780 cal BC have been obtained (Table 9). This range of dates supports the interpretation that this feature resulted from multiple events and/or was affected by animal disturbance.

To the north of the trench lay Features W and C: a pair of roughly linear pits with complex fills (Illus 7). Pit W lay to the east, it measured 2.7m × 1.02m and was 0.4m deep and it was excavated over several seasons. There appeared to be evidence of slumping in the fills and at least one post-hole (DE) was recognised as cut into the feature; the records suggest that there might also have been several stake-holes, though these were not identified during excavation. Two radiocarbon determinations of 3943–3711 and 3942–3708 cal BC came from Pit W (Table 9).

Pit C lay alongside and to the south-west of Pit W. It measured 1.5m × 1.1m and was 0.6m deep (Illus 8). There was evidence for slumping and silting in the fills. Post-hole CZ lay to the north of Pit C and post-holes DL and DN were to the south. Pit C appeared to have been dug after the filling of Pit W and this would be supported by the dates: 3933–3705, 3769–3653 and 3763–3724 cal BC (Table 9).

AGRICULTURAL FEATURES

The traces of two furrows of broad rig, thought to be medieval in date, were clearly discernible running north-west/south-east across the trench (Illus 6). A stone-filled field drain was recorded to the south-east of the main trench.

NATURAL FEATURES AND DISTURBANCE

A number of features were interpreted as natural (AP; U; H; DK; BR; DS; DR), mainly ‘bush’ or tree root hollows (Illus 6). In addition, as noted above, many of the feature fills showed evidence of animal disturbance. This often focused around the areas of visible charcoal remains with

TABLE 2
Nethermills, lithic types identified by Kenworthy; collectively these comprised his 'specials' category

Type	*Sub-type*
Core	Undifferentiated
	Blade core
	Micro core
	Core fragment
	Core trimming flake
	Core rejuvenation flake
	Utilised core
	Utilised core trimming flake
Retouched/utilised	Retouched/utilised flake
	Retouched/utilised blade segment
	Burnt utilised flake
	Burnt utilised blade
	Utilised chip
Unretouched flakes and blades	Blade segments
Microlith	Undifferentiated
	Crescent
	Backed bladelet
	Rod
	Scalene triangle
	Triangle
	Quadrilateral
	Unfinished
	Microburin
	Microburin with backing
	Burnt microburin
Retouched pieces	Backed flake
	Scraper
	Scraper on core
	Button scraper
	Burin
	Burnt burin
	Burin spall
	Borer
	Awl
	Notched blade
	Heated notched flake

possible implications for the precision of some of the radiocarbon determinations.

SPATIAL INTEGRITY

At the time of excavation, Kenworthy suggested that the central grouping of post-holes provided evidence for a circular structure 4.5m in diameter, of Mesolithic date; supported by the location of general occupation soil and the lithic concentration. Certainly, the lithics indicate Mesolithic activity on the site, and structural remains would not be out of place with this. It may be, however, that the visual patterning is a result of the fortuitous survival of features across a palimpsest that has been damaged by later ploughing. The radiocarbon determinations do not support any association between the individual elements of this supposed structure, but they may well have been affected by the considerable animal disturbance noted during excavation. As a result, it is not possible to prove (or disprove) the existence of the structure.

To the south of the main cluster of remains, a number of post- and stake-holes were excavated. Kenworthy did not focus on these at the time of excavation and none have been dated, but it is possible that they represent the less well-preserved remains of a second structure. They could also represent ancillary structures or part of the general palimpsest of features. An early plan suggests that Kenworthy considered the possibility of a second structure between these two areas, but this is not upheld in later work and there is no clear evidence for it (see discussion below).

The two pits to the north were felt to be associated with one another, and the radiocarbon determinations here do provide a rare, coherent set of dates which gives some credence to this suggestion, though there is little material culture relating to these features which fall traditionally within the early Neolithic. There is thus no clear interpretation of their function.

ARTEFACTS

Most of the artefacts are flaked stone tools.

FLAKED STONE

INTRODUCTION

The flaked lithic assemblage comprises around 30,000 pieces. These were all examined by Kenworthy who divided them into rough types (Table 2). Kenworthy's assessment first sub-divided the assemblage into two: 'specials' and 'non-specials'. Specials comprised a number of types including cores and retouched pieces; perhaps not all of them allocated on the most logical or uniform basis (Table 2). 'Non-specials' was the rest. There are notes relating to possible further analysis of the lithics and Kenworthy devoted some time to this, but it does not appear to have taken place. In 2012 Torben Bjarke Ballin examined the 'specials' afresh.

Despite the problems in assessing a lithics assemblage 30 years after excavation and in the absence of original excavators and information, Ballin undertook a thorough review. His work is archived in full and available online and the following information has been drawn from it. Lithic analysis had the following aims:

- Characterisation of the assemblage with special reference to raw materials and typo-technology;
- Production of a catalogue of the material examined;
- Elucidation of chronological information where possible;
- Interpretation;
- Assessment of research potential.

In the event, only a portion of the material could be examined because most of the assemblage was individually wrapped and bagged and it was deemed too time consuming and costly to unwrap everything. Given uncertainty over Kenworthy's lithic classification and doubt as to what the 'non-special' category actually comprised, examination focused on the 'specials'. 'Non-specials', assumed to contain the bulk of the debitage, was not included. Thus, an assemblage of 2,750 pieces, or roughly 9% of the whole assemblage, was investigated. While this method of sample selection is heavily biased, it was deemed the best way forward in

TABLE 3
Nethermills, catalogue of cores and modified tools

Type	*Sub-type*	*Sub-totals*	*Totals*
CORES			127
	Core rough-outs	3	
	Single-platform cores	70	
	Opposed-platform cores	7	
	Cores with two platforms at angle	3	
	Irregular cores	6	
	Atypical cores	1	
	Bipolar cores	30	
	Core fragments	7	
TOOLS			
MICROLITHS/MICROLITH-RELATED			1,147
	Microlith preforms	42	
	Angle-backed/rhomboid pieces	3	
	Obliquely blunted points	23	
	Isosceles triangles	6	
	Isosceles triangles small	2	
	Scalene triangles	82	
	Quadrilaterals	1	
	Crescents	29	
	Edge-blunted pieces	30	
	Idiosyncratic microliths	5	
	Backed bladelets	42	
	Truncated bladelets	12	
	Frags of microliths	70	
	Frags of microliths/backed bladelets	180	
	Microburins	620	
SCRAPERS			81
	Blade-scrapers	10	
	Short end-scrapers	36	
	Thumbnail-scrapers	2	
	Double-scrapers	3	
	Side-scrapers	8	
	End-/side-scrapers	11	
	Atypical scrapers	3	
	Scraper-edge fragments	8	

Type	*Sub-type*	*Sub-totals*	*Totals*
KNIVES			44
	Truncated pieces	40	
	Backed blades	3	
	Scale-flaked knives	1	
PIERCERS			25
	Large piercers	7	
	Mèches de forêt (drill tips)	18	
BURINS			6
	Burins	5	
	Burin spalls	1	
COMBINED TOOLS			2
VARIOUS EDGE-MODIFICATION			233
	Notched pieces	39	
	Pieces with edge-retouch	193	
	Pieces with invasive retouch	1	
NON-LITHICS			5
	Stone beads	1	
	Hammerstones	1	
	Pottery	1	
	Glass beads	2	
TOTAL TOOLS			1,543
TOTAL			1,670

the circumstances. Indeed, spot tests indicated that most of the cores and 'tools' had been recognised as 'specials' by Kenworthy. Among the material examined, 1,670 cores and modified tools were identified (Table 3; Appendix 1), and these form the basis for the present report. Given the specialised nature of use-wear analysis, the decision was made to focus on modified pieces rather than 'utilised' pieces, despite the inclusion by Kenworthy of pieces with obvious traces of use-wear in his 'specials' category.

RAW MATERIALS

99.5% of the assemblage is made of flint; other materials comprise agate (one core), chalcedony (one core), quartz (three pieces: a core; a core fragment; a truncated piece). The flint cortex indicates the use of small pebbles (mainly 0.04m–0.06m), of the sort that might have been collected from the coast (Kenworthy commented on the lack of pebble flint in the local river gravels (1981: 4)). Burning is visible on 12% of the assemblage.

TECHNOLOGY

The interpretation of lithic technology was hampered by the fact that some pertinent types such as crested blades and platform rejuvenation flakes are likely to be under-represented among the pieces examined, together with the total absence of analysis of debitage and unmodified pieces. Nevertheless, examination of the blanks

TABLE 4
Nethermills, typologically definable tool blanks

	n	%
Pebbles	1	0.1
Blades	167	18.1
Microblades	509	55.1
Flakes	245	26.5
Cores	2	0.2
Total	924	100.0

selected for modification does yield interesting results (Table 4). The dominance of blade-types reflects the presence of a blade industry, and this was reinforced by the cortex cover which suggested that flake blanks were selected on a more ad hoc basis (and included more cortex) than blades and microblades (where cortex was lacking) (Table 5).

Despite the limitations of not analysing debitage, examination of the core forms, blades and retouched pieces made it possible to suggest an operational schema for the production of flaked stone tools. The occurrence of cores of different types from different stages of the production process (Illus 9) indicated that cores were roughed out from pebbles by the detachment of primary flakes, partly to remove cortex and partly to prepare the core for blade production by forming small crests or guide ridges. They were then carefully maintained by platform rejuvenation and platform trimming, allowing the knappers to control the production of both blades and microblades until most cores were exhausted.

Not surprisingly, blades and microblades were more often made using soft percussion while hard percussion was reserved mainly for flakes (Table 6). There was also some evidence for bipolar (anvil) reduction, mainly among the larger pieces.

The abundance of microburins and the presence of microlith preforms (Illus 12) indicates that microlith manufacture took place on site. The role of the microburin

TABLE 5
Nethermills, reduction sequence of all typologically definable tool blanks

	Quantity						*Per cent*					
	Pebbles	*Blades*	*Micro-blades*	*Flakes*	*Cores*	*Total*	*Pebbles*	*Blades*	*Micro-blades*	*Flakes*	*Cores*	*Total*
Primary	1			9		10	100			4		1
Secondary		24	6	88	1	119		14	1	36	50	13
Tertiary		143	503	148	1	795		86	99	60	50	86
TOTAL	1	167	509	245	2	924	100	100	100	100	100	100

technique in the manufacture of microliths is debated (de Wilde & de Bie 2011), but, in addition to the artefacts themselves, the remains of microburin facets were recorded on many finished microliths, confirming the use of the technique at Nethermills. Highly standardised methods of microlith production were used, with most microliths being made on non-cortical blanks. Other tool types, such as scrapers, were often made on cortical blanks, probably waste flakes from earlier stages in the knapping process.

ARTEFACT TYPES

Cores (Illus 10 and 11)

The 127 cores were divided into eight types (Table 7).

The majority of the cores were regular platform cores intended for the production of microblades. Fourteen of these were handle cores that had removals from one end of an elongated platform only. Most of the platforms were plain but there had been careful trimming of the platform edge. While some cores were worked until exhausted (ie it was not possible to remove further microblades), others were discarded due to knapping failures such as overshot removals or the development of hinge fractures. There were also 30 bipolar cores.

MICROLITHS (ILLUS 12 AND 13)

Microliths and microlith-related pieces dominate the modified tools. The majority of these are microburins (no. = 620), which are usually associated with the manufacture of microliths. Most of the microliths are of narrow blade types (no. = 183; scalene triangles, crescents, backed bladelets, and edge-retouched pieces), but a few artefacts that conform to broad blade types were recognised (no. = 10; isosceles triangles, quadrilaterals and rhomboids). In addition, some, such as the obliquely blunted points (no. = 23), have been recorded on both narrow blade and broad blade sites.

SCRAPERS (ILLUS 14)

The most common of the larger retouched pieces were scrapers, of which there were 81. Just over half of the scrapers were made on cortical pieces and they include a variety of types (Table 3), of which blade-scrapers and end-scrapers were most common. There were also two artefacts where a scraper had been combined with another edge.

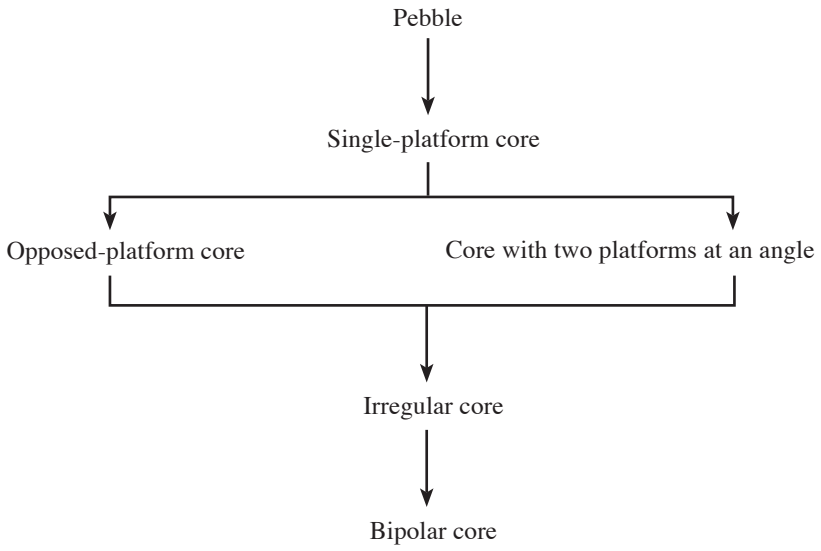
OTHER RETOUCHED PIECES (ILLUS 15)

A total of 46 of the artefacts were catalogued as knives, made on both blade blanks and flake blanks but with slightly more blades. In addition to retouch, nine pieces have visible use-wear. There were 25 piercers, which can be sub-divided into two categories: traditional piercers (no. = 7) and smaller *mèches de forêt* 'drill' tips (no. = 18, these artefacts have been included among the microliths on some sites).

Many of the artefacts had edge-modification and these were divided into three main types: notched pieces (no. = 39); edge-retouched pieces (no. = 193); and invasive retouched pieces (no. = 1). This classification gives a false sense of unity in that it is likely that a wider variety of intentions and functions (including some microburins) are represented. Burins comprise six pieces (five burins and one spall). This was one of the few categories where many of Kenworthy's original identifications were set aside: the original classification included many more burin spalls, but closer inspection revealed them to be debitage (often bipolar).

LITHIC DISTRIBUTION

At Nethermills, the flaked lithics came from the ploughsoil, the occupation layer below that, and the stratified features. Occasional notes on lithic finds within features are scattered through the notebooks, but no overall table correlating finds to features was found. During excavation Kenworthy suggested that the lithic assemblage clustered in the area of the main structure, but the present analysis could not discern any spatial patterning in the lithic distribution across the site. Individual artefact types, as well as the whole assemblage, were distributed more or less equally across the site and there was no patterning indicative of drop zones, wall lines, entrances, or activity and hearth areas. Research indicates that the ploughzone often preserves



ILLUS 9 Core reduction at Nethermills (after Ballin 2012)

'ghost' patterning in artefacts where it has been present (Andersen 1972; Roper 1976; Wickham-Jones 1990), but there was no evidence for this at Nethermills. Rather, the large size and spread of the assemblage here is most likely to be indicative of a palimpsest that has accrued over many different visits to the site and been subsequently affected by millennia of cultivation.

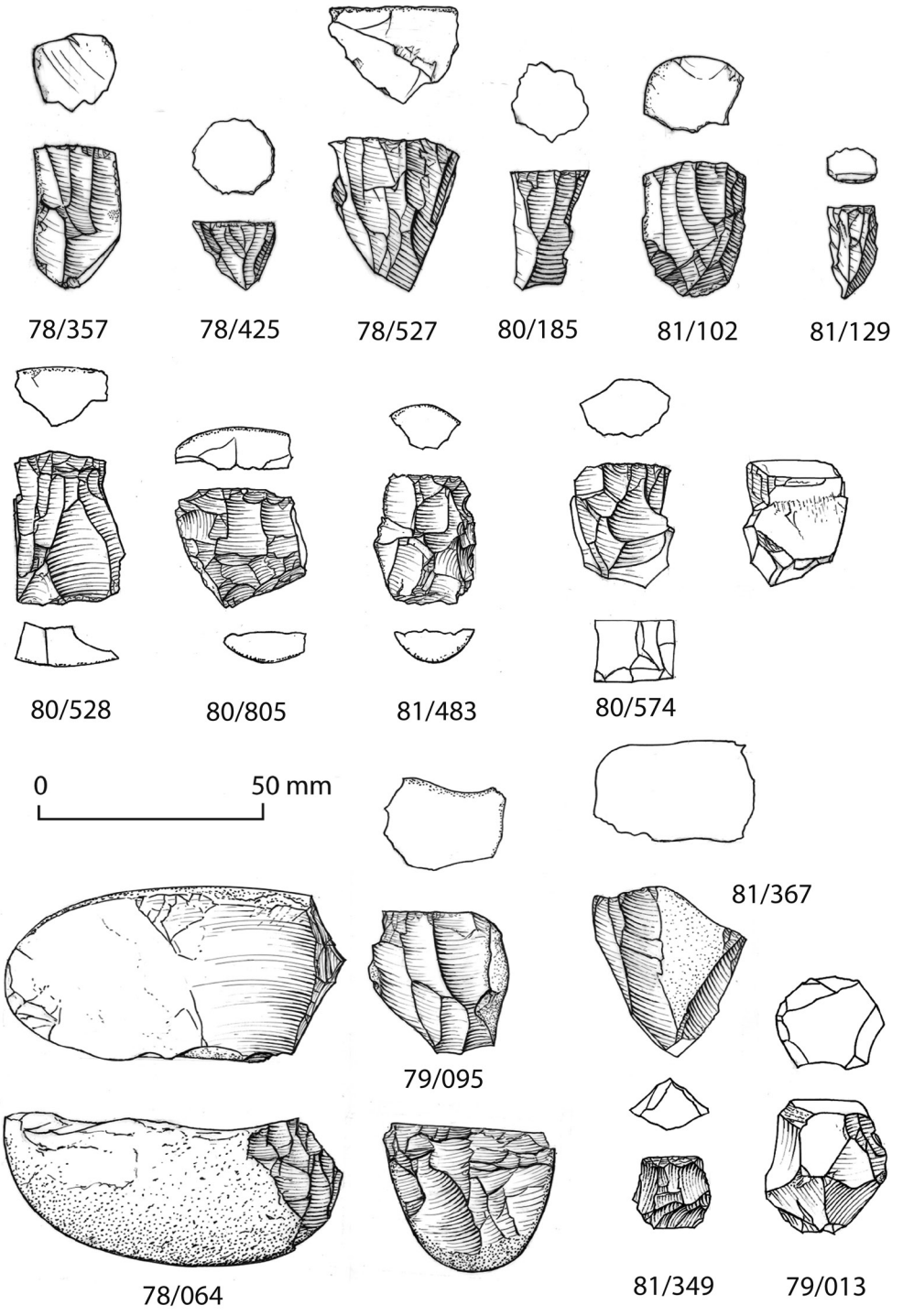
CHRONOLOGICAL AFFILIATIONS OF THE LITHIC ASSEMBLAGE

The lithic assemblage does incorporate specific types that are commonly associated with particular time periods.

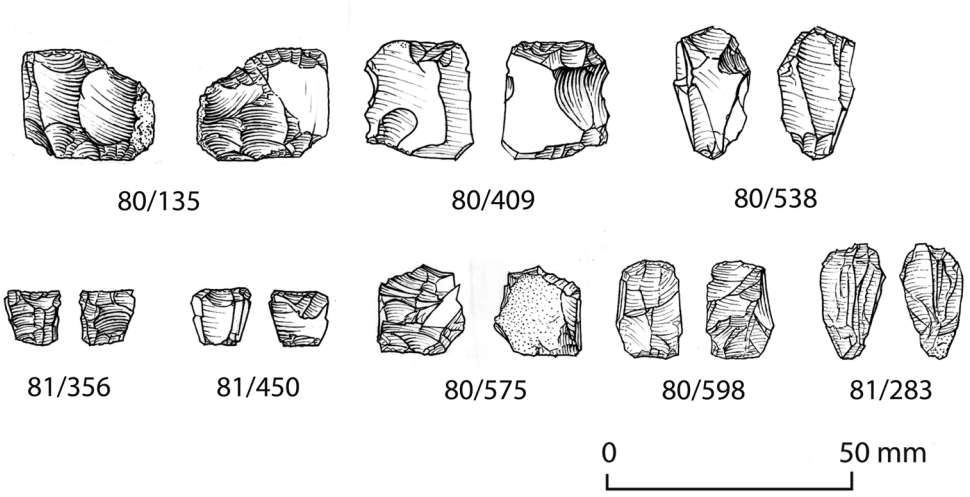
A few pieces show formal similarities with well known Upper Palaeolithic implement types,

TABLE 6
Nethermills, percussion techniques applied to produce the site's technologically definable tool blanks

	Quantity				*Per cent*			
	Blades	*Micro-blades*	*Flakes*	*Total*	*Blades*	*Micro-blades*	*Flakes*	*Total*
Soft percussion	52	53	25	130	75	92	23	56
Hard percussion	8		62	70	12		59	30
Indeterminate platform technique	2		7	9	3		7	4
Platform collapse	7	2	7	16	10	4	7	7
Bipolar technique		2	4	6		4	4	3
TOTAL	69	57	105	231	100	100	100	100



Illus 10 Nethermills, Platform cores. Single-platform: 78/357, 78/425, 78/527, 80/185, 81/102, 81/129, 79/095, 81/367, 78/064. Opposed-platforms: 80/528, 80/805, 81/483. Angled platforms: 80/574. Irregular cores: 81/349, 79/013



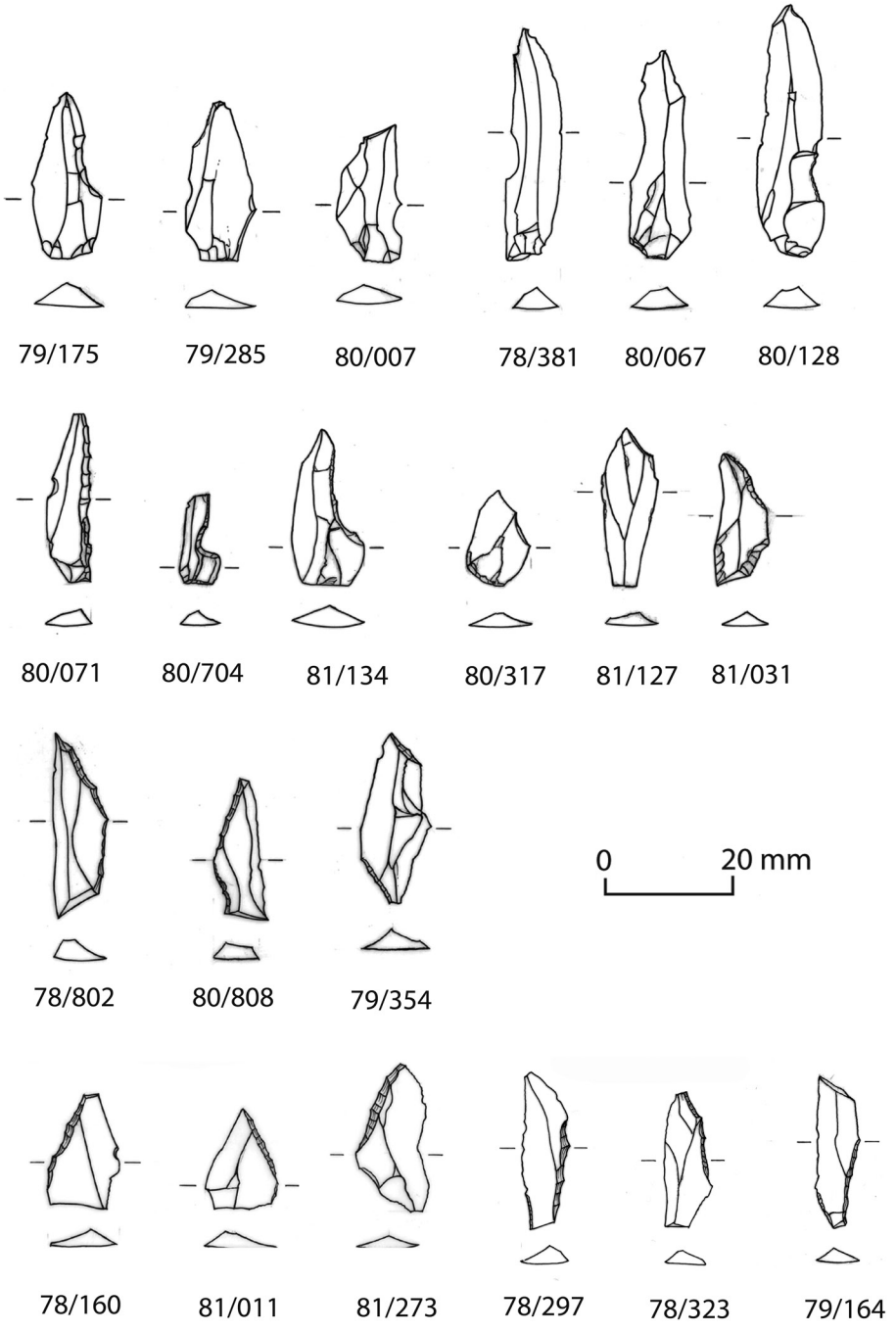
Illus 11 Nethermills, bipolar cores. Standard: 80/135, 80/409, 80/538. Small: 81/356, 81/450, 80/575. Quartz: 80/598. Agate: 81/283

such as tanged arrowheads and angle-backed pieces. Most notable among these is 81/596 (Illus 13), the central fragment of a tanged point. In addition, there are two angle-backed pieces and a rhomboid (78/802, 80/808 and 79/354 (Illus 12)), two blade-scrapers (78/123, 79/404 (Illus 14)), the former of which has a distinctly acute scraper edge, and one of the obliquely truncated pieces (78/019 (Illus 15)). These are few in number (no. = 7) and do not form a single pattern with regard to either tool type or precise period. Until recently, the presence of sporadic atypical pieces like these would not have been considered significant with regard to pre-Mesolithic activity, however, given the increasing evidence for Upper Palaeolithic activity in Scotland (Saville & Ballin 2009; Ballin et al 2010; Mithen et al 2015), the possibility that they document occasional pre-Mesolithic visits to the site cannot be discounted. The tanged point, in particular, is a type that has received considerable attention in recent studies (eg Ballin & Bjerck 2016). Though it is not possible to assign this specific artefact to a particular type, it is likely to be related to either the Hamburgian period (13500–11500 BC), or the Ahrensburgian period (11000–10000 BC), to which the larger blade-scraper and obliquely truncated blade fragment may also be related. With its asymmetrical tang (eg Grimm et al 2012), it is more likely to date to the Hamburgian than later.

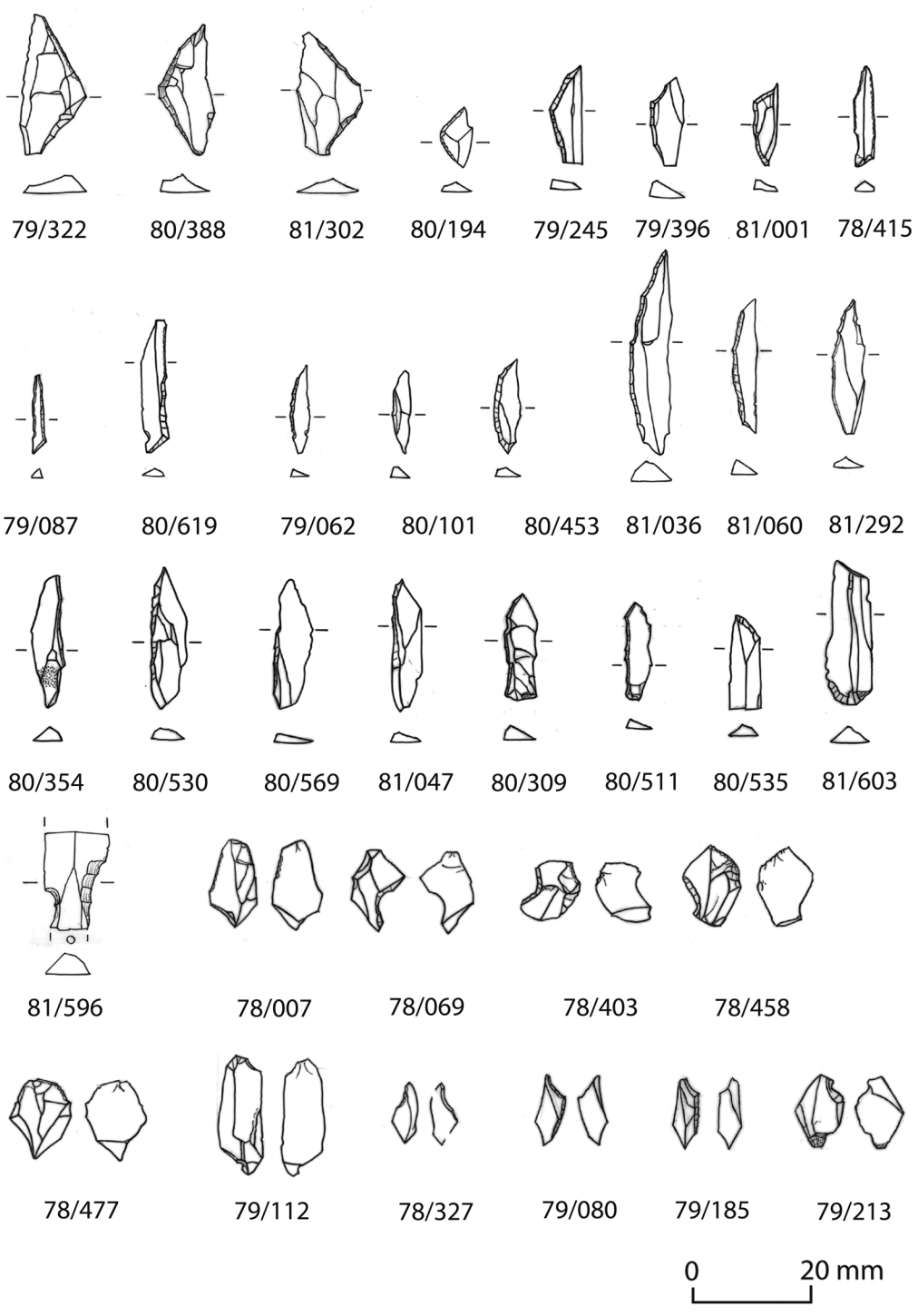
In the UK, robust angle-backed pieces are usually associated with the Creswellian (and thus contemporary with the Hamburgian and late Magdalenian), but on the European Continent angle-backed points and blades have also been recovered from transitional early

Table 7
Nethermills, core types

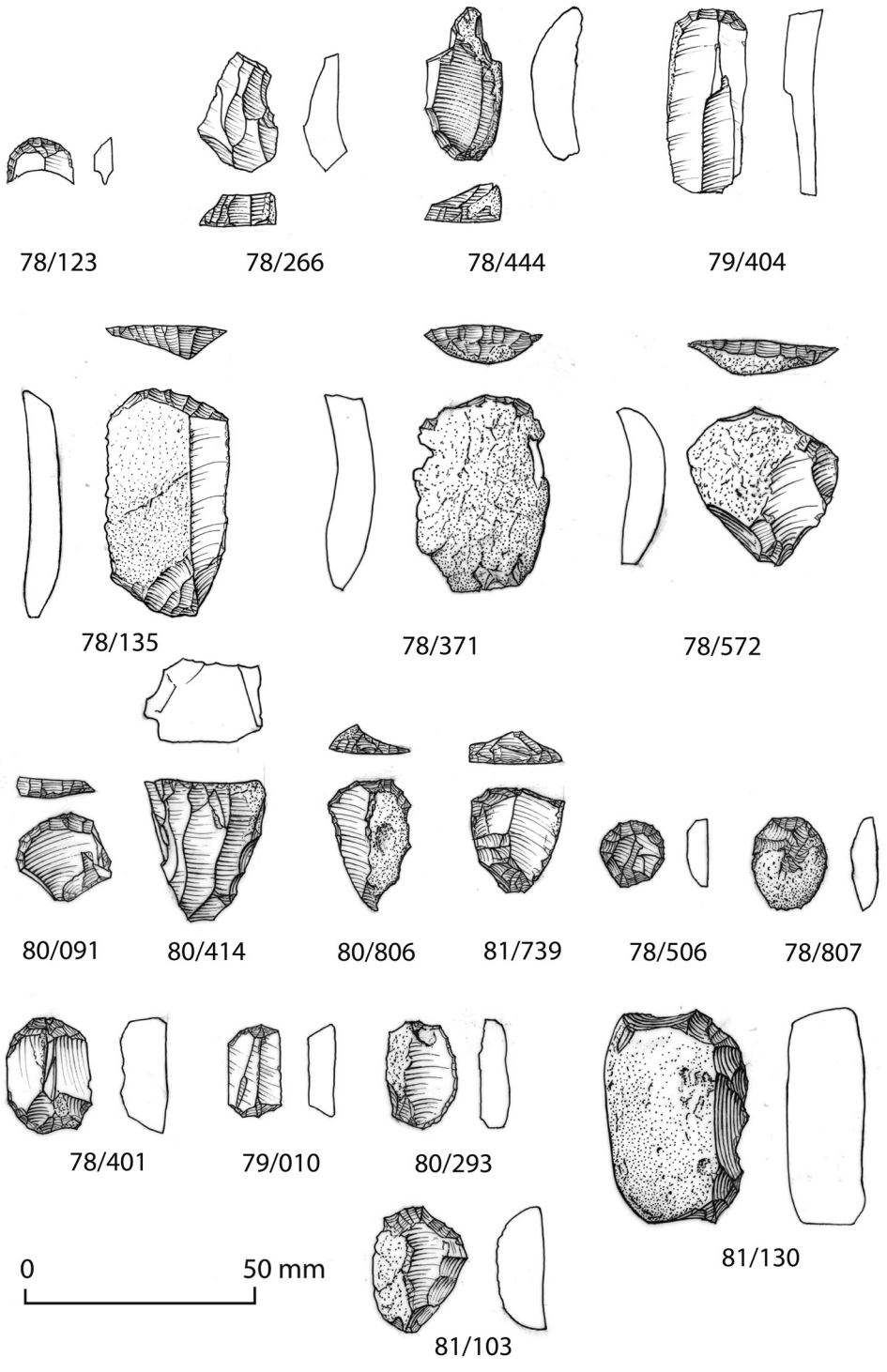
Core Type	*Number (percentage of cores)*
Core rough-out	3 (2.4%)
Single-platform core	70 (55.1%)
Opposed-platform core	7 (5.5%)
Two-angled platforms	3 (2.4%)
Irregular core	6 (4.7%)
Atypical core	1 (0.8%)
Bipolar core	30 (23.6%)
Core fragments	7 (5.5%)
TOTAL	127 (100%)



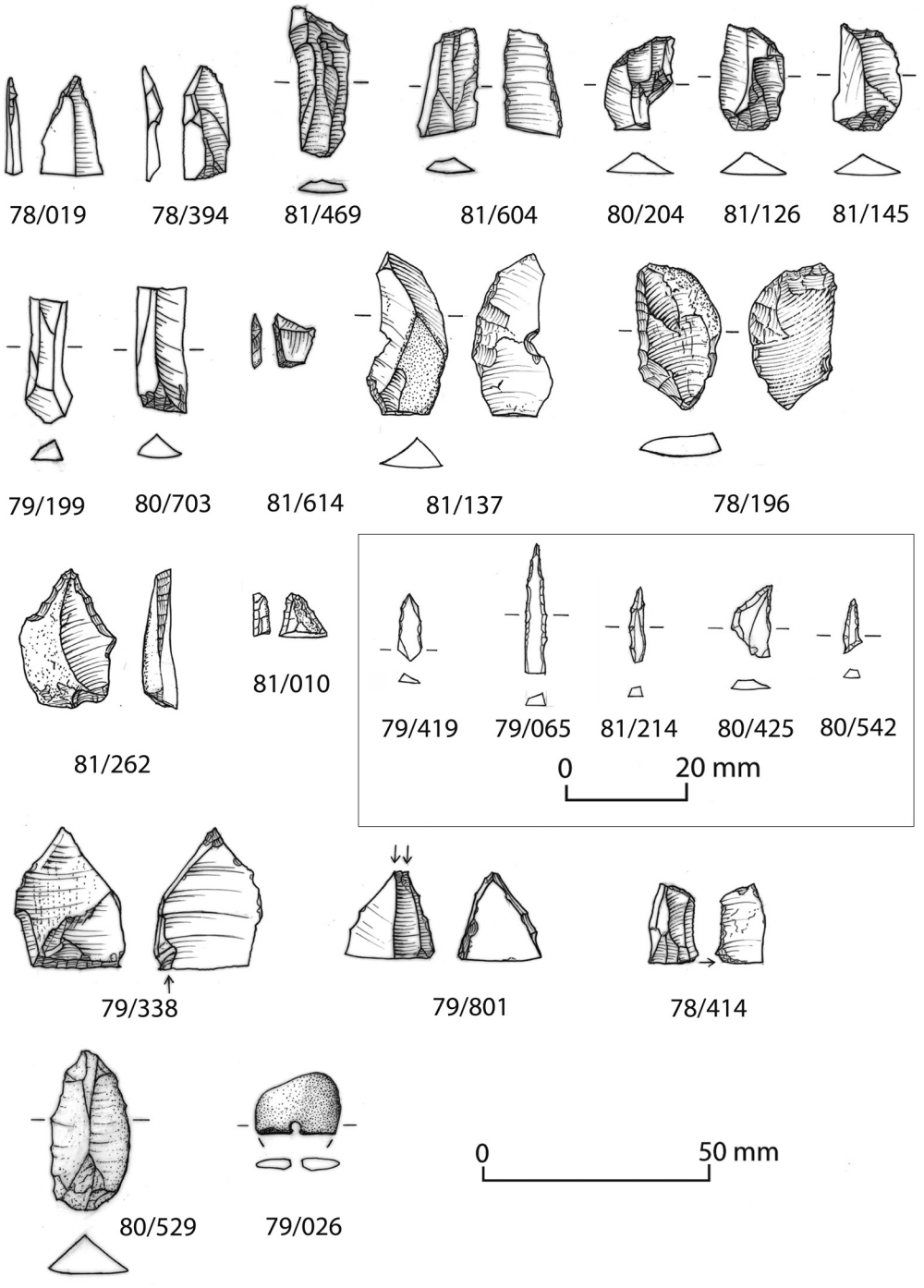
Illus 12 Nethermills, Microliths. Preforms: 79/175, 79/285, 80/007, 78/381, 80/067, 80/128. *Lamelles à cran*: 80/071, 80/704, 81/134, 80/317, 81/127, 81/031. Angle-backed: 78/802, 80/808. Rhomboid: 79/354. Obliquely blunted: 78/160, 81/011, 81/273. Elongated: 78/297, 78/323, 79/164



ILLUS 13 Nethermills, Microliths. Isosceles triangles: 79/322, 80/388, 81/302, 80/194. Scalene triangles: 79/245, 79/396, 81/001, 78/415, 79/087, 80/619. Crescents: 79/062, 80/101, 80/453, 81/036, 81/060, 81/292. Edge-blunted: 80/354, 80/530, 80/569, 81/047. Backed bladelets: 80/309, 80/511. Truncated bladelets: 80/535, 81/603. Tanged Point: 81/596. Proximal microburins: 78/007, 78/069, 78/403, 78/458, 78/477, 79/112, 78/327, 79/080, 79/185, 79/213



Illus 14 Nethermills, Scrapers. Blade-scrapers: 78/123, 78/266, 78/444, 79/404. Short end-scrapers: 78/135, 78/371, 78/572, 80/091, 80/414, 80/806, 81/739. Thumbnail-scrapers: 78/506, 78/807. Double-scrapers: 78/401, 79/010. Side-scrapers: 80/293, 81/103, 81/130



Illus 15 Nethermills, miscellaneous retouched pieces and the stone bead. Oblique truncated pieces: 78/019, 78/394, 81/469, 81/604. Curved truncated pieces: 80/204, 81/126, 81/145. Straight truncated pieces: 79/199, 80/703. Transverse arrowhead: 81/614. Backed blade: 81/137. Scale-flaked knife: 78/196. Large piercer: 81/262, 81/010. *Mèches de Forêt:* 79/419, 79/065, 81/214, 80/425, 80/542. Burins: 79/338, 79/801, 78/414. Combi tool: 80/529. Stone bead: 79/026

Federmesser sites (discussed in Saville & Ballin 2009: 34). In Europe, rhomboids are occasionally found with isosceles triangles and trapezoids in Early Mesolithic (eg Maglemosian) contexts, but they have also been retrieved from late Upper Palaeolithic contexts, such as the Ahrensburgian, where they form part of so-called Zonhoven assemblages (cf Schwabedissen 1954: Abb 10).

In terms of comparison between these early prehistoric assemblages from Scotland and England, it should be borne in mind that assemblages from northern and southern Britain may differ significantly in terms of typo-technological composition. Where, for example, Early Mesolithic assemblages from England, such as Star Carr, include large blade-scrapers, blade-scrapers appear to be absent from Early Mesolithic sites in Scotland (eg Morton, An Corran, Lussa Bay, Glenbatrick Waterhole, etc) (Mercer 1970; 1974; Coles 1971; Saville et al 2012). Scottish Early Mesolithic scrapers generally comprise small oval flake-based pieces. It would not be surprising, therefore, to find that the composition of the emerging Late Palaeolithic/Early Mesolithic sites of the north includes some artefact types and technological approaches that do not fit within the conventional boxes ascribed through analysis of material farther south in the UK.

The bulk of the assemblage is unequivocally Mesolithic in nature, but this covers a long period within which lithic variation certainly took place (Saville & Wickham-Jones 2012). As noted above, there are a few broad blade microliths (obliquely blunted points and isosceles triangles) at Nethermills, but while in England these would conventionally indicate early activity, pre-7000 BC, the Mesolithic in Scotland does not fall into the chronological phases defined by Jacobi in 1976 (based on broader blades and geometric microlith types preceding narrow blade technologies with microliths such as scalene triangles and crescents). In Scotland, the chronological position of broad blade artefacts has yet to be clearly elucidated. Few broad blade sites in Scotland have been accurately dated, and, in contrast to the situation in England, there is now considerable evidence for the use of narrow blade microlith technologies here by 8400 BC (Saville 2008). Roughly 5% of the Nethermills assemblage was identified as truly broad blade (on the basis of microlith type) and, in view of the lack of chronological resolution for broad blade industries in Scotland, it is not possible to assign this element to any particular period of activity on site with certainty. It is probably early, but in the absence of securely dated deposits here it remains simply part of the make-up of the palimpsest which has contributed to the spread of tools in the area.

TABLE 8
Nethermills, breakdown of the retouched pieces

Type	*Total*	*Percentage of retouched pieces*
Microliths excluding microburins	527	34.3%
Microburins	620	40.3%
Scrapers	81	5.3%
Burins	6	0.4%
Knives	44	2.9%
Edge-retouched	233	15.1%
Piercers	25	1.6%
Combined	2	0.1%
TOTAL	1,538	100%

Narrow blade microliths and knapping styles dominate the flaked lithic assemblage from Nethermills. This covers a wide chronology in Scotland, from the earliest Mesolithic sites (eg Cramond, *c* 8400 cal BC (Saville 2008)) to later material (Finlay et al 2002), though most of the narrow blade sites fall into the earlier millennia. There was very little lithic material to indicate later activity at Nethermills, despite the radiocarbon determinations. Thumbnail-scrapers with pressure-flaked working edges (of which there are two, 78/506 and 78/807 (Illus 14)) are a common Early Bronze Age type and there is a single scale-flaked (slug) knife (78/196

(Illus 15)), which is also likely to come from this period. In addition, two other pieces with retouch indicative of Bronze Age traditions were recorded.

Though the possibility of the survival of microlith technologies into later times has long been mooted (from Lacaille 1954, onwards), there is, in fact, no secure evidence for this in Scotland. Work by Griffiths suggests an overlap between sites using rod microliths and sites with Early Neolithic technologies in the uplands of Yorkshire (2014), but she also suggests that the situation is likely to have been very regionally specific and that in lower valleys, for example, there is less evidence for overlap. It has to be concluded that, while the riverside at Nethermills may well have been visited both before and after the Mesolithic, the archaeological material from the excavated site primarily documents activity during the Mesolithic.

INTERPRETATION OF THE LITHIC ASSEMBLAGE

Both before and after excavation, Kenworthy drew parallels between the range of artefact types found at Nethermills and the interpretation of base camps in the contemporary archaeological literature (Mellars 1976; Binford 1978). This interpretation is highly questionable, however, given the likely build-up of the material as a result of many visits over a long period of time. The widespread distribution of burnt flint, suggesting many small hearth sites, supports the idea that the excavated assemblage is derived from a considerable palimpsest, as does the lack of any specific patterning in terms of artefact type or association.

In general, Kenworthy was right that there is a broad range of artefact types, and, while microliths certainly predominate, it would be simplistic to relate activity here to hunting alone (Finlay 2000; 2006). It is not possible to identify specific activity areas, but it does seem likely that the lithic assemblage from Nethermills has resulted from a range of activities including, but not restricted to, those associated with hunting. It also seems likely that it has accrued from repeated visits to the site and that, whether or not there were structures on site, specific areas were not set aside for specific tasks on a repeated or long-term basis.

OTHER FINDS

Coarse Stone tool: an oval hammerstone of quartzite with crush marks at the more pointed end (80/452: 64mm × 45mm × 36mm).

Prehistoric pottery: a single rim sherd (81/637: 19mm at its widest point).

Stone bead: a single disc of mica schist (79/026: 19.7mm × 17.7mm × 3.6mm (Illus 15)). The hole is conical, rather than bi-conical, suggesting that it was drilled from one side only. The artefact is split, the surface of the fracture suggesting that this occurred either during manufacture or use. This find was made in 1979 in Layer 2: ploughsoil. It is interesting in light of the existence of beads of similar shape and character, usually of shale, on other Mesolithic sites such as Nab Head in Wales and Star Carr (Jacobi 1980; Nash 2012; Lillie 2015).

Glass beads: there are two spherical glass beads with central holes. 80/650 is intact and opaque white in colour (diameter 3.2mm, thickness 2.3mm). 81/297 is broken; it is transparent yellow in colour (diameter 8.5mm, thickness 6mm).

Clay Pipes: There were 18 fragments of clay pipe. These were examined by Dennis Gallagher (nd) who reported that all date to the later 19th century. Where it was possible to discern place of manufacture they were from Aberdeen. It is likely that they were deposited in the field during the spreading of midden as fertiliser from nearby settlements.

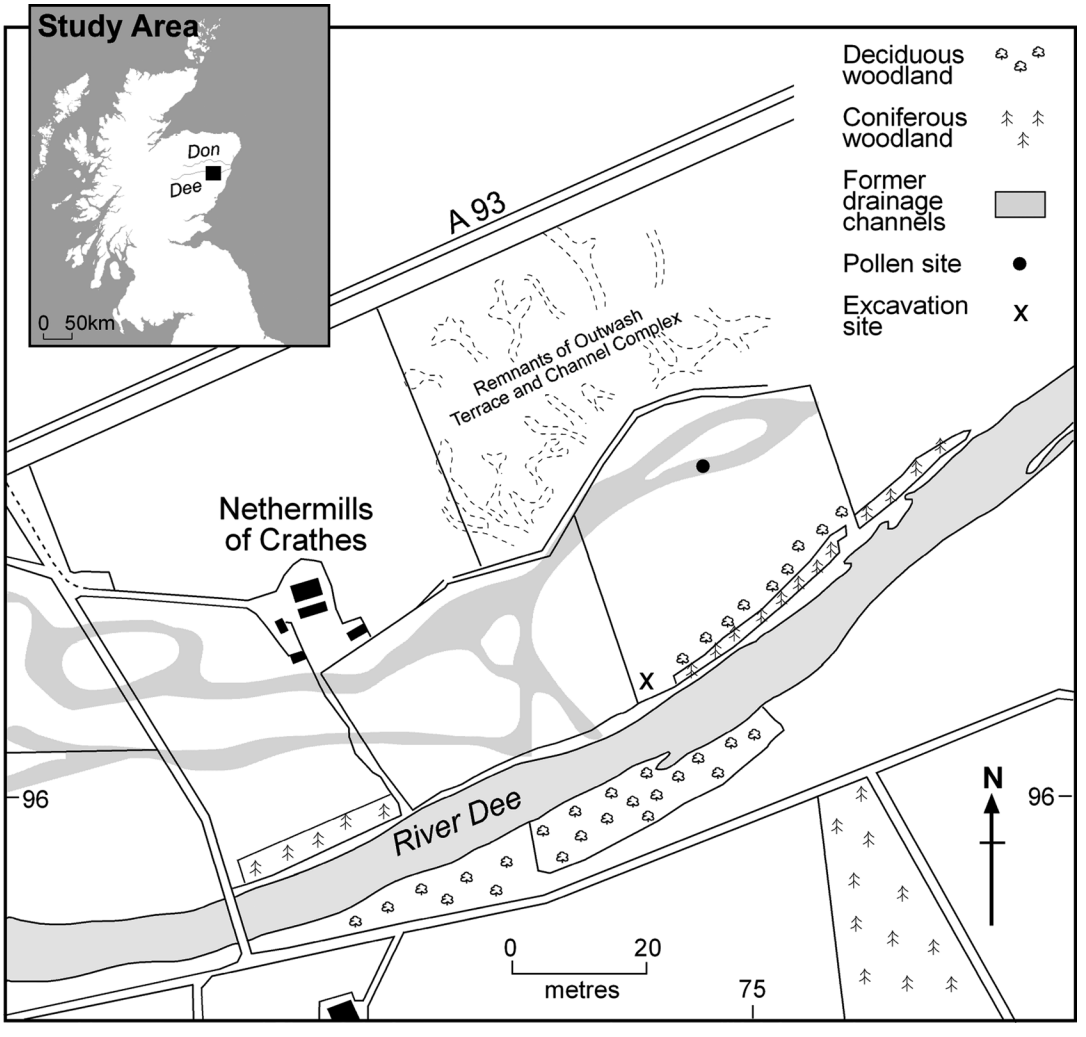
ENVIRONMENTAL REMAINS

In 1985 Dr William Boyd (now of Southern Cross University, Australia) worked on the environmental remains from Nethermills and this resulted in the publication of a paper on the use of wood at the site in 1992 (Boyd & Kenworthy

1992). The section below is summarised from this report.

A large quantity of organic material was recovered from the site: comprising mainly wood charcoal and carbonised hazelnut fragments. In total, 263 samples from stratified features and 192 samples from the occupation horizon (Contexts 003–005) were examined. More recently, the few extant organic samples in the archive have been examined by Dr Susan Ramsay (nd).

Most of the charcoal from the post-holes was *Quercus* and this is supported by Ramsay, who also recorded mainly *Quercus*. In addition, both reports identified small quantities of *Betula* and *Corylus*. Ramsay also found *Pinus sylvestris* and she commented on one sample of *Picea* (cf Spruce), which probably relates to modern contamination. The main difference in the two reports is that while Ramsay comments on the unusual (in Mesolithic terms) absence of hazelnut shell, Boyd and Kenworthy report an abundance of hazelnut fragments. In addition, they note that fragments of oak bark were present in several post-holes, in some cases 'still attached to fragments of identifiable *Quercus* charcoal' (Boyd & Kenworthy 1992: 15). Sadly,

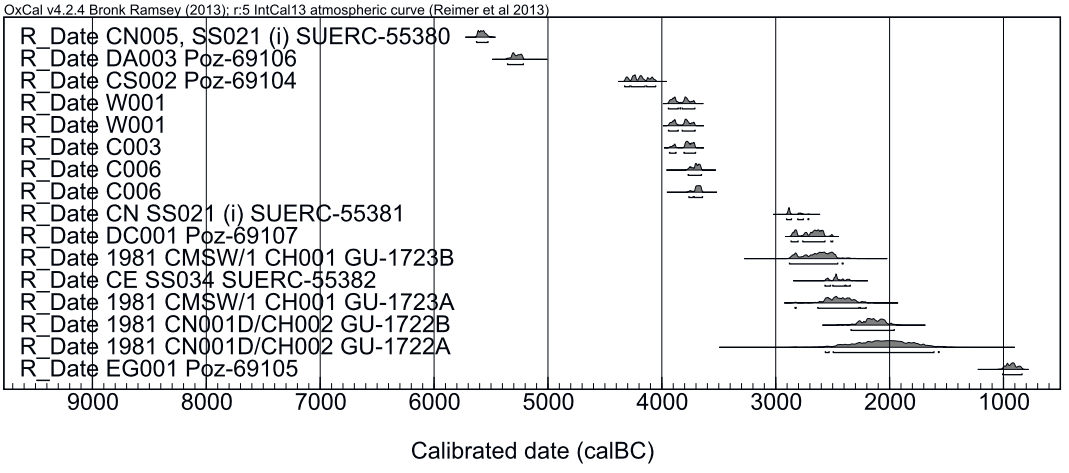


Illus 16 Nethermills, Palaeochannels and the current environmental setting of the site (after Ewan 1981)

the fragments of *Quercus* that survived among the remaining environmental samples in 2015 did not include identifiable elements such as bark, twigs or roundwood. Furthermore, the samples of hazelnut shell have been lost; most of this came from the topsoil and occupation horizon.

Preliminary pollen work on samples from peat deposits from an infilled river channel 400m north of the site was undertaken by Lorna Ewan as part of an undergraduate dissertation (Ewan 1981) (Illus 16). This work did not include the radiocarbon dating of any of the peat deposits, but Ewan's findings were correlated to dated pollen assemblages from the region (Edwards 1978) with which there was considerable correspondence. Ewan's discussion suggested that oak, hazel and birch were all present on the lower slopes along the river, supporting Boyd and Kenworthy's inference that local resources were used on site. However, given the chronological range of features, this use of resources was clearly not restricted to the Mesolithic. Ewan also identified the presence of *Alnus* and *Salix* in her samples, providing a useful picture of local conditions. Both Ewan and Boyd and Kenworthy contrasted the local oak woodland with the pine dominated forests farther west in the uplands of the Cairngorms.

These patterns of environmental evidence align well with other evidence for past environments and human use of such natural resources in the region (Vasari & Vasari 1968; Clark & Edwards 2004; Edwards 2004; Tipping et al 2009). The dominance of oak charcoal probably reflects its presence at and around the site. Oak wood is highly suitable for use as a strong and long-lasting timber; it splits readily into usable lumber. The suggestion that oak was selectively collected and used may be supported by the lack of hazel wood, despite the abundance of hazelnuts. The latter would have been a valuable source of nutrition and thus collected for their own value. While hazel may have grown at some distance, it is equally likely that it was a component of the river terrace woodland, along with the other tree species. The regional vegetation history for this mid-Holocene period is characterised in such places as being dominated by oak forest. The well-drained river terrace would have been most suitable for oak forest containing smaller quantities of birch and hazel, with alder and willow growing on the nearby riverbanks. Any pine wood is more likely to derive from higher in the catchment, and may suggest that the site occupants also collected river driftwood. Boyd and Kenworthy found little evidence for deliberate management of the local forest, a suggestion that still holds good, and that the charcoal and nut evidence reflects continued use of abundant local naturally growing resources.



ILLUS 17 Nethermills, calibrated radiocarbon determinations

TABLE 9
Nethermills, context of the radiocarbon determinations, calibration OxCal 4 (Bronk Ramsey 2014)

Context	*Date of submission*	*Lab code*	*Date BP*	*Material*	*Delta ^{13}C*	*Calibrated 1σ*	*Calibrated 2σ*	*Comments*	*Disturbance*
CN001D/CH002 Batch sample	1981	GU-1722A	3650±175	Willow and other charcoal	–26.2		2600–1500 BC	Feature CH/CN is generally 'confused' and difficult to interpret. CN is badly disturbed by animal runs some still voided	Yes
CN001D/CH002 Batch sample	1981	GU-1722B	3740±60	Willow and other charcoal	–26.2		2340–1950 BC	Feature CH/CN is generally 'confused' and difficult to interpret CN is badly disturbed by animal runs some still voided	Yes
CMSW1/2 CH001 Batch sample	1981	GU-1723B	4055±75	Willow and other charcoal	–26.1		2900–2350 BC	CM is a post-pipe within CN which is within CH. CN is badly disturbed by animal runs some still voided	Possible
CMSW1/2 CH001 Batch sample	1981	GU-1723A	3950±70	Willow and other charcoal	–26.2		2700– 220 BC	CM is a post-pipe within CN which is within CH. CN is badly disturbed by animal runs some still voided	Possible
C 003 Pit complex	March 2014	SUERC-50957 (GU32890)	4999±27	Charcoal *Betula*	–25.9	3797–3713 BC	3933–3705 BC		
C 006 Pit complex	March 2014	SUERC-50958 (GU32891)	4932±27	Charcoal *Betula*	–25.9	3748–3657 BC	3769–3653 BC		
C 006 Pit complex	March 2014	SUERC-50959 (GU32892)	4914±29	Charcoal *Betula*	–25.6	3703–3657 BC	3763–3724 BC		

Context	*Date of submission*	*Lab code*	*Date BP*	*Material*	*Delta ^{13}C*	*Calibrated 1σ*	*Calibrated 2σ*	*Comments*	*Disturbance*
W 001 Pit complex	March 2014	SUERC-50960 (GU32897)	5021±29	Charcoal *Betula*	–25.6	3933–3766 BC	3943–3711 BC	The uppermost context	
W 001 Pit complex	March 2014	SUERC-50964 (GU32898)	5016±29	Charcoal *Quercus*	–25.8	3931–3715 BC	3942–3708 BC	The uppermost context	
CN 005, SS021 (i) Pit north of structure	September 2014	SUERC-55380 (GU35104)	6644±28	Charcoal *Quercus*	-24.9	5618–5558 BC	5628–5527 BC	CN is badly disturbed by animal runs some still voided. Mottled grey brown soil	Yes
CN SS021 (i) Pit north of structure	September 2014	SUERC-55381 (GU35105)	4232±24	Oak *Quercus sp*	-26.7	2900–2780 BC	2905–2710 BC	CN is badly disturbed by animal runs some still voided	Yes
CE SS034 Post-hole, structure	September 2014	SUERC-55382 (GU35106)	3951±29	Oak *Quercus sp*	-25.4	2563–2354 BC	2568–2346 BC	Some animal disturbance, plenty of charcoal	Yes
CS002	February 2015	Poz-69104	5360±35	Oak *Quercus sp*		4320–4076 BC	4327–4055 BC	CS is a post-pipe within CX CS002 is a darker fill which was only differentiated in the SW quad	
EG001	February 2015	Poz-69105	2780±35	Oak *Quercus sp*		995–860 BC	1008–838 BC	Top context, grey silt with much charcoal, animal disturbance on E end	Yes
DA003	February 2015	Poz-69106	6305±35	Oak *Quercus sp*		5318–5227 BC	5355–5217 BC	DA003 is west part of DA. Pit with multiple posts	
DC001	February 2015	Poz-69107	4100±35	Oak *Quercus sp*		2849–2579 BC	2866–2500 BC	Dark brown soft fill, some animal disturbance in 002	Possibly

RADIOCARBON DETERMINATIONS (TABLE 9)

Four radiocarbon determinations were obtained on samples submitted at the time of excavation. In addition, 19 samples were submitted in connection with the recent analysis. Information relating to laboratories and calibration methods is supplied in Table 9. This resulted in a series of 16 widely spread determinations suggesting the burning of organic material from the mid-6th millennium BC onwards (Illus 17). The dates obtained in 1981 were derived from bulk samples, while the later dates, even when on smaller samples and apparently better contexted material, were not on recognisable elements such as twigs or small roundwood. In general, the later dates were obtained on fragments that were very small, mineralised and poorly preserved. It was not possible to determine if outer rings were present on any of the fragments so there may be significant errors in the dates in relation to human activity. As noted in Table 9, nine of the dated contexts had evidence of possible animal disturbance. All dates are thus of limited value.

These dates come from a variety of features (Table 9) and they do not help to elucidate the presence of potential structural elements on site. Bayesian modelling of the radiocarbon determinations was not undertaken due to the lack of contextual information and wide spread of determinations. Pits C and W did both yield a coherent range of early 4th-millennium cal BC dates, and it is relevant to note that these were among the few contexts where animal disturbance was not recorded.

While the radiocarbon determinations add little to detailed understanding of Mesolithic activity at Nethermills as confirmed by the lithic assemblage, they do support the existence of later activity, something that is only hinted at by the lithic material examined. As noted above, it is very unlikely that the microlithic industries continued in use into later prehistory.

NETHERMILLS: SITE INTERPRETATION

The bulk of the excavated material from Nethermills provides evidence for activity in the Mesolithic. It is not possible to be specific about the nature of that activity, but it is likely to have involved repeated visits to the site and possibly periods of discontinuity. The radiocarbon determinations do suggest that some of this activity took place in the 6th and 5th millennium cal BC, but given the lack of coherence to many of the features, it is impossible to say more about the character or duration of this activity.

INTERPRETATION OF THE STRUCTURAL REMAINS

At the time of excavation, Kenworthy identified a possible circle of post-holes in the mid-section of the excavation trench, which seemed to coincide with the occupation deposit and the main concentration of finds. As noted above, he interpreted this as evidence for a circular structure of Mesolithic date and similar to that which had been excavated by Woodman at Mount Sandel (1985). In his archived report, Ballin records that Kenworthy also proposed a second structure to the south of this, though this structure only appears on a single sketch plan drawn during or shortly after the 1981 excavations and it does not appear to have been considered in detail later on. Boyd and Kenworthy's publication in 1992 only refers to one house. This discussion will consider the two possible structures in turn.

STRUCTURE ONE

The putative Structure One lay in the centre of the main trench and comprised a number of post-holes, many of which were apparently recut (Table 10).

Although visually these features appear to correlate, closer inspection suggests that the situation is not clear-cut. The existence of two plough furrows neatly delimits the interpreted structure, suggesting that it may partly be a product of fortuitous survival. It should also be noted that in his later plans Kenworthy omitted a number of more amorphous features in order to clarify the appearance of those he considered significant. As noted above, the

TABLE 10
Nethermills, features relating to putative Structure One

Feature	*Interpretation*	*Associated organic material*	*Notes*	*Date*
CN/CM	Pit with clear post-hole	*Quercus* *Betula* *Corylus*: wood and hazelnut shell	Boyd and Kenworthy record bark	6644 ± 28 BP (SUERC-55380) *Quercus* 4232 ± 24 BP (SUERC-55381) *Quercus*
EG	Two intersecting post-holes	*Quercus* *Corylus*: hazelnut shell		2780 ± 35 BP (Poz69105)
CE	Post-hole, possibly a recutting of EH	*Quercus* *Corylus*: hazelnut shell		3951 ± 20 BP (SUERC-55382), *Quercus*
EH	Post-hole	*Quercus* *Corylus*: hazelnut shell		
CT	Pit possibly containing two post-holes	*Quercus* *Corylus*: hazelnut shell	Boyd and Kenworthy record bark	
CX/CS	Pit/post packing around a post-hole	*Quercus* *Corylus*: hazelnut shell		5360 ± 35 BP (Poz69104)
L	Pit containing at least one post-hole, possibly recut	*Quercus* *Betula* *Corylus*: wood and hazelnut shell	Boyd and Kenworthy record bark and the cusp of an acorn	
EK	Post-hole			
B	Post-hole			
DA	Pit with evidence for several intercutting post-holes	*Quercus* *Corylus*: hazelnut shell	Boyd and Kenworthy record bark	6305 ± 35 BP (Poz69106)
DC	Pit with evidence for several intercutting post-holes	*Quercus* *Corylus*: hazelnut shell	Boyd and Kenworthy record bark	4100 ± 35 BP (Poz69107)
EA	Post-hole, slightly inside the wider arc of posts	*Quercus*	Boyd and Kenworthy record bark	
BS	Post-hole, slightly inside the wider arc of posts	*Quercus* *Corylus*: hazelnut shell		
CK	Pit containing at least one post-hole	*Quercus*		
EF	Post-hole			
GG	Stake-hole, the only stake-hole associated with the arc			

radiocarbon determinations do not provide any chronological associations between the putative post-holes. It is also important to remember the disturbed nature of many contexts (animal disturbance was recorded across the site), which has compromised both the understanding of individual features and the resolution of the dates. Overall, the visual correlation of these features is compelling, but the radiocarbon dates strongly question the presence of a coherent structure here. The radiocarbon determinations suggest a palimpsest of features of different dates; the lithic evidence, meanwhile, indicates Mesolithic activity in this area.

STRUCTURE TWO

Kenworthy's proposed second structure lies to the south of Structure One and incorporates only a short arc of post- and stake-holes (DF, DM, AH, AF, AG, AR, and possibly R, N, P, as well as T, Y, Z, AC). There is no dating or other evidence to support this interpretation. However, Kenworthy is correct that the southern section of the trench does contain a number of post-holes, albeit all of them slighter than those of Structure One. None yielded enough organic material to be dated, nevertheless, many contained evidence for oak, and a few had hazelnut shells. The focus of these post-holes lies to the south, and, if reconstructed as a unified structure, it would be of uncertain, possibly sub-circular, shape and only partially excavated (Illus 6). The evidence suggests that if a structure were present it was built of oak, but there is no evidence for re-cutting and it would have been of slender construction. No dates have been obtained from the organic material here, and flaked lithic material was less dense in this area, though still of Mesolithic characteristics. This evidence is suggestive of a possible structure, but only further excavation (and dating) would prove or disprove its coherence (Table 11).

NEOLITHIC PITS

To the north of the excavation trench, pits C and W (Illus 7 and 8) have both yielded early 4th-millennium cal BC dates (Table 9). Traditionally this would place these features in the earlier Neolithic. Lithic material was markedly less dense in the immediate vicinity of these pits, but it is important to note that no recognisably Early Neolithic lithics were found on the site. Both pits were roughly linear and they lie alongside one another. Each was less than 1m deep and their amorphous fills suggested that they may have resulted from multiple filling events, perhaps in addition to slumping. Pit W seemed to contain several stake-holes, but there was no evidence for this in Pit C, which seems, from the radiocarbon evidence, to have been cut after Pit W. Three post-holes, DL, DN and CZ were, however, located around Pit C. These pits appear to provide coherent evidence for 4th-millennium activity at Nethermills albeit there is little obviously related material culture. At the time of excavation, Kenworthy suggested that they were burial pits, but there is no evidence to confirm this. These pits form part of a wider group of pits in Aberdeenshire that date to the late 5th–early 4th millennium cal BC that contain little in the way of diagnostic material culture. They bridge the gap between the late Mesolithic and earliest Neolithic in the region (Noble et al 2016) albeit their precise interpretation at Nethermills is uncertain.

EARLIER ACTIVITY AT NETHERMILLS

Indications that the site may have been visited during the Upper Palaeolithic are present, though sparse. They comprise the fragment of a tanged point, together with six other lithic pieces, all of disparate type and varied affiliation (see above), but in general suggesting occasional activity anytime between 13500–10000 BC. The emerging evidence for Upper Palaeolithic Scotland to date suggests the presence of small exploratory groups of hunters who may have left little archaeological footprint (Mithen et al 2015). In this respect, the lack of any coherent chronological or cultural patterning among the Nethermills pieces of Palaeolithic affinity would not be out of place.

LATER ACTIVITY AT NETHERMILLS

The lithic assemblage from Nethermills contains only five pieces indicative of post-Mesolithic flint working. To these may be added the

TABLE 11
Nethermills, features relating to Structure Two

Feature	*Size*	*Interpretation*	*Associated organic material*
DF	0.23m × 0.18m 0.12m deep	Truncated post- or stake-hole, vertical	*Quercus*
DM	0.21m × 0.17m 0.12m deep	Post-hole	*Quercus*
AH	0.08m × 0.06m 0.04m deep	Stake-hole, inclined to south-west	*Quercus* *Corylus*: wood
AF	0.06m × 0.06m 0.07m deep	Stake-hole, inclined to north	
AG	0.04m × 0.04m 0.04m deep	Stake-hole	
AR	0.2m × 0.2m 0.08m deep	Post-hole, vertical	*Quercus* *Corylus*: hazelnut shell *Betula*
R	0.27m × 0.2m 0.11m deep	Post-hole	
N	0.13m × 0.13m 0.08m deep	Stake-hole	
P	0.26m × 0.24m 0.16m deep	Post-hole	*Quercus* *Corylus*: hazelnut shell
T	0.43m × 0.15m 0.11m deep	Post-hole	*Quercus*
Y	0.14m × 0.13m 0.07m deep	Post-hole	*Quercus*
Z	0.12m × 0.06m 0.09m deep	Stake-hole	*Quercus*
AC	0.12m × 0.12m 0.34m deep	Stake-hole	*Quercus* *Corylus*: hazelnut shell

single rim sherd of early prehistoric pottery. The presence of Pits C and W, with their early Neolithic dates, indicates some later activity on site, but it is not possible to be sure what this represents. Other evidence for later activity lies in the radiocarbon determinations, but it is not associated with identifiable material culture. To date there is no secure evidence in Scotland that microlithic industries continued into later prehistory, and there is nothing at Nethermills to suggest this.

MESOLITHIC SITES IN THE VICINITY OF NETHERMILLS

The area of the River Dee around Banchory has attracted the attention of flint collectors from

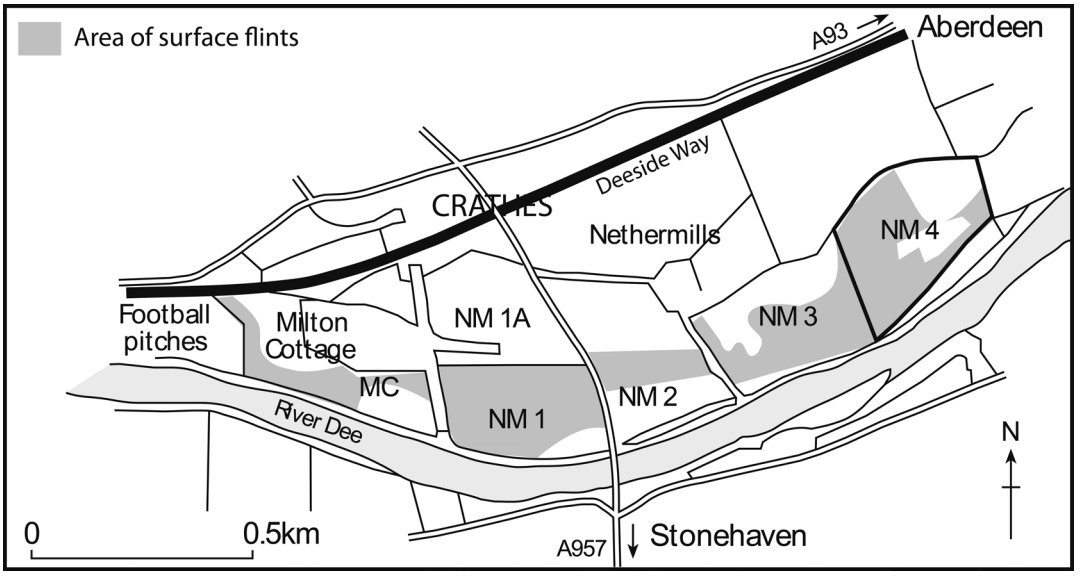
the days of Paterson in the early 20th century (Paterson & Lacaille 1936) to the work of Kenney at its close (Kenney 1993).

The Mesolithic assemblage excavated at Nethermills is likely to have derived from a palimpsest that had built up over a considerable period of time. In this respect it is important to remember that Kenworthy excavated only a tiny portion of a much bigger site. Grieve identified, and collected from, a number of flint scatters at Crathes (including the four fields of Nethermills and one designated Milton Cottage (*DES* 1975; CANMORE 2015)), all with similar material. The sites cover five fields and stretch along the river terrace for nearly 2km (Illus 18). In 1978, Kenworthy selected the area most likely to answer his research questions on the basis of lithic density and he excavated in the easternmost field (NM4). In more recent years, fieldwalking has continued to take place across the area under the aegis of the Over Fifties Archaeological Research Society (OFARS), now reconstituted as the North-East Scotland Archaeological Research Society (NESARS), directed by Heather Sabnis (a volunteer on the original excavation), initially with the collaboration of Kenworthy. This work has the aims of characterising the extent, intensity and nature of the lithic scatters at Crathes (Sabnis & Kenworthy 2008; 2009; Sabnis 2011; 2012; 2014). In addition, fieldwalking has been undertaken by Sheila Duthie, across both the north and south sides of the river. This brief account draws on these reports and takes account of all known recent fieldwalking.

Field collection was undertaken after ploughing and after the 'weathering' of the soil by rain, which helped to expose the lithics by removing the finer grained soil cover, whereas the walking of newly ploughed fields often led to the misleading conclusion that lithic material was absent. Fields were walked in 2m transects and lithics recorded by GPS and bagged individually – except where they occurred within 1m of each other when they were bagged together.

Between 2008 and 2012 this work recovered an assemblage of around 10,000 flaked lithics in a continuous scatter across the fields (Table 12).

Most of this assemblage has been collected by Sabnis and the following brief characterisation is based on her assessment of this material, which numbers 9,856 pieces in total.



Illus 18 Crathes, extent of surface flints collected from the fields in the vicinity of the excavation site at Nethermills (NM4)

TABLE 12
Crathes, lithic scatter sites along the river terraces on the northern bank of the River Dee

Site Name	*Grid Reference*	*Canmore ID and Site Number*	*Aberdeenshire HER Number*	*Notes*	*Approximate size of lithic assemblage*	*Year of fieldwork Collector*
Milton Cottage	NO 7473 9595	ID 36664 NO79NW 11	NO79NW0011	Broad and narrow blade microliths, cores, scrapers and debitage	700 (not including 1973 material)	1973, 2008, 2011 Grieve, OFARS/Sabnis
Durris Bridge also known as Crathes Mains, Nethermills West or NM1 and 1A	NO 7505 9600	ID 36639 NO79NE 24	NO79NE0022	Mainly narrow blade microliths but a few broad blade pieces, cores, scrapers and debitage. Also a polished flint knife, and other Neolithic types	4,200	1973, 2003, 2008, 2011, 2012 Grieve, OFARS/Sabnis, Duthie
Nethermills West or NM2	NO 7534 9591			Broad and narrow blade microliths, cores, scrapers and debitage	930 (not including 1973 material)	1973, 1978, 2004, 2009, 2010, 2011, 2012 Grieve, OFARS/Sabnis, Duthie
Nethermills East, NM3 also known as Nether Mills of Drum	NO 7564 9608		NO79NE0099	Broad and narrow blade microliths, cores, scrapers and debitage	2,690 (not including 1973 material)	1973, 2002, 2009 Grieve, OFARS/Sabnis, Duthie
Nethermills East, NM4 also known as Nethermills	NO 7588 9616	ID 36638 NO79NE 23	NO79NE0021	Broad and narrow blade microliths, cores, scrapers and debitage	1,950 (not including excavation)	1973, 1978, 1979, 1980, 1981, 2009 Grieve, OFARS/Sabnis
NM5, to east of excavation field	NO 795 982				10	Duthie

As with the excavated material, the field-walked assemblage comprises mainly pebble flint (all but three pieces). Most diagnostic pieces are Mesolithic and this includes a number of microliths as well as blades and blade cores (Table 13).

Most of the pieces are flakes and blades and the breakdown of clear diagnostic elements in the assemblage may be seen in Table 13. The platform cores include both blade cores and flake cores and all of the types recognised in the excavated assemblage are present, including handle cores. The microliths included broad blade types but the majority are narrow blade. Broad types include wide-based triangles and obliquely blunted points; the wide-based triangles tend to be larger than those found during the excavation. Narrow blade microliths comprise mainly crescents and edge-backed microliths and they are of similar dimensions to those found during excavation. There are also many microburins, in common with the

Table 13
Crathes, composition of diagnostic elements of the assemblage found during fieldwalking

Type	*Sub type*	*Number*
Split pebbles		50
Cores		
	Single-platform	189
	Two platforms	27
Flakes		1274
Blades		708
Broad blade microliths		
	Wide-based triangles	14
	Obliquely blunted points	3
Narrow blade microliths		
	Crescents	15
	Edge-backed microliths	14
	Other	2
Microburins		28
Scrapers		
	End	12
	Side	7
	Thumbnail	4
Leaf-shaped arrowheads		4
Knives	Flaked	2
	Ground and polished	1

excavated assemblage. Scraper types and sizes accord with those from the excavations.

One immediate contrast with the excavated material lies in the lack of classical Neolithic type fossils from the excavation compared to the small flaked knives, leaf-shaped points and polished knife from the field collections (which were supplemented by two potsherds of possible Neolithic date). These support the radiocarbon evidence that the human presence in the area included activity dating to the earlier 4th millennium cal BC.

It is not possible to separate out detailed foci for different periods, and there are, of course, no radiocarbon determinations associated with the fieldwalking, but it is clear that the northern banks of the River Dee at Crathes were a favoured location for several millennia. Lithic distribution charts were produced by calculating the total number of lithics in each 10m × 10m square, based on the GPS readings and the number at each find-point. These indicate two main concentrations of finds (Illus 19, A–D), together with other, smaller, foci.

From these plots it would appear that the main concentrations of lithics lie along the middle river terrace at the northern edge of NM1, and farther to the east along the same terrace at the juncture of fields NM3 and NM4 (Illus 19, D). This latter spot coincides with the excavation location.

The number and nature of the lithic scatters along this stretch of the River Dee show that extensive Mesolithic activity, which may well include structural remains, is in evidence along this part of the river. Excavation and further fieldwalking in other areas of the fields here would undoubtedly reveal further detail of Mesolithic activity. Given the encroachment of recent housing developments onto the northern reaches of the site and the proximity of the city of Aberdeen, examination for the survival of stratified features on other parts of the site should be a priority.

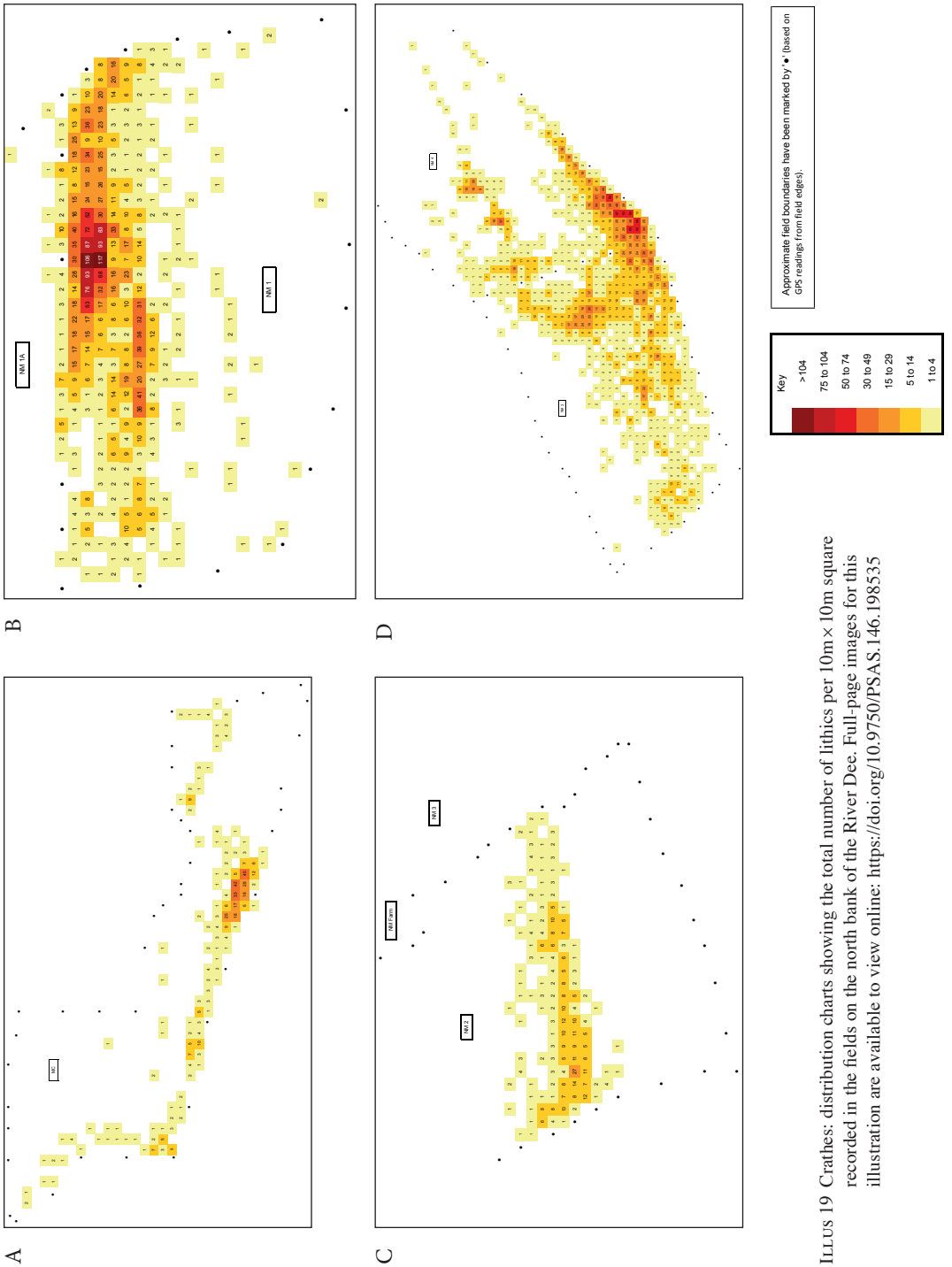
DISCUSSION

While it is not possible to validate the Mesolithic 'house' at Nethermills, the density of lithics suggests very extensive Mesolithic activity along this stretch of the River Dee. The existence of post-holes that once contained oak posts on which the bark had been left is highly suggestive of structural activity, but the radiocarbon dates do not indicate chronological integrity to the excavated features. Nevertheless, the recovery of an assemblage of around 30,000 flaked lithics, over 95% of which are of Mesolithic affiliation, is a strong indicator of Mesolithic activity, and, though the excavation of a Mesolithic house cannot be supported, the Nethermills landscape is clearly a Mesolithic site of some significance, with evidence of later prehistoric activity at this locale, too. The lack of clear material culture for these later episodes in the lithic material can partly be explained by the lack of definitive lithic type fossils in these periods and partly by the possibility that later activity was relatively brief and small in scale.

MESOLITHIC ACTIVITY AT NETHERMILLS

It is important to remember that the area excavated at Nethermills represents only a very small part of what was clearly a much larger site. Detailed work on the lithic assemblages from the northern bank of the River Dee has not been undertaken, but the general characteristics of the material indicate activity in the Mesolithic, together with some evidence for later activity. In the absence of full archaeological investigation, interpretation of this material is preliminary, but within the generally accepted paradigms of a mobile Mesolithic lifestyle it might be suggested that this was a favoured location that was repeatedly revisited over several millennia. Visits might be of different length and for different purposes, by different social groups and at different times of the year. In other words, within mobile lifestyles a location such as this would serve many purposes. Given the possible range of activities to be expected from separate visits, a wide variety of evidence, including various structural elements, might accrue.

As noted above, Kenworthy drew parallels between Nethermills and the Mesolithic structure at Mount Sandel, then recently excavated by Woodman in Ireland (1985). Several similar sites



ILLUS 19 Crathes: distribution charts showing the total number of lithics per 10m × 10m square recorded in the fields on the north bank of the River Dee. Full-page images for this illustration are available to view online: https://doi.org/10.9750/PSAS.146.198535

to Mount Sandel have since been excavated (eg Cass ny Hawin, Woodman 1987; East Barns, Gooder 2007; Howick, Waddington 2007a; Ronaldsway, Brown 2011; Echline Fields, Robertson et al 2013; Low Hauxley, Waddington & Bonsall 2016) and there is also other evidence for less robust structures (eg Kinloch, Rum, Wickham-Jones 1990; Echline Fields, Robertson et al 2013). Many of these structures are substantial and their precise role is still under debate (Waddington 2007b), but in general they are interpreted as dwellings and associated with narrow blade microlith industries (Waddington 2015). The repertoire of Mesolithic structures is rapidly growing in both number and variety and, while this is exciting, it should be remembered that the hunter-gatherer attitude to built constructions and their role in the landscape was much more fluid than we sometimes think. Buildings might have lain empty for a season; different members of society might have occupied them at different times; and they might have served different purposes at different times of the year (David et al 2014). Larger, more permanent structures do not necessarily mean more clearly defined functions, less mobility, or bigger community groups. The situation has certainly advanced since Wickham-Jones considered the evidence for structures in the Scottish Mesolithic (2004), but there is still much work to be done before we can consider the role of Mesolithic house structures in detail.

The Mesolithic evidence from Nethermills may not allow for an exploration of the role of Mesolithic structures, but the lithic assemblage may be interpreted as relating to a variety of activities, including hunting, that took place over repeated visits to the site. This interpretation is supported by the general location. The River Dee at this point is likely to have comprised a number of anastomosing channels (Tipping pers comm) and would have offered a variety of resources, as did its fertile wooded hinterland. It also offered easy access to other ecosystems both up and down river and in this respect the mobile lifestyle ascribed to the hunter-gatherer communities of Scotland is significant. The River Dee is easily navigable (and research suggests it would have been so in the past (Werritty & Hoey 2004)). Research has now identified evidence for Mesolithic activity along the length of the River Dee, from Chest of Dee in the Cairngorms to the coast (below), and Nethermills lies at the heart of this.

Given this location on a major routeway, it is not surprising to find that the material culture that has survived suggests a variety of activities. The immediate environment offered both land- and freshwater-based resources, including salmon and other freshwater fish, freshwater mussels, birds, land and riverine mammals such as otters, as well as a range of vegetation including woodland and open land (Jenkins 1985). Interestingly, while the site lies near to a traditional crossing point of the River Dee (Durris Bridge) from which a route runs south (The Slug Road to the coast at Stonehaven is mentioned as a turnpike in the *New Statistical Account* in 1845, p 175), even today other main routes in the area run east/west and follow the course of the river, emphasising the lasting importance of the water course for recent movement in this part of Aberdeenshire. If we assume that settlement took place here in the Mesolithic, however short-lived, it is likely that full use was made of the available resources, perhaps on different occasions and at different times of the year. The presence of hazelnut shell suggests activity in late autumn or winter. Other seasonal indicators are lacking, but a location such as this would support a hunter-gatherer community at most times of the year.

DEESIDE IN THE MESOLITHIC

The lithic scatters at Nethermills extend along the northern bank of the River Dee so that it is difficult to separate one focus of activity from another. There are, however, other lithic find spots elsewhere along the river. In 1992, Boyd and Kenworthy published a map indicating another 12 field sites both upstream and downstream of Nethermills; and the River Dee was also targeted by Kenney for research into lithic finds of possible Mesolithic or Early Neolithic date (1993). Kenney reported finds as far west as Invergelder on the Balmoral estate, but concluded that find spots were less dense to the west of Banchory.

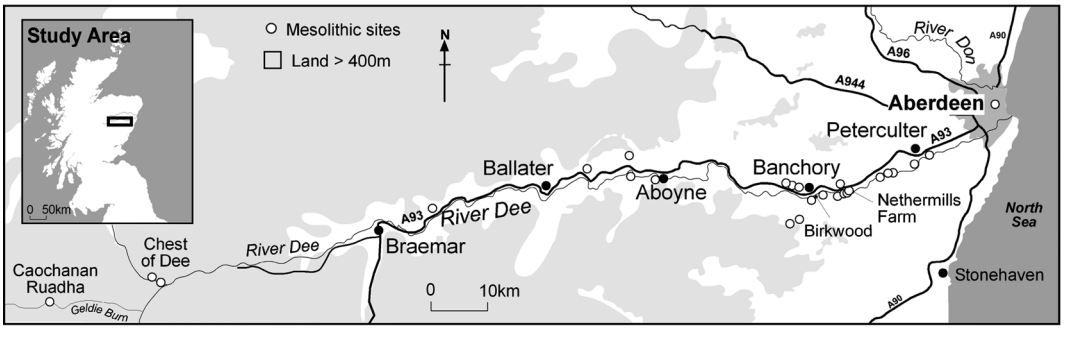
TABLE 14
Nethermills, Mesolithic sites in the immediate vicinity of the excavation site

Site	*Grid reference*	*Canmore ID*	*Canmore site number*	*Description*
Birkwood	NO 7103 9569	36694	NO79NW 9	Lithic scatter
Warren Field, Crathes	NO 7375 9668	36671	NO79NW 1	Pit alignment and lithic scatter
Balbridie	NO 7380 9590	36666	NO79NW 1	Lithic scatter

Current interpretation of Mesolithic Scotland assumes a territorial round that encompasses the sophisticated understanding and use of a wide range of ecosystems. As noted above, the River Dee would lie at the heart of a system such as this, and it may be that the problems of locating and identifying Mesolithic material (Saville & Wickham-Jones 2012) have limited the available evidence and resulted in a bias towards specific visible archaeological 'envelopes'. In this respect, it is noteworthy that recent work by the Upper Dee Tributaries Project (Fraser et al 2013; Noble et al 2014) has extended the distribution of Mesolithic sites upstream to include the whole length of the river, from the uplands to the sea (Illus 20). The Dee Tributaries work also shows how new sites may be found in previously unproductive areas.

Notable sites in the vicinity of Nethermills include the pit alignment and lithic scatter at Crathes on the north side of the river (Murray et al 2009), Birkwood on the southern bank of the River Dee (Paterson & Lacaille 1936), and the lithic scatter at Balbridie, also on the south bank (Reynolds 1980; Ralston 1982). All of these have yielded extensive collections of lithic material including microliths (Table 14). In addition, fieldwalking by Duthie has identified a series of lithic scatter sites of unidentified date to the south of the river, together with another at Drumoak, to the east of Nethermills (Table 15).

Downstream, the river flows through fertile agricultural land that is increasingly built upon by housing. There are a number of flint scatters with a Mesolithic component (Mann 2013), including a recently recorded site at Milltimber (NGR: NJ 855 015) and a site at Garthdee Road (NGR: NJ 923 032, Canmore ID 281364, NMRS Site Number NJ 90 SW 268 (Murray & Murray 2015)), both of which have structural remains. Farther downstream, the city of Aberdeen has



ILLUS 20 Nethermills, Mesolithic find spots along the River Dee

masked early prehistoric finds, though Kenney reports the recovery of lithic material, including microliths, from four sites in the centre of Aberdeen (Kenney 1993: 20).

Upstream, the fertile land continues, though the land rises, and after about 20km the valley sides narrow and the river enters the more mountainous terrain of the Cairngorms. Lithic scatters with a Mesolithic component have been recorded along this stretch of river, but none has been examined in detail until recently, when the Upper Dee Tributaries Project (Fraser et al 2013) uncovered extensive evidence for Mesolithic activity along the high reaches of the River Dee and its tributaries, notably at White Bridge and Chest of Dee and along the Geldie Burn at Caochanan Ruadha. The lithic assemblages include narrow blade cores and microliths of comparable type to those from Nethermills, and the dates range from the late 8th millennium BP to the turn of the 6th/5th millennium BP (Warren pers comm; Noble et al 2014).

The range of work undertaken on these sites, and the dates of analysis make direct comparison difficult at this stage, but it is clear that the River Dee comprised an important Mesolithic routeway. Future work might include detailed analysis of the lithic assemblages and raw materials in order to assess whether the source really is coastal flint, and whether it was being moved into the uplands, or whether other materials were being exploited as well (the assemblages in the uplands include the use of rhyolite for example). It will also be interesting to consider material size in order to assess any diminution in artefacts away from the sources, but at this stage, the necessary detail is not consistently available from the many assemblages involved. Given the span of the Mesolithic, direct links between individual sites may prove difficult to establish. Nevertheless, the quantity of Mesolithic sites that has been recorded along the river suggests that it was much used in early prehistory. Nethermills lies at its core and is the largest site yet identified.

While she acknowledged the problems of locating lithic scatter sites in much of the terrain traversed by the River Dee, Kenney concluded that 'the Banchory/Crathes area was the focus of early activity, especially Mesolithic' (1993: 20). To date, her work remains the most comprehensive look at the River Dee as a complete river system in the Mesolithic.

THE WIDER CONTEXT OF NETHERMILLS

River travel is fundamental to interpretations of the Mesolithic lifestyle in Scotland. It facilitated access across the landmass to a variety of resources. It is quite possible that the communities who used the River Dee were small and rarely needed to look farther afield. Nevertheless, research elsewhere suggests that hunter-gatherers ranged across greater territories (Wickham-Jones

TABLE 15
Nethermills, undated lithic scatter sites in the vicinity of the excavation site

Site	*Grid reference*	*Approximate number of lithics*
Park, Drumoak, north bank of the River Dee	NO 7938 9796	117
Wester Durris, south bank of the River Dee	NO 765 963	4
Kirkton of Durris, south side of the River Dee	NO 774 963	52
Nether Balfour, south side of the River Dee	NO 778 966	151
Upper Balfour, south side of the River Dee	NO 784 962	91
Woodlands field, Upper Balfour Farm, south side of the River Dee	NO 785 959	39

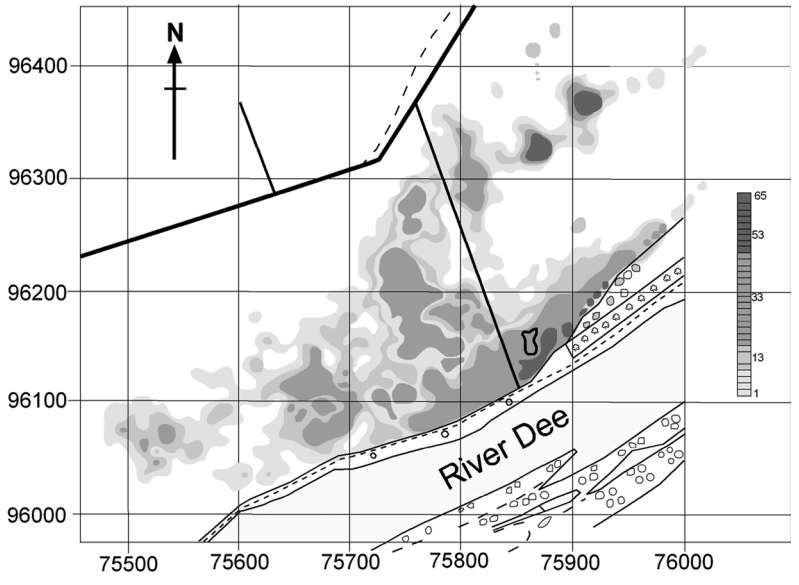
2005) and it is important to set the communities of the River Dee, and Nethermills in particular, into a wider context.

The North-East Scotland Research Framework resource assessment (Mann 2013) lists over 50 sites with Mesolithic material in north-east Scotland, of which less than 10 have been dated, and many of these are isolated pits on later sites. Most of the sites lie in the lowlands along the major rivers, especially the River Dee and the mouths of the rivers Don and Ythan, but this is simply where the present agricultural land is located (thus facilitating the recognition of sites today) and the Dee Tributaries project suggests that the uplands were also extensively used. The current distribution of sites is undoubtedly a relic of the way in which archaeological work has led to the detection of sites, but it does also highlight the importance of the River Dee (and other river systems) in the wooded environments of the early Holocene.

THE SIGNIFICANCE OF THE MESOLITHIC LANDSCAPE AT NETHERMILLS

Overall, the landscape at Nethermills represents one of the largest Mesolithic sites in the UK. Kenworthy's excavations targeted one tiny area where a palimpsest of cut remains survived. The excavated site covered 154 square metres and yielded *c* 30,000 lithics. Fieldwalking has yielded lithics across an area of roughly 600,000 square metres (Illus 18) (Sabnis 2014; Duthie pers comm). Extrapolation out from the excavation reveals the true nature of the potential remains. Even allowing for differential distribution and density, an assemblage of well over one million lithics could be preserved here, most likely with associated stratified features. Illus 21 indicates the existence of various 'high spots' of lithic material in the fields around the excavation trench, which are clearly worthy of investigation. It is over 30 years since excavation took place and modern intensive ploughing and other agricultural activities will, no doubt, have impacted adversely on the archaeology. Nevertheless, refined prospection, excavation and analytical techniques, and prompt and careful radiocarbon dating might be more successful in validating and exploring the surviving Mesolithic remains of the fields at Nethermills.

Given the location of these remains at the heart of a wider system of hunter-gatherer and other activity, it is clear that this is a landscape of



ILLUS 21 Nethermills, lithic density around the excavation site

considerable significance for Mesolithic studies and a potentially very important resource within the suite of Scottish archaeology. Assessment of the survival of material here should form a high priority for any local or national archaeological strategy.

CONCLUSION

Final evaluation of the excavated site at Nethermills has been slow, but the significance of the remains, despite the lack of a coherent Mesolithic structure at the site, is considerable. The scatter of lithics indicates repeated visits by Mesolithic communities creating one of the densest and most extensive concentrations of Mesolithic lithics in Scotland. Unfortunately, it has not been possible to verify the existence of a 'Mesolithic house' at Nethermills. Radiocarbon assay from a variety of features associated with the potential structure provided a wide spread of dates, suggesting organic samples ranging from the 6th millennium BC onwards. The relationship of one feature to another thus remains uncertain, but is likely to represent a palimpsest of activity rather than a single phase. This picture is no doubt clouded not only by the passage of years but also by the disturbed nature of many contexts, which has compromised both the understanding of individual features and the resolution of the dates.

Nevertheless, the recovery of an assemblage of around 30,000 flaked lithics, most of which are of Mesolithic affiliation, is a strong indicator of Mesolithic activity on site. Indeed, very few of the lithics suggest more recent activity and only a single sherd of prehistoric pottery was recorded. While the clarity of the structural remains found at Nethermills during the excavation from 1978–81 is disappointing, the density of lithics along the river at this point is highly suggestive of extensive activity in the Mesolithic and it is probable that features relating to this activity survive beneath the ploughsoil here.

Nethermills was a location that held particular attraction for human communities down the millennia. It was the focus of Mesolithic activity, probably on many occasions, and may have attracted activity during other periods of prehistory. Knowledge of the Mesolithic, with its mobile lifestyle, is dependent on analysis of wide patterning across considerable stretches of landscape. Nethermills, set at the heart of a major river system and with potentially related sites both inland in the Cairngorms and towards the sea, is a significant resource, and one that could significantly advance our understanding of the Mesolithic. It is clearly an area with considerable potential for the survival of material relating to a period of Scottish prehistory that remains surprisingly poorly understood.

ACKNOWLEDGEMENTS

Many people have helped to bring the results of the excavations at Nethermills to publication and a great debt is owed to all of them. The original excavations were undertaken by the late James Kenworthy, who inspired a love of the Mesolithic in his students, both local and farther afield. Work to achieve the final publication was facilitated by Historic Environment Scotland with the help of Jonathan Trigg and Alan Saville. Permission for the original excavation was granted by Lord Cowdray and his tenant: W Abernethy. Northlight Heritage helped co-ordinate the post-excavation programme along with staff at the University of Aberdeen. Bill Boyd unearthed the environmental material and kindly consulted on the final report. Lorna Ewan also revisited the past by providing her original environmental assessment. Jane Kenney kindly gave permission to use material drawn from her PhD research. Anna Ritchie drew up an archive list of the contents of James' boxes and folders. The late Magdalena Midgeley, Alan Russell, Bill van de Veen and Allana Simpson were all thanked in the interim report for work during and after excavation. Torben Bjarke Ballin, Dennis Gallagher and Susan Ramsay are all to be thanked for their specialist work and more general comments. Marion O'Neil produced the lithics drawings; Jennifer Johnston produced the excavation and other drawings. One problem has been the disappearance of the site photographs: to remedy this Alan Russell has handed his photographs taken during the excavation over to the archive and Jonathan Trigg provided Illus 8 from the material he had. Heather Sabnis and Sheila Duthie kindly shared the results of their fieldwalking. Marjorie Wilson unearthed further material from James' archive. Ann Clarke and several anonymous referees are all thanked for their comments which helped to make the publication a stronger, clearer,

piece of work. This publication is grant aided by Historic Environment Scotland.

APPENDIX

Definitions of the main lithic categories:

Bipolar core: The final waste product of hammer-and-anvil production of flakes and blades. These cores have no actual striking platforms but instead two opposed crushed ridges (one reduction axis). If the core has been re-orientated, it would tend to have an extra set of opposed crushed ridges (a second reduction axis) at an angle perpendicular to the original reduction axis. The cross-section of a bipolar core tends to be lenticular.

Bipolar flakes and blades: In contrast to ordinary platform blanks, bipolar blanks have no actual platform remnant but a crushed proximal ridge and, occasionally, also some damage where they rested on the anvil.

Chips: All flakes and indeterminate pieces the greatest dimension (GD) of which is ≤ 10mm.

Flakes: All lithic artefacts with one identifiable ventral (positive or convex) surface, GD > 10mm and L < 2W (L = length; W = width).

Indeterminate pieces: Lithic artefacts which cannot be unequivocally identified as either flakes or cores. Generally, the problem of identification is due to irregular breaks, frost-shattering or fire-crazing. *Chunks* are larger indeterminate pieces, and in, for example, the case of quartz, the problem of identification usually originates from a piece flaking along natural planes of weakness rather than flaking in the usual conchoidal way.

Blades and microblades: Flakes where L ≥ 2W. In the case of blades W > 8mm, in the case of microblades W ≤ 8mm.

Cores: Artefacts with only dorsal (negative or concave) surfaces – if three or more flakes have been detached, the piece is a core, if fewer than three flakes have been detached, the piece is a split or flaked pebble.

Tools: Artefacts with secondary retouch (modification).

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This paper is published with the aid of a grant from Historic Environment Scotland