Lithic Research

AOC Archaeology Group

CARWOOD, BIGGAR

PRESENTATION AND DISCUSSION OF THE LITHIC ASSEMBLAGES FROM THE CARWOOD AREA TEST PIT EXCAVATION

LITHIC RESEARCH REPORT

Torben Bjarke Ballin

60131-25

15th April 2026

DESTINATION TWEED

UNCOVERING THE TWEED

Archaeology • Heritage • Conservation

On Behalf of: *Destination Tweed*
Old Melrose Dairy Steading
Melrose
TD6 9DF

National Grid Reference: *NT 4565 3270*

Author: *Torben Bjarke Ballin,*
Lithic Research

Illustration by: *Torben Bjarke Ballin & Beverley Ballin-Smith*

Document Review History

Rev	Date	Author	Approved by	Revision Stage
01	15.04.2026	Torben Bjarke Ballin	Cathy MacIver	For issue

Non-Technical Summary

Two workshops were undertaken by Torben Bjarke Ballin on behalf of the *Uncovering the Tweed* project at Biggar Museum in January to February 2026. Participants were given the opportunity to learn about identification and cataloguing of lithics and reviewed the contents of several lithic assemblages retrieved during a campaign of fieldwalking and excavation undertaken over several years by the Biggar Archaeology Group under the leadership of the late Tam Ward. The Carwood Area test pitting assemblage was selected for further work and this specialist report presents the findings of the project. In summary the assemblage from the Carwood Area likely forms part of a larger, multi-period sites around Carwood Farm and the site was likely settled repeatedly from the Mesolithic/Neolithic transition onwards. The assemblage demonstrates evidence of activity during the Early, Middle and Late Neolithic periods, as well as the Early and Middle Bronze Age.

Acknowledgements

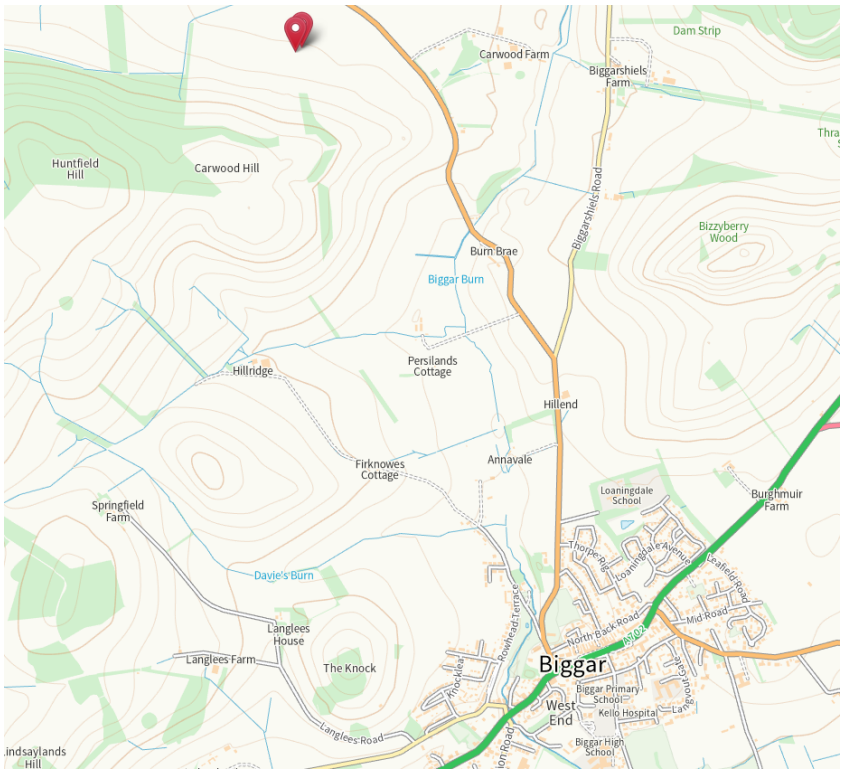
We are grateful to Biggar Museum for hosting and facilitating the workshops and providing access to the assemblages. Michele Learmonth coordinated the logistics and identified assemblages that could be of interest. Thanks to the staff and volunteers at Biggar Museum including Sharon Bradley and Jim Ness and to Biggar Archaeology Group members for being so accommodating about the works undertaken. AOC would also like to thank all the participants for attending the workshops and to Torben for his expertise. The Destination Tweed project is a multi-partner collaboration led by the Tweed Forum. As part of the wider Destination Tweed which has over thirty funders, the Uncovering the Tweed project is funded by National Lottery Heritage Fund Scotland, Historic Environment Scotland, and the Fallago Environment Fund.

Participants learning about lithic ID from Torben during the first workshop

INTRODUCTION

In connection with AOC Archaeology's *Uncovering the Tweed* project, a number of workshops were carried out for local volunteers, offering them basic training in the identification of lithic raw materials, types and technology. One of these workshops took place at Biggar Museum, South Lanarkshire, followed by a second workshops where the volunteers attempted to use their newfound skills to classify, characterise and catalogue bags of lithics from a number of locations at and around Carwood Farm NNW of Biggar (Fig. 1). These finds included a site excavated by the late Tam Ward and members of the Biggar Archaeology Group (BAG) in 2008-09 (Carwood Farm) and a site investigated by test pitting by Jim Ness and members of BAG in 2014 (Carwood Area). As shown in Fig. 1, these two sites were located immediately next to each other, approximately 3km NNW of Biggar town. In addition, finds from fieldwalking in the area around those two sites were also inspected.

Fig. 1. The location of the two sites in relation to Carwood Farm (c. 1km towards the east) and Biggar town towards the SSE. The two sites are so close that they are almost indistinguishable on the map (map copied from the programme Grid Reference Finder – gridreferencefinder.com).

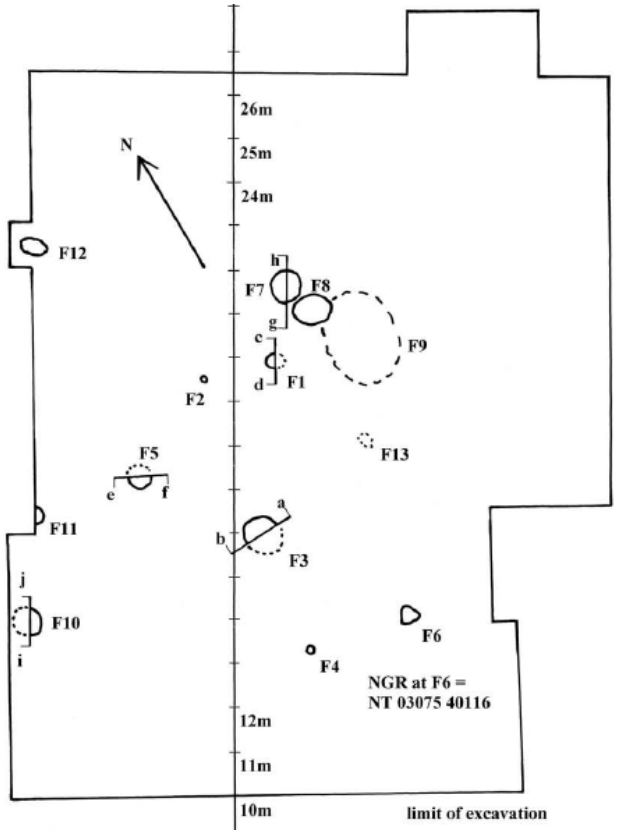


Following the events at Biggar Museum, it was decided to produce the present final professional report on the finds from Carwood Farm 2008-09 and Carwood Area 2014, that is, the finds initially catalogued by the volunteers at the Biggar Museum workshop. It was decided to focus on the finds from these two neighbouring sites and leave the fieldwalking collections for the present time, as these fields are in some cases situated several kilometres from the excavated/test-pitted locations which they may not be linked to in any way. Carwood Farm and Carwood Area may be parts of the same prehistoric site.

The purpose of the present report is to characterize the lithic artefacts in detail, with special reference to raw-materials, typological composition and technology. From this characterization, it is sought to date and interpret the finds to the degree this is possible. The evaluation of the lithic material is based upon a detailed catalogue of all the lithic finds from Carwood Farm and Carwood Area, and in the present report the artefacts are referred to by their number in the catalogue (CAT no.).

In this report the typology follows Ballin (2021); GD = greatest dimension and av. dims = average dimensions.

Fig. 2. The excavation at Carwood Farm; a baseline is running through the site, orientated roughly NNE/SSW (Ward 2013).



THE LITHIC FINDS FROM THE CARWOOD FARM EXCAVATION

Following successful fieldwalking as part the *Pre-History North of Biggar* project, it was decided to carry out a small excavation at this location (NGR: NT 03075 40116). The ploughsoil was hand-trowelled, and the buried turf then removed and checked for finds. Then the ground was trowelled clean to determine if any *in situ* finds were left and if any subsurface features had survived. The ploughsoil finds were not plotted, whereas the *in situ* finds were plotted in plan with reference to the base line at 10cm accuracy. The entire trench was finally trowelled down to natural which was a thin layer of orange/brown till.

As shown in Fig. 1, 12 pits were recorded (Ward 2013). They were generally sectioned and one half excavated, but Features (F) 6, 7 and 8 contained relatively high proportions of pottery and were therefore fully excavated. F8 and F9 were notably disturbed by rabbit and mole burrowing.

General overview

During the excavation at Carwood Farm, 242 lithic artefacts were recovered (Table 1). In total, 80.5% of the artefact assemblage is debitage, 3.7% is cores, and 12.8% is tools.

Table 1. Carwood Farm. General artefact list.

	Flint	*Chert*	*Quartz/-ite*	*Pitch-stone*	*Jet*	*Various stone*	*Total*
Debitage							
Chips		2		1			3
Flakes	37	105	2	2			146
Blades	6	13		1			20
Microblades	1	2		3			6
Indeterminate pieces		15					15
Crested pieces	3	2					5
Total debitage	*47*	*139*	*2*	*7*			*195*
Cores							
Single-platform cores		1		1			2
Levallois-like cores		4					4
Irregular cores	1						1
Bipolar cores		1					1
Core fragments		1					1
Total cores	*1*	*7*		*1*			*9*
Tools							
Discoidal scrapers		1					1
Short end-scrapers		5					5
Double-scrapers		1					1
End-/side-scrapers		1					1

	Flint	*Chert*	*Quartz/-ite*	*Pitch-stone*	*Jet*	*Various stone*	*Total*
Scraper-edge fragments		1					1
Polished-edge knives	1						1
Scale-flaked knives		2					2
Truncations		1					1
Combined knives/scrapers	1						1
Fragments of bifacial implements	2						2
Pieces w edge-retouch	5	6					11
Axeheads, incl. flakes						4	4
Napkin rings					2		2
Hammerstones			1			1	2
Pounders			2				2
Anvils			1				1
Total tools	*9*	*18*	*4*				*31*
TOTAL	**57**	**164**	**6**	**8**	**2**	**5**	**242**

Raw materials – types, sources and condition

As shown in Table 2, the assemblage is notably dominated by chert (67.8%) and flint (23.5%), supplemented by a number of other raw materials. These other raw materials include quartz and quartzite (2.5%), Arran pitchstone (3.3%), materials belonging to the jet family (0.8%) and a variety of rock types, such as greywacke, Cumbrian tuff and metamicrogabbro.

Table 2. Carwood Farm. Raw material composition.

	n	%
Flint	57	23.5
Chert	164	67.8
Quartz/-ite	6	2.5
Pitchstone	8	3.3
Jet	2	0.8
Various stone	5	2.1
TOTAL	**242**	**100.0**

In Britain, flint is defined as a lithic raw material deriving from chalk, whereas chert is a flint-like material from other types of sedimentary rock, such as limestone, sandstone, mudstone, etc. Only one reddish-brown flake (CAT 136) was defined as local (i.e., Scottish) flint, probably deriving from the North Sea coast (Table 3). Almost 85% of the flint is mottled-grey probably Yorkshire flint (Ballin 2011b), whereas it is thought that two pieces of black flint may have been procured from other sources, such as outcrops in East Anglia (Saville 1981). In connection with his examination of the finds from sites near the Overhowden Henge, the analyst showed that the two main types of later Neolithic arrowheads were based on very different raw material preferences. The Middle Neolithic chisel-shaped arrowheads are almost entirely (75-90%) based on mottled-grey so-called Yorkshire flint, whereas the Late Neolithic oblique arrowheads are notably dominated by black *so-called* Yorkshire flint (50-80%).

Table 3. Flint types present.

Mottled-grey exotic flint	48	84.2
Black exotic flint	2	3.5
Local flint	1	1.8
Discoloured flint	6	10.5
TOTAL	**57**	**100.0**

This trend (a 'flip' in raw material preferences from Scottish Middle Neolithic assemblages to Late Neolithic assemblages) is mirrored elsewhere in Scotland, with diagnostic Late Neolithic flints from for example Ormiegill chambered cairn in Caithness (Clarke *et al.* 1985, Fig. 2.8), the Midmill settlement in Aberdeenshire (associated with Grooved Ware; Ballin 2010b) and a ritual pit at Guardbridge in Fife (associated with Grooved Ware; Ballin 2016) being in black flint.

Six pieces of discoloured flint are burnt and weathered pieces.

Compared to the site's vitreous flint, the chert has a distinctly 'greasy' lustre. The chert from the present site is generally light- to dark-grey or black, but one flake (CAT 212) is based on a form of rust-brown/grey chert like one of the unusual chert forms recovered from the Hamburgian site Howburn near Biggar (Ballin *et al.* 2018, Fig. 15; this report's Fig. 3). The grey and black cherts from Carwood Farm are notably flawed, characterised by intersecting fault-planes which caused the material to fracture into roughly tabular fragments. One of 46 cortical chert artefacts has rough vein cortex, indicating that this material may have been procured by mining, whereas the remaining 45 pieces (98% of the cortical chert artefacts) all have smooth pebble cortex, clearly showing that the chert from Carwood Farm was generally procured by collecting pebbles from derived sources, probably local watercourses.

Fig. 3. Carwood Farm. Rust-brown/grey chert artefacts – CAT 212 from the present site is in an identical type of chert. Photo: Beverley Ballin Smith

Only one flake of milky quart was recovered (CAT 7), whereas four stone tools (pounders CAT 96 and 235, hammerstone CAT 236, and anvil CAT 92) and flake CAT 50 are based on collected water-worn cobbles of purple quartzite. Eight pieces of black, aphyric pitchstone were all procured from sources on the Isle of Arran (Ballin 2009; Ballin & Faithfull 2009). The fact that they are aphyric suggests that they may have been obtained from outcrops in eastern Arran, but aphyric volcanic glass was also available from Monamore Glen further down the east-coast and from layers in the otherwise porphyritic outcrops at Tormore on the island's west-coast. The Biggar area is probably the area in mainland Scotland from which most archaeological pitchstone has been recovered, but this may partly be an effect of a very active local group of volunteers (Ballin & Ward 2008).

Two pieces (CAT 234, 242; the latter is presently missing) *may* be fragments of jet napkin rings although Alison Sheridan (former principal Curator of National Museums Scotland; pers. comm.) suggests that one piece may be from a bangle. It is not entirely certain whether they are actual jet

(from Whitby in Yorkshire) or cannel coal, lignite or oil shale (from sources in Scotland) (Watts & Pollard 1998; Sheridan & Davis 2002; Sheridan 2025).

One hammerstone (CAT 107) is in greywacke, a type of coarse sandstone which forms part of the local bedrock (Paterson & Ward 2013). Two fragments of polished flakes (CAT 5, 6) are both in Cumbrian tuff from the Lake District in north-west England (Group VI according to Clough 1988, 7). This is a fine-grained, greenish-grey volcanic rock formed from solidified ash during the Ordovician period approximately 450 million years ago. Although many local raw materials were also used for the production of Scottish polished stone axeheads, Cumbrian tuff dominates the Scottish Neolithic stone axeheads (55% of all grouped axeheads from Scotland are in this material; Ritchie and Scott 1988: Table 32).

In the Carwood Farm excavation report, two axeheads (CAT 90, 91) were defined as Cumbrian tuff and the pieces subsequently referred to as Great Langdale axeheads (Ward 2013). However, as the pieces are not quite as greenish-grey as one would expect of Cumbrian tuff, and as they are considerably more coarse-grained than most axeheads in this material, the analyst first consulted Dr Alison Sheridan, formerly Principal Curator at National Museums Scotland, who – having inspected the photographs sent to her – replied that they were unlikely to be Cumbrian tuff. The analyst then contacted Dr Mik Markham, the Implement Petrology Group, who wrote:

'[...] it looks like an equigranular, randomly orientated to medium- to fine-grained igneous rock. The tiny white laths are probably plagioclase feldspar and the pale greenish colour could be from chlorite/amphiboles altered from pyroxene. The presence of plagioclase feldspar and lack of orientation of the grains confirms to me it is not Langdale Tuff. It is most probably a metamicrogabbro/diorite, an igneous shallow intrusive rock. That said, and as a general rule of thumb, the transition from basic (i.e., gabbro/basalt) to intermediate (dolerite/andesite) to acid (granite/rhyolite) is marked by an increase in visible quartz. The photos do not appear to show any quartz so I would suggest towards the basic end of the igneous rock spectrum. From the photographs I would guess this is an 'altered microgabbro' (altered dolerite) or and altered dolerite / andesite'.

The same photographs were sent to Dr John Faithfull, formerly Curator in Mineralogy and Petrology at The Hunterian, University of Glasgow, who replied:

'Zooming in on the pictures, the rock seems to have a lot of randomly-orientated, slightly elongated pale crystals. This suggests to me an igneous texture, although the greenish-grey colour suggests a low-grade metamorphic mineralogy. [...] I'd hypothesise something like a a low-grade metamorphosed, or altered, dolerite/microgabbro, or similar. This would suggest that the source is *not* the Great Langdale or Creag na Caillich 'axe factories''.

Comparing the suggestions by Drs Markham and Faithfull, the analyst suggests that the raw material of axeheads CAT 90 and 91 is probably metamicrogabbro, and it is presently not known where this raw material was procured from.

Debitage

In total, 195 pieces of debitage were recovered from the site (Table 4). The debitage includes three chips, 146 flakes, 20 blades, six microblades, 15 indeterminate pieces and five preparation flakes (all crested pieces).

Table 4. Carwood Farm. Relative composition of the debitage.

	Number					**Per cent**				
	Flint	*Chert*	*Quartz /-ite*	*Pitch-stone*	*Total*	*Flint*	*Chert*	*Quartz /-ite*	*Pitch-stone*	*Total*
Chips		2		1	3		1.4		14.3	1.5
Flakes	37	105	2	2	146	78.7	75.6	100.0	28.6	74.9
Blades	6	13		1	20	12.8	9.4		14.3	10.2
Microblades	1	2		3	6	2.1	1.4		42.8	3.1
Indeterminate pieces		15			15		10.8			7.7
Crested pieces	3	2			5	6.4	1.4			2.6
TOTAL	**47**	**139**	**2**	**7**	**195**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

The flakes are generally hard-hammer specimens (with pronounced bulbs-of-percussion), whereas the microblades tend to be soft-hammer specimens (discrete bulbs-of-percussion), and the broad blades are a mixture of the two. In addition, three flakes and blades were produced by the application of bipolar (hammer-and-anvil) technique.

As shown in Table 5, approximately three-quarters of the flint and chert artefacts are cortex-free specimens, showing that time was invested in decorticating the cores. The quartz/quartzite objects are mostly cortical, as five of these six pieces are cobbles used as tools without decortication. The pitchstone and jet artefacts are entirely cortex-free.

Only four blades and microblades are intact. The microblade measures 18.1 x 4.9 x 5.9mm, whereas the blades have av. dims of 39.3 x 17.7 x 7.8mm. Fig. 4 shows the width of all blades and microblades; most of the blades have a width between 10mm and 14mm, that is, they are fairly large/broad. Chert blades/microblades outnumber flint ones by a factor of 2:1. Four blades/microblades are in pitchstone.

Table 5. Carwood Farm. Reduction sequence (less chips).

	Numbers				**Per cent**			
	Primary	*Secon-dary*	*Tertiary*	*Total*	*Primary*	*Secon-dary*	*Tertiary*	*Total*
Flint	2	12	43	57	3.5	21.1	75.4	100.0
Chert	6	40	116	162	3.7	24.7	71.6	100.0
Quartz/-ite	4	1	1	6	66.6	16.7	16.7	100.0
Pitchstone			7	7			100.0	100.0
Jet			2	2			100.0	100.0
Various stone	1		4	5	20.0		80.0	100.0
TOTAL	**13**	**53**	**173**	**239**	**5.4**	**22.2**	**72.4**	**100.0**

Fig. 4. Carwood Farm. The width of all blades and blade fragments.

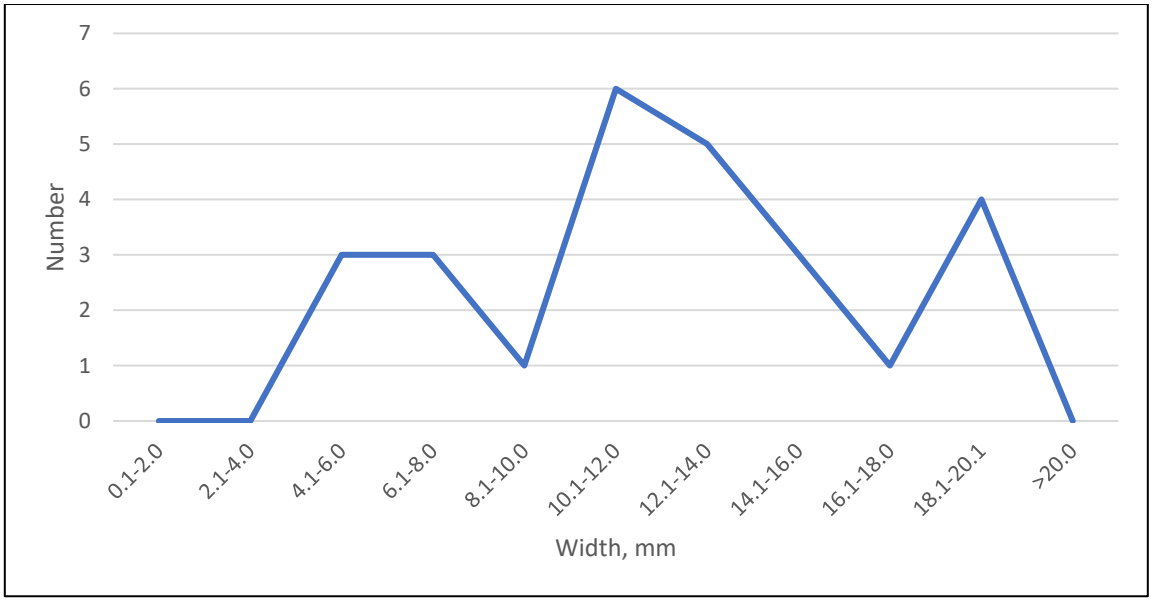
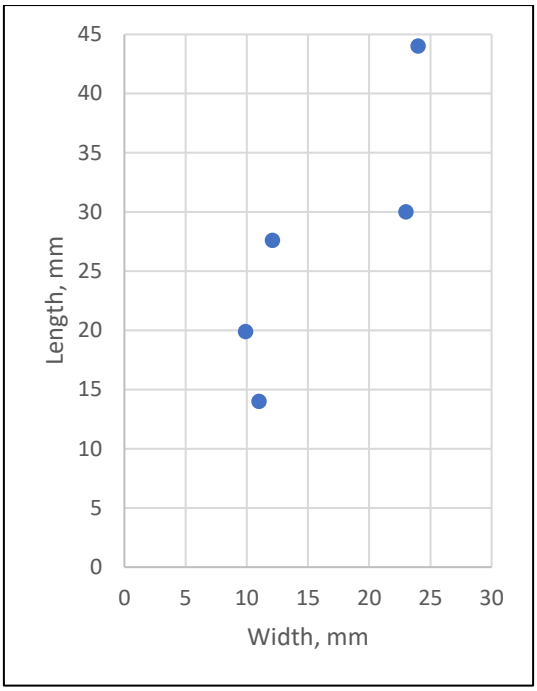


Fig. 5. Carwood Farm. The dimensions of the crested pieces.



Eleven of the flakes have finely faceted platform remnants, suggesting that they were detached from Levallois-like cores (Ballin 2011a). Three of those are chert and eight are flint. As no Levallois-like cores in flint were found, these cores may either remain in unexcavated parts of the site or they were thrown out of the site/exported to other sites in the area.

Five preparation flakes were also recovered, all of which are crested pieces. Three are in flint and two are chert. Two of the crested pieces are blades and three are flakes. All the crested pieces are intact. The two crested blades have dimensions of 19.9 x 9.9 x 4.8mm and 27.6 x 12.1 x 4.6mm, respectively.

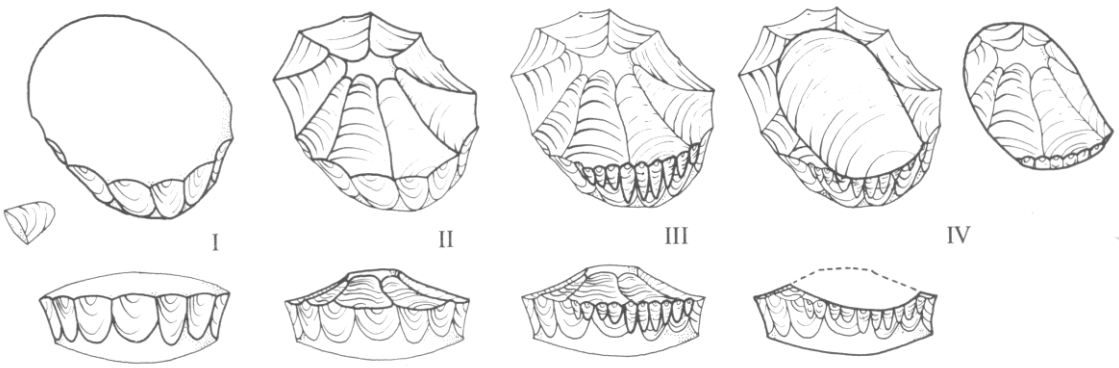
Cores

Only nine cores were recovered, namely two single-platform cores, four Levallois-like cores, one irregular core, one bipolar core and one core fragment. Seven cores are in chert, one is flint and one is pitchstone.

Single-platform cores: CAT 241 is a traditional conical single-platform blade-core in chert, and it measures 37 x 25 x 26mm. It has a plain, untrimmed platform and a surviving crest at the rear; it has been reduced along roughly three-quarters of its circumference. CAT 1, on the other hand, is a small flat core in black, aphyric pitchstone, and it measures 16 x 15 x 9mm. It is probably based on the distal fragment of a thick flake (the flaking-front shows a ventral hinge fracture near the apex). It has a plain, untrimmed platform, and the two lateral sides of the piece are defined by fault-planes. A few small flakes were detached from the front of this piece.

Levallois-like cores: All four pieces in this category are in chert. CAT 56 is an elongated, thick flake (64 x 45 x 34mm) which has had flakes removed along one lateral edge, and from one end. This modification probably represents an attempt to produce a tortoise-shaped rough-out for a Levallois-like core, with the lateral removals representing an attempt to produce a guide-ridge or crest and the terminal modification an attempt to produce a faceted platform. The piece was probably abandoned prematurely due to its many internal fault planes. CAT 57 is also a preform – in this case a fully formed tortoise shaped rough-out (Fig. 6.III), with an intact faceted platform, two intact lateral crests and an untouched upper flaking-front shaped by the centripetal detachment of small flakes from all sides. The lower face is cortical and domed, and the piece measures 35 x 30 x 17mm. It is uncertain why this piece was discarded.

Fig. 6. Carwood Farm. The operational schema of the Late Acheulean / Mousterian Levalloisian (Roe 1981, Fig. 3:9): I. Basic shaping of nodule; II preparation of domed dorsal surface; III. preparation of faceted striking platform on core; IV. the flake and the struck core, with their characteristic features. Drawn by the late M.H.R. Cook.



CAT 58 is an equally small Levallois-like core (34 x 31 x 15mm), and it has a faceted platform, one well-shaped crest and a slightly less well-defined crest along the opposite side. Some small flakes have been detached from the upper face, but the core was probably abandoned due to the presence of interfering fault-planes which messed up the flaking-front. The lower face is cortical and domed.

CAT 60 has neat faceting at one end, which may represent the core's striking-platform. There are no proper crests and the distal end/terminal has broken off. This piece is probably based on a thick flake, and when one detached flake developed a hinge-fracture which dug into the flaking-front, the core was abandoned. It measures 31 x 40 x 13mm and has a cortical, domed lower face.

Irregular cores: One irregular or multi-platform core was retrieved from the site (CAT 106). It is based on so-called black flint, a type of exotic flint usually associated with the Late Neolithic period (cf. Ballin 2011b). It has clearly been reduced from a minimum of three directions.

Bipolar cores: Only one bipolar core (Ballin 1999) was recovered from Carwood Farm (CAT 59). It is in chert, and it is a bifacial specimen with one reduction axis (one set of two opposed crushed terminals). The core measures 26 x 19 x 11mm.

Core fragments: CAT 220 is a large core fragment (GD = 50mm) from a core that disintegrated due to its many internal fault-planes. It has a surviving untrimmed platform-edge from which several large flakes were detached.

Tools

The 31 tools include nine scrapers, four cutting implements, one combined scraper/knife, two fragments of bifacial tools, 11 pieces with edge-retouch, four axeheads and fragments thereof, two fragments of jet napkin rings (one possibly a bangle) and five cobble tools (Table 1).

Scrapers: All nine scrapers are in chert. One diminutive discoidal scraper (CAT 98) is missing one lateral side; it measures 20 x 14 x 8mm. Its dorsal face appears to be cortical, but the white colour is simply discolouration due to exposure to fire. Five short end-scrapers are roughly the same size with av. dims of 27 x 28 x 12mm. Double-scraper CAT 229 is slightly smaller, measuring 21 x 20 x 9mm. All end-scrapers have convex working-edges. Most have steep working-edges, but short end-scraper CAT 65 has an acute edge. Short end-scraper CAT 230 and double-scraper CAT 229 are both based on crested flakes. The working-edge of short end-scraper CAT 65 is so neat and regular that it must have been shaped by the application of pressure-flaking. End-/side-scraper CAT 223 is a short flake (25 x 18 x 6mm) with a relatively convex, fine working-edge at the distal end and a straight, steep working-edge along the left lateral side. In addition, one scraper-edge fragment was also found on the site.

Cutting implements: The knives from Carwood Farm form a very diverse category, with polished-edge knife CAT 238 being the most sophisticated piece. It is the proximal segment of a broad flint blade (16 x 15 x 5mm), and the bulbar area has been flattened by removing minuscule ventral chips. Its left lateral side has been sharpened by polishing the outer 2-5mm of the ventral and dorsal face of the edge. As shown in Manby (1974, Figs 36-37), knives with polished edges are particularly common in the Late Neolithic period. By comparison, two flake-based scale-flaked chert knives (CAT 221, 222; GDs = 21-28mm) are immensely plain, with simple invasive retouch of the outer 5mm of one edge, dorsal face. Both objects are fragments of expedient tools. CAT 227 is the fragment of a chert flake with a straight truncation (GD = 17mm). The truncation was probably meant to protect the users index finger while using the flake as a knife.

Combined tools: CAT 109 is an exceptionally well-executed scraper/knife based on a regular broad flint blade (50.9 x 19.0 x 7.3mm). It is a combination of a plano-convex knife with invasive dorsal retouch of both lateral sides, and a blade-scraper with a convex, steep scraper-edge at either end. Although this piece was recovered from ploughsoil, it may represent a ploughed-out pit in which this piece was deposited.

Bifacial implements: CAT 147 and 148 are both fragments of relatively large bifacial pieces (GD = 23-34mm). It is uncertain which tool forms they are fragments of, but they could have formed part of laurel leaves, discoidal knives, large arrowheads, foliate knives or even axehead rough-outs.

Pieces with edge-retouch: A total of 11 pieces with edge-retouch were also recovered from the location, half of which are in flint and half in chert. Three pieces are based on broad blades, seven

on flakes and one is based on an indeterminate piece. These pieces are probably tools and tool fragments with different functions.

Figs A-C. Figs A and B show the two faces of axehead CAT 90, and Fig. C shows axehead CAT 91. Both axeheads are thought to be in metamicrogabbro. Photo: Beverley Ballin Smith.

Polished stone axeheads: Two polished stone axeheads in metamicrogabbro (CAT 90, 91) and two flakes detached from such axeheads, although probably in Cumbrian tuff (CAT 5, 6), were also recovered. CAT 90 is the remains of a chubby ovoid all-over polished axehead with domed broadsides and a pointed butt. One lateral side is regularly rounded, whereas the other forms a broad side-facet with rounded edges against the two broadsides. It measures 107 x 63 x 37mm. The edge end of the axehead was used for hammering and is now rounded and crushed. A substantial part of one face has come off. CAT 91 was probably a similar axehead, although with two regularly rounded lateral sides and subsequently a rounded-oval cross-section. It is the frontal fragment of the original tool and measures 61 x 63 x 28mm. It may have been used as a core, with several flakes removed from both ends and one lateral side, and the corner of the break facet away from the working-edge is rounded and abraded and appears to have been used as a pounder. As discussed in the raw material section, both polished axeheads are based on metamicrogabbro from an unknown outcrop of igneous rock.

Two flakes with GDs between 24-35mm are from cannibalised polished axeheads, and the fine-grained nature of the material and the slightly greener colour of the pieces indicate that they are based on Cumbrian tuff (Bradley & Edmonds 1993) rather than metamicrogabbro.

Fig. D. The two flakes (CAT 5-6) struck of cannibalised polished axeheads in Cumbrian tuff. Photo: Beverley Ballin Smith.

Napkin rings: Two polished fragments of jet (GDs *c*. 28mm) may be from so-called napkin rings although one could be from a bangle (Alison Sheridan pers. comm; 2025). Intact napkin rings have been recovered in connection with BAG's work around the Camps Reservoir (Fig. 7).

Fig. 7. Carwood Farm. Two complete napkin rings from excavations at Camps Reservoir.

Cobble tools: The applied terminology of stone artefacts follows the nomenclature proposed in connection with the analysis of the assemblage from Barabhas 3, Lewis (Ballin 2010a; also see Ballin 2018; Ballin Smith 1994). The definitions are mainly based on the character of the use-wear/damage, the character of the applied motion or force, and artefact size:

Hammering motion

Hammerstones: 1) fist-sized or slightly smaller/larger; 2) crushed ends.

Light hammering, mainly pushing/rotating motion

Pounders: 1) usually fist- to head-sized (smaller specimens are not uncommon); 2) pecked, faceted ends.

Grinders/pestles: 1) fist-sized or slightly smaller/larger; 2) finely pecked to ground/polished, rounded facet at one or both ends.

Pushing motion

Polishers: 1) fist-sized or slightly smaller/larger; 2) highly polished, striated, usually slightly concave/slightly convex faces, occasionally forming clear facets against the edges.

Rubbers: 1) usually too large to use in the same fashion as the above types – mostly head-sized or larger; 2) usually one ground/polished, striated, slightly convex face; used in connection with saddle querns, which have the same type of wear, but one concave face.

It should be noted that:

1) Hammerstones as well as pounders may have had flakes detached from their terminals, due to the applied force. However, the detachment of flakes from the ends is more commonly experienced in connection with hammerstones.

2) There is notable overlap between the categories pounders and grinders/pestles, probably largely as a matter of degree of use, with grinders/pestles having been used more extensively, thus acquiring smoother work-faces. As a consequence, this group is simply referred to as pounders in the present report.

3) Pounders, grinders and pestles are generally perceived as having been used in connection with a vessel (a 'mortar'), whereas hammerstones did not require a vessel.

4) Small rubbers are distinguished from polishers by their usually convex face (*never* concave) – in some cases, the ground/polished face of a rubber may curve gently, but notably, up towards one end, probably as a consequence of the specific way they were moved across the working surface of a saddle quern.

This category includes two hammerstones (CAT 107, 236), two pounders (CAT 96, 235) and one anvil (CAT 25). CAT 107 is in greywacke, whereas the other cobble tools are in quartzite. None of these tools has been modified, and they are defined as to category by their use-wear.

CAT 107 is a hammerstone and has crush-marks at one end, whereas the other end has broken off. It measures 74 x 59 x 36mm. The other hammerstone, CAT 236, is considerably smaller, measuring 48 x 42 x 35mm. It has peck-marks near both terminals.

The wear of the pounders is more smooth than that of the hammerstones. CAT 96 is intact, and measures 115 x 93 x 75mm. It has light wear at both ends and it has not yet developed the typical facets around the worn area. CAT 235 is a large flake (49 x 62 x 29mm) knocked off one end and lateral side of a pounder, probably due to extensive and heavy-duty use. The worn area would have been relatively large, probably 60 x 50mm, and the wear was clearly formed by pecking/abrasion. Due to the extensive use, the worn area has developed notable facets against the tools unworn broadsides and lateral sides.

CAT 92 is a quartzite pebble which has lost most of one broadside (64 x 48 x 36mm). It has notable peck-marks near the edge of one broadside, and the missing other broadside was probably detached due to heavy pecking on this side. As the assemblage includes one bipolar core and four bipolar flakes and blades, it is most likely that this piece was used as an anvil in connection with bipolar (hammer-on-anvil) reduction.

DISTRIBUTION AND ONSITE ACTIVITIES

As shown in Table 6, 196 (81%) of the 242 lithics from Carwood Farm are from ploughsoil, and they have not been given any onsite coordinates. Only 15 pieces have been given coordinates and this group is too numerically small to discuss the general onsite distribution of finds.

Table 6. Carwood Farm. General distribution of the lithics.

	n	*%*
Ploughsoil	196	81
With coordinates	15	6
Features	31	13
TOTAL	**242**	**100**

Thirty-one pieces are from features (pits), and they are distributed as shown in Table 7.

Table 7. Carwood Farm. Lithics recovered from features.

Feature	*Categories*	*Comments*
1	4 flakes, 1 crest, 1 edge-retouch	All in chert
3	1 chip, 1 flake, 1 blade, 1 microblade, 1 indet. piece	All in chert
5	2 flakes	Both in chert
6	5 flakes, 3 indet. piece, 1 micro-blade	Chert, but microblade is pitchstone
7	2 flakes, 1 indet. piece, 1 axehead, 1 anvil	Chert; axehead is metamicrogabbro and anvil quartzite
8	1 axehead	Metamicrogabbro
9	1 indet. piece, 1 disc.-scraper, one pounder	Chert, but pounder is quartzite

As mentioned above, F8 and F9 have been heavily disturbed by rabbit and mole burrowing but, as shown in Fig. 2, pit F8 is still fairly well-defined. Most of the lithic artefacts from the pits seem to be knapping waste and plain tools in chert, and the analyst suggests that these pieces may have entered the features when they were dug through existing occupation layers (the site was probably visited on a number of occasions, such as during the Early, Middle and Late Neolithic periods as well as the Bronze Age period; see dating section).

However, the pitchstone microblade (CAT 85) and the two polished axeheads in metamicrogabbro (CAT 90, 91) probably represent deliberate depositions ('ritual'). It is well-known that pitchstone (commonly in the form of microblades) were deposited in pits, with the vast majority of these pitchstone-bearing pits dating to the Early Neolithic. The pit-deposited pitchstone was not uncommonly buried with flakes struck of discarded axeheads in Cumbrian tuff, as well as Carinated pottery (Ballin 2015). The dating of the pitchstone-bearing pit F6 to the Early Neolithic is supported by pottery which may be Carinated Ware, as well as one radiocarbon-date (see dating section), and it is possible that the pits with axeheads post-date this pit, as pits F7 and F8 contained pottery identified by the excavator as Impressed, Grooved and Beaker Wares.

In summary, the lithic finds probably represent several consecutive domestic settlements at the site, as well as artefacts (pitchstone and polished stone axeheads) deposited in ritual pits.

DATING

A number of elements are important to the dating of the lithic assemblage, namely 1) raw material preferences; 2) typology; 3) technology; and 4) other elements (radiocarbon-dates and pottery styles).

Diagnostic raw material preferences

A number of raw materials are interesting, such as the mottled-grey and black so-called Yorkshire flint, the pitchstone and the metamicrogabbro used for the two axeheads. Most of the flint is mottled-grey Yorkshire flint, and two pieces are black flint (CAT 15, 106) which could have been procured from sources further south in England, possibly in east Anglia. As argued in Ballin (2011b), the mottled-grey flint may mostly date to the Middle Neolithic period, whereas the black flint may be Late Neolithic, commonly being associated with Grooved Ware and oblique arrowheads (Ballin 2010b; 2016; Clarke *et al.* 1985).

Although pitchstone post-dating the Early Neolithic has been found along the Scottish west-coast and on Orkney (Ballin 2009), most pitchstone from southern, central and eastern Scotland has been recovered from contexts datable to the Early Neolithic (Ballin 2015; this report's Fig. 8). Pitchstone microblades (like CAT 85 from F6, as well as two pitchstone microblades from the site surface), are most likely to date to this period.

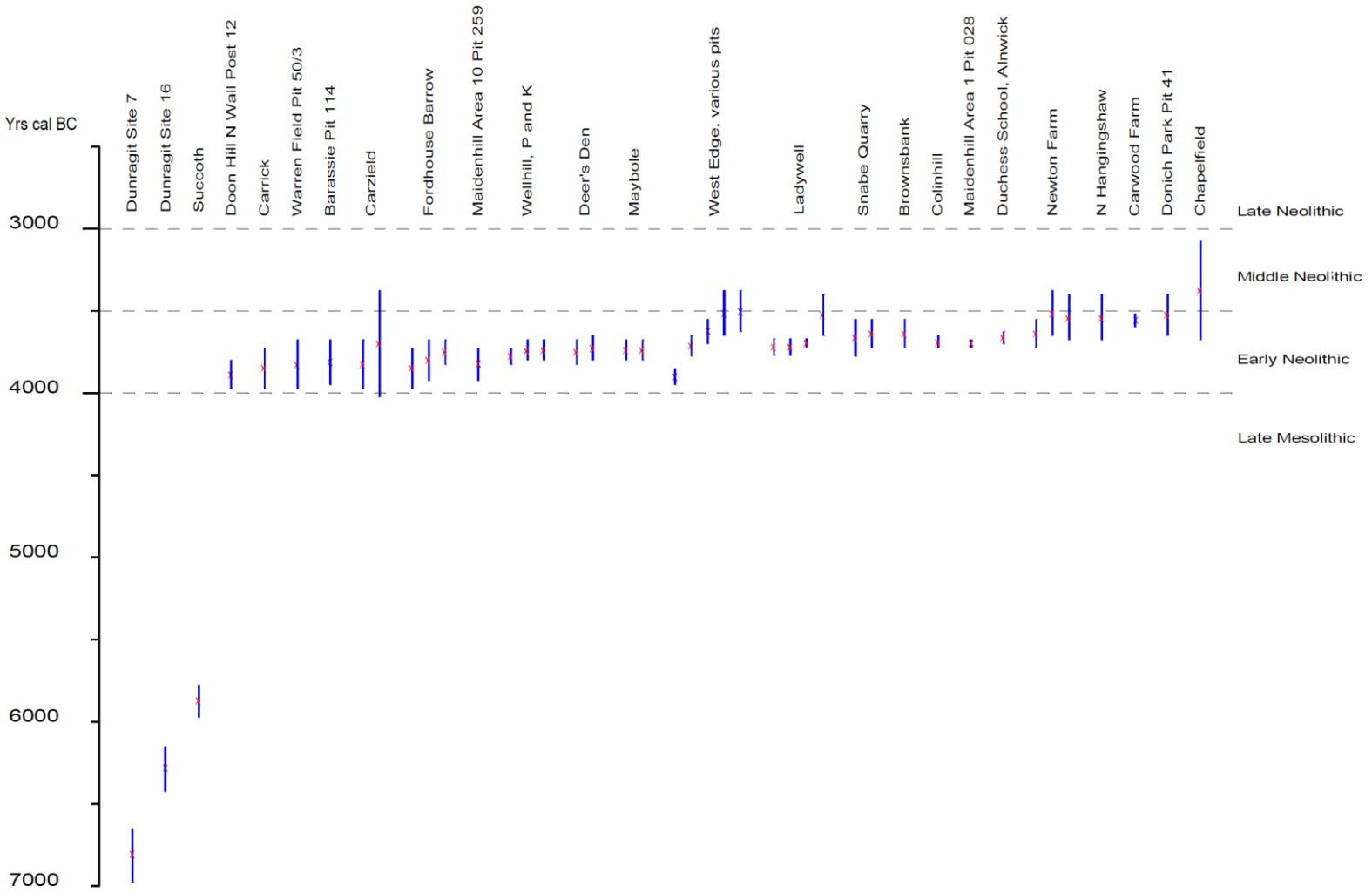
It is uncertain whether the metamicrogabbro is diagnostic, but the importance in the present context is that the two axeheads (CAT 90, 91) were *not* made of Cumbrian tuff as suggested in the original DSR on Carwood Farm (Ward 2013). An identification of the axeheads' raw material as Cumbrian tuff would have indicated a potential Early Neolithic date, but as the pits F8 and F9 yielded pot sherds identified as Impressed, Grooved and Beaker Wares (although it is suggested that the pottery from Carwood Farm should be professionally scrutinised) and *not* Carinated Ware, the two axeheads may post-date the Early Neolithic period. However, two flakes from polished axeheads (CAT 5, 6) *are* in Cumbrian tuff and probably date to the Early Neolithic.

Diagnostic types

The assemblage includes several diagnostic tool types, such as polished-edge knives, scale-flaked knives, combined plano-convex knives/scrapers, fragments of bifacial implements, fragments of (possibly) jet napkin rings, polished stone axeheads and pounders. In terms of the general dating of these types, see Ballin (2021).

Polished-edge knives (like CAT 238) may be found in Middle/Late Neolithic contexts, but they (and particularly blade-based forms) seem to be particularly common in the Late Neolithic period (Manby 1974, Figs Figs 36-37). Scale-flaked knives occur throughout the Neolithic/Early Bronze Age period and it is not possible to date the two flake-based pieces from the site more precisely within this period. CAT 109 is a combined plano-convex knife/double-scraper based on a regular broad blade in mottled-grey Yorkshire flint (Ballin 2011b), and it probably dates to the Middle/Late Neolithic period (Ballin 2021; Manby 1974). Two fragments of relatively large bifacial implements (CAT 147, 148) can only be dated to the period Early Neolithic-Early Bronze Age in general.

Fig. 8. Radiocarbon-dated pitchstone-bearing pits.



Two possible fragments of jet napkin rings (CAT 234, 242) probably date to the Middle Bronze Age period (Sheridan & Davis 2002; Sheridan 2025; if one piece is into a fragment of a bangle, this suggests an Iron Age/Roman period presence at the site). Only a small number of these pieces have been found and several are associated with male burials. This suggests that the two fragments from Carwood, like the well-executed plano-convex/double-scraper CAT 109, may derive from one or more destroyed cremation burials. As suggested above, the two flakes struck off polished axeheads in Cumbrian tuff (CAT 5, 6) are probably Early Neolithic, whereas the two polished axeheads in metamicrogabbro (CAT 90, 91) may post-date this period, as they are associated with post-Early Neolithic pottery styles. Pounders like CAT 96, 235 are common throughout the Neolithic-Iron Age period (Clarke 2006; Ballin 2018; Ballin Smith 1994).

Diagnostic technological attributes

Only three technological details are diagnostic, namely the general use of broad blade technology, the polishing of flint and stone, and – most importantly – the application of Levallois-like technique.

The fact that 25 of 39 blades and blade tool blanks are broad blades (65%) suggests that there was no or little activity at the site in the Late Mesolithic. In addition, three of the seven microblades are in pitchstone and one of those was recovered from a pit (F6) which (as expected; Ballin 2015) returned an Early Neolithic radiocarbon-date (see below). Broad blades were also produced in the Early Mesolithic, but these early blades tend to be somewhat more irregular than the ones produced during the Scottish Neolithic. The character of the blades from Carwood Farm does not allow them to be dated within the Neolithic period in general. The Scottish Bronze Age industries are flake industries.

In Scotland, the polishing of flint and stone generally post-dates the Mesolithic period. One polished-edge blade knife was recovered from the site (CAT 238). The formation of knife-edges by polishing the edges of flakes and blades was particularly common during the Late Neolithic period (Manby 1974).

The assemblage includes four Levallois-like cores and 11 Levallois-like flakes. Two of the cores are rough-outs, and CAT 57 is a particularly well-executed, tortoise-shaped ('text-book') specimen. In Scotland, this technique was only used during the Middle and Late Neolithic periods.

Other diagnostic elements

The lithic finds are also dated indirectly by their association with pottery and charcoal. A large number of pot sherds were recovered, including Carinated pottery, Impressed Ware, Grooved Ware and Beakers. The sherds suggest activity at the site during the Early, Middle and Late Neolithic periods as well as during the Early Bronze Age.

Two charcoal samples (both *corylus*) were radiocarbon-dated, one from F1 (SUERC-45152/GU-29847) and one from F6 (SUERC-45151/GU-29846). The sample from F1 was dated to 3106-2921 cal BC (the transition between the Middle and Late Neolithic periods), whereas the sample from F6 was dated to 3604-3523 cal BC (the end of the Early Neolithic period; see Fig. 8). In lithic terms, F1 only contained knapping debris, whereas F6 contained knapping debris and pitchstone

microblade CAT 85. The knapping debris in the two pits probably entered the features when they were dug through existing knapping floors, whereas the pitchstone microblade may represent deliberate deposition (cf. Ballin 2015).

DISCUSSION

As mentioned above, this site probably represents repeated settlement at the location from the Early Neolithic and through to and including the Middle Bronze Age. The pits probably represent ritual deposition as well as possibly burials at the site, where the pits were dug through existing knapping floors. As the site is probably a palimpsest where it will be impossible to separate the distribution patterns of the different settlements, the assemblage has limited research potential. However, the finds does shed light on a number of issues – and raise new questions:

Raw material procurement

A number of lithic raw material were clearly procured through extensive exchange networks, such as almost all the flint (north-east and possibly south-east England), the pitchstone (from the Isle of Arran), the axehead materials (Cumbrian tuff from north-west England; at present it is uncertain which volcanic area the metamicrogabbro derives from), and the jet (if this material is 'proper' jet then it was procured from Whitby in Yorkshire, whereas a number of related materials could have been obtained from a number of Scottish outcrops).

The chert, on the other hand, is a local lithic raw material. The cortex of the cortical pieces from Carwood Farm is almost entirely (98%) smooth pebble cortex possibly having been collected from local streams, whereas the lithics from the Palaeolithic site of Howburn Farm mostly have vein cortex (68%), showing that it was quarried, probably from small quarry pits like the one from Burnetland Hill in the Borders, just east of Biggar. The question is what is behind the different procurement patterns? Do the different procurement patterns reflect distance from the primary sources or chronology (the lithics from Howburn mainly being Late Upper Palaeolithic, Mesolithic and Early Neolithic and those from Carwood Farm Neolithic-Bronze Age)? This is presently unknown and requires further detailed analysis of assemblages from the Biggar area.

The Levallois-like technique

The number of lithic diagnostic types and technological approaches suggest that most of the assemblage may date to the Middle/Late Neolithic period. Four chert cores are Levallois-like cores, and 11 flakes are Levallois-like flakes. Consensus (Ballin 2011a) has generally been that these cores were pre-formed to allow the detachment of large broad flakes for the production of chisel-shaped and oblique arrowheads (supplemented by the production of blades from the areas immediately below and around the two crests), and this should indeed have been possible on the basis of a core as large as CAT 56 (if it had not been discarded due to its numerous internal fault-planes). However, the beautiful tortoise-shaped rough-out CAT 57 is so small (GD = 35mm) that it would have been useless for this purpose, and the two Levallois-like cores CAT 58 and 60 are of the same diminutive size (GDs = 34-40mm). The purpose of these very small Levallois-like chert cores is presently unknown.

Eight of the eleven Levallois-like flakes are in flint, and as there are no Levallois-like cores in this material it must be assumes that these cores 1) may have been thrown out of the site in connection with what Binford (1983) referred to as 'tossing' ('preventive site maintenance'), 2) they may still be present in unexcavated parts of this site, or 3) if the still contained enough mass for further reduction, they may have been exported out of the site when the settlers moved on.

The features

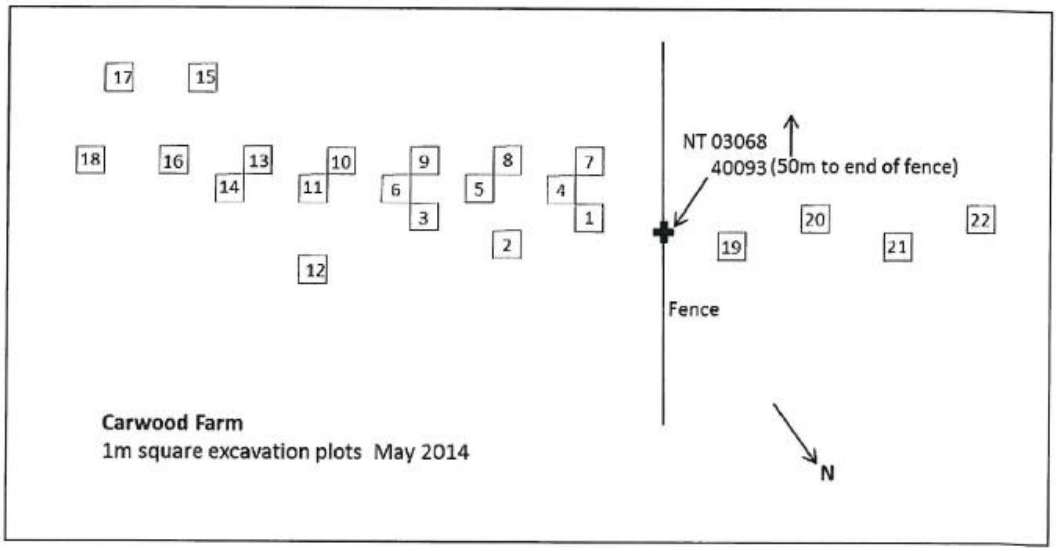
The pits at Carwood Farm were all fairly shallow (Ward 2013, Fig. 3) and they are likely to have been truncated somewhat by ploughing. This makes it quite possible that some pits (ritual or funereal) may have been ploughed out completely. One pitchstone microblade (CAT 85) was recovered from F6, and it is quite possible that the site's other two pitchstone microblades (CAT 2, 3) may represent destroyed pits. Flakes from cannibalized Great Langdale axeheads (like CAT 5, 6) also occasionally occur in pits with pitchstone and Carinated pottery (Ballin 2015) and they might also represent ploughed-out pits. Polished-edge knives (like CAT 238) and combined tools (like CAT 109) clearly fall into the category of particularly well-executed implements and could represent deliberate deposition.

If the two jet fragments are indeed from so-called napkin rings (in actual fact, dress accessories), those pieces may also represent destroyed pits, in this case possibly a burial. As Sheridan states, many fragments of such pieces are stray finds, and some have been found on settlements, but several are also known from burials (Wort's Causeway, Cambridgeshire (Sheridan 2025), Camps Reservoir, South Lanarkshire (Hunter & Ward 2021), Yarrow Kirk in Scottish Borders (Smith 1857) and Alnham, Northumberland (Jobey & Tait 1966).

THE LITHIC FINDS FROM THE CARWOOD AREA TEST PITTING INVESTIGATION

In 2014, the BAG (led by Jim Ness) carried out test-pitting of a small area near the site excavated by Tam Ward in 2008-09. A number of different grid references have been given for the site, with the official reference in the report (Ness 2018) being NT 03050 40150, whereas the reference on the bags is NT 03098 40133, and on the plan in the report the reference is NT 03068 40093. However, whichever grid reference is followed, it places the test-pitted site immediately next to Ward's excavated site.

Fig. 9. Carwood Area. Plan of the test-pitted site.



Twenty-two 1m^2 test pits were stripped to the old ground surface, removing *c*. 30cm of ploughsoil. A number of lithic finds and potsherds were recorded from these test pits. In total, 44 lithic artefacts were recovered. Below, the assemblage is presented and briefly discussed.

General overview

During the excavation of the Carwood Area, 44 lithic artefacts were recovered (Table 8). In total, 84.1% of the artefact assemblage is debitage, 4.5% is cores, and 11.4% is tools.

Table 8. Carwood Area. General artefact list.

	Flint	*Chert*	*Jet*	*Slag*	*Total*
Debitage					
Chips	1	14			15
Flakes	4	11	1		16
Blades	1	1			2
Indeterminate pieces		3			3
Crested pieces		1			1
Total debitage	*6*	*30*	*1*		*37*
Cores					
Irregular cores		1			1
Bipolar cores		1			1
Total cores		*2*			*2*
Tools					
Short end-scrapers	1				1
Scrapers, atypical		1			1
Pieces w edge-retouch		1			1
Slag				2	2
Total tools	*1*	*2*		*2*	*5*
TOTAL	**7**	**34**	**1**	**2**	**44**

Raw materials – types, sources and condition

With 34 pieces, the assemblage is heavily dominated by chert, supplemented by seven pieces of flint, one piece of jet and two pieces of slag. The descriptions of these raw materials generally follow the descriptions given for the raw materials from the excavation at Carwood Farm.

The chert is the same grey and black forms as those from Carwood Farm, and the cortex tends to be pebble-cortex. Most of the flints are mottled-grey, but end-scraper CAT 246 is in black flint, suggesting that this piece may date to the Late Neolithic period and have been procured from sources south of Yorkshire (Ballin 2011b). It is uncertain whether the jet flake is made of jet proper

or a related material. Two pieces of slag are irrelevant to the discussion of the prehistoric site, but suggest fairly recent industrial activity in the area.

Characterisation

As mentioned above, 37 pieces are debitage, two are cores and three are tools. Two pieces of slag (one glassy and one porous) will not be dealt with any further. The debitage includes 15 chips, 16 flakes, two blades, three indeterminate pieces and one crested piece. Most of the debitage is dominated by chert, supplemented by six pieces of flint and one piece of jet. The chert blade (CAT 264) is irregular and short and barely satisfies the the definition of a blade ($L \geq 2W$); it measures 24.1 x 12.0 x 4.7mm. The flint blade (CAT 256) is a burnt medial segment with a width of 8.7mm; it is considerably more regular than the chert blade. The crested piece (CAT 270) is the proximal-medial segment of a microblade with a width of 7.5mm.

The assemblage includes two cores (both chert), namely one irregular core (CAT 248) and one bipolar core (CAT 274). The former was reduced from a minimum of three different directions, and it has a GD or 35mm. The latter is a bifacial specimen with one reduction axis (one set of opposed terminals), and it measures 28 x 20 x 12mm.

The three tools include two scrapers and one piece with edge-retouch. One scraper is flint and the other two pieces chert. CAT 246 is the broken-off working-edge of a short end-scraper with a GD of 25mm. It is based on a bipolar core in black flint and its working-edge is exceptionally well-executed. The raw material suggests a Late Neolithic date. CAT 275 is an atypical scraper with steep retouch (probably used for scraping) at both ends and along both lateral sides. It is based on an irregular core in chert and has a GD of 26mm. CAT 273 is the distal fragment of a flake with sporadic retouch at the distal end, and it has a GD of 17mm.

Dating

The assemblage contains very few (and generally weak) diagnostic elements. The mottled-grey flint is likely to date to the Middle/Late Neolithic period. Although the jet flake (CAT 250) can be from any part of the post-Mesolithic period, it is most likely to be from the later Neolithic or later (Sheridan & Davis 2002). The most precise date is offered by the scraper-fragment in black flint. As explained above, in Scotland black flint is mostly associated with Late Neolithic/Grooved Ware period objects (Ballin 2011b).

Discussion

Unfortunately, this assemblage is so numerically small that it is almost impossible to draw any safe conclusions as to the date and nature of the site. However, there is definitely a later Neolithic presence at the site, and given its proximity to Carwood Farm, excavated by Tam Ward and his team, Carwood Area is most likely a peripheral part of the probably extensive and multi-period settlement Carwood Farm.

CONCLUSION

As just stated above, Carwood Area probably forms part of the larger, multi-period site Carwood Farm. There is no evidence suggesting pre-Neolithic occupation at the location, but the site was probably settled repeatedly from the Mesolithic/Neolithic transition onwards. There is evidence of activity at Carwood Farm/Area during the Early, Middle, and Late Neolithic periods, as well as in the Early and Middle Bronze Age and probably later.

Commonly, archaeologists distinguish between so-called rubbish pits and ritual pits (including burials) (Brophy & Noble 2012), and Ward (2013, 23) suggests that the pits at Carwood Farm are simply rubbish pits into which household rubbish (lithic waste and pot sherds) was deposited. However, this analyst disagrees with this view, particularly as several of the finds from the pits fall into the category of 'special' objects, such as exotic lithic materials (Arran pitchstone) and axeheads. The presence in several pits of what was probably complete pots and cereal indicates some form of offerings, possibly to deities or ancestors.

As mentioned above, some artefacts found outside the surviving (shallow) pits are most certainly also 'special', such as the extremely well-executed combined scraper/knife CAT 109, polished-edge knife CAT 138, several other pieces in Arran pitchstone and the two jet objects (CAT 234, 242), at least one of which may be a part of a napkin ring. They may also represent deliberate deposition in pits, the napkin rings possibly even burial (Sheridan & Davis 2002), but where the pits on this ridge in the landscape may have been destroyed entirely by ploughing. Admittedly, some of these 'nice' artefacts are broken, but in prehistory broken objects were occasionally sacrificed as '*pars pro toto*' that is, pieces which represent the original complete pieces (Henriksen 1998).

The lithic waste in the pits is perceived by the analyst as evidence of how the pit diggers cut through existing knapping floors on the surfaces of domestic settlements. Most of the lithics in the pits is in the form of plain debitage, including chips, flakes, blades and indeterminate pieces, and it is unlikely that this generally small-sized material, which would have posed no problem to traffic across the settlement surface, would have been collected and deposited in 'rubbish pits'. Most of the remaining finds from ploughsoil are also domestic knapping debris, including several Levallois-like cores.

Being a so-called mixed palimpsest site where it is not possible to separate material from the various visits to the location, this assemblage has relatively low research potential. However, it does shed light on a number of issues, as listed in the discussion relating to the finds from Carwood Farm.

ACKNOWLEDGEMENT

The analyst would like to thank a number of colleagues for having offered comments and advice on issues relating to a number of lithic raw materials: Former Principal Curator at National Museums Scotland Dr. Alison Sheridan; Principal Curator at National Museums Scotland Dr. Fraser Hunter; Dr. Mik Markham, the Implement Petrology Group; and former Curator at the Hunterian Museum, University of Glasgow, Dr. John Faithfull.

BIBLIOGRAPHY

Ballin, T.B. 1999: Bipolar Cores in Southern Norway - Classification, Chronology and Geography. *Lithics* 20, 13-22.

Ballin, T.B. 2009: *Archaeological Pitchstone in Northern Britain. Characterization and interpretation of an important prehistoric source*. British Archaeological Reports British Series 476. Oxford: Archaeopress.

Ballin, T.B. 2010a: *Barabhas 3, Lewis, Western Isles*. Unpublished report commissioned by Historic Scotland.

Ballin, T.B. 2010b: *The lithic assemblages from Midmill, Aberdeenshire*. Unpublished report commissioned by Murray Archaeological Services.

Ballin, T.B. 2011a: The Levallois-like approach of Late Neolithic Britain: a discussion based on finds from the Stoneyhill Project, Aberdeenshire. *In* A. Saville (ed.): *Flint and Stone in the Neolithic Period*. Neolithic Studies Group Seminar Papers 11, 37-61. Oxford: Oxbow Books.

Ballin, T.B. 2011b: *Overhowden and Airhouse, Scottish Borders. Characterization and interpretation of two spectacular lithic assemblages from sites near the Overhowden Henge*. British Archaeological Reports British Series 539. Oxford: Archaeopress.

Ballin, T.B. 2015: Arran pitchstone (Scottish volcanic glass): New dating evidence. *Journal of Lithic Studies* 2(1), 5-16.

[http://journals.ed.ac.uk/lithicstudies/article/view/1166]

Ballin, T.B. 2016: *The lithic assemblage from Guardbridge, Fife*. Unpublished report commissioned by Archas Archaeology.

Ballin, T.B. 2018: The Elliott Collection lithic assemblage. *In* M.A. MacLeod Rivett: Barabhas Machair: Surveys of an Eroding Sandscape. *Scottish Archaeological Internet Reports* 76, 37-81.

[http://archaeologydataservice.ac.uk/library/browse/issue.xhtml?recordId=1158354&recordType=MonographSeries]

Ballin, T.B. 2021: *Classification of Lithic Artefacts from the British Late Glacial and Holocene Periods*. Oxford: Archaeopress Publishing Ltd.

Ballin, T.B., & Faithfull, J. 2009: Gazetteer of Arran Pitchstone Sources. Presentation of exposed pitchstone dykes and sills across the Isle of Arran, and discussion of the possible archaeological relevance of these outcrops. *Scottish Archaeological Internet Reports (SAIR)* 38.

[http://www.sair.org.uk/sair38].

Ballin, T.B., & Ward, T. 2008: General characterisation of the Biggar pitchstone artefacts, and discussion of Biggar's role in the distribution of pitchstone across Neolithic northern Britain.

[http://www.biggararchaeology.org.uk/pdf_reports/SR_PITCHSTONE_REP_08.pdf]

Ballin, T.B., Saville, A., Tipping, R., Ward, T., Housley, R., Verrill, L., Bradley, M., Wilson, C., Lincoln, P., & MacLeod, A. 2018: *Reindeer hunters at Howburn Farm, South Lanarkshire. A Late Hamburgian settlement in southern Scotland – its lithic artefacts and natural environment*. Oxford: Archaeopress.

Ballin Smith, B. (ed.) 1994: *Howe. Four Millenia of Orkney Prehistory*. Society of Antiquaries of Scotland Monograph Series. Edinburgh: Society of Antiquaries of Scotland.

Binford, L.R. 1983: *In Pursuit of the Past. Decoding the Archaeological Record*. London: Thames & Hudson.

Bradley, R. & Edmonds, M. 1993: *Interpreting the axe trade. Production and exchange in Neolithic Britain*. Cambridge: Cambridge University Press.

Brophy, K., & Noble, G. 2012: Within and beyond pits: deposition in Lowland Neolithic Scotland. *In* H. Anderson-Whymark & J. Thomas 2012: Regional Perspectives on Neolithic Pit Deposition - Beyond the Mundane: *Neolithic Studies Group Seminar Papers* 12, 63-76. Oxford: Oxbow Books.

Clarke, A. 2006: *Stone Tools and the Prehistory of the Northern Isles*. British Archaeological Reports British Series 406. Oxford: Archaeopress.

Clarke, D.V., Cowie, T.G. & Foxon, A. 1985: *Symbols of Power at the Time of Stonehenge*. Edinburgh: National Museum of Antiquities of Scotland.

Clough, T.H.M. 1988: Introduction to the regional reports: prehistoric stone implements from the British Isles. *In* T.H.M. Clough & W.A. Cummins (eds): *Stone Axe Studies 2. The Petrology of Prehistoric Stone Implements from the British Isles*, 1-11. CBA Research Reports 67. London: Council for British Archaeology.

Henriksen, M.B. 1998: 'Pars pro toto'-begravelser i romersk jernalder – et aspekt af jernalderens begravelsesritualer. *In* A.L. Sommer & A.L. Ballegaard (eds): *Dødens Rum*, 99-112. Odense: Odense Universitetsforlag.

Hunter, F., & Ward, T. 2021: Cannel coal 'napkin ring' fasteners. *In* T. Ward: *The survey and excavation of a Bronze Age and later landscape at Camps Reservoir, near Crawford, South Lanarkshire, 1992 and 1994*. Unpublished DSR.

Jobey, G.J., & Tait, J. 1966 Excavations on palisaded settlements and cairnfields at Alnham, Northumberland, *Archaeologia Aeliana* (4th Series) 44, 5–48.

Manby, T.G. 1974: *Grooved Ware Sites in Yorkshire and the North of England*. British Archaeological Reports British Series 9. Oxford, British Archaeological Reports.

Paterson, I. & Ward, T. 2013: *The Lithology of Biggar Archaeology Group's Prehistoric Projects*.

[http://www.biggararchaeology.org.uk/pdf_reports/BAG_LITHIC_GEOLOGY.pdf]

Ritchie, P.R., & Scott, J.G. 1988: The petrological identification of stone axes from Scotland. *In* T.H.McK Clough & W.A. Cummins (eds.): *Stone Axe Studies. Volume 2. The petrology of prehistoric stone implements from the British Isles,* 85-91. CBA Research Report 23. London: Council for British Archaeology.

Roe, D.E. 1981: *The Lower and Middle Palaeolithic Periods in Britain*. London, Boston and Henley: Routledge & Kegan Paul.

Saville, A. 1981: *Grimes Graves, Norfolk. Excavations 1971/72: Volume II. The Flint Assemblage*. London: Her Majesty's Stationery Office.

Sheridan, J.A. 2025: *Report on the pair of 'napkin ring' dress accessories (SF120 and 121) from Burial 999, Wort's Causeway, Cambridgeshire*. Unpublished report commissioned by Oxford Archaeology (East).

Sheridan, A., & Davis, M. 2002: Investigating jet and jet-like artefacts from prehistoric Scotland: The National Museums of Scotland project. *Antiquity* 76, 812-825.

Smith, J.A. 1857: Notes on Some Sepulchral Cists . . . near Yarrow Kirk, Selkirkshire. *Proceedings of the Society of Antiquaries of Scotland* II (1854-7), 484-9.

Ward, T. 2013: *Fieldwalking and Excavation at Carwood Farm 2007 – 2009. Interim Report*. Unpublished DSR.

Watts, S., & Pollard, A.M. 1998: Identifying archaeological jet and jet-like artifacts using FTIR. *In* B. Pretzel (ed.): *Postprints: IRUG2 at the V&A,* 37-52. London: Victoria & Albert Museum.

www.aocarchaeology.com
www.facebook.com/aocarchaeology
www.sketchfab.com/aocarchaeology
@aocarchaeology
insitu.org.uk

AOC Archaeology Group

INVERNESS | EDINBURGH | LEEDS | YORK | MILTON KEYNES | LONDON