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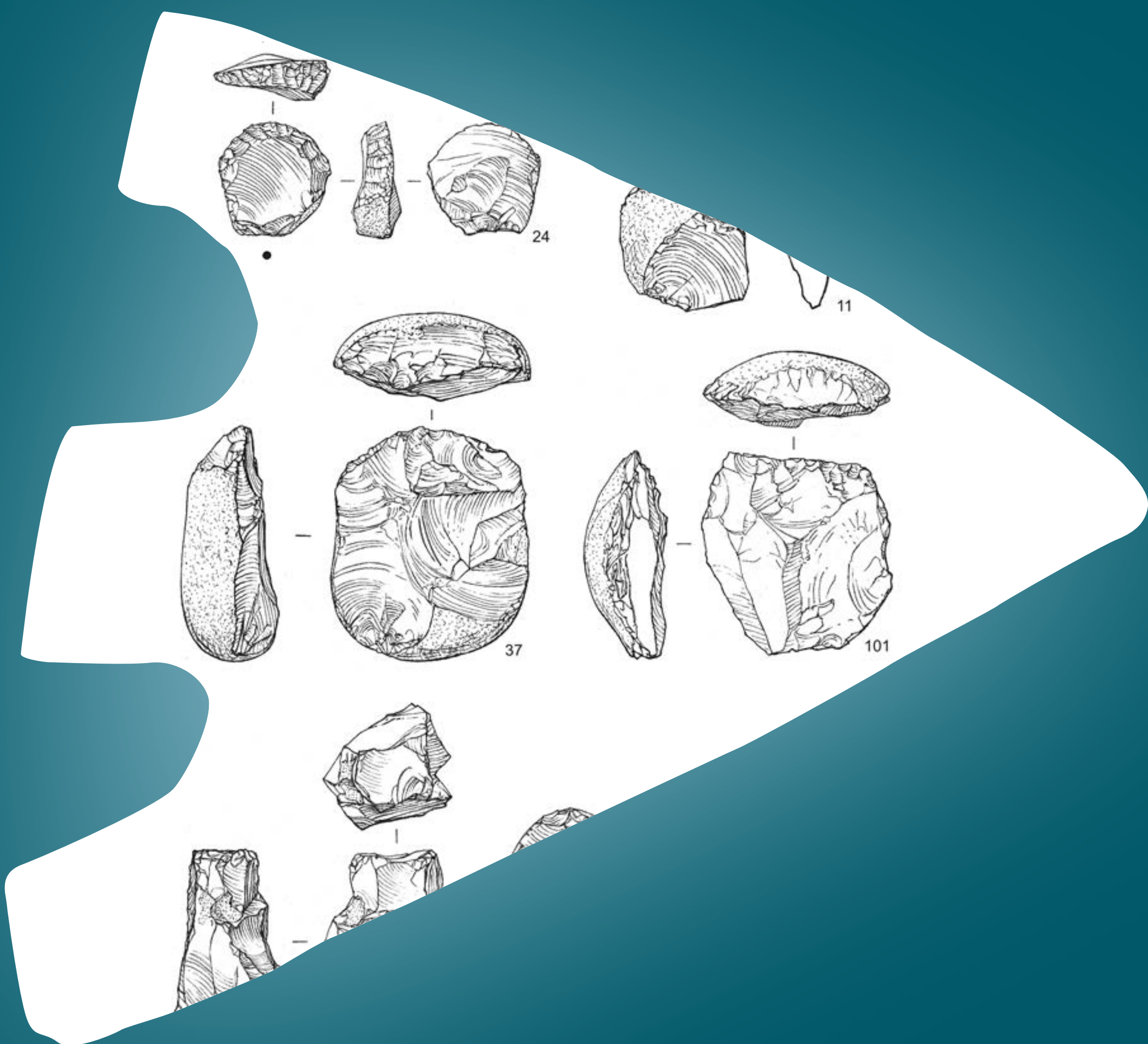

ARO32: Artefacts of Buchan flint from Greenacres, Wester Clerkhill, Peterhead, Aberdeenshire

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ARO32: Artefacts of Buchan flint from Greenacres, Wester Clerkhill, Peterhead, Aberdeenshire

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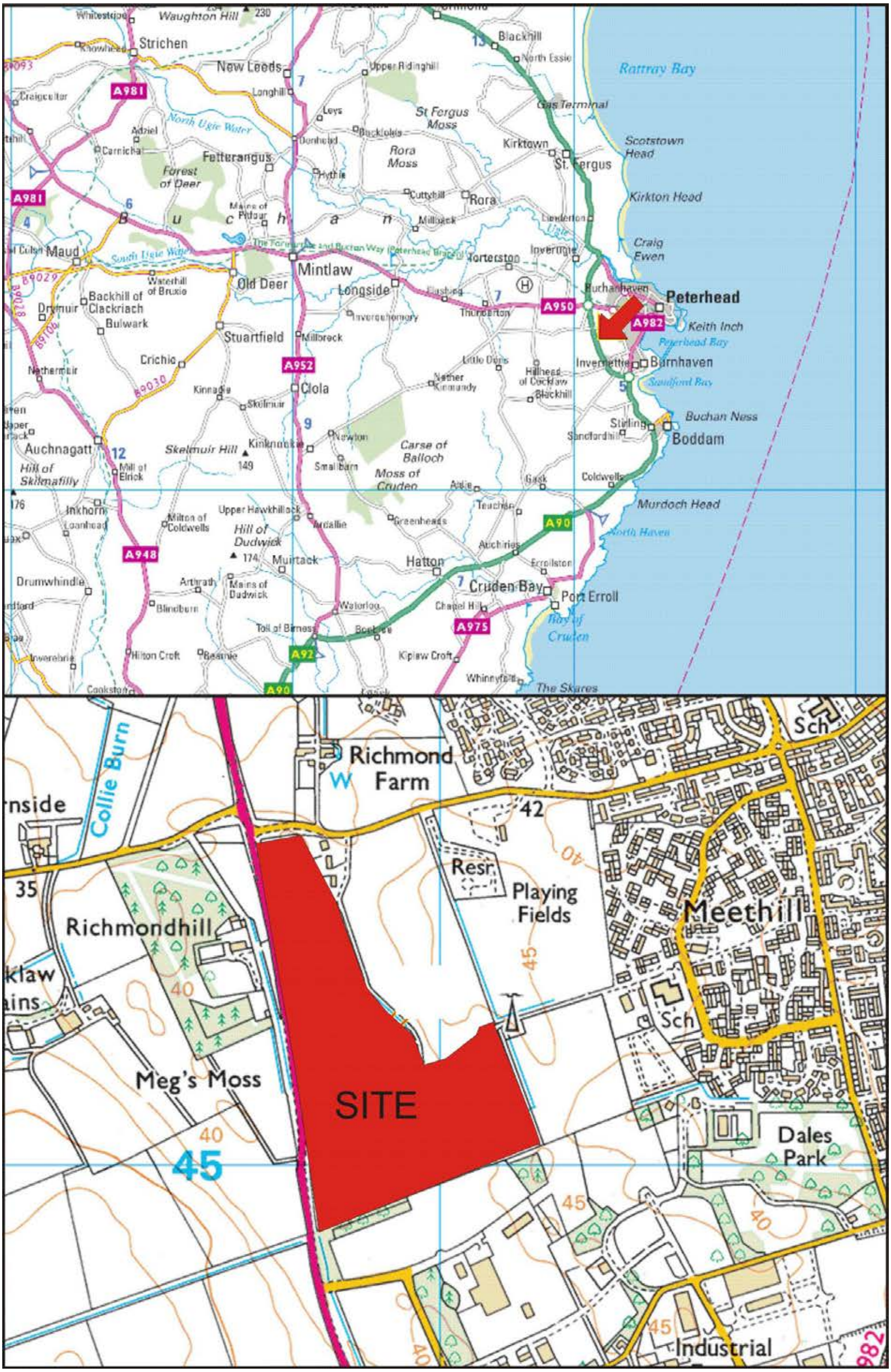

Figure 1: Location plan of the site.

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Summary

An archaeological evaluation was carried out by Cameron Archaeology in December 2015 on behalf of Claymore Homes at Greenacres, Wester Clerkhill, Peterhead, in advance of development of the area. A total of 29 trenches were machine excavated that was equivalent to 5% of the total area. During the evaluation, 697 flints were recovered from the two fields comprising the evaluation area. Although no features were identified in the trenches due to the shallow topsoil and the extensive damage from agricultural practices, the lithic artefacts indicated occupation of the site during the middle or late Neolithic. This publication is a result of a post-excavation research design (PERD) prepared for and agreed with Aberdeenshire Archaeologist Bruce Mann, as no further fieldwork was required at the site.

Introduction and archaeological background

The site (Figure 1) is centred on NGR: NK 1088 4525 at 35-45m OD and lies to the immediate east of the A90 between Meethill and Richmondhill on the west side of Peterhead. It comprised two fields under grass (Plate 1). The shallow topsoil is derived from the clay till overlying granite bedrock (British Geological Survey 2018). Waterlogging in the fields was caused by the generally shallow but heavy clay topsoil.

A desk-based assessment was carried out prior to the evaluation where it identified that there are no Scheduled Ancient Monuments within 1 km of the site. Approximately 300 m to the south is the site of Fairy Hillock (National Record of the Historic Environment NK14SW 68), a natural mound transformed into an eighteenth or nineteenth century garden feature. After archaeological investigation in 2008 the feature was removed in order to create an industrial yard (Murray and Murray 2008, 27). Nineteenth century farmhouses are present at Wester Clerkhill, Richmond Farm (NRHE NK14NW 360), Richmondhill House (NRHE NK14NW 361; Listed B), Cocklaw Mains (NRHE NK14NW 69), Whitehill House (NRHE NK14SW 13) and Lodge (NRHE NK14SW 13.1), Dales Cottage (NRHE NK14NW 362) and Wellington (NRHE NK14SW 12).

Historic maps such as Gordon's map c. 1636-52 (Figure 2) and Blaeu's map of 1654 (Figure 3) both show the farm of 'Clerkhill'. The name was identified as 'Clarkhill' in the Roy Military Survey of Scotland 1747-55 (Figure 4), and on the 1st Edition OS map (1868) the farm and its land are identified as Easterton of Clerkhill (Figure 5) but by 1901 (2nd Edition OS map) the land was renamed Westerton of Clerkhill (Figure 6), and this name was maintained on the 3rd edition OS (1926).

Plate 1: General view of the area investigated. Looking east (photo by Alison Cameron).

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Figure 2: Gordon's map of c 1636-52 showing 'Clerkhill'. Reproduced with the permission of the National Library of Scotland.

Figure 3: Blaeu's map of 1654 showing 'Clerkhill'. Reproduced with the permission of the National Library of Scotland.

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Figure 4: Roy Military Survey of Scotland 1747-55, showing 'Clarkhill' © British Library Board.

Figure 5: 1st Edition OS map showing outline of proposed development. Aberdeen Sheet XXIII.10/06 (Peterhead) Survey date: 1868 Publication date: 1872. Reproduced with the permission of the National Library of Scotland.

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Figure 6: 2nd Edition OS map showing outline of proposed development. Aberdeenshire 023.10/06 (includes: Peterhead) Publication date: 1901 Revised: 1900. Reproduced with the permission of the National Library of Scotland.

Results of the fieldwork

The archaeological evaluation was carried out during December 2015 (Cameron 2016), where along with the 29 machine-excavated trenches, field walking also took place and pieces of flint were recovered from across the investigated area (Figure 7, Plate 2).

The northern field, which contained two raised knolls, had 19 trenches excavated by machine across it. A small number of flints was found and recovered by hand in its shallow clay topsoil that had a depth of 100-200 mm. Due to the glacial till (clay) causing waterlogging of the field, numerous stone and ceramic field drains were also encountered during the trenching. Plough scars were noted cutting the top of the till in most trenches but no archaeological features were identified (Plate 3).

Plate 2: Selection of typical flints from Wester Clerkhill (photo by Alison Cameron).

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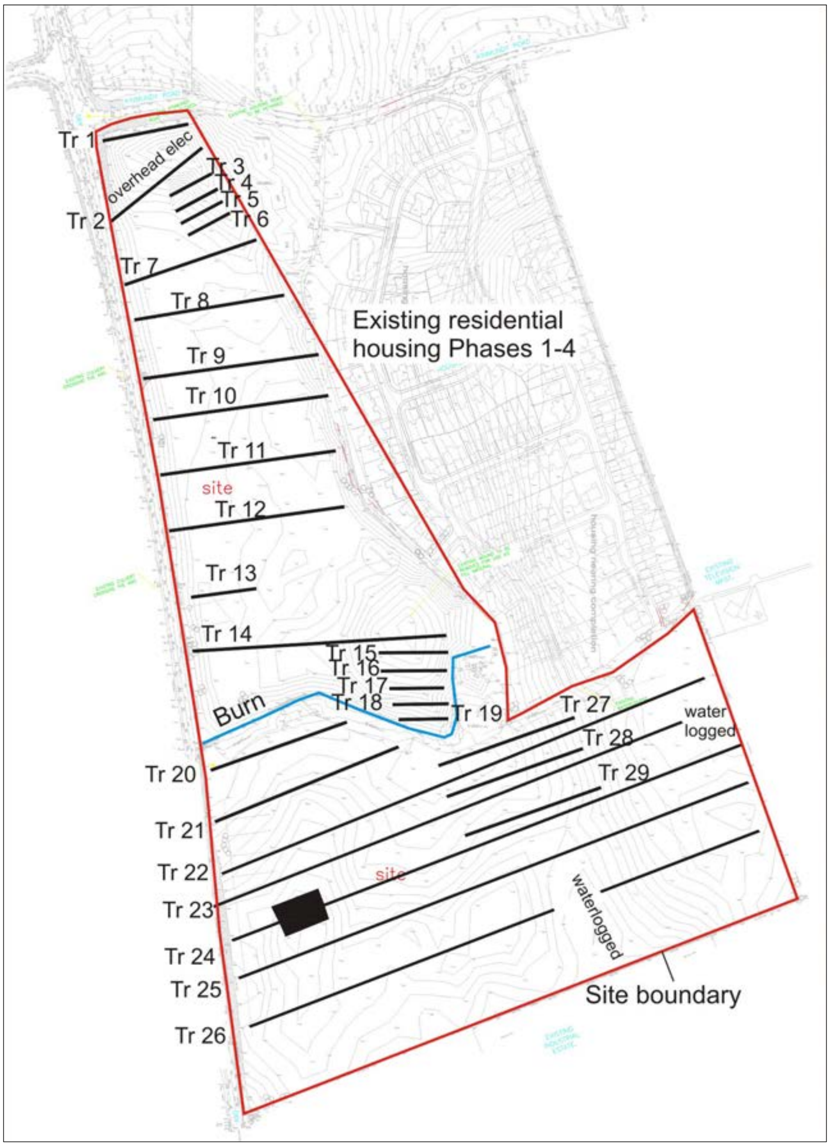

Figure 7: Plan showing evaluation trenches (base map © Claymore Homes).

Plate 3: PC020314 Trench 4 with ploughing scars, field drains and a shallow topsoil. Looking North (photo by Alison Cameron).

The southern field with its shallow clay topsoil was also waterlogged, and field drains and plough scars were noted in most trenches. There were two elevated areas with a 0.5 m deep palaeo-channel between them. Flints were found throughout the area and retrieved by hand from the topsoil, but were mainly recovered from the higher elevations of trenches 23 to 26. The main concentration of flints was found at the west end of Trench 24 along with potential features. An area 20 m by 30 m was opened up across the trench to investigate them, but when half sectioned they were identified as natural stone holes (Plate 4). There were also several large stones *in situ* in the subsoil, in contrast to the remainder of the site which was stone free. The damage to the site caused by intensive ploughing was evident in this excavated area and it was deemed unlikely that any shallow features would survive on the site, and therefore no additional fieldwork or sampling was carried out.

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Plate 4: The open area around Trench 24 with stone holes, extensive field drains and ploughing scars. Looking north.

All the archaeological work was carried out in the context of Scottish Planning Policy (SPP) Planning Advice Note (PAN 2/2011) and Scottish Historic Environment Policy (SHEP), which states that archaeological remains should be regarded as part of the environment to be protected and managed, and in accordance with Chartered Institute for Archaeologists (CIfA) standards and guidance. The site archive is lodged with National Record of the Historic Environment and the finds have been declared to the Treasure Trove Unit.

The lithic artefacts

Approximately 98% of the lithic artefacts were retrieved from the southern field between trenches 22-29, and it is likely that those pieces were associated with later Neolithic settlement situated on the elevated parts of it. However, all traces of this settlement (or settlements) have been obliterated by modern agricultural activities, and all that remains is the present lithic assemblage. However, the assemblage appears to be single-period, with all the diagnostic evidence suggesting that the area was settled in the later Neolithic, and as such it is not entirely devoid of research potential. The flint is also obviously of Buchan Ridge type (Bridgland et al. 1997), and adds important evidence to the understanding of the use of this resource in prehistoric times, as well as information relevant to the understanding of the glaciation and deglaciation of Buchan.

The purpose of this analysis is the detailed characterization of the lithic artefacts, with special reference to raw-materials and typo-technological attributes. From the characterization, the finds are dated and discussed, focusing in particular on the region's later Neolithic industry and the use of Buchan Ridge flint at that time. The evaluation of the material is based upon a detailed catalogue (supplied as an Access database) of the lithic finds from the site. The artefacts are referred to in this catalogue by their catalogue number (CAT no.).

The assemblage

From the mechanical trenching and excavation at Wester Clerkhill, 697 lithic artefacts were recovered. They are listed in Table 1. In total, 69% of this small assemblage is debitage, 20% is cores and 11% is tools. This composition is clearly the result of the methods used to recover the assemblage (above), thus favouring larger pieces.

The definitions of the main lithic categories are as follows:

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

Flakes: All lithic artefacts with one identifiable ventral (positive or convex) surface, GD > 10 mm 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 > 8 mm, in the case of microblades W ≤ 8 mm.

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 (modication).

Av. dim.: Average dimensions

GD: Greatest dimension.

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Debitage	
Chips	1
Flakes	437
Blades	10
Indeterminate pieces	26
Crested pieces	3
Platform rejuvenation flakes	1
Total debitage	478
Cores	
Split pebbles	12
Core rough-outs	3
Single-platform cores - plain	20
Cores w 2 platfs at angle	3
Levallois-like cores	29
Discoidal cores, plain	6
"Flaked flakes"	2
Irregular cores	22
Bipolar cores	35
Core fragments	9
Total cores	141
Tools	
Frags of bifacial implements	1
Scale-flaked knives	1
Backed knives	1
Short end-scrapers	11
Double-scrapers	1
Side-scrapers	7
End-/side-scraper	1
Piercers	3
Oblique truncations	1
Pieces w retouched notch(es)	1
Combined scraper-knives	1
Pieces w edge-retouch	39
Fire-flints	10
Total tools	78
TOTAL	697

Table 1: General artefact list.

Raw materials – types, sources and condition

Apart from one flake in jasper (CAT 370), all finds from Wester Clerkhill are in flint. Most of the flints are red, orange or honey-brown, supplemented by some grey and olive-coloured pieces (Plate 5). Most flints are relatively vitreous and fine-grained, whereas others are more chalcedonic with a 'greasy' hue. Most, however, are characterized by impurities of internal chalk balls, micro-crystals or fossils and they tend to be riddled with fault planes and thermal cracks. These impurities and flaws caused a large proportion of the site's flint nodules to fracture in an uncontrollable manner when prehistoric knappers attempted to reduce them, or in modern times when hit by the plough, or possibly the mechanical excavator used in the archaeological investigation.

Plate 5: The range of colours of the flint found at the site. (photo by Alison Cameron).

In the catalogue, comments on the presence of macroscopic wear or damage is noted on approximately 100 pieces have. In some cases, it is suggested that this may 'possibly' represent modern damage (e.g. plough impact), and in other cases that this may 'probably' be plough-damage. If the term 'possible' was applied, the pieces were generally defined as carrying either use-wear or even retouch, whereas if the edge-alteration of a piece was considered to 'probably' be modern damage, the piece was simply defined as debitage. Usually, only larger pieces would have had their edges 'scraped' by the plough, as smaller pieces would have been moved rather than 'scraped' due to their small sizes/weight. However, at this site even small pieces were 'scraped', as the clayey soil prevented the objects from being moved when struck by a machine.

In comparison with the flint from the Stoneyhill site (Suddaby and Ballin 2010) immediately on top of the flint-bearing Buchan Ridge Gravels c. 4-5 km south and south-west of the site (Hall 1993; Bridgland et al. 1997), it is obvious that the present assemblage is based on Buchan Ridge flint. The largest pieces have greatest dimensions of almost 80 mm, and the large cobble fragments recovered during the investigation suggests that most likely nodules of considerable size were available (discarded natural pieces from the site were up to 120 mm long). Although mining of Buchan Ridge flint did take place during the later Neolithic (e.g. Saville 2005; 2006; 2008; 2011), it is most likely that any flint transported out of the quarry complex by man would have been 'tested' and the most heavily flawed pieces deselected prior to transportation. The fact that many fairly small natural pieces of flint were recovered from the site (as small as 10-20 mm across),

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and that many of the used nodules were heavily flawed pieces, indicates that those nodules were available in the investigated fields, probably in the form of erratics.

This suggestion is supported by recent geological fieldwork in the region, which indicates that – despite claims in older geological literature that parts of Buchan may have been unaffected by glacial erosion – it is '…now considered unlikely that it was unglaciated at least during the whole of the Late Devensian' (Merritt et al. 2003, 9), and '…it is concluded that all of Buchan was glaciated during the Late Devensian' (ibid., 76). Basically, the dumping of debris by a retreating glacier is the only way natural Buchan Ridge flint could have been scattered across Wester Clerkhill.

Table 2 shows the proportions of cortical against inner pieces at the site, and the fact that c. 20% of the pieces are primary and a total of c. 70% cortical (primary+secondary) supports the suggestion that no prepared (for example, partially decorticated and tested) cores or blanks were imported into the area from the Buchan Ridge quarry sites, despite the proximity of these locations.

	n	%
Primary	87	19
Secondary	232	52
Tertiary	128	29
TOTAL	447	100

Table 2: Reduction sequence of all unmodified flakes and blades.

Debitage

In total, 478 pieces of debitage were retrieved from the site (Table 3). Due to the fact that sieving was not carried out, the debitage only includes one solitary chip. The remainder of the debitage includes 92 flakes, two blades (no microblades), 26 indeterminate pieces and four preparation flakes (three crests and one core tablet). As two of the crests have finely faceted platform remnants, it is thought that they may have been detached from Levallois-like cores. Ten waste flakes and three pieces with edge-retouch also have finely faceted platform remnants, indicating that they were detached from Levallois-like cores.

The technologically definable flakes and blades are mostly hard percussion specimens (60%), supplemented by 30% bipolar flakes (Table 4). Only 2% have discrete bulbs of percussion, and 8% could not be defined in detail.

	n	%
Chips	1	trace
Flakes	437	92
Blades	10	2
Microblades	0	0
Indeterminate pieces	26	5
Preparation flakes	4	1
TOTAL	478	100

Table 3: Relative composition of the debitage.

	n	%
Soft percussion	5	2
Hard percussion	187	60
Indeterminate platform technique	6	2
Platform collapse	19	6
Bipolar technique	95	30
TOTAL	312	100

Table 4: Applied percussion techniques: definable unmodified flakes and blades.

A total of 52 pieces (7.5%) were crazed from exposure to fire, mostly from Trenches 24-26. This suggests that prehistoric fireplaces were present on the site, probably in the form of domestic hearths.

Cores

The assemblage includes 12 split pebbles, three core rough-outs, 19 plain single-platform cores, one opposed-platform core, three cores with two platforms at an angle, 29 Levallois-like cores, six plain discoidal cores, two 'flaked flakes', 22 irregular cores, 35 bipolar cores, and nine core fragments. The assemblage is clearly dominated by five categories: split pebbles, single-platform cores, Levallois-like cores, irregular cores and bipolar cores, which are defined in greater detail below.

Figure 8 shows the greatest dimension of the intact *split pebbles*. Apart from one piece (CAT 587), all split pebbles are early-stage bipolar cores which were abandoned after the detachment of a small number of flakes. The diagram suggests that most raw nodules may have been in the order of 60 mm, but that some were up to 80 mm long.

The 19 *single-platform cores* form a homogeneous group of broad and thick cores with an av. dim. of 44 by 39 by 30 mm (Figure 9). Most have plain platforms and crudely trimmed platform-edges, but nine have either faceted or finely faceted

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platforms, suggesting that these pieces may be contemporary with the site's Levallois-like cores. Twelve have cortical 'back-sides.

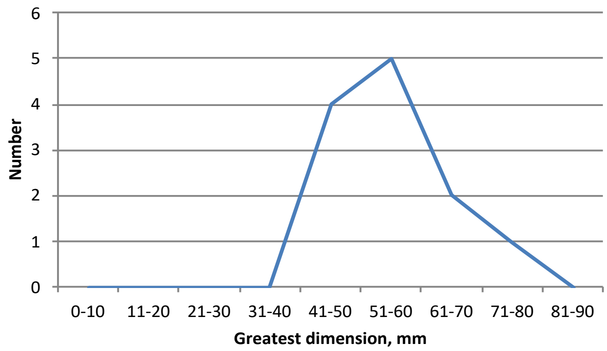

Figure 8: Greatest dimensions of the intact split pebbles.

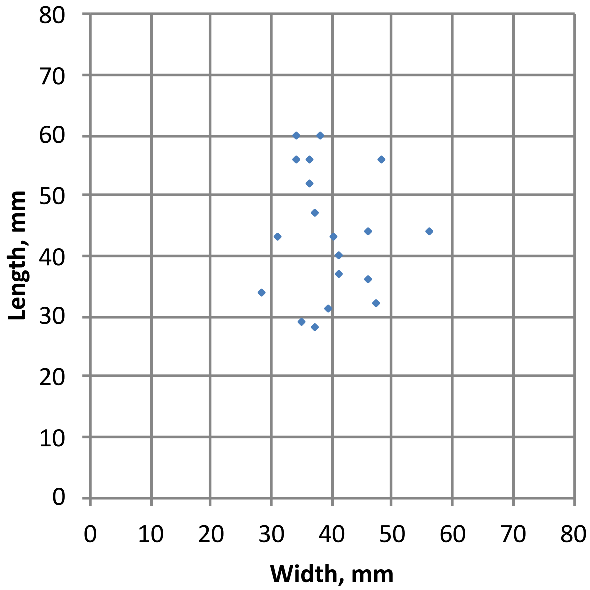

Figure 9: The length:width of all intact single-platform cores.

A total of 13 single-platform cores display incipient cones on the platform, indicating that these cores were reduced by the application of hard percussion like the Levallois-like cores. The use of this approach suggests that the cores post-date the early Neolithic, which – along with the Scottish Late Upper Palaeolithic and Mesolithic periods – is characterised by the use of soft percussion for the production of their main blank forms (cf. Ballin 2014b, Table 3). The cores from Wester Clerkhill mostly produced elongated (blade-like) flakes.

In relative terms, the 29 *Levallois-like cores* measure on average 49 by 42 by 20 mm (Figure 10), and they are slightly longer than the single-platform cores (L:W ratio 1.2 against 1.1), and notably thinner (W:Th ratio 2.1 against 1.3). They mostly have slightly domed lower faces. Two pieces were defined as early-stage 'tortoise-shaped' pre-forms (CAT 37, Figure 11, and CAT 291), but most of these cores are clearly heavily used specimens (for discussion of Levallois-like cores, see Ballin 2011a; Suddaby and Ballin 2010).

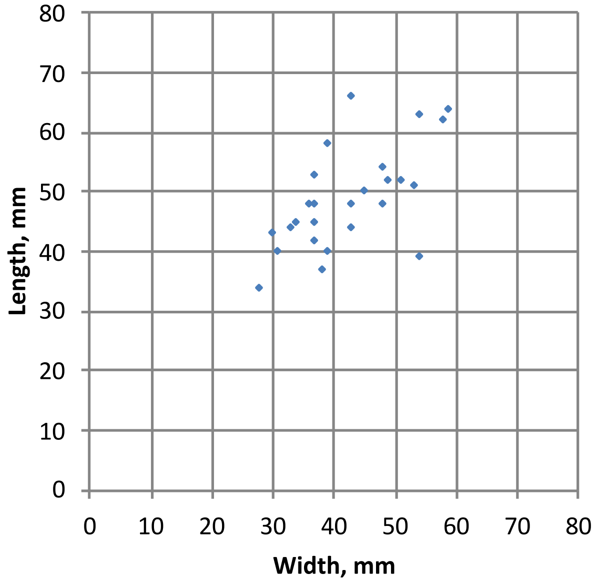

Figure 10: The length:width of all intact Levallois-like cores.

Some of the cores are so exhausted that they no longer have an intact platform, but apart from the most heavily used pieces, which may have been reduced from several directions and even worked partially in bipolar technique, they generally only have one platform. Some pieces have incipient cones on their platforms, suggesting that, like the single-platform cores, the Levallois-like cores were also reduced by the application of hard percussion. Approximately half of them display trimming whereas the other half do not. Of the cores with intact platforms, ten have plain platforms, eight have faceted platforms, and five have finely faceted platforms. Usually, these cores are characterized by faceted or finely faceted platforms, but in this case the dominance of plain platforms may be a result of these cores representing the final stages of an operational schema.

As most of these cores were worked from single platforms, the question is how they can be easily distinguished from single-platform cores proper? As shown in Figure 12, their thickness may be the most important attribute in terms of identification, with later Neolithic single-platform cores generally being fairly thick and the period's Levallois-like cores notably flat. It is possible that one of the key differences in terms of forming

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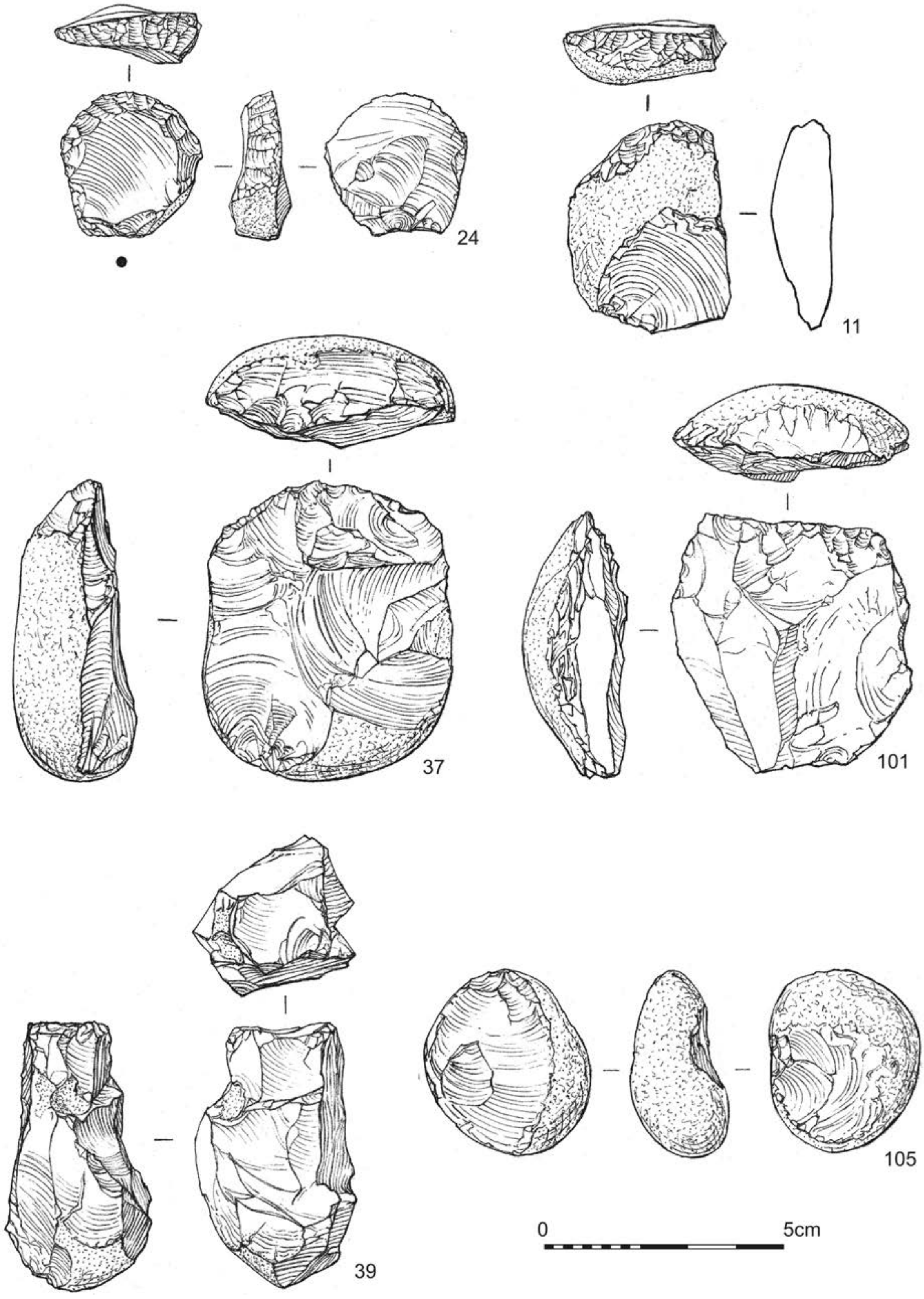

Figure 11: Lithic artefacts - CAT 11 short end-scraper, CAT 24 scraper/knife, CAT 37 and CAT 101 Levallois cores, CAT 39 single-platform core and CAT 105 bipolar core.

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these two different core types is the first step of the operational schema, where rough-outs for single-platform cores may have been produced either by splitting pebbles across or simply detaching a primary 'opening flake', whereas Levallois-like core rough-outs may have been formed by splitting a pebble along the long axis, providing a flat core blank, which would then be equipped with two lateral crests (Ballin 2011a; Suddaby and Ballin 2010). CAT 588 has both original crests intact, whereas seven pieces have partially surviving crests along one or both lateral sides.

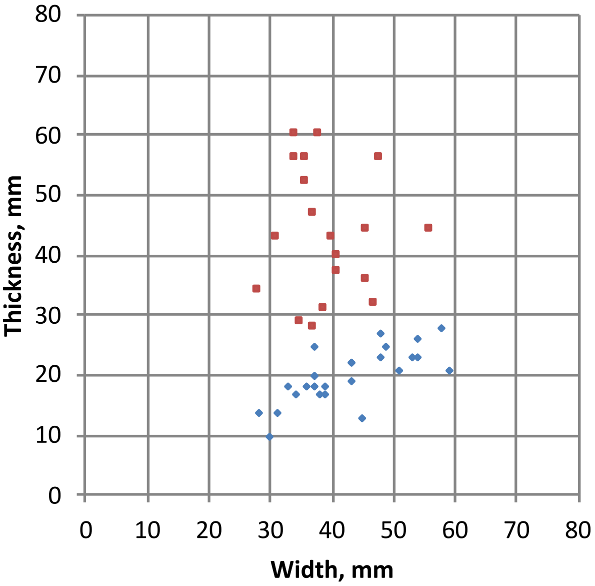

Figure 12: The width:thickness of all intact single-platform (red) and Levallois-like (blue) cores.

Figure 13 shows the size of the site's *irregular cores*, that is, cores which were struck from more than two directions. These pieces measure on average 47 by 37 by 27 mm. Some of the irregular cores are roughly cubic, whereas others are more irregular.

The intact *bipolar cores* measure on average 41 by 34 by 17 mm (Figure 14). The length and width of these pieces corresponds roughly to the dimensions of the site's other main core types (see above), but they are clearly considerably flatter. Approximately 60% are bifacial and the remainder unifacial, and almost four-fifths have one reduction axis (one set of opposed terminals), where approximately one-fifth were worked from two perpendicular directions, showing that these cores were re-orientated during the reduction process.

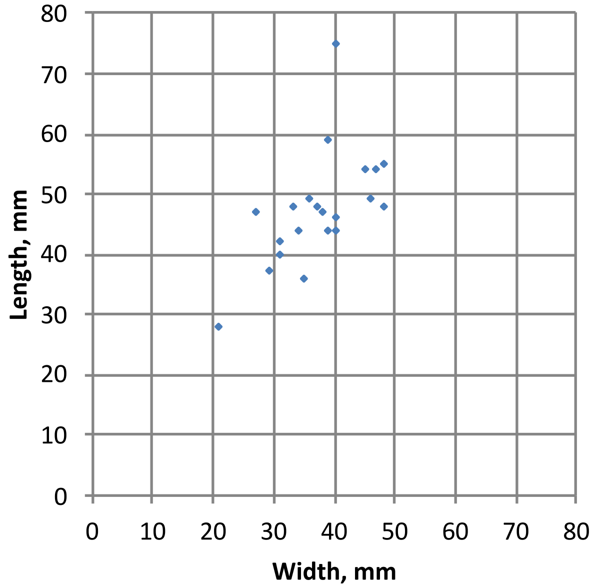

Figure 13: The length:width of all intact irregular cores.

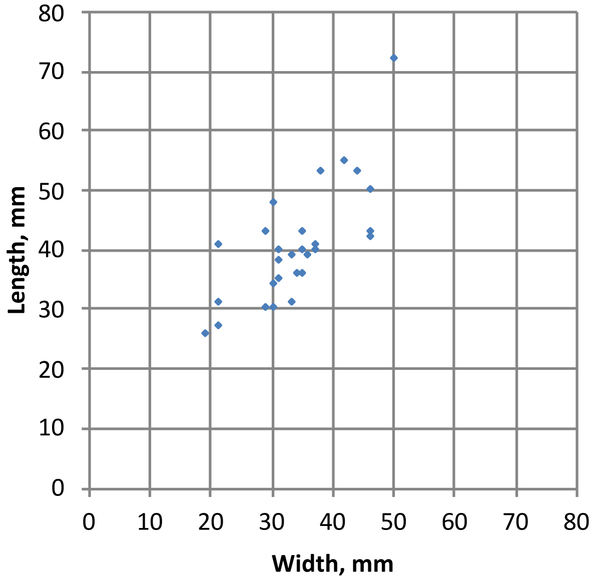

Figure 14: The length:width of all intact bipolar cores.

Three *core rough-outs* are preforms of single-platform cores. One *opposed-platform core* and three *cores with two platforms at an angle* represent an intermediary stage between single-platform cores and irregular cores. Six *plain discoidal cores* and two 'flaked flakes' (so-called Kombewa cores; Inizan et al. 1992, 57) are both simple forms of discoidal cores, where the Levallois-like core may be the most sophisticated form of discoidal core, and although they may appear as solitary specimens throughout prehistory, they are common in later Neolithic and Bronze Age contexts (cf. Saville 1981; Ballin 2002).

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Tools

The 78 tools (Table 1) include a number of implement categories, such as one fragment of a bifacial implement; three knives; 19 scrapers; three piercers; one truncated piece; one notched piece; one combined scraper-knife; 39 pieces with edge-retouch; and ten potential fire-flints. Some of the edge-retouched pieces may be pieces with robust use-wear or pieces with modern damage. With 19 pieces, the scrapers clearly dominate the formal tools (24% of all tools and 49% of the tools less edge-retouched pieces).

Bifacial implements: CAT 356 (Figure 15) is the burnt tip fragment of an indeterminate bifacial piece with unilateral invasive retouch (GD 30 mm).

Knives: This category includes one scale-flaked knife (CAT 31) and two backed knives (CAT 216, Figure 16, and CAT 694, Figure 17). The former is a small flake (19 by 22 by 5 mm) with sporadic, expedient scale-flaking along its right lateral side. The latter two pieces (av. dim.: 34 by 18 by 8 mm) are regular short blades with steep inverse backing along one lateral side, with fine, flat use-wear along the opposite edge from cutting.

Scrapers: This category (19 pieces) includes 11 short end-scrapers, one double-scraper, six side-scrapers, and one end-/side-scraper (Figure 18). The scrapers are dominated by end-scrapers (58%) and side-scrapers (32%).

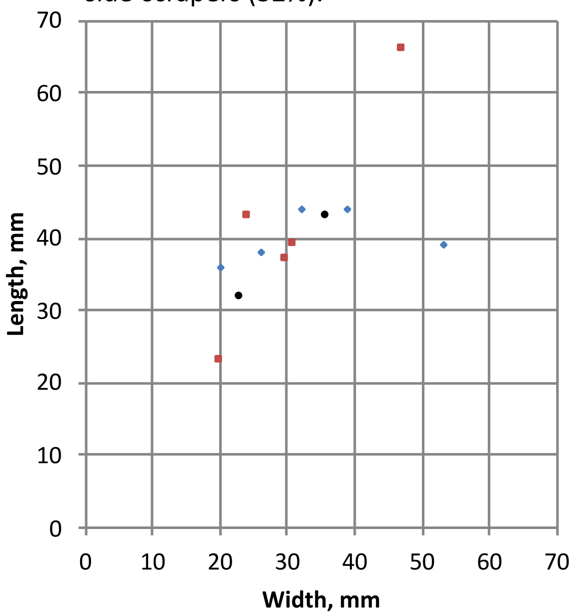

Figure 18: The length:width of all intact scrapers; red = end-scrapers; blue = side-scrapers; black = other scrapers.

Apart from CAT 474, which is a very small expedient piece (GD 22 mm), and CAT 27, which is a relatively thin elongated piece with a straight acute scraper-edge (43 by 24 by 9 mm) all end-scrapers are robust implements. It is possible to subdivide the nine robust end-scrapers into two main categories: 1) highly expedient, mostly fully cortical pieces (CAT 25, 104, 194, 471, 689), all of which are characterized by poorly executed working-edges; CAT 194 and 689 are intact, and they measure 66 by 47 by 18 mm and 39 by 31 by 10 mm, respectively; and 2) primary and secondary pieces with more regular convex, steep scraper-edges (CAT 11, Figure 11, CAT 102, 464, Figure 15, and CAT 600, Figure 19), one of which is intact (CAT 600: 37 by 30 by 15 mm).

The side-scrapers are mostly expedient pieces with modification which amounts to little more than crude rubbing. It cannot be ruled out that some of these may be pieces with modern damage (e.g. plough impact or plough 'rubbing'). Only one side-scraper, CAT 614 (Figure 19) measuring 38 by 26 by 10 mm, is a regular tool with a well-executed working-edge, and which has a straight, steep scraper-edge along its longest edge.

CAT 30 is an end-/side-scraper on an irregular thick flake (GD 43 mm), and it has an almost straight, steep scraper-edge at its distal end, as well as along its left lateral side. CAT 330 is a small irregular flake fragment (GD 32 mm) with a steep working-edge at either end – one scraper-edge is convex, whereas the other is straight.

Piercers: Three piercers form a highly heterogeneous group. CAT 670 is based on a discarded Levallois-like core, which has had a robust tip formed at one end (63 by 52 by 29 mm); CAT 685 (Figure 17) is a medium-sized core-piercer, with a three-sided robust tip at one end and a thick handle at the other end (52 by 32 by 24 mm); and CAT 695 (Figure 17) is a primary flake, which had a relatively fine point formed at its proximal end (33 by 25 by 10 mm) – the outermost tip of the piercer has broken off.

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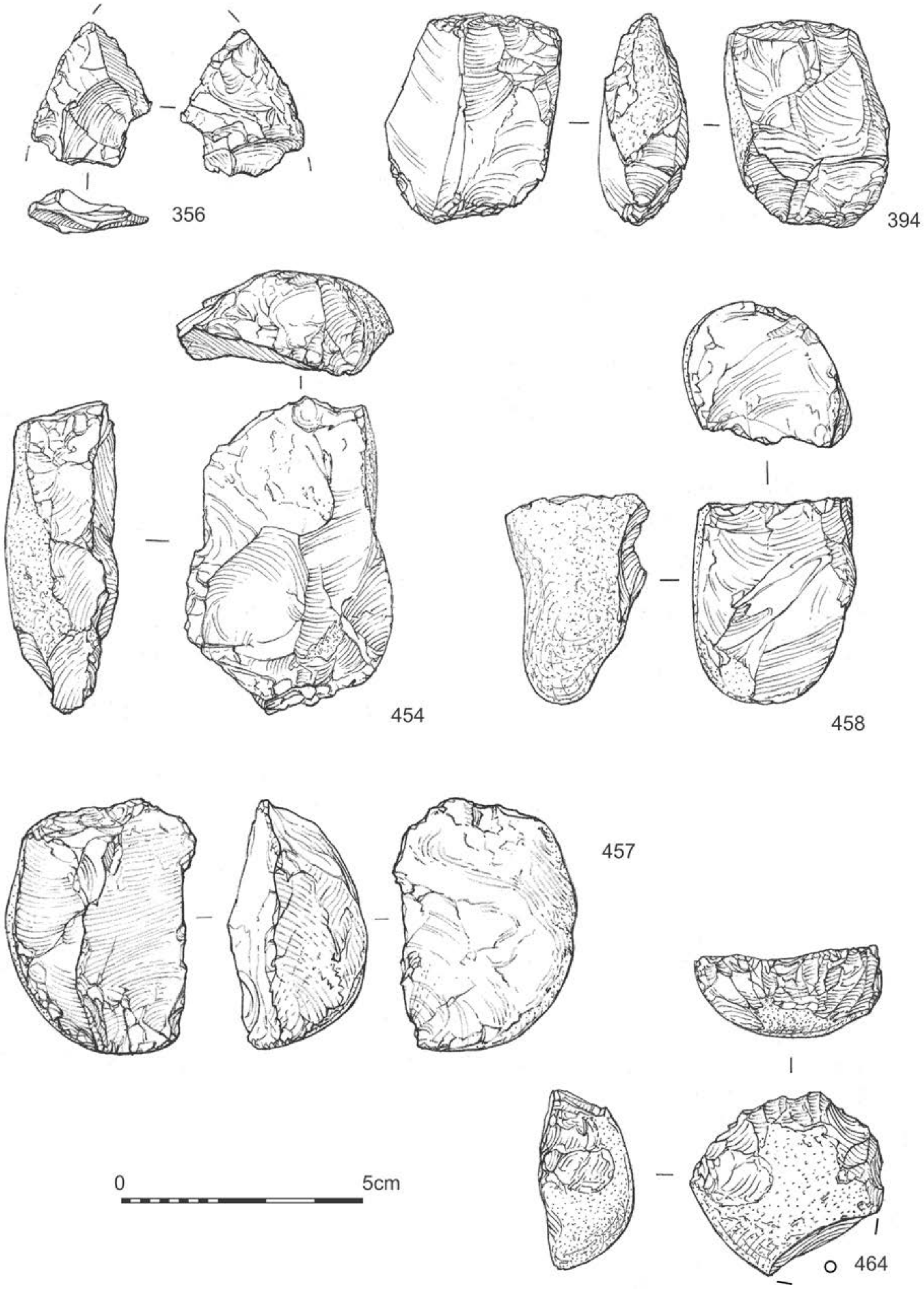

Figure 15: Lithic artefacts – CAT 356 bifacial implement, CAT 394 and CAT 457 bipolar cores, CAT 454 Levallois core, CAT 458 single-platform core and CAT 464 short end-scraper.

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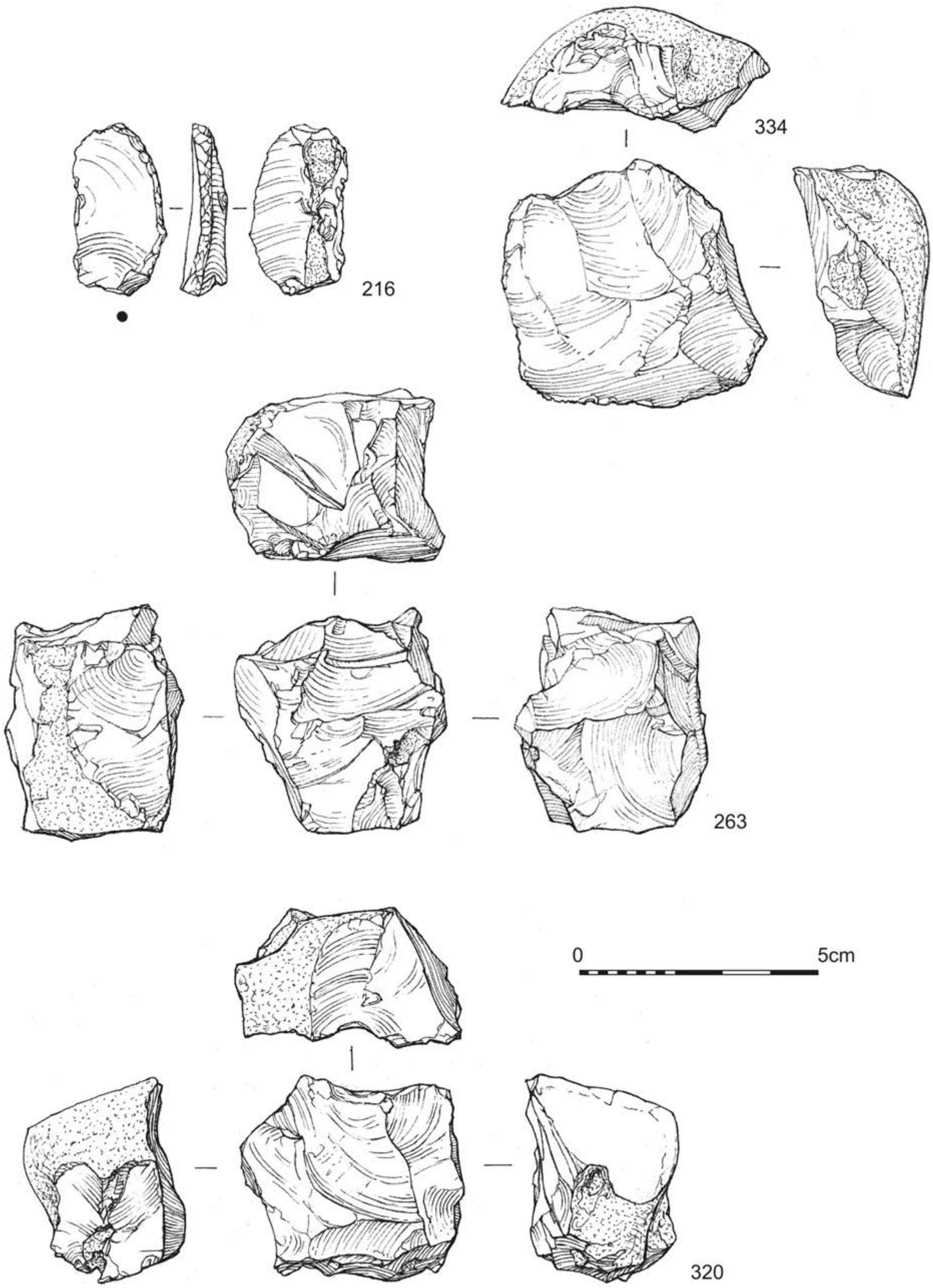

Figure 16: Lithic artefacts – CAT 216 backed knife, CAT 263 and CAT 320 irregular cores, and CAT 334 Levallois core.

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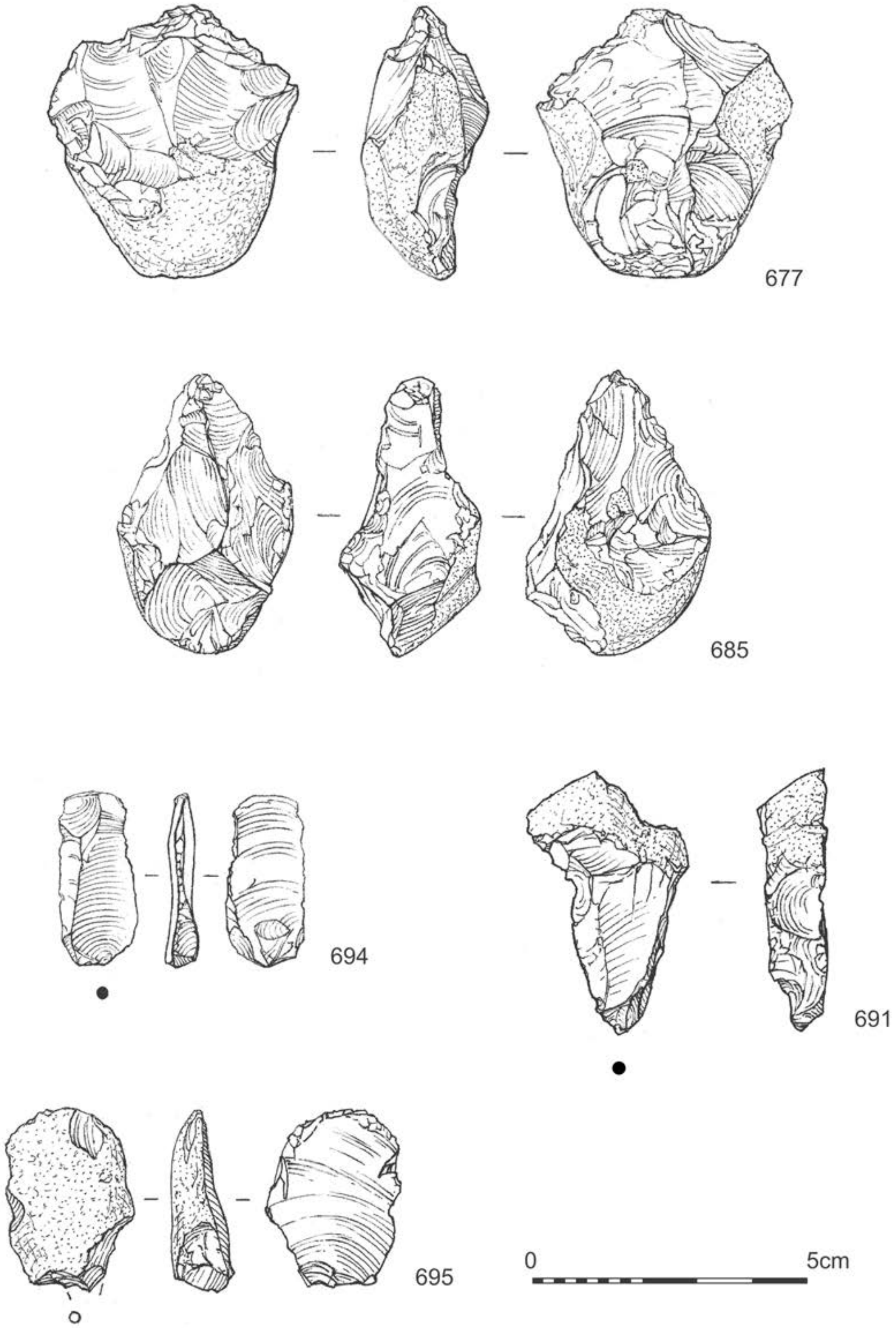

Figure 17: Lithic artefacts – CAT 677 bipolar core, CAT 685 and 695 piercers, CAT 694 backed knife, and CAT 691 crested flake.

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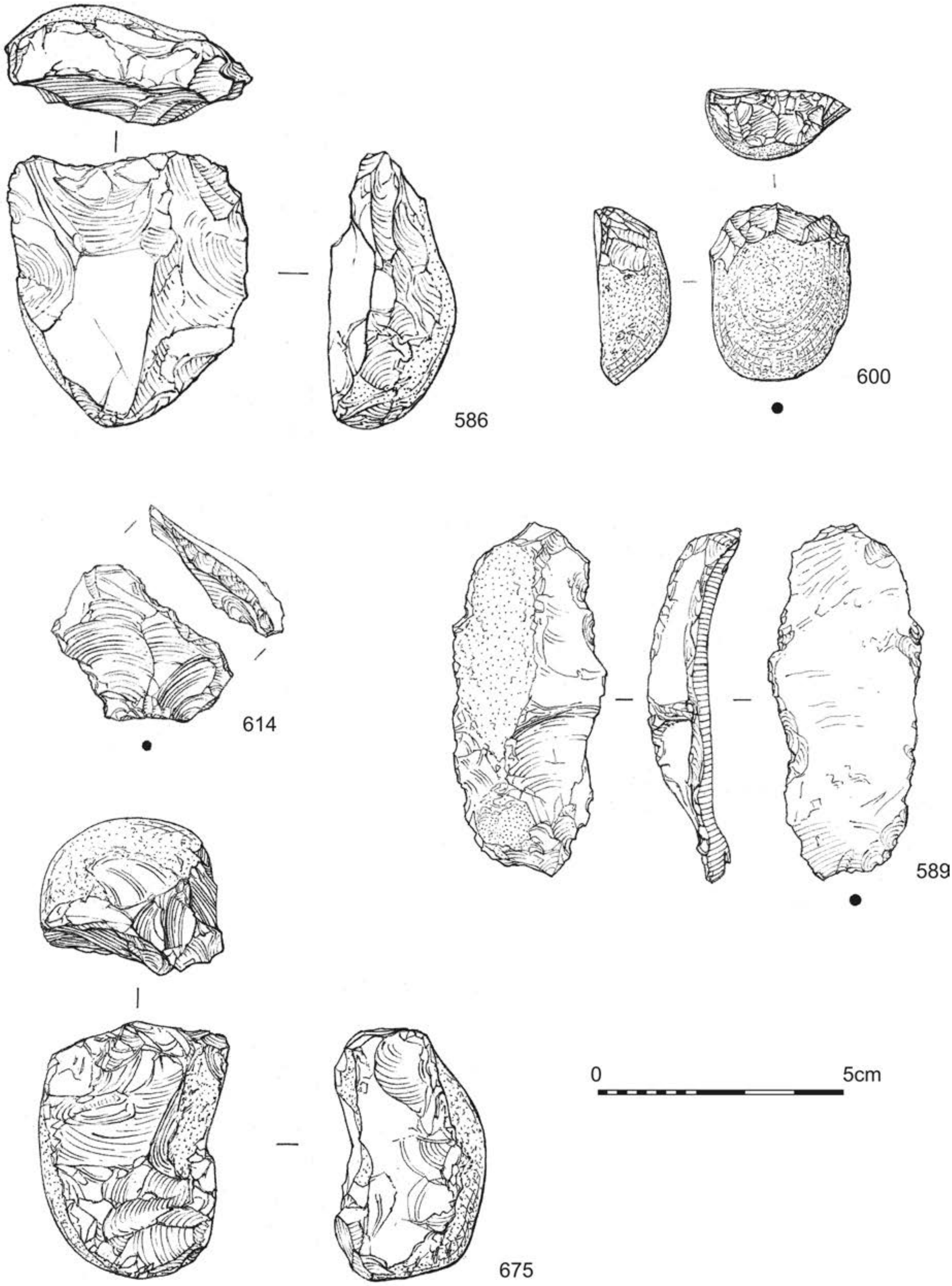

Figure 19: Lithic artefacts – CAT 586 Levallois core, CAT 589 piece with oblique truncation, CAT 600 short end-scraper, CAT 614 side-scraper, and CAT 675 single platform core.

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Other tools: One *truncated piece* CAT 589 was recovered from the site. This piece stands out, as it is based on a large, well-executed broad-blade (73 by 32 by 14 mm). It has an oblique truncation at the distal end, but an apparent proximal truncation, as well as lateral modification, may mainly be modern damage. This piece does not fit the general technological approach followed at this largely later Neolithic site, with most other blanks being relatively short blades (few) and mostly robust flakes. It may possibly date to the late Upper Palaeolithic period. CAT 20 is a flake (GD 43 mm) with a large *notch* in one lateral side (chord c. 10 mm). The notch may be the result of plough impact. CAT 24 is a highly regular *combined tool* based on a hard-hammer flake (30 by 30 by 9 mm). It has a regular pressure-flaked, convex, steep scraper-edge at the distal end, and a scale-flaked cutting-edge along its left lateral side.

Ten pieces (GD 22-61 mm) were defined as *fire-flints*. They are evenly distributed across robust flakes, thermal flakes and indeterminate pieces, all of which display extensively battering of their edges. Although several of these are likely to be pieces with modern edge-damage, several are also likely to be genuine fire-flints, used with a steel strike-a-light. This is suggested by the concave delineation of some battered edges. Fire-flints are common throughout the Iron Age – post-medieval period (cf. Ballin 2014a).

Technological summary

This technological summary is based on the evidence presented in the raw material, debitage (tool blanks), core and tool sections above. Due to the fact that all finds were recovered from plough soil, and that they are therefore all unstratified objects, it is not possible to say with any degree of certainty whether the flints represent more than one visit to the site. However, the assemblage does appear homogeneous, and its typo-technological composition is consistent with a date within a middle/late Neolithic framework.

The assemblage represents an industry which focused on the production of squat and elongated flakes/short blades. The fact that the different core types are of roughly the same general size, suggests that although some cores may represent a sequence, where one core type is transformed into other core types as the reduction process proceeds (traditionally, single-platform core ⇒ core with two platforms at an angle ⇒ irregular core ⇒ bipolar core), some cores from each category must have been shaped directly from the original pebble, as for example an irregular core with a GD of 60mm cannot be based on a recycled single-platform core of the same size. The same is the case for the bipolar cores. Although some may represent the final stage of an operational schema, where small platform cores are exhausted entirely by the use of anvil technique, the largest bipolar cores must represent the first stage of an operational schema. This suggestion is supported by the fact that 11 of the site's 12 split pebbles were opened by the application of anvil technique.

Levallois-like cores are usually defined by having been prepared by finely faceting the cores' platforms, rather than trimming the platform-edges in the traditional single-platform manner (Ballin 2011a; Suddaby and Ballin 2011), but many of the Levallois-like cores from this site have plain platforms, and some of the single-platform cores have faceted or finely faceted platforms. The absence of faceting of some Levallois-like cores, however, may be due to these cores being heavily exhausted specimens and they may have had their platforms rejuvenated. At this site, the main difference between the two core forms is shape, with the single-platform cores being thick and the Levallois-like cores flat (Figure 12), possibly indicating different ways of preparing core rough-outs? As suggested above, single-platform cores may have been produced either by splitting pebbles across or simply detaching a primary 'opening flake', whereas Levallois-like core rough-outs may have been formed by splitting a pebble along the long axis and providing a flat core blank, which would then be equipped with two lateral crests (Ballin 2011a; Suddaby and Ballin 2010). Much further research is needed before we can say that we fully understand why later Neolithic people apparently produced two different forms of cores with one platform. It has been previously suggested (Ballin 2011a; Suddaby and Ballin 2010) that the main function of the Levallois-like cores may have been to allow the production of

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two different blank forms from the same cores, namely squat flakes from the cores' broad-sides (for chisel-shaped and oblique arrowheads) and elongated blanks from the lateral sides under and along the crests (for cutting implements).

Secondary modification, and the transformation of blanks into tools, was usually carried out by simple edge-retouch, but a number of pieces were shaped by the use of invasive retouch, such as an indeterminate bifacial implement (CAT 356), a scale-flaked knife (CAT 31), and a combined scraper-knife (CAT 24).

Distribution

Due to the fact that the site was generally investigated by trial trenching, it is not possible to discuss the distribution of the lithics in detail, but Table 5 gives an impression of the distribution of the artefacts within the site as a whole.

Trench	Segment	n
02	East	5
07	East	2
11		1
14		2
22		9
22/23		29
23	West	42
23/24	East	6
24		13
24	West	147
24	Centre	45
24	East	21
24	Stone hole	8
24/25	West	9
25	West	37
25	Centre	54
25	East	76
26	West	63
26	Centre	83
26	East	14
27		3
28		14
29		14
	TOTAL	697

Table 5: Distribution of worked flint across the excavated trenches.

Very few pieces were recovered towards the north, with 98% of all lithic objects deriving from the southern field (mainly Trenches 23-26). Most likely, these finds were associated with one or more later Neolithic settlements on the elevated parts of this field. However, all traces of this settlement or settlements have been obliterated by modern activities, and all that is left is the present lithic assemblage.

Dating

The Wester Clerkhill assemblage includes little dating evidence. The use of invasive retouch for the production of some tools suggests a date within the Neolithic/Early Bronze Age framework, whereas the presence of numerous Levallois-like cores narrows this date down to the middle or late Neolithic periods. As shown in Suddaby and Ballin (2011, 40), there are indications that the Levallois-like technique and its products became slightly less refined through this period, with blades becoming fewer and shorter towards the Neolithic/Early Bronze Age transition. It is possible that the relatively low number of proper blades reflects this development, and that the assemblage from Wester Clerkhill is relatively late within the later Neolithic framework. The high number of bipolar cores and flakes may also indicate a relatively late date, with (in eastern Scotland) the Early Neolithic period being practically devoid of bipolar cores and flakes (e.g. Ballin 2016a), and with the number of such pieces growing through the later Neolithic and Early Bronze Age periods (Ballin 2014b).

The blade blank of the site's only truncated piece (CAT 589) is so large and regular that it appears out of place. Recently, late Upper Palaeolithic blades and blade tools have been identified in East of Scotland lithic assemblages (Ballin 2016b; 2016c; Ballin and Wickham-Jones forthcoming), and it is possible that this piece represents a short visit to the site in pre-Mesolithic times.

Conclusion

Although the present assemblage was recovered entirely by trial trenching as the site generally appears to have been destroyed by centuries of deep ploughing, it still has some research potential. Apart from one particularly large blade tool (CAT 589, Figure 19), which may be a residual late Upper Palaeolithic piece, the collection as a whole is typo-technologically homogeneous, and the finds suggest a date in the middle or late Neolithic.

The assemblage is the product of an industry focused on the manufacture of flakes and elongated flakes/short blades, mainly from

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single-platform, Levallois-like, irregular and bipolar cores. The Levallois-like technique is still fairly poorly understood, and the question as to why later Neolithic people in eastern Scotland apparently had two parallel operational schemas for the production of, seemingly, the same types of blanks, has not yet been answered in a satisfactory manner. More research is certainly needed to deal with this question.

In addition to the recovery of waste flakes and discarded core remnants, a number of implements were also found. Apart from numerous pieces with simple edge-retouch, many of which may or may not be pieces with modern edge damage (e.g. plough impact), the tools are dominated notably by scrapers, with sophisticated pieces being almost entirely absent. Only one fragment of a bifacial implement (CAT 356) was recovered. This composition corresponds to what would be expected from an ordinary domestic settlement of the time (cf. Stoneyhill Grid J/Trench 1; Suddaby and Ballin 2011), but it differs substantially from the composition of contemporary assemblages like Overhowden and Airhouse (Ballin 2011b), which may have had functions relating to the adjacent ritual complex of Overhowden henge. These latter assemblages include numerous chisel-shaped and oblique arrowheads, scale-flaked and plano-convex knives, polished-edge implements, strike-a-lights and combined tools.

In terms of future perspectives, an attempt should be made to shed light on the distribution of Buchan Ridge flint in the area. At present, there is little evidence to suggest that Buchan Ridge flint was transported far from the area's mining complex, despite the fact that this heavily flawed raw material is relatively easy to recognize. However, at Wester Clerkhill, local erratic surface flint of Buchan Ridge type appears to have been exploited despite the fact that the Peterhead area was, until recently, considered as having been more or less ice-free during the last Ice Age (Sutherland and Gordon 1993). Recent geological research in the region suggests that this was not the case, and that all of Buchan was at some stage covered by ice during the Late Devensian (Merritt et al. 2003). However, more work needs to be invested in researching the region's glacial movements and on the distribution of erratic sources of Buchan Ridge flint in the general Peterhead area. This would prevent artefacts in this type of flint being misinterpreted as representing exchange from the Buchan Ridge outcrops, as this material could simply have been collected locally as erratics.

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