11 THE LITHIC ASSEMBLAGE, *by Torben Bjarke Ballin*

In total, 74 lithic artefacts were recovered from the Laigh Newton excavations (table 3). Thousands of unworked lithic pieces from sieved samples were discarded. The purpose of this analysis was to characterise the lithic assemblage in detail, with special reference to raw materials, typological composition and technology. From this characterisation, it was sought to date the lithic assemblage and discuss its affiliation. The evaluation of the lithic assemblage was based upon a detailed catalogue of all the lithic finds from Laigh Newton, and the artefacts in this report are referred to by their number (CAT) in the catalogue (see Appendix 6).

The definitions of the main lithic categories are as follows:

- *Chips*: All flakes and indeterminate pieces the greatest dimension (GD) of which is ≤ 10mm.
- *Flakes*: All lithic artefacts with one identifiable ventral (positive or convex) surface, GD > 10mm and L < 2W (L = length; W = width).
- *Indeterminate pieces*: Lithic artefacts which cannot be unequivocally identified as either flakes or cores. Generally the problem of identification is due to irregular breaks, frost-shattering or fire-crazing. *Chunks* are larger indeterminate pieces, and in, for example, the case of quartz, the problem of identification usually originates from a piece flaking along natural planes of weakness rather than flaking in the usual conchoidal way.

Table 3 Lithic artefact list

	Laigh Newton West	Laigh Newton North-west	Laigh Newton Central	Laigh Newton East	Total
Debitage					
Chips, flint	1	2	2	12	*17*
Chips, quartz	4	7			*11*
Flakes, flint	4		4		*8*
Flakes, quartz		5	5		*10*
Flakes, chert		1	1		*2*
Flakes, agate			1		*1*
Blades, flint			1		*1*
Blades, pitchstone			1		*1*
Microblades, flint				9	*9*
Microblades, pitchstone	1				*1*
Indeterminate pieces, flint			3		*3*
Total debitage	*10*	*15*	*18*	*21*	*64*
Tools					
Short end-scrapers, chert		1			*1*
Discoidal knives, flint			1		*1*
Truncated pieces, flint		1			*1*
Denticulated pieces, quartz		1			*1*
Fragments of polished implements, flint			1		*1*
Pieces with edge-retouch, flint	2		1		*3*
Pieces with edge-retouch, chert			1		*1*
Pieces with edge-retouch, pitchstone		1			*1*
Total tools	*2*	*4*	*4*		*10*
	12	**19**	**22**	**21**	***74***

- *Blades and microblades*: Flakes where L ≥ 2W. In the case of blades W > 8mm, in the case of microblades W ≤ 8mm.
- *Cores*: Artefacts with only dorsal (negative or concave) surfaces – if three or more flakes have been detached, the piece is a core, if fewer than three flakes have been detached, the piece is a split or flaked pebble.
- *Tools*: Artefacts with secondary retouch (modification).

11.1 General observations

The assemblage was clearly dominated by flint (60%) and quartz (30%), supplemented by some chert (5%) and pitchstone (4%), as well as a solitary piece of agate (1%). The agate flake (CAT 9) may be natural. It is possible to sub-divide the flint into two main forms, namely a south-west Scottish form and an exotic (imported) form ('Yorkshire flint'; Saville 1994, 63). The former is generally light and opaque, and it may include some impurities, whereas the latter is more vitreous, homogenous and usually darker. The south-west Scottish flint type may have been procured along local shores, but as this form of flint is also found in Northern Ireland (ibid, 63), it is almost impossible to determine whether an individual piece represents procurement from Scottish sources or importation, unless the object has surviving cortex: abraded cortex would indicate procurement from a local pebble source, whereas a fresh, powdery surface suggests that the piece was obtained from primary sources in County Antrim. In the case of Laigh Newton, there are no indications that flint may have been imported from Antrim.

Yorkshire flint was exchanged in two sub-forms, a dark-brown, pure form and a dark-grey, slightly less vitreous, marbled form. The finds from Laigh Newton include both these types. However, only the former is absolutely certain to derive from north-east England, as the latter is more similar in appearance to the south-west Scottish/Antrim type, with mis-identification being a possibility. Although recent research into Scottish imported flint reveals that Yorkshire flint may have been imported into south-east Scotland already in the later part of the Early Neolithic (Ballin forthcoming a), in most parts of Scotland, Yorkshire flint is largely associated with the Late Neolithic Levallois-like technology (Ballin forthcoming b) and the production of arrowheads and cutting implements. The exchange in Yorkshire flint seems to tail off in the Early Bronze Age period. Eight pieces of flint (CAT 3, 13, 15–6, 32–3, 48 and 50), from Laigh Newton West and Central were thought to be in this material (almost one-fifth of all flint artefacts).

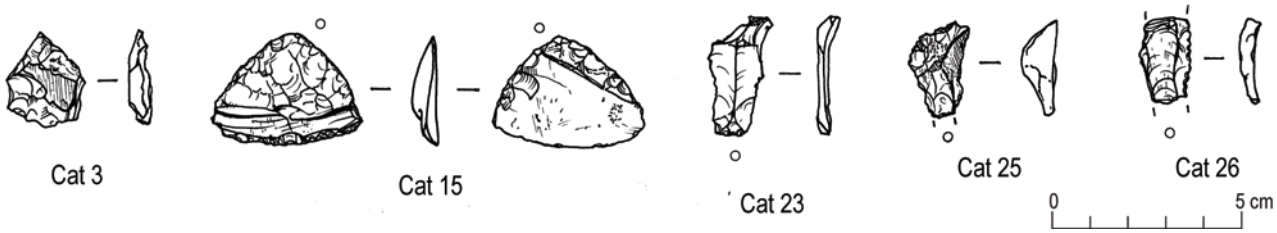
The quartz artefacts were generally homogenous white, milky quartz with acceptable flaking properties, although two transparent chips (CAT 30 and 37) were rock crystal. Quartz occurs in sedimentary and igneous as well as metamorphic rock formations (Pellant 1992, 86), but the abraded cortex of several pieces suggests procurement from beach or river deposits. The chert (CAT 1, 4 and 25) corresponds to what is generally known as Southern Uplands chert. Southern Uplands chert occurs in many colour variations, with black, grey, blue-green/grey-green, and brown/brown-green being the most common varieties. Though banding does occur, the Laigh Newton chert is generally plain or lightly speckled, light- to dark-grey, radiolarian chert. Scottish chert is particularly common in Carboniferous Limestone (Ballin & Johnson 2005, 62), but it also occurs in some earlier and later sedimentary formations, such as Ordovician and Silurian formations (Cameron & Stephenson 1985). At Laigh Newton, the chert was most likely to have been procured from local Carboniferous outcrops (Woodland 1979).

Three artefacts (CAT 5, 20 and 26) in Arran pitchstone (Williams Thorpe & Thorpe 1984) are black, aphyric volcanic glass with a green tinge. The pieces were generally very homogeneous, with small spherulites, but few macroscopically visible crystallites (Ballin & Faithfull 2009). CAT 26 was slightly banded. Although some porphyritic sources (for example at Tormore and Auchagallon on Arran's west coast) have narrow bands of aphyric material, the Laigh Newton specimens were so homogeneous that they are unlikely to have been procured from areas outwith the wider Corriegills district on Arran's east coast. CAT 9 appears to be a small agate flake, but the piece is relatively irregular and may be natural. Although there were numerous pieces of chalcedony/agate in the material from the site's sieved samples, this raw material was apparently ignored by the inhabitants. The related raw materials chalcedony, agate and jasper generally derive from igneous formations.

Laigh Newton West and Central had roughly the same distribution of raw materials, with almost 60% flint, approximately one-third quartz/chert (poor-quality supplementary raw materials) and 5–8% pitchstone (one piece each). Laigh Newton North-west was dominated by the poorer raw materials quartz and chert (almost 80%), with 16% flint and, again, a single piece of pitchstone. Laigh Newton East stands out, with its sub-assemblage being exclusively in flint.

11.2 Laigh Newton West

The sub-assemblage from the westernmost site included twelve pieces, ten of which were debitage, with two being tools. The debitage consisted of one flint chip, four flint flakes and four quartz flakes, as well as one pitchstone microblade. Flint flakes CAT 32 and 33 probably represent importation from north-east England. Both tools (CAT 21 and 29) were flints with simple edge-retouch, one of which was on a blade and one on a microblade. Technologically definable blanks were detached by soft as well as hard percussion.



Illus 15 Lithics: Catalogue nos: 3 Polished piece of probable Yorkshire Flint; 15 Late Neolithic scale flaked knife of probable Yorkshire Flint, 23 Flint blade with oblique truncation, 25 Chert short end-scraper flake, 26 Pitchstone blade with edge-retouch

The modified flint microblade (CAT 29) was detached by the application of soft percussion. The production of microblades, as well as the use of soft-hammer technique, are characteristics of the Late Mesolithic period and the earliest part of the Early Neolithic (see for example Ballin 2006; Ballin forthcoming c). This piece was local flint. In terms of size and general execution, it corresponds to the microblades from the small concentration at Laigh Newton East.

The two small flakes (CAT 32 and 33) in Yorkshire flint are most likely to date to the later part of the Neolithic period and were recovered from the same feature (pit 040) as an undiagnostic flint flake (CAT 19).

Amongst the upper level packing stones of pit 250 in the north-western corner of the western excavation site, two diagnostic lithics were retrieved, namely a pitchstone microblade (CAT 20) and a retouched flint blade (CAT 21). The examination of pitchstone artefacts in connection with the author's recent pitchstone project suggests that, on the Scottish mainland outside Argyll, pitchstone use was largely an Early Neolithic phenomenon (Ballin 2009). In Scotland, broad blades of the size of CAT 21 usually date to the middle or later Neolithic period (Ballin forthcoming a).

11.3 Laigh Newton North-west

The sub-assemblage from Laigh Newton North-west included nineteen pieces, fifteen of which were debitage, with four being tools. The debitage consisted of two flint chips, seven quartz chips, five quartz flakes and one chert flake. This sub-assemblage included no exotic flint. The four tools comprised one end-scraper on a short chert flake (CAT 25; illus 15); one flint blade with an oblique distal truncation (CAT 23; illus 15); one denticulated quartz flake (CAT 28); and one pitchstone blade with sporadic edge-retouch (CAT 26; illus 15). Apparently, all flint and chert blanks and implements were detached by the application of hard percussion, whereas it was not possible to define how the pitchstone blade was detached, as it is a medial fragment. The quartz blanks were all detached by the application of bipolar technique.

The widths of the two blade-based implements (CAT 23 and 26) suggest middle or later Neolithic dates of origin. The quartz element of this sub-assemblage (ie less exclusive procurement), in conjunction with the presence of a typical denticulated piece, may indicate later prehistoric dates, as denticulated pieces are particularly common in Middle and Late Bronze Age contexts (Ballin 2002).

11.4 Laigh Newton Central

This sub-assemblage included twenty-two pieces, eighteen of which were debitage, with four being tools. The debitage consisted of two flint chips, four flint flakes, five quartz flakes, one chert flake, one possible agate flake, one flint blade, one pitchstone blade, and three indeterminate pieces in flint. The four tools comprised one discoidal knife on a flint flake (CAT 15; illus 15), one fragment of a polished flint implement (CAT 3; illus 15), one edge-retouched flint flake (CAT 8), and one edge-retouched chert flake (CAT 4). All definable tools, as well as most blanks in flint and chert, were detached by the application of hard-percussion; the quartz artefacts seem to have been manufactured in bipolar technique.

The widths of the flint blade and the pitchstone blade suggest a date in the middle to later part of the Neolithic period. The presence of six pieces (CAT 3, 13, 15, 16, 48 and 50) of probable Yorkshire flint (partly the dark homogeneous form, partly the lighter marbled form) indicates activities during the later Neolithic period. CAT 15 is a sophisticated, sub-triangular form of discoidal knife, with three slightly convex, acute edges. Its dorsal face was formed entirely by invasive retouch, whereas the ventral face displays invasive retouch along two of the three edges. In terms of outline, it corresponds to a polished 'discoidal' knife from Kempston, near Bedford, England (Evans 1897, fig. 256; Clark 1932, 41). Discoidal knives are generally perceived as a Late Neolithic form (Butler 2005, 170).

Illus 16 Microblade fragments from Laigh Newton East

11.5 Laigh Newton East

In contrast to the other three sub-assemblages, which appeared to be chronologically mixed, the lithic finds from the easternmost site seemed to represent a chronological unit, and they were most likely initially deposited at the same time and in connection with the same visit to the site. The twenty-one lithics were all in flint, with twelve pieces being chips and nine microblades or microblade fragments (illus 16), and were recovered from the fills (39005 and 39007) of two pits (39006 and 39008). All microblades were detached by soft percussion, and they were generally fairly narrow and thin. Only CAT 71 was intact, probably because it is a fraction thicker and more robust than the other microblades.

The dimensions of the microblades indicate a date either in the Late Mesolithic period or in the earliest part of the Early Neolithic, and the flint is local, as would be expected from an early assemblage.

11.6 Discussion of the lithic assemblage

The lithic assemblage from Laigh Newton was composed of four main sub-assemblages, and all but that from the easternmost site were chronologically mixed (see table 4). The finds from the eastern site most likely represent a Late Mesolithic or very early Early Neolithic microblade industry, and the artefacts were probably deposited in connection with a brief visit to the location. If all artefacts left during this visit were recovered, the small assem-

Table 4 Dates of the activities at Laigh Newton, as suggested by diagnostic lithic elements

	Late Mesolithic/ Early Neolithic	Early Neolithic	Late Neolithic	Early Bronze Age	Later prehistory
Laigh Newton West	?	■	■		
Laigh Newton North-west		■	?		■
Laigh Newton Central		■	■		
Laigh Newton East	■				

blage may represent the activities of Late Mesolithic (full-time) hunters or Early Neolithic (part-time) hunters. If the finds are the truncated remains of a larger assemblage, it may represent a more substantial Mesolithic camp or a Neolithic residential settlement.

The other three sub-assemblages all included Early Neolithic material, as represented by the three pitchstone objects (Ballin 2009), but they were also characterised by a noticeable Late Neolithic element. The Late Neolithic finds included broad hard-hammer blades, though none was detached by the application of the so-called Levallois-like technique (Ballin forthcoming a), a sub-triangular discoidal knife, and a number of chips and flakes in Yorkshire flint. Although the exchange in Yorkshire flint may have been initiated in the later part of the Early Neolithic period, and probably continued into the Early Bronze Age, in Scotland this raw material is mainly associated with the Late Neolithic period (Ballin forthcoming b). The quartz finds from Laigh Newton Central, not least the denticulated piece, may date to the later part of Scottish prehistory.