
5 THE LITHIC ASSEMBLAGE: DEFINITIONS AND COMPOSITION

INTRODUCTION

The excavations yielded an assemblage of 138,043 pieces of worked stone. This represents only a fraction of the stone debris that littered the site as a result of the manufacture and use of stone tools throughout its prehistoric occupation. The analysis of this material has been complicated by two factors: firstly, two widely separated periods of occupation were revealed; secondly, the site was not fully excavated so that the assemblage is only a sample of the material originally deposited there.

There are three broad stratigraphic categories from which material was derived:

- ‘mesolithic’: anthropogenic features dating from the mid ninth to the mid eighth millennium BP
- ‘neolithic’: mixed anthropogenic and natural features dating from the late fifth to the late fourth millennium BP
- ‘ploughsoil’: a mixed anthropogenic horizon of recent origin.

Much of the assemblage must have been laid down in the earliest period, with the result that material from this phase has contaminated the later deposits, whilst the third horizon contains material from both earlier periods.

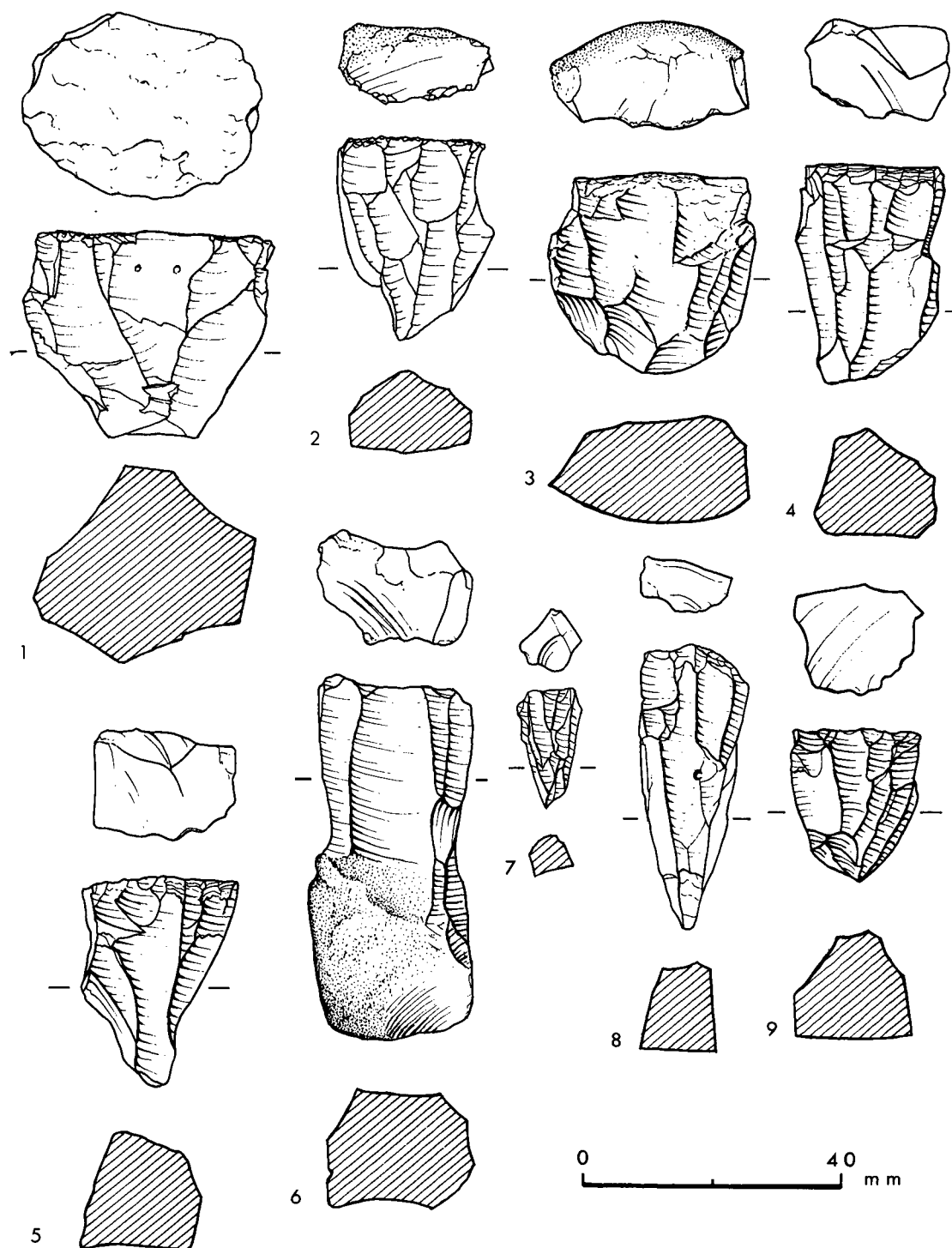
The recovery methods employed for each of these stratigraphic categories have already been described (Chapter 2). In order to prepare the initial, on site, catalogue the whole assemblage was treated alike, and the definitions used for this and for all subsequent analysis are presented below.

The initial catalogue divided the assemblage into basic types (Tab 2) and enabled a general picture to be built up. As the problems of distinguishing bloodstone from flint were not resolved until the detailed post-excavation analysis (Chapters 4 and 6), the two materials were considered as one for the initial catalogue, and they were called chalcedony. Once an adequate method of distinguishing between the two materials had been formulated, then specific samples of the assemblage were sub-divided and so, in the post-excavation analysis, the use of bloodstone could be compared to the use of flint (Chapters 6 and 7).

DEFINITIONS

The following list is intended as a tool to clarify the interpretation of the lithic catalogue, and the sections on specialised lithic analysis. Lithic specialists may sometimes impart specific nuances of meaning to their use of particular terms, and so it is necessary to know the precise meaning of the terminology used to describe any assemblage. The definitions given here are those that were used for the analysis of the lithic material from Kinloch; though they are specific to Kinloch, the list is presented with a view to its potential use in the analysis of material from similar sites. Some terms are not included here, these are terms for which there is less scope for variety in interpretation. Clear definitions of these may be found in Tixier *et al* 1980, and these are the definitions followed by those working on the material from Kinloch.

- 1 Knapping is the process of flaking stone for the manufacture of tools; it refers to both primary and secondary technology.
- 2 Primary Technology is the first part of the systematic process of stone tool production: nodules of raw material are prepared into cores and then used for the manufacture of flakes and blades. Many blades and flakes may be used as functional tools in their original form.
- 3 Secondary Technology is the second part of the tool production process: selected blades and flakes are modified into specific tool types. For the Kinloch analysis these types are defined by attributes relating to both technology and morphology.
- 4 Reduction Technique is the specific way in which force is applied to the raw material during tool manufacture. This may be through percussion, pressure, or grinding. Percussion may be direct (hammer on to core), or indirect (hammer to punch to core). Hammers may be hard or soft.
- 5 Reduction Method is the overall process through which knapping is achieved. This may involve the application of several different reduction techniques (Pélegrin 1982, 65).
- 6 Platform Technique is a reduction technique used in primary technology in which percussion is applied at an angle to the platform of a core. The core may be freely supported or supported on an anvil.
- 7 Bipolar Technique is a reduction technique used in primary technology in which percussion is applied to the top of the core. The core is always supported on an anvil.
- 8 Hard Percussion is a reduction technique in which the implement used to transfer force to the core is of approximately the same hardness as the worked material. Force is normally direct. Relevant technological attributes include: a large, pronounced bulb of force; clearly visible ripples; radial fissures from the point of impact; bulbar scars.
- 9 Soft Percussion is a reduction technique in which an implement softer than the worked material is used. It may be direct or indirect. Relevant technological attributes include: a diffuse or flat bulb of force; a platform lip at the edge of the ventral surface.
- 10 Bulbs of Force have been divided into the following types:
 - 10.1 Diffuse Bulbs: slightly domed, poorly developed with no ripples or radial fissures.
 - 10.2 Flat Bulbs: a flat ventral surface with no sign of a bulb and no other identifiable attributes.
 - 10.3 Pronounced Bulbs: a prominent bulb with readily identifiable ripples.
- 11 Orientation: during examination artifacts are always held with the dorsal face uppermost and the proximal end towards the observer (and illustrated as such).
- 12 Dimensions are recorded in millimetres in the order: length: width: thickness.
 - 12.1 Length is the measurement taken along a line at 90° to the platform of the piece.
 - 12.2 Width is the measurement taken across the widest part of the piece, at 90° to the length and in the same plane.
 - 12.3 Thickness is the measurement taken from the ventral surface to the highest point of the dorsal surface along a line perpendicular to both length and width.
- 13 Primary Material: artifacts with cortex platforms and cortex over the dorsal surface.
- 14 Secondary Material: artifacts with flake platforms but some cortex over the dorsal surface.
- 15 Inner Material: artifacts with no surviving cortex surfaces.
- 16 Decortical Material: primary or secondary removals used to open and shape a nodule.
- 17 Pebbles are lumps of raw material from which one or two flakes may have been removed at random.
- 18 Cores are lumps of raw material from which a sequence of removals has been taken. They have been classified into four types:
 - 18.1 Bipolar Cores: cores from which removals are made by the splitting of the parent nodule by the bipolar technique. At Kinloch the bipolar cores did not develop flat platforms.
 - 18.2 Platform Cores: cores from which removals are taken from the side of the core by use of the platform technique.
 - 18.3 Disc Cores: cores from which removals are taken from alternate faces of the core by applying percussion to the core edge. In this way the negative scar of a previous removal becomes the platform for the next removal. These cores are freehand supported.
 - 18.4 Amorphous Cores: cores from which removals have been made in no regular fashion.
- 19 Blades are long thin removals with parallel, straight sides and acute edges. They are knapped by a specific reduction method known as blade strategy.
- 20 Regular Flakes are removals with a minimum of 10mm of regular acute edge. They are wider than blades and do not require the use of a blade strategy. They are, by definition, always over 10mm in either length or width.
- 21 Irregular Flakes are removals with no regular edge. They may be large or small and are frequently chunky in aspect. This category includes all flakes of less than 10mm maximum dimension.
- 22 Chunks are removals with neither platform nor ventral surface. They are generally the unintentional by-products from knapping. They may be large or small.
- 23 Modified Pieces are artifacts that have been modified after primary reduction by the use of secondary technology. At Kinloch this was always done by retouching. The individual types of modified piece found at Kinloch are fully described in Chapter 7.
- 24 Blanks are pieces (generally flakes and blades, but sometimes cores or chunks) that have been selected for modification. No unmodified blanks were identified at Kinloch, but the reconstruction of the predominant types of blank that were selected for the different modified pieces was of interest.
- 25 Debris is a by-product of knapping: that material which inevitably results from the knapping process but which was not the goal of that process. Some debris may be suitable for use with or without modification.
- 26 Debitage: is debris that was not suitable for any further purpose, material discarded immediately upon the end of the knapping exercise. It includes much very small material.
- 27 Tool: the term tool is a subjective term reserved for pieces (whether modified or not) considered to be potentially of use as manipulated artifacts. The term, therefore, includes both unretouched blades and regular flakes, as well as retouched artifacts; in addition a core may become a core tool.



ILL 26: The lithic assemblage, cores: 1-9 platform cores.

COMPOSITION

The total composition of the assemblage may be seen in Table 2; the individual types, their production and the raw material from which they derive are discussed in detail below.

Type	Chalcedony	Quartz	Agate	Silicified Limestone	Volcanic Glass	% Cortex	Total
PEBBLES	91	12	17			100	120
CORES							
Bipolar	267	11	2			12	1252
Platform	929	8	1			34	
Disc	7					28	
Amorphous	26		1			34	
BLADES	2572	3				3	2575
REGULAR FLAKES	13230	150	8	18	2	8	13408
IRREGULAR FLAKES	104944	444	151	50	2	6	105591 (69% <1cm)
CHUNKS	13364	40	82		2	17	13489
MODIFIED ARTIFACTS							
Microoliths	1155						1155
Non-Microlithic	452			1			453

Table 2: The total lithic assemblage: composition by type and material.

PEBBLES

The 120 pebbles represent less than 1% of the total assemblage. The majority are of chalcedony (82%), while the remainder are of quartz or agate; all are small. In many cases one or two flakes have been removed from the pebbles, and thus they may represent raw material that was never utilised.

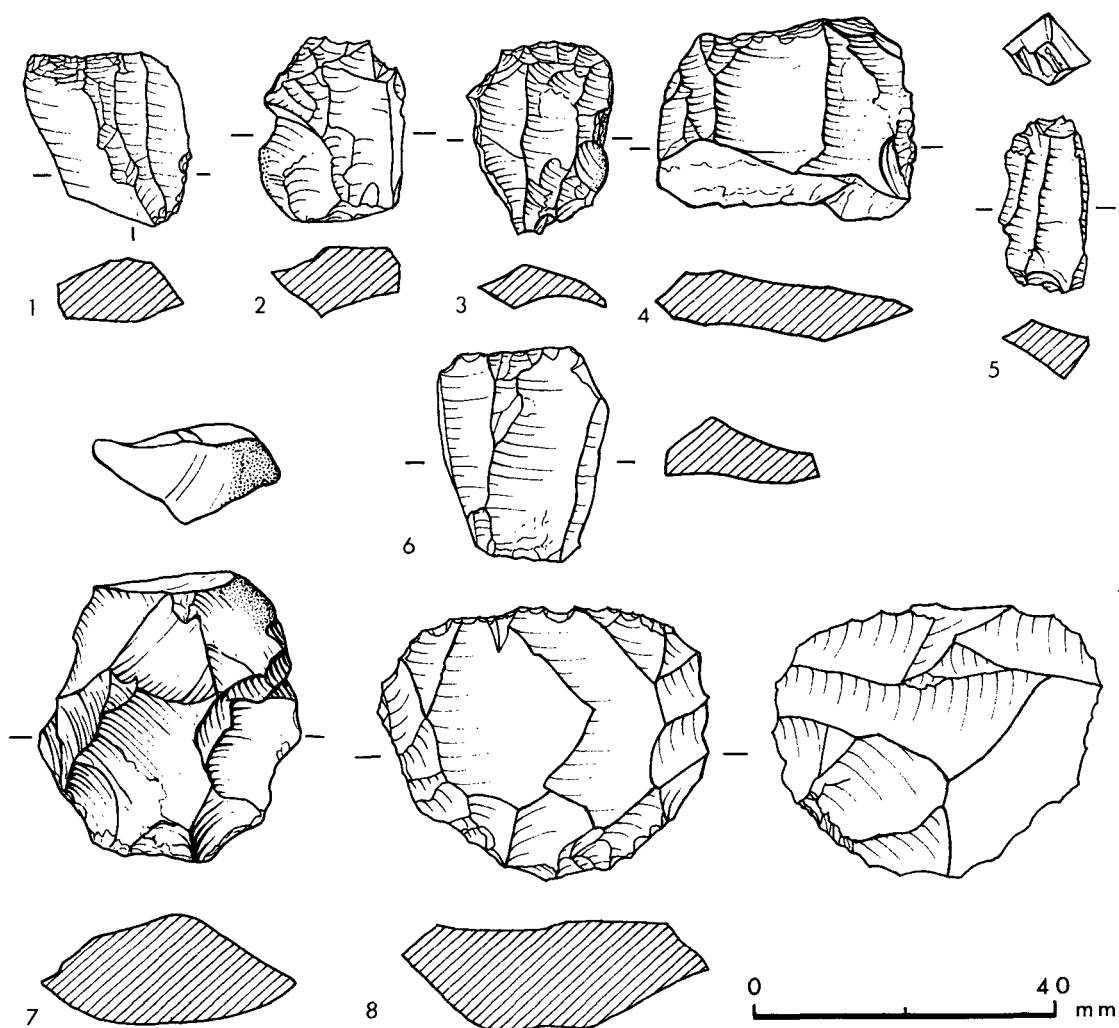
CORES (Ills 26, 27, 28)

Cores represent 1% of the assemblage. There are 1252 in all, the majority are platform cores (75%), in addition 22% are bipolar cores, and there are a few disc cores (a total of 7), as well as 27 amorphous cores. Both the bipolar and the platform cores tend to have all of the cortex removed and, although this is clearly a result of the reduction strategy, it may also be related to the small size of the original nodules. A total of 146 (16%) of the platform cores have two platforms, the majority of the rest have single platforms. Some of the cores were large enough to have been further reduced, but analysis done by Oliver (1987) demonstrated that most were worked until they were quite small and that there was little difference in the mean length at discard between the different types of core (Tab 3). This suggests that platform and bipolar cores were both reduced

until they were too small to produce useful flakes or blades, and that the bipolar technique was used in its own right and not just as a method for working out exhausted platform cores (Chapters 6 and 14). However, 10% of all cores were apparently discarded because of the develop-



ILL 27: Platform core of agate; scale 2:1
(Photograph – I Larnier).



ILL 28: The lithic assemblage, cores: 1-6 bipolar cores: 7-8 disc cores.

ment of step fractures. These can be due to knapper error or to flaws in the raw material, and they usually lead to the premature abandonment of a core.

cores without recourse to the preparation of an artificial crest. The manufacture and alteration of the blades is dealt with in more detail in Chapter 6.

CORE TYPE	MEAN LENGTH AT DISCARD (mm)
Platform	27
Bipolar	25
Amorphous & Disc	26

Table 3: The lithic assemblage: core lengths at discard.

REGULAR FLAKES

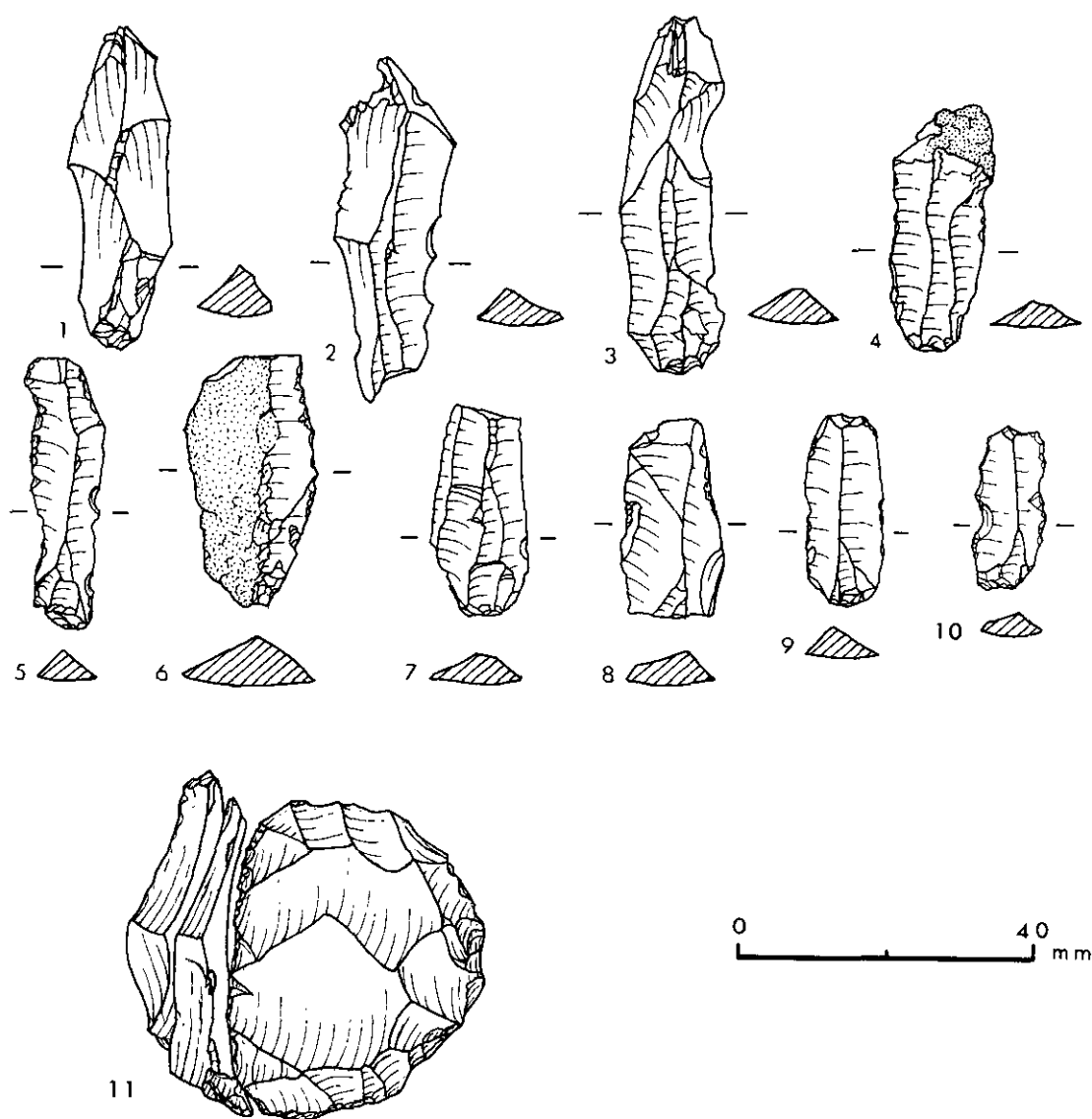
Regular flakes make up 10% of the assemblage, there are 13,413. The majority (98%) are of chalcedony; there are also some of quartz and a very few of siliceous limestone, agate, and volcanic glass. There are few primary flakes, and only 7% are secondary, most flakes are inner. Some derive from core trimming (75) or core rejuvenation (15), but these may be under-represented as the rapid count made their recognition difficult.

BLADES (Ill 29)

There are 2575 blades, 2% of the assemblage. With the exception of three quartz blades, all are of chalcedony. 96% are inner; there are 88 secondary blades and 3 are primary; only 8 crested blades were recovered. It would seem that the nodules could readily be flaked into blade

IRREGULAR FLAKES

There are 105,597 irregular flakes, 76% of the assemblage. The majority (99%) are of chalcedony; others cover the whole range of materials exploited. There are few secondary or primary flakes; 95% are inner.



ILL 29: The lithic assemblage, blades. 11 is a refit of blades 1 and 2 to core 26.8.

Included here are one core rejuvenation flake and 25 core trimming flakes. As this category is defined by small size as well as by irregularity of edge, it incorporates both irregular flakes whether large or small and tiny regular flakes. The category was created in an attempt to cover the by-products of knapping, but because it was not subdivided many different by-products lie within this broad class, eg both tiny retouching flakes and larger trimming flakes. During the more detailed analysis of the assemblage the irregular flakes that were of less than 10mm in maximum dimension were separated out and counted in an attempt to get more information from the variety within this category but, although the presence or absence of such small pieces did prove to be of interest in places, there was not time to examine this small debitage in detail and divide it into constituent types. Work done elsewhere has shown that this could be of great interest (Clarke 1986; Newcomer & Karlin 1987).

CHUNKS

10% of the assemblage are chunks, 13,490 pieces in total. A few are of quartz and agate, and there are two of volcanic glass, but over 99% are chalcedony. This may reflect the difficulties of recognising artifactual debris of quartz and agate some of which is likely to have been discarded as natural. Most of the chunks (83%) are inner pieces.

MODIFIED PIECES

Only 1% of the assemblage is modified, a total of 1,608 artifacts. The modified pieces fall into two categories: microliths and others. This distinction is based both on the size of the artifact and on the nature of the modification. Tables 4 & 5 present a general breakdown of the artifact types involved, and each is described in detail in Chapter 7.

SCRAPERS		Microburins	33
Simple	79	Lamelles à Cran	6
Angled	86	Obliquely Blunted	16
Concave	25	Backed Bladelets	144
Resharpener Flakes	17	Scalene Triangles	158
Broken	21	Crescents	53
BORERS	56	Double Edge Crescents	11
EDGE RETOUCHE ARTIFACTS		Rods	8
Simple	26	Fine Points	18
Complex	33	Invasive Points	2
Broken	38	Fragments	706
RETOUCHE BLADE SEGMENTS	7		
INVASIVE POINTS			
Complete Leaf Shaped	3		
Complete Barbed & Tanged	1		
Broken Leaf Shaped	4		
Basal Fragments	3		
Tips	2		
Miscellaneous Fragments	3		
BURINS			
Tool	1		
Spall	1		
MISCELLANEOUS			
Complete	15		
Broken	31		
GUNFLINT	1		

Table 4: The lithic assemblage: modified artifacts, non-microlithic types.

Table 5: The lithic assemblage: microlithic artifact types.

SUMMARY

The initial classification suggested that the site contained evidence for both the manufacture and the use of stone tools. The evidence for manufacture consisted of the quantities of knapping debris: cores; core trimming and rejuvenation flakes; irregular flakes; and chunks. Evidence for use lay in the modified artifacts and in the blades and regular flakes many of which were doubtless used without modification. The modified artifacts included scrapers, borers, bifacial points, and a variety of microliths. A number of factors suggested that some of these, at least, had been used (Chapter 8).