HOWE
B BALLIN SMITH (Ed)

FICHE 3 CONTENTS LIST

Howe Excavation 1978-1982

Bone Artefacts

Bird Bone

SF	Context	Phase	Description
1958	399	8	Gannet ulna, sub triangular in section and hollowed. Broken along its length. Possible faint knife marks on surface which is highly polished. The complete end is polished smooth. (illus 89) ML 65 mm MD 9 mm
1976	715	8	Gannet ulna shaft, from a similar piece to SF 1958. Fragment.
3326	360	7	Right ulna shaft of greylag (?) goose, sawn across and rubbed smooth at cut end. Other end is shattered. Shaft is smoothed. (illus 89) ML 75 mm MD 19 mm
3398	1084	7	Greylag size goose, ulna prox, juvenile. May have been rubbed down to a square section.

Bone artefacts

Counters

2137	798	7	Irregular bone roundel with smooth edges. Surface of bone used as the upper surface of counter. Scored by 5 roughly parallel grooves across the surface and by 2 grooves in shape of an off-centre cross. The grooves are not symmetrical. (illus 106) MD 23 mm MT 4 mm

Toggles

916	451	8	Proximal end of left metatarsal of sheep/goat, with a bored hold through the length of the shaft. The shaft has been cut off close to the proximal end. ML 30 mm MW 20 mm MT 18 mm MD of hole 7 mm

SF	Context	Phase	Description
2486	883	7	Highly polished piece of mammal long bone shaft, cut diagonally at the ends. Flat on one side, convex on the other. At mid point on convex side is a notch 8 x 1.55 mm with 4 slightly deeper grooves within the notch. (illus 92) ML 77 mm MW 11 mm MT 6 mm
2680	883	7	Piece of cattle metatarsal shaft, cut at both ends and marrow cavity hollowed out. All the bone surface, including the ends is smoothed. (illus 92)
3361	981	7	Piece of large mammal long bone shaft broken at both ends and longitudinally. Smooth exterior bone surface. Two incised grooves cross the exterior surface close to one broken end. ML 532 mm MW 21 mm MT 7 mm Lines c1.5 mm wide and 1 mm deep
4271	1	9	Piece of large mammal long bone shaft, broken at both ends and longitudinally. V-shaped groove crosses the width of the remaining exterior bone surface, c5 mm wide and 2 mm deep. ML 55 mm MW 21 mm MT 8 mm
Beads			
845	423	8	Small piece of long bone sawn from centre of shaft. Cut ends smoothed and polished. The piece is broken longitudinally, and originally would have been a hollowed cylinder. Exterior surface is smoothed and polished. ML 36 mm MW 13 mm MT 6.5 mm
2011	161	8	Cattle femur head, smoothed after surface bone had been almost completely removed. The dome shape has been reduced with a cut round the diameter, straightening the sides. A hole 7 mm in diameter is bored through the bone and a smaller elliptical hole 4 x 5 mm has been bored diagonally through the bone from the edge of the straight side to merge with the larger hold. MD 29 mm MT 20 mm

SF	Context	Phase	Description
2516	894	7/8	Small piece of mammal long bone shaft, flattened on one side and semi-circular. Has been broken across its length and width. Other surface smooth and polished. Remains of a hole 4 mm in diameter on flat side, bored through thickness of bone. (illus 107) ML 22 mm MW 15 mm MT 7 mm
2598	960	8	Similar to SF 2516. A rounded piece of bone, flattened on one side, broken through the bone and lengthways. Surface smooth. Remains of a hole through flat side. ML 27 mm MW 16 mm MT 7 mm MD of hole 6 mm
5841	1550	7	Small piece of burnt long bone shaft, broken irregularly at both ends. Smooth surface. Hole down centre of bone. May have been a bead. ML 24 mm MD 12 mm MD of hold 4 mm
7264	1906	5/6	Thin bone sliver. Rounded but with warped surfaces. Has central hole. MD 21.5 mm MT 1.5 mm MD of hole 6 mm
Spindlewhorls			
52	28	9	Proximal epiphysis of cattle or deer humerus, broken across the centre hole, leaving a semi-circular indentation in the broken surface. Bone surface worn at one place with 2 cut marks at this point. MD 41 mm MT 20 mm MD of hole 15 mm
4260	336	8	Cattle femur head with a worn surface and large central hole. Bored vertically through the dome. MD 38 mm MT 21 mm MD of hole 12 mm
4523	1352	8	Femur head. Conically rounded with slightly flattened base. Pierced at apex and base by a central rounded shaft through the bone. Polished. (illus 110) MD 33 mm MT 27 mm MD of hole 9.5 mm
4934	1456	7	Cattle femur epiphysis, incomplete. Off-centre hole 7 mm in diameter, bored through thickness of bone. MD 39 mm MT 27 mm

SF	Context	Phase	Description
5293	1491	7	Cattle femur head. Surface bone almost completely worn away. Large central hole also worn. (illus 110) MD 40 mm MT 21 mm MD of hole 12 mm
7316	2020	4	Cattle femur head with a small hole bored through from top to bottom. Very worn with virtually no surface bone surviving. MD 38 mm MT 28 mm MD of hole 6 mm
7397	1993	4	Cattle femur head, very worn with much surface bone lost. Small hole bored through the bone and hollowed at the base. MD 40 mm MT 31 mm MD of hole 6 mm-15 mm
7853	722	8	Femur head broken across through a large hole bored through the bone. ML 40 mm MW 30 mm MT 16 mm MD of hole 15 mm
7873	1306	7	Cattle femur head sawn from the femur. A hole has been bored through the bone from the top of the dome and worn into an oval. MD 44 mm MT 23 mm MD of hole 6 mm
Perforated bone			
335	349	9	Shaped and smoothed flake of large mammal long bone shaft, has broken through a deliberately bored hole, c10 mm in diameter. ML 28 mm MW 28 mm MT 7 mm
394	363	8	Small piece from proximal end of a small long bone and broken longitudinally to end in a point. Near the remains of the articulation is an arc of a hole. ML 31 mm MW 14 mm MD of arc 4.5 mm
397	335	9	Proximal end and part of shaft or right metacarpal of sheep/goat. Surface smooth and polished. A hole was bored through the shaft from front to back and the bone has broken at this point. Bobbin.
544	204	8	Proximal end and c¼ of shaft of left metacarpal of sheep/goat. Bone surface smooth and a hole was bored through the shaft from front to back. Bone has broken at this point. Bobbin. ML 65 mm MW 20 mm MT 14 mm MD of hole 5 mm

SF	Context	Phase	Description
835	204	8	Small eroded fragment of large mammal rib, smooth on flat side. One end has broken at a deliberately bored hole. Perforated plate. ML 45 mm MW 27 mm MT 6 mm MD of hole 6 mm
1169	491	8	Bone plate joined to another by 2 iron rivets. Incomplete. ML 39 mm MW 11 mm Rivets 10 mm long
1861	633	8	Part of shaft of sheep/goat metapodial, both ends have broken off. Circular hole bored through shaft from front to back in centre of shaft. Bobbin. ML 77 mm MW 17 mm MT 10 mm MD of hole 6 mm
1924	722	8	Small piece of sheep/goat metapodial shaft, broken at both ends and longitudinally. Remains of a circular hole through bone, and piece broken at this point. Bobbin. ML 50 mm MW 13 mm MT 3 mm MD of hole 4.5 mm
3671	1352	8	Sheep/deer metapodial, slightly damaged at one end. Pierced through by off-centre hole. Bobbin. (illus 94) ML 98 mm MW 21 mm MD of hole 4.5 mm
3765	1	9	Distal articulation and shaft of sheep/goat long bone. The articulation is worn and broken. Broken across and along shaft. Central hole pierced through shaft from front to back. Bobbin. ML 98 mm MW 22 mm MT 9 mm MD of hole 6 mm
4492	1340	7	Small sheep/goat tibia. Broken at both ends but half of one articulation still surviving. Hole pierced from front to back at this end. The articulation has broken off across the hole. ML 68 mm MW 12 mm MT 8 mm MD of hole 6 mm
4956	1458	7	Metapodial. One end damaged. Shaft pierced through by off centre elongated hole. Bobbin. (illus 94) ML 103 mm MW 20 mm ML of hole 13 mm

SF	Context	Phase	Description
5097	1545	7	Flake cut longitudinally from large long bone shaft, and broken at both ends through bored holes. One other hole remains intact. Perforated plate. (illus 94) ML 79 mm MW 26 mm MT 7 mm MD of hole 7 mm
5728	1583	7	Wedge shaped bone fragment, possibly unfinished artefact. One end not cut through completely. Other end has cut marks, as well as on body. Central hole. (illus 94) ML 68 mm MW 25 mm MD of hole 11 mm
7250	1287	5/6	Pig metapodial, hollowed and ends cut and polished. Body highly polished. Off-centre rounded hole cut in one surface. ML43 mm MW 12 mm MT 12 mm MD of hole 6 mm (illus 92)
Needles			
2694	912	8	Distal end of pig fibula shaped to a point. Wide end had a hole bored through. Bone surface polished and smoothed apart from pointed end. ML 51 mm MW 6 mm MT 4 mm MD of hole 5 mm
2850	1017	7	Broad and flat needle made of a sliver of ox long bone shaft. Broken across through a hole at one end. Hole was linear. Surface smooth and polished except at hole. (illus 95) ML 59 mm MW 9 mm MT 4 mm MW of hole 3 mm
3580	1046	7	Double pointed flake of rib bone with square hole cut through at widest part. Bone surface very smooth. ML 97 mm MW 14 mm MT 4 mm MW of hole 5 mm (illus 95)
6222	839	8	'Eye' of a needle, probably from a pig fibula. Needle broken along shank. Bone surface smooth. ML 31 mm MW 8 mm MT 3.5 mm Hole 3.5 x 2 mm

SF	Context	Phase	Description
6897	1198	8	Small piece of burnt bone, cylindrical and flattened at one end. Has broken across the hole at the slightly flattened end. Mammal long bone shaft or antler cortex. ML 23 mm MW 4.5 mm MT 4 mm
7102	1868	5/6	Flat, thin tapering sliver of long bone shaft [illegible] polished. One end is a sharp flat point, the [illegible] end has broken across a hole cut through the [illegible] ML 60 mm MW 12.5 mm MT 2 mm
Pins			
2113	711	8	Broken pin shaft of ox long bone shaft. Cylindrical in section and cut to a sharp point. ML 32 mm MD 3.5 mm
2145	826	7/8	Eroded pin with tip broken off. No original surface bone left. ML 91 mm MW 10 mm MT 10 mm
2557	912	8	Splinter of mammal long bone shaft, broken at both ends. Tapers slightly towards one end. Smoothed and polished surface. ML 65 mm MW 5 mm MT 4 mm
2559	912	8	Broken pin from mammal ulna or fibula. Pointed end remains and surface is well polished. ML 56 mm MW 4 mm MT 3 mm
2902	973	7	Broken pin from a pig fibula. Pointed end remains. Surface smoothed and polished. ML 37 mm MW 4.5 mm MT 3.5 mm
2919	1067	7	Pig fibula broken in half across shaft. At the distal end the shaft has been cut across diagonally forming a blunt point. ML 127 mm
4129	917	8	Pin from ox-sized long bone shaft. One end has a flat blunt point. The other end is cut and shaped, and may have carried a terminal. Shaft cylindrical and smoothed. ML 67 mm MD 4 mm

SF	Context	Phase	Description
4211	37	8	Pig fibula shaped as a pin. Distal end cut longitudinally to make a flat fan shaped terminal. Proximal end of shaft to a fine point. Surface well polished. ML 92.5 mm MW 14 mm MT 3.5 mm
4307	1181	8	Pointed end of shaft of pin of ox-sized long bone shaft. Pin cylindrical in section and surface is smoothed and well polished. ML 44 mm MD 4 mm
4415	580	9	Pig fibula. Tapering pin with slightly curved point. Polished shank. ML 87 mm MW 13 mm MT 3 mm
4463	1326	7	Long cylindrical shaft of pin from an ox-sized long bone shaft. Blunt point at one end and shaft cut across at the other. Smooth and well polished surface. ML 70 mm MD 5 mm (illus 95)
4722	1326	7	Slightly curved square shanked pin. Pointed at one end, square at the other. Polished. (illus 95) ML 75 mm MW 3 mm
4790	1326	7	Proximal end and part of shaft of left ulna of a ?lamb. Shaft smoothed and polished in part. ML 45 mm MW 15 mm MT 8 mm
4890	61	7	Long tapering and pointed flake of a cattle or red deer metatarsal shaft. Cut cleanly at one end and sharpened to a point at the other. Whole surface smoothed and polished. (illus 95) ML 133 mm MW 13 mm MT 7 mm
5067	1583	7	Flake of large mammal long bone shaft, tapering slightly at both ends. One end is pointed, although extreme tip of point broken off. Surface is worn smooth and but not polished. ML 113 mm MW 7.5 mm MT 6 mm

SF	Context	Phase	Description
5179	1491	7	Curved and cylindrical piece of long bone shaft, possibly sheep. Tapers to a point at one end, though both ends are broken. Shaping rough and pin not polished. ML 57 mm MD 4 mm
5186	1594	7	Fragment of pin from a pig fibula. Ovoid in section with a well polished surface. Broken at both ends. Tapers slightly from end to end. ML 39.5 mm MW 5.5 mm MT 4 mm
5340	1468	6	Tapering bone with a slight curve. Broad end, wedge shaped and slightly rectangular in section. Point of pin missing. Highly polished. (illus 95) ML 56 mm MW 5.5 mm
5822	1	9	Very thin and sharp-pointed length of pig fibula. Broken to show ovoid section. Highly polished. ML 49 mm MW 4 mm MT 3 mm
6887	1242	7/8	Thin sliver of bone, broken at both ends. Roughly shaped to almost cylindrical section. ML 23 mm MD 3 mm
7100	1868	5/6	Pig fibula sliced at the distal end to a broad flat fan shaped terminal with a small hole bored through at the centre of the 'fan'. Proximal end of shaft sharpened to a point. Shaft broad and flat, smooth but not polished. (illus 95) ML 79 mm MW 13 mm MT 4 mm
7108	1881	7	Pig fibula. Slightly curved bone pin. Point broken off. Highly polished and pierced at broad end by off centre hole. (illus 95) ML 79 mm MW 10 mm MD of hole 3 mm
7398	1883	4	Thin curved piece of sheep long bone shaft, tapering to a sharp point at one end. Other end rounded. Smooth and polished surface. ML 40 mm MD 3.5 mm

SF	Context	Phase	Description
7832	834	8	Pointed end of shaft of sheep sized long bone. Ends in a curved point. Cylindrical in section. Surface smooth and polished. Other end broken. ML 23 mm MD 3 mm
78333	1594	7	Pig fibula broken part way down shaft. Extreme end of distal end broken off. Shaft smooth and polished. ML 46 mm MW 9 mm MT 3 mm
7855	883	7	Pig fibula? Tapered, almost circular shaft, broken at both ends. Surface sm ed but not polished. ML 57 mm MD 5 mm
7856	979	8	Pig fibula with distal end shaped to a point and proximal articulation shaved and flattened. Surfaces smoothed but not polished. ML 87 mm MW 8 mm MT 4 mm
7877	894	7/8	Worked pig fibula. Shaft smooth and worn, broken at both ends. ML 94 mm MW 12 mm MT 5 mm
Points			
203	237	8	Two pieces of mammal long bone worked to a point at one end and broken at the other. The point is worn smooth and the extreme tip is broken off. ML 81 mm MW 19.5 mm MT 7 mm
221	298	8	Flake of cattle/red deer metatarsal shaft. Broken longitudinally and at one end. Other end worn into a blunt point. ML 170 mm MW 17 mm MT 7 mm
340	346	8	Small piece of mammal long bone shaft, pointed at both ends. One point sharp, the other blunt. ML 60 mm MW 7 mm MT 5 mm
1984	722	8	Left ulna of sheep/goat, sharpened distally along shaft to form a fragile point. ML 69 mm MW 12 mm MT 12 mm
2006	25	7	Piece of mammal long bone shaft formed into a sharp point at one end. Exterior surface smoothed at point. ML 67 mm MW 12 mm MT 9 mm (illus 95)

SF	Context	Phase	Description
2008	25	7	Point from left ulna of a sheep/goat. Point formed at distal end of shaft. V-shaped notch cut into the bone at olecranon process and shaft's bulge above articulation cut off. ML 119 mm MW 19 mm MT 12 mm
2016	25	7	Flake of mammal long bone shaft pointed at one end. Broken irregularly at other end but bears traces of cut marks close to break. ML 42 mm MW 12.5 mm MT 5.5 mm
2018	25	7	Mammal right ulna broken irregularly at the thicker end. Opposite end cut to a point. Bone broken longitudinally, and edges of break are flattened and smoothed. ML 72 mm MW 21 mm MT 13 mm
2019	25	7	Right tibia of sheep/goat broken at proximal end. Distal end worked to a point, tip broken. Bone surface smooth and polished but with many shallow cut marks. ML 112 mm MW 24 mm MT 21 mm
2074	786	8	Two small pieces of mammal long bone shaft. One piece long and thin and pointed at both ends. The other piece is almost triangular with one broad and sharp point. 1. ML 38 mm MW 7 mm MT 4 mm 2. ML 27 mm MW 11 mm MT 3 mm
2106	786	8	Shaft of sheep/goat left tibia with proximal end cut off and shaft cut longitudinally into a broad and blunt point. (illus 95) ML 90 mm MW 21.5 mm MT 15.5 mm
2805	1	9	Sheep/goat tibia. Shaft cut longitudinally and fashioned into a broad blunt point. ML 79 mm MW 21 mm MT 18 mm
2845	956	7	Small piece of shaft of metapodial of sheep/goat, broken irregularly at one end and cut into a blunt point at the other. ML 60 mm MW 12 mm MT 10 mm

SF	Context	Phase	Description
2890	973	7	Piece of flat and longitudinally broken piece of long bone shaft. The unbroken side has been shaved to form a narrow sharp point, slightly curved and smoothed. ML 105 mm MW 8.5 mm MT 7 mm
4222	1182	7	Small piece of mammal long bone shaft, broken at one end and also longitudinally. Other end pointed, worn and smoothed. ML 38 mm MW 8 mm MT 4 mm
4608	1326	7	Longitudinally cut flake of mammal long bone shaft, broken at one end and fashioned into a blunt point at other. Edges of point smoothed. ML 60 mm MW 8.5 mm MT 3 mm
4611	1323	7	Point made from a flake of right tibia shaft of sheep/goat. The flake flares from point to base and has a worn wide V-shaped notch at the base. The surface is worn, smooth and shiny at the point. ML 82 mm MW 21 mm MT 5.5 mm
4732	1406	6	Small triangular flared flake of long bone shaft of large mammal which has been fashioned to a rounded point at one end. The cut long edges and the remains of the point are worn and smoothed. The artefact is burnt. ML 59 mm MW 17 mm MT 5.5 mm
4753	1456	7	Shaft of right tibia of sheep/goat broken at proximal end and fashioned to a point at the other. Cut edges smooth and rounded with wear. Surface of bone smooth. ML 122 mm MW 26 mm MT 22.5 mm
4758	1457	7	Two bone points found together a. Smallest piece is a thin sliver of surface bone with a long sharp point, with worn smoothed edges. Broken at other end. ML 55 mm MW 8 mm MT 3 mm

SF	Context	Phase	Description
			b. Larger piece is from a metapodial broken longitudinally. The broken end of the shaft has been shaved into a very sharp curved point. Point smooth and worn. ML 99 mm MW 20 mm MT 16 mm
4852	1509	7	Piece of thin slender bone ending in a point and cut from a large mammal long bone. The bone is burnt or stained and is highly polished and smooth. (illus 95) ML 58 mm MW 9 mm MT 4.5 mm
4918	1067	7	A long piece from the shaft of a large mammal metatarsal. The piece has been fashioned into a sharp rounded point at one end. All cut or broken edges are smooth and worn. ML 88 mm MW 16.5 mm MT 9 mm
5266	1470	7	Large piece of cattle tibia shaft cut longitudinally and fashioned to a broad blunt point at the distal end. (illus 95) ML 147 mm MW 25 mm MT 9 mm
5278	1470	7	Flared piece of large mammal long bone shaft, fashioned to a long rounded point at one end, the tip of which is missing. The piece is highly polished and smoothed. ML 84 mm MW 12 mm MT 6 mm
6995	2046	3	Small thin flake from a mammal long bone shaft, worked to a sharp point at one end. The point is smoothed. ML 59 mm MW 7 mm MT 4 mm
7313	2019	7	Flake from a large mammal rib irregularly broken at one end and worked to a long sharp point at the other. Point worn and smooth. ML 76 mm MW 13 mm MT 4 mm

SF	Context	Phase	Description
7376	1	9	Piece of right tibia shaft of sheep/goat split sagitally. The proximal end is broken off and the distal end tapers to a rounded sharp point. The surface and the cut edges around the point are worn and smooth. ML 97 mm MW 22 mm MT 17 mm
7448	1287	5/6	Possible point cut from a mammal long bone shaft. Shaped and smooth. May have ended in a sharp point but the tip is now missing. ML 72 mm MW 8 mm MT 3 mm
7818	1077	8	Broken metacarpal shaft of sheep/goat which tapers to a point. Marks towards the point suggest deliberate working. ML 110 mm MW 25 mm MT 9.5 mm
7838	2045	5/6	Flat piece of cattle ulna fashioned to a point at one end. The surface is smooth and worn all over and the tip of the point is missing. ML 90 mm MW 16 mm MT 17 mm
7839	2046	3	Small and narrow flake of mammal rib(?) bone, pointed at one end and broken at the other. Smooth edges and surface. ML 29 mm MW 5 mm MT 3 mm
7840	2046	3	Long, thin flake of large mammal ulna(?) shaft worked to a rounded sharp point at one end. Smooth and worn around point and along edges. ML 76 mm MW 7 mm MT 4.5 mm
7841	1868	5/6	Flake cut from ox-sized long bone. Surface worn and smooth around the point. Extreme tip of point broken off. ML 63 mm MW 8 mm MT 6 mm
7842	1906	5/6	Small flake cut longitudinally from a long bone shaft of a large mammal, broken at one end and worked into a flattish point at the other. Smoothed and worn at point although extreme tip broken off. ML 50 mm MW 10 mm MT 4 mm

SF	Context	Phase	Description
7846	722	8	Small thin curved flake of mammal long bone shaft broken at one end and pointed at the other. Surface around the point is worn and smooth. ML 59 mm MW 6 mm MT 3.5 mm
7857	981	7	Rounded length of cattle ulna(?), slightly curved and eroded. Cut to a blunt rounded point at one end. Broken across at the other. ML 63 mm MD 6 mm
7858	979	8	Proximal end and part of shaft of left metacarpal of sheep/goat. Shaft has been cut longitudinally leaving a 'blade' which ends in a sharp curved point. ML 94 mm MW 15 mm MT 11 mm
7859	1017	7	Half of proximal end and small portion of shaft of sheep/goat metacarpal. Small extant proportion of shaft cut to a sharp point. ML 48 mm MW 11 mm MT 6 mm
7878	37	8	Small flake of bone from a long bone shaft, worked to a point at both ends. One point long, narrow and sharp. The other end is less tapered and blunt. Smooth surface is worn. ML 45 mm MW 5 mm MT 2 mm
Awls			
49	8	8	Sheep/goat left tibia broken down through shaft with distal end sharpened to a blunt point. Surface and point are very smooth. (illus 96) ML 139 mm MW 14.5 mm MT 13 mm
2021	25	7	Left tibia shaft of sheep/goat possibly used as a handled awl. Two elliptical holes have been bored through the proximal end. Distal end sharpened to a point, tip of which is missing. Surface of bone is smooth and polished. (illus 96) ML 106 mm MW 21 mm MT 26 mm MD of holes 7 mm x 5 mm

SF	Context	Phase	Description
2178	830	7	Sheep/goat left tibia broken across shaft towards proximal end leaving a splinter which has been sharpened to a point. Edges all smoothed. (illus 96) ML 137 mm MW 24 mm MT 19 mm
2859	1017	7	Right ulna of cattle with distal end removed and shaft brought to a point. Proximal end smooth, possibly from handling (illus 96) ML 208 mm MW 50 mm MT 27.6 mm
4555	1244	7	Sheep/goat metapodial split longitudinally and distal end shaped into a sharp point. The edges of the artefact have been rounded and smoothed by wear. ML 74 mm MW 14 mm MT 6 mm
4726	1251	7	Proximal end of left cattle ulna with distal end of the small piece of shaft worked to a sharp point. Surface of bone is well polished. (illus 96) ML 110 mm MW 54 mm MT 20.5 mm
4789	1208	7	Distal end of young sheep/goat metapodial with distal epiphysis missing. Shaft has been cut to a short point which is well smoothed and rounded. ML 71 mm MW 19 mm MT 12.5 mm
4823	1508	7	Proximal end of shaft of cattle ulna with olecranon roughly broken off. The remainder of shaft has been brought to a sharp point. The surface is smooth and well polished. ML 74 mm MW 22.5 mm MT 13.5 mm
4937	1458	7	Distal end and c1/3 of shaft of sheep/goat metapodial. Proximal end of shaft has been cut to a thin sharp point. Cut edges are smooth and worn, (illus 96) ML 80 mm MW 19.5 mm MT 13 mm
5351	1468	6	Awl from a right tibia of sheep/goat. Distal end intact and shaft sharpened to a point. Bone surface smooth. (illus 96) ML 117 mm MW 23 mm MT 19 mm

SF	Context	Phase	Description
5370	1271	7	Sheep/goat metatarsus with proximal end removed and shaft made into a point. Extreme end of point smooth and edges rounded. (illus 96) ML 108 mm MW 21 mm MT 13 mm
6994	2046	3	A splinter cut longitudinally from the metatarsus of a large mammal, with the distal end of the piece brought to a point. Point rounded and smooth. ML 107 mm MW 21.5 mm MT 9 mm
7843	1881	7	Splinter of a sheep/goat metatarsus with half of distal articulation remaining and the shaft worked to a point. Edges of splinter smoothed around point. ML 96 mm MW 16.5 mm MT 15 mm
Handles			
752	553	8	Small bone socketed handle, squarish in section with incomplete iron blade in situ in socket. The junction of handle and blade is covered with a thin silver trim. The bone is slightly burnt on one side near the blade. (illus 130) ML 48 mm MD 8 mm ML of blade 8 mm MW of blade 6 mm
2022	25	7	Handle made from a cow right metatarsal. The proximal facet has been mostly hacked off. Distal end of the shaft is cut straight and cleanly across and edges of cut slightly smoothed. Socket is cut out at this end. Bone surface is mostly well polished. ML 116 mm MW 32 mm MT 27 mm Diameter of socket 12 x 14 mm Depth of socket 101 mm
2515	923	8	Large mammal rib sawn cleanly at both ends. Core hollowed out at both ends. At widest end the flat surface bears a groove 29 mm long, 3 mm wide and 1 mm deep. Surface eroded. (illus 97) ML 128 mm MW 35 mm MT 15 mm

SF	Context	Phase	Description
4063	1067	7	Fragment of large mammal long bone shaft roughly cut at both ends. Edges eroded and worn as is the surface bone. The bone is hollow and may be a surviving fragment of a handle. ML 51 mm MD 23 mm MD of centre c15 mm
7854	883	7	Piece of cattle metapodial shaft broken across and longitudinally with part of one end showing from being sawn. Bone was hollowed out and the surfaces smoothed. ML 47 mm MW 18 mm MT 16 mm
Spatulate tools			
2881	704	7	Mammal rib bone rounded at one end with a 3 mm diameter hole bored through it. Other end thin, worn and broken. Upper edge smooth and polished, lower edge has lost most of its surface bone and is worn and pitted. (illus 98) ML 138 mm MW 16 mm MT 5.5 mm
4532	1223	7	Highly polished mammal long bone shaft flake. Broken and flaking at one end, flattened and rounded at the other. (illus 98) ML 127 mm MW 9 mm MT 4.5 mm
7029	1830	7	Rib(?) bone with surface cut away to core on one side. One end broken, the other flattened and rounded. Surface mostly smooth and polished. ML 105 mm MW 8 mm MT 4 mm
7821	1314	7	Piece of large mammal bone, rounded and almost cylindrical in section at one end. Broken at this end. Other end flattened and spatulate. Surface worn away in places, otherwise smooth and polished. ML 104 mm MW 9 mm MT 5.5 mm
7825	1470	7	A shaped sliver of large mammal rib giving the appearance of a miniature shovel. A wide but short end narrows to a longer shaft and then widens to a 'blade'. One side of this piece is surface bone the other side is core. The 'blade' may have been longer. May be a bone off-cut. ML 83 mm MW 22.5 mm MT 3 mm

SF	Context	Phase	Description
Scoops/Gouges			
600	368	8	Piece of tibia shaft broken at one end. Cut longitudinally and the non-broken and shaped to a blunt rounded point. ML 77 mm MW 26 mm MT 9 mm
2193	826	7/8	Longi dinally split bone. One end broad and pointed with sides cut back. The other end roughly broken. ML 165 mm MW 35 mm
2228	826	7/8	Cattle tibia shaft, split sagitally and both ends broken. One end rounded and appears worked, but may be due to marrow extraction. ML 123 mm MW 25 mm MT 11 mm
2297	861	7	Cattle tibia or humerus shaft split sagitally with one end broken the other shaped and bevelled to form a scoop or scraper. The outer surface of bone is smooth especially aroun the shaped end. (illus 98) ML 123 mm MW 42 mm MT 8 mm
2530	912	8	Cattle right metatarsal sliced longitudinally through shaft. Distal end shaped roughly into a scoop and worn. ML 89 mm MW 40 mm MT 20 mm
2525	901	8	Proximal end of cattle right radius with the shaft cut obliquely forming a rounded scoop/gouge. Edges of this end are worn down and broken at one side. ML 85 mm MW 71 mm MT 38 mm
4152	961	7/8	Piece of cattle radius shaft, split sagitally, shaped into a handle(?) at the proximal end. Rounded at distal end and worn. Smooth on exterior surface. ML 117 mm MW 27 mm MT 11.5 mm
4159	961	7/8	Flake of cattle tibia shaft with distal end cut straight across. The proximal end is cut to a rounded blunt point. The exterior surface is smooth and polished. The tool has been burnt. ML 54 mm MW 27 mm MT 8 mm

SF	Context	Phase	Description
4188	1177	7	Piece of large mammal long bone shaft with one end roughly broken and the other cut into a blunted rounded point with the extreme tip broken off. All cut edges are worn and rounded. ML 131 mm MW 22 mm MT 8 mm
4449	1352	8	Cattle femur shaft split sagitally with the distal end rough and broken but proximal and shaped into a rounded scoop. Slightly waisted between broken and rounded ends. Well shaped and almost symmetrical. (illus 98) ML 135 mm MW 35 mm MT 18 mm
4966	1456	7	Sheep tibia used as a gouge. Worked end formed by a diagonal cut across the bone. Worked end rounded and highly polished. (illus 98) ML 111 mm MW 18 mm
7378	1848	5/6	Cattle right tibia shaft flake. Distal end broken irregularly. Proximal end rounded and all edges worn. ML 132 mm MW 29 mm MT 24 mm
7860	1007	8	Flake of large mammal long bone shaft, broken at one end but with smoothed cut longitudinal edges ended at other extremity in a tapered blunted point. Surfaces are worn and smoothed. ML 66 mm MW 18 mm MT 8 mm
Scrapers			
3934	1323	7	Right innominate of red deer cleanly sliced across the acetabulum; the ileum is present and forms the scraper blade. It is worn very thin and is cracked at the edge. ML 183 mm MW 70 mm MT 30 mm
4035	1111	8	Large mammal rib fragment, roughly pointed at one end and broken across the other. Point and side edges all worn. Surface smooth on one side and partly worn away on the other. ML 61 mm MW 22 mm MT 6 mm

SF	Context	Phase	Description
4305	1162	7	Small irregular shaped flake of cattle tibia shaft. One edge may be cut, but no signs of wear. Could also be butchering debris. ML 42 mm MW 32 mm MT 6 mm
4911	1067	7	Large mammal rib fragment founded at one end, and worn along this and along lower edge. Surface bone smooth and polished on one side, worn and breaking away on the other. (illus 98) ML 141 mm MW 32 mm MT 9 mm
5337	1468	6	Right metacarpal of red deer with proximal end intact but shaft cut away close to articulation leaving a blade-like section of shaft which is well worn and polished with a rounded end. The proximal articulation would have acted as a handle. (illus 98) ML 136 mm MW 30 mm MT 21 mm Blade - MT 6 mm MW 16 mm
7861	1116	8	Cattle rib tapered to a blunt point at one end. Worn along its length on both edges. Scratch and cut marks visible on both surfaces. ML 227 mm MW 38 mm MT 6 mm
Shovels			
4027	1111	8	Right scapula of horse(?). Spine intact, whereas normally cut off or at least trimmed if bone was used as a shovel. Edges of the blade at its widest point may have been trimmed. ML 306 mm MW 131 mm MT 39 mm
4940	1503	7	Scapula with rib removed. Bone above socket is well polished. Broad end damaged with use, some fragments of bone chipped off and edges rounded with use. (illus 102) ML 276 mm MW 141 mm
7062	1080	7	Right scapula of cattle, with blade completely broken off. Spine has been cut down to the rest of the bone level. Surface is worn and scratched. ML 138 mm MW 61 mm MT 42 mm

SF	Context	Phase	Description
7881	37	8	Reconstructed fragmentary cattle left scapula. Rib mostly removed and tip worn smooth and chamfered. ML 235 mm MW 70 mm
7882	1259	8	Two irregular adjoining fragments of cattle scapula shovel with rib removed. Some cut marks on opposite surface. ML 136 mm MW 58 mm
Miscellaneous			
71	1	9	Proximal articulation of cattle right metatarsal. Has been cut across at the start of the shaft. The cut is stepped and grooved. May be a decorative end to a knife handle. ML 21.5 mm MW 40.5 mm MT 38 mm
113	54	8	Squared piece of bone. Deeply notched around two-thirds of width by knawing. Bone hollowed. Gaming piece? (illus 92) ML 28 mm MW 17 mm MD of hole 12.5 mm
114	107	8	Dome-shaped piece of bone with cut sides. Has been hollowed out. Flat base has an almost centrally placed hole bored through it. Another small hole c1 mm in diameter lies close to the first. Pin head, from cattle metacarpus shaft. (illus 92) ML 27 mm MW 19 mm MH 20 mm MD of hole 4 mm
611	362	8	Distal end of large mammal metapodial and small part of shaft. The bone has been cut and broken longitudinally severing part of the articulation. There are also cut marks across the end. On the shaft is a ridged lump of bone core left from slicing vertically through the bone. ML 53 mm MW 22 mm MT 13.5 mm
3006	731	8/9	Piece of a long bone shaft probably a sheep tibia, with both ends cut cleanly. The bone is slightly curved from end to end and hollow. It has a smooth polished outer surface. End blown flute? ML 94 mm MW 15 mm MT 13 mm (illus 92)

SF	Context	Phase	Description
3046	1	9	Elongated bowl and a small part of a handle of a scoop/spoon from a flake of a large mammal long bone shaft. The bowl is elongated and shallow with a rounded end which tapers slightly towards the narrow handle. The whole piece is well polished. ML 57.5 mm MW 19 mm MT 4 mm
4821	1064	5/6	Segment of hollowed long bone, calcined through being burnt. Semi-circular in shape, pierced by a rounded hole in the centre of the base. Bone split at base through hole. Pin head. (illus 92) ML 27 mm MW 13 mm MT c5 mm MD of hole 4.5 mm
4925	1458	7	Irregular and broken piece of long bone shaft. At one end the object has a diagonal worn groove c17 mm long. There are 2 short and shallow worn grooves below the other suggesting that thonging or string was wound round the bone. ML 122 mm MW 21 mm MT 10 mm
5058	1	9	Distal end of red deer metacarpal, the articulation has been neatly sawn off the shaft. The section across the shaft shows 2 holes c4 mm in diameter, either side of the articulation tube. The holes may have helped to fasten this object onto a pin. Pin head?. (illus 92) ML 28 mm MW 36 mm MT 25 mm
5353	1689	7	Small bone peg, bone and species not identified, cut straight across at one end and diagonally at the other. Almost cylindrical in section. ML 21 mm MW 6 mm MT 5 mm
7826	1	9	Large mammal rib bone split longitudinally. Edges and inner surface smoothed. Sliced straight across at one end and cut to a point at the other. Two wedge shaped notches have been cut into both edges of the bone, opposite each other. Rib bone knife? ML 163 mm MW 20 mm MT 3.5 mm
7827	1373	7	Piece from a large mammal long bone shaft, slightly curved with a large central hole c18 mm diameter. ML 38 mm MW 30.5 mm MT 7 mm

SF	Context	Phase	Description
7844	839	8	Small piece of large mammal long bone shaft with a kite-like incised design. ML 37 mm MW 13 mm MT 8 mm ML of design 8 mm
7863	858	7/8	Small scapula, foetal sheep/goat, with central portion of blade cut out in V shape and spine cut down, leaving a fork-shaped artefact. The edges of the blade are also cut back so that the articulation appears to stick out at the sides. Ends of the blade are cut diagonally towards the centre. ML 64 mm MW 33 mm MT 9 mm
7879	985	7	Worked large mammal rib bone flake cut longitudinally. One end worked and tapered into a blunt point. The other end is cut at the edges and across the bone width forming a slight 'tang' to the end of the piece. ML 156 mm MW 23 mm MT 3.5 mm
Others - Horn, Tooth etc			
2069	786	8	A tooth split longitudinally and the root shaved to a point. ML 33 mm MW 9 mm MT 6 mm
3033	826	7/8	Possible pig canine or incisor, with root ending in a point. Root smoothed and polished. ML 45 mm MW 8 mm MT 6.5 mm
4187	785	8	Pig incisor with root sharpened forming a long point. Appears worn and used. ML 45 mm MW 4 mm MT 5.5 mm
4469	1326	7	Dome shaped piece of tooth or ivory. Highly polished all over. Traces of a longitudinal groove on the flat surface in the centre of which is evidence of an iron shank. Pin head. ML 21 mm MW 18 mm T 10.5 mm
4593	1403	7	Probable pig canine, curved and cylindrical in section. Surface highly polished. (illus 99) ML 73 mm MW 13 mm MT 12 mm

SF	Context	Phase	Description
5253	1644	7	Small conical piece, possibly tooth. Ends in a blunt point. Other end broken. Piece burnt and possibly polished. ML 17 mm MD 5 mm
5673	1689	7	Horn core broken at base. A cut groove runs diagonally round the circumference slightly higher than mid-point. On one side the groove is deep and runs from edge to edge. On the other the groove is shallower and does not run the full width of the core. ML 74 mm MW 33 mm MT 22 mm Groove MW 1.5 mm MDepth 1.5 mm
Antler Artefacts			
Combs			
307	296	8	Fragment of a double-sided comb. Five teeth and the end piece of one side remaining. The teeth are c17 mm long and 2 fragmentary central rivet holes are 3 mm in diameter. ML 12 mm MW 34 mm MT 3 mm
308	296	8	Fragment of a double-sided comb with 4 complete teeth 17 mm long surviving on one side, and stumps of others on the other. Part of a 3 mm diameter rivet hole remains. Could be a non-joining part of SF 307. ML 10 mm MW 38 mm MT 3 mm
798	525	8	Double-sided hair comb in 2 main fragments which do not join. The largest piece has the remains of 2 convex connecting plates with a double sequence of dot-in-ring decoration and 2 iron rivets. There is a suspension hole at one end, and may have had one at the other end as well. (illus 100) ML 29 mm MW 30 mm MT 6 mm
872	291	8	Fragmentary pieces of bone comb? Pieces decorated on both sides with dot-in-ring decoration. Also the remains of 2 iron rivets. Rivets ML 9 mm MT 3 mm

SF	Context	Phase	Description
1138	525	8	Reconstructed double-sided comb with 2 convex connecting plates joined by 6 rivets. There is no decoration but has suspension holes at both ends. The teeth were probably cut after the connecting plates were attached as the plates have cut marks along their edges. (illus 100) ML 112 mm MW 47 mm MT 9 mm
2177	727	7	Fragment of weaving comb which had broken during manufacture. The piece is curved with one tooth cut and another started. It has broken where the third tooth would have been. ML 57 mm MW 32 mm MT 7 mm
2670	982	8	Weaving comb with a slightly waisted handle. The broad end has 8 small, tapering and pointed teeth. The upper surface is polished. (illus 101) ML 112 mm MW 40.5 mm MT 8 mm ML of teeth 15 mm
3648	923	8	Fragment of handled weaving comb, with the stubs of 9 teeth remaining. Below the teeth is a horizontal groove. The comb is broken across the handle and the surface is badly worn. ML 60 mm MW 30 mm MT 9 mm
3672	1346	7	Handle of a weaving comb broken across the base of the teeth and badly weathered. The handle is curved in section and had at least 7 teeth. At the base of the handle is a worn curved notch. ML 90 mm MW 47 mm MT 11 mm
4178	1093	7	Reconstructed weaving comb with 5 out of 8 long teeth still intact. The handle is slightly waisted. (illus 101) ML 123 mm MW 35 mm MT 10 mm ML of teeth 28 mm
4200	1186	9	Short but broad weaving comb with polished upper surface and edges. Five teeth are intact out of an original 9. (illus 101) ML 95 mm MW 46 mm MT 14 mm ML of teeth 24 mm

SF	Context	Phase	Description
4376	1269	8	Small double sided comb complete apart from one end tooth and a missing facing plate. The surviving facing plate is plain and convex in section with holes at either end. There are corresponding holes on the comb, and as there is no iron staining, bone pegs may have been used to connect the pieces. (illus 100) ML 50 mm MW 43 mm MT 7 mm
4907	61	7	Complete single-sided hair comb. Curved in section with 18 teeth. The top of the comb bears decoration in the form of a band of cross hatching on the convex side and a diagonal zig-zag on the concave side. The suspension hole lies at one end. (illus 100) ML 47 mm MW 31 mm MT 6 mm ML of teeth 15 mm
5157	1456	7	Incomplete handled weaving comb, broken longitudinally through the comb. Only 2 long teeth remain intact and the handle is in the shape of a fish-tail. (illus 101) ML 126 mm MW 30 mm MT 11 mm ML of teeth 27 mm
7018	1838	7	Weaving comb which originally had 6 teeth of which 4 remain. The handle is waisted and has a swallow-tail end of which one tail is broken. The surface of the handle has an incised design of 3 grooves in the shape of a broad arrow. The comb is worn and smooth all over. (illus 101) ML 107 mm MW 48 mm MT 15 mm ML of teeth 34 mm ML of grooves 30 mm
7339	2027	4	Fragment of weaving comb with the remains of 6 teeth, originally would have had 7 or more. The handle is missing, but the surface was polished. The head is slightly curved. ML 46 mm MW 46 mm MT 9 mm ML of teeth 11 mm

SF	Context	Phase	Description
7848	912	8	Part of a handled weaving comb, with the base sawn across. The stumps of 3 teeth remain. The piece is rough with many knife cuts. ML 102 mm MW 30 mm MT 26 mm
Perforated antler			
744	572	8	Slightly curved plate with a rough break at one end. Sides are cut and smoothed. Has 2 rivet holes 3.5 mm in diameter. One hole lies toward the unbroken end the other in the middle and is surrounded by an elongated cut depression in the plate surface. (illus 94) ML 91 mm MW 20 mm MT 6 mm
2490	912	8	Antler tine shaped at its base into a rectangle with cut marks still visible. Tip of the time is shaped to a point. A hole 7 mm in diameter is bored through the tine close to the base. Surface of the piece is smooth and polished. ML 94 mm MW 18 mm MT 15 mm
2869	1067	7	Rectangular plate with smoothed exterior surface and 2 rivet holes 6 mm in diameter. The remains of another rivet hole lies at the broken end. (illus 94) ML 70 mm MW 24 mm MT 4.5 mm
4021	1107	8	Small piece of badly eroded antler tine, broken at both ends. Small circular hole bored through the tine near the broken tip end, 3 mm in diameter. ML 38 mm MW 14 mm MT 11 mm
4121	1082	7	Slightly curved flake of antler smoothed on both sides and broken at one end. Contains 6 rivet holes of 2 types. Three are 5 mm diameter and the larger 8 mm diameter holes are counter sunk, possibly indicating the piece's reuse. (illus 94) 108 mm MW 24 mm MT 4 mm
4298	1187	7	Cut and rectangular piece of antler flake, broken at both ends through rivet holes. The centre hole is complete and waisted and 8 mm in diameter. ML 68 mm MW 26 mm MT 8 mm

SF	Context	Phase	Description
4443	1352	8	Antler flake roughly cut and smoothed and broken at one end through a rivet hole. Two complete holes remain, both counter-sunk and c6 mm in diameter. The centre hole is rectangular. (illus 94) ML 76 mm MW 19 mm MT 7 mm
4750	1410	8	Antler tine roughly hacked from beam at base and whittled down 20 mm from end. A hole is cut through the shaft at this point 5 x 10 mm. The edges of the shaft are worn and polished smooth. The tip of the tine is missing. ML 67 mm MW 20 mm MT 16 mm
4791	1410	8	A peg shaped piece of antler stem cut immediately above the burr and trimmed to shape. The end of the piece is broken and a hole has been bored through the peg below the head. ML 75 mm MW 31 mm MT 31.5 mm MD of hole 8 mm
7830	1545	7	Slightly convex piece of antler stem, oblong in shape broken at each end through rivet holes. One long side also broken. Both surfaces smoothed and might suggest it was a comb facing plate. ML 45 mm MW 20 mm MT 6 mm MD of holes c 7 mm
Points			
1328	644	8	Small piece of antler beam with one end worked to a blunt point, but badly eroded. Surface slightly faceted. ML 57 mm MW 18 mm MT 8 mm
4151	821	8	Small antler flake pointed at one end, sharp and smooth but with signs of wear. ML 27 mm MW 11 mm MT 4 mm
5168	1491	7	Flat and curved flake of antler pointed at one end and curved at the other. Worn and smoothed. (illus 95) ML 105 mm MW 13 mm MT 6 mm

SF	Context	Phase	Description
5349	1468	6	Well fashioned point, flattened on one side and rounded on the other. At the opposite end of the point is a handle formed by uncut antler jutting out. ML 80 mm MW 18 mm MT 6 mm
Handles			
375	285	8	Curved and tapering handle, butt end is broken. The bone is hollowed at the blade end and is roughly finished. Two opposing holes are cut through the bone at the blade end, and lie in an elongated groove. ML 129 mm MW 28 mm MT 16 mm MD of holes 4.5 mm
400	349	9	Cylindrical piece of antler with core hollowed out, and sawn at both ends. Outer surface has been smoothed and polished, and decorated with 2 dot-in-double circle designs. (illus 97) ML 56 mm MW 18 mm MT 18 mm
714	439	9	Hollowed stem of antler, very broken at one end. Cut marks visible on surface of handle. (illus 97) ML 116 mm MW 37.5 mm MT 42 mm
1844	25	7	Possible unfinished handle. At the lower end there has been an attempt to tidy and shape the end. At the opposite end the bone has been partially cut through and then broken off. An 8 mm diameter hole has been bored into this centre piece of cortex to a depth of 25 mm. ML 112 mm MW 34 mm MT 26.5 mm
2005	25	7	Socketed handle, sawn off at the butt end and polished. Handle ends cut to shape. Socket deep. (illus 97) ML 112 mm MW 39 mm MDepth of socket 22.5 mm

SF	Context	Phase	Description
2007	25	7	Socketed handle, well worn and smooth on the surface, and on inner surface of the socket. Both ends sawn cleanly across. ML 91 mm MW 26 mm MT 31 mm Depth of socket 63 mm
2013	25	7	Socketed handle, poorly preserved with most of outer surface worn away. Core has been removed at cut end. ML 118 mm MW 31 mm MT 38 mm
2164	826	7/8	Curved antler tine, badly worn and eroded on surface, with tip broken off. Base of tine cut cleanly from beam and cortex hollowed out to a depth of c19 mm ML 154 mm MW 24 mm MT 31 mm
2997	1082	7	Unfinished antler handle, from beam. Sawn cleanly at one end. Other end has a central raised lump of cortex, with the beginnings of a hole bored into it. Surface worn but not smooth or polished. (illus 97) ML 117 mm MW 30 mm MT 38 mm MDepth of hollow 9 mm
4189	1076	7	Broken antler tine with cortex hollowed out. The pointed end has been broken off but the base has been sawn. ML 82 mm MD 23 mm MD of socket c15 mm
4373	1269	8	Polished antler, probably a handle, broken longitudinally. The core has been hollowed out, the inner surface of which is smooth and has traces of iron-staining at the open end. The handle is sawn at the other end and the cut edges are worn. The handle tapers from sawn end to socketed end. (illus 97) ML 88 mm MW 14 mm MT 17.5 mm ML of socket 50 mm

SF	Context	Phase	Description
4613	1218	7	Piece of cut and hollowed antler. Probably one half of a handle. Straight cut at one end and an irregular break at the other. 103 mm MW 38 mm MT 11 mm
4652	1394	7	Beam fragment of antler, sawn straight across one end and broken at the other. There may have been an attempt to hollow out the core. (illus 97) ML 120 mm MW 29 mm MT 39 mm
5276	1470	7	Piece of beam with the base ends of 2 crown tines present. The pointed ends of the tines have been broken off. The end of the beam is also broken. The core is hollowed at this end to a depth of c18 mm. ML 190 mm MW 67 mm MT 24 mm
5941	1	9	Fragment of antler beam, hollowed through its length apart from one end. Sawn across at one end and probably broken at the other, although worn smooth. Surface has been worn smooth. (illus 97) ML 75 mm MW 29 mm MT 35 mm
Picks			
2009	722	8	*Reconstructed pick of a cast antler. Beam forms the* handle and the brow tine as the pick head. The tip of this tine is worn away completely and the surface is scratched 35-40 mm from the point. The other tines have been removed apart from the topmost tine which is also worn. The burr is intact. ML 393 mm MW 44 mm MT 51 mm
2212	37	8	Part of a small pick using a cast antler. The beam is broken close to the base and the brow tine is worn at the point and on its surface. ML 152 mm MW 30 mm MT 36 mm

SF	Context	Phase	Description
2615	955	7	Possible pick using a butchered antler with part of the skull still attached. Broken around the burr and the base of the beam. Upper part of the beam is broken off and the second tine has been sliced off. The large curved brow tine has a smoothed but scratched surface, and the point is broken off. ML 303 mm MW 52 mm MT 55 mm
2646	979	8	Pick from a butchered deer. The long, curved brow tine is worn near the tip and the tip has been worn away. The second tine has been broken off. The beam is also broken but the edges of the break appear worn. (illus 102) ML 296 mm MW 49 mm MT 48 mm
2956	1088	7	Small pick using cast antler. The whole artefact is very worn and smooth all over. The point of the brow tine is worn away and the beam is broken or cut before the second tine branch. ML 148 mm MW 32 mm MT 41 mm
2996	979	8	Large piece of antler with burr still attached. Brow tine very worn and point broken off. A small crescent shaped cut is visible on the brow tine. The main beam is broken irregularly and the second tine is broken off. Other cut marks are also visible on the beam. ML 206 mm MW 41 mm MT 47 mm
4059	1517	7	Fragment of pick. The first tine was used as the pick end, as the tine is worn and the end broken off and the slightly hollowed. The second tine was probably shed. The shaft still has a pedicle and the antler was broken above the second branch. (illus 102) ML 276 mm

SF	Context	Phase	Description
7134	1901	4/6	Well preserved antler pick with complete beam. The second tine was sawn off. Two tines on the top of the beam are sawn off leaving stumps with deep saw cuts. The antler burr has also been cut off, just below the brow tine junctions. The short brow tine is smoothed, polished and the tip is worn away. (illus 102) ML 374 mm MW 27.5 mm MT 39.5 mm
Miscellaneous			
2139	826	7/8	Slice of antler with blunt points at both ends. A non-circular hole is bored through the piece at the widest point and is countersunk on both sides. (illus 95) ML 87 mm MW 16 mm MT 5.5 mm MD of hole 10 mm
3346	912	8	Thin flake of antler with cut edges and slightly tapering. Notches and groove cut across the surface close to the widest end. ML 58 mm MW 11 mm MT 6 mm
44834	1513	7	Small arc of antler, possibly part of a ring or bead. The piece is cylindrical and the surface is smooth. ML 8 mm MD 8 mm
4867	63	7	Tapering and cylindrical piece of antler, cut at one end and broken at the other. The surface is rough and uneven. A peg. ML 38 mm MD 6.5 mm
5840	1550	7	Rounded piece of tine cut at both ends and smoothed on the edges, but broken longitudinally. Core slightly hollowed and the outer surface is smoothed. Possibly a small handle, peg or toggle. ML 53 mm MW 13 mm MT 7 mm
6744	1901	4/6	A piece of smoothed antler, worn with a series of irregular grooves at one end where the object is broken. It may have been a peg. ML 61 mm MW 12.5 mm and 17 mm MT 8 mm

SF	Context	Phase	Description
7847	711	8	Small piece of antler whittled to a point and broken across at the opposite end. ML 38 mm MW 5 mm MT 4 mm
Used tines			
149	135	7/8	Tine cut from a beam with a diagonal stroke, and cut also at this end and a notch. Point is smoothed. (illus 103) ML 99 mm MW 27 mm MT 20 mm
306	309	9	Extreme tip of tine, blunt and smoothed. Cut from the tine. Some of the surface and most of the end has decayed and flaked. ML 18 mm MW 8 mm MT 7 mm
336	357	8	Small curved tine, sawn from beam. Tip appears to have been broken through use. Surface is smoothed with wear around the point. ML 78 mm MW 15 mm MT 11 mm
1035	4	9	End of a small tine. The surface is worn, and the point is blunt. The point may have been shaped, and the tine has been broken at the other end from the beam. ML 53 mm MW 17 mm MT 12 mm
1037	17	8	Small tine with a pronounced curve. Surface completely worn and smooth. Was cut from the beam and a small groove lies close to this end. ML 57 mm MW 14 mm MT 13 mm
1114	538	8	Tine with a worn and smooth blunted point. The tine has been cut from the beam and cut marks are visible parallel to the base on 3 sides. ML 108 mm MW 34 mm MT 19 mm
1158	662	8	Long tine with point broken off, also broken at the base. A number of cut marks above the base suggest that the tine may have been chopped off the beam. Most of the surface is smooth. ML 146 mm MW 19 mm MT 21 mm

SF	Context	Phase	Description
1807	710	8	Small point, blunt and smooth. Partly sawn through tine then broken off. Several cut marks present on point. ML 30 mm MW 12 mm MT 15 mm
1833	722	8	Tine with a pronounced curve. Cut at one end and the point has been sharpened and polished smooth. (illus 103) ML 140 mm MW 20 mm MT 31 mm
2032	722	8	Sawn tine. Slightly polished and point blunted. (illus 103) ML 95 mm MT 49 mm
2160	826	7/8	Tine with broken end and worn point. The point may have been sharpened. Some cut marks on the body. (illus 103) ML 122 mm MW 17 mm MT 18 mm
2304	863	7	Small piece of tine, broken at both ends, but point appears to have been worn away as the surface is smooth. The piece is smoothed and burnt. ML 28 mm MW 8 mm MT 10 mm
2491	906	7	Piece of beam with 2 tines The tine points are worn and one has a 'v' shaped notch cut out of it. The single point is smooth. ML 121 mm MW 44 mm MT 25 mm
2524	867	7	Tine broken irregularly from beam, though partially cut through. Point is worn and smooth. ML 123 mm MW 19 mm MT 19 mm
2597	883	7	tine cut and smooth at the point and sawn from the beam leaving cut marks on the edge. ML 77 mm MW 17 mm MT 19 mm
2726	727	7	Tine with blunt point and worn surface. Part of the core has been hollowed out indicating that it may be a sockated handle rather than a point or awl. Has broken longitudinally. ML 103 mm MW 23 mm MT 21 mm

SF	Context	Phase	Description
2876	1053	7	Broken tine with point shaped and worn smooth. A slice has been cut from the tine flattening one side of it. ML 52 mm MW 13 mm MT 9 mm
2891	973	7	Tine with smooth and broken point. The base is broken but may have been partly cut from the beam. ML 82 mm MW 17 mm MT 19 mm
2895	1067	7	Small tine with flared broken base suggesting that the break was near the junction with the beam. The point is blunt and the surface, smooth. ML 82 mm MW 33 mm MT 15 mm
2903	973	7	End of tine with a heavily worked point. The surface has been faceted by cutting producing a sharp edge at the point. ML 72 mm MW 16 mm MT 16.5 mm
2907	1076	7	Tine possibly used as a point. Has been cut off the main stem and the base shaped. One part of the surface is cut and faceted. Point is smooth. ML 102 mm MW 16 mm MT 17 mm
4024	984	8	Piece of tine with both ends cut. At the wider end the core is slightly hollowed and smoothed. At the narrow end there is a hole bored into the core of the tine 15 mm deep and 7 mm in diameter. The narrow end is cut straight across and the other end is angled. Possibly a small handle. ML 58 mm MW 17 mm MT 16 mm
4073	1048	7	A long tine cut from the main beam. Surface of the antler is black, and greying to rds the point, suggesting it was burnt. The point has been sharpened with long cut marks. (illus 103) ML 142 mm MW 20 mm MT 24 mm
4135	1143	8	Poorly preserved tine with surface decayed. Point has been cut off leaving a flat edge. Other end has been cut from the beam, and the core hollowed at this point for c50 mm. Possible a handle. ML 96 mm MW 21 mm MT 20 mm

SF	Context	Phase	Description
4213	1115	7	Tine with a smooth and worn point. Tine partially cut and then broken from the beam. ML 73 mm MW 26 mm MT 18 mm
4293	1252	8	Long tine with a worn surface. Appears to have been broken from the beam. The point is smooth and worn and was sharpened. ML 154 mm MW 18.5 mm MT 22 mm
4381	733	8	Tine broken diagonally from the beam. Also broken longitudinally for about half its length. The point has been sharpened and the surface is worn. ML 125 mm MW 20 mm MT 10.5 mm
4855	63	7	Tine cut from main beam, with other cut marks visible. The pointed end is worn and polished. ML 97 mm MW 22 mm MT 27.5 mm
4864	63	7	Tine broken from beam with surface near and around point worn and smooth. ML 123 mm MW 16 mm MT 20 mm
4916	1323	7	Top-most tine cut from beam with the twin tine also cut off. Surface of the tine is smooth and worn. There are cut marks on the remaining portion of beam. ML 79 mm MW 22 mm MT 16 mm
5190	1457	7	Tine cut from antler with worn point. ML 119 mm MW 46.5 mm MT 33 mm
5479	1766	5/6	Tine cut from beam with a diagonal cut. Five cut marks across the tine near the point. ML 84 mm MW 13 mm MT 11 mm
5684	1768	7	Tine may have been partly sawn from the beam then broken. Has a worn and blunt point. ML 57 mm MW 16 mm MT 11 mm
6389	1646	7	Tine with a cut and shaped lower end and a worn point. One side is cut and grooved and the other has a 'v'-shaped notch. ML 83 mm MW 17 mm MT 14 mm
6538	1830	7	Tine broken at the bottom end and is also broken longitudinally for about half its length. The surface is worn. ML 190 mm MW 19 mm MT 18 mm

SF	Context	Phase	Description
7845	267	7/8	Base of tine cut obliquely with toothed projections. The tip may have been sharpened. ML 53 mm MD 11 mm
Whalebone Vessels			
631	451	8	Reconstructed piece forming a flat base with a small portion of the vessel wall. ML 215 mm MW 101 mm MT 19 mm
2702	747	7	Reconstructed hollowed vertebra, probably part of a vessel. The vessel has a thick base with thin walls thickening towards the rim. Cut marks are visible on the interior from the hollowing process. MH of vessel 160 mm MT of base 43 mm MW of rim 31 mm MT of wall c10 mm
5192	1491	7	Angled piece of whalebone vertebra. Probably part of a vessel base and wall. ML 104 mm MW 65 mm MT 24 mm
7115	1875	5/6	Thoracic vertebra hollowed out to form a vessel, and spine cut off. The epiphyses are missing. The internal profile is convex but does not follow the exact curve of the outer profile as the wall becomes thicker towards the base. MH 163 mm MT 23 mm
Lids and Rims			
2054	786	8	Possibly a vessel lid made from a whale vertebral epiphysis. Has a circular hole bored through the centre. Two cut marks are visible one on the smooth upper surface 10 mm long and one on the core surface c15 mm long. MD 97 mm MT 13 mm
4788/7335	1067/2028	7&3	An arc of whale vertebral epiphysis joined from 2 phases. It appears to have been cut from the whole bone. Cut marks are present on the piece. MD 278 mm MW 29 mm MT 31 mm
6760	1884	5	Small square-sectioned curved piece of whale vertebral epiphysis. Possibly a broken rim piece. ML 102 mm MW 30 mm MT 28 mm

SF	Context	Phase	Description
7125	1884	5	Recons .cted vertebral piece forming part of a flat plate-like object which has been cut from the bone, and cut round the edges. Incomplete but possibly a lid. ML 223 mm MW 149 mm MT 27 mm (reconstructed MD c270 mm).
7242	1067	7	An arc of whalebone vertebral epiphysis forming part of a rim, possibly a non-joining part of SF 4788/7335. ML 147 mm MW 25 mm MT 32 mm
7332	1993	4	Reconstructed vertebral epiphysis trimmed around the edge. May be a lid or waste. MD (est) c150 mm MT 12 mm
7852	786	8	Small round plate of vertebral epiphysis, incomplete. Small circular hole c5 mm diameter is bored through the centre. Probably a vessel lid. MD 77 mm MT 7 mm
Mattocks			
19	8	8	Large, flat piece of bone cut longitudinally from the bone and straight across at one end and shaped into a gently curving blade at the other. Bone burnt and brittle. Two walsted holes have been cut through the bone on either side of the mid-line and towards the straight edge. Holes splayed and c16 mm in diameter. Incomplete. ML 146 mm MW 134 mm MT 18 mm (illus 104)
2512	901	8	Flat, blade-like piece of whalebone cut longitudinally from the bone. The blade is slightly angled and has one straight edge, the other side is very worn. Cut marks are visible on the surface. At the top edge of the blade is a worn semi-circular groove through the bone, probably the remains of a hole. The implement is broken at this point, and the extreme tip of the blade is worn away. ML 172 mm MW 84 mm MT 24 mm MD of hole c18 mm

SF	Context	Phase	Description
4266	336	8	Small, flat, blade-like piece of whalebone cut longitudinally from the bone. The lower edge of the blade is worn and crumbling. Both long sides are also worn and rounded. The upper part of the artefact has broken away leaving 2 depressions which may have been lower parts of holes. The piece may also have been re-used after it was broken. ML 77 mm MW 71 mm MT 15 mm
5152	1545	-7	Large, heavy blade of whalebone cut longitudinally. The lower curved edge is worn thin and smooth with small breaks at the right hand side. The top edge of the tool is broken cleanly across and through 2 close set holes. The holes are smooth around the edges. Towards the centre of the bone is a large diagonally cut hole. The hole slopes from top back to bottom front with most wear on these 2 edges. (illus 104) ML 237 mm MW 117 mm MT 27 mm
5273	1470	7	Possible mattock. Thick piece of bone with flat faces, thin and worn on curved edge, broken at opposite end and down the right side. Has the remains of 2 large holes cut through the bone at a slant. (illus 104) ML 153 mm MW 87 mm MT 27 mm
7259	1977	7	Part of a square mattock, incomplete. Cut longitudinally from the bone. One side is curved and one edge is worn, broken at other edge and down its length. Broken at a large slanting hole c60 mm long. Grooved on surface. ML 211 mm MW 90 mm MT 35 mm
7310	1960	4	Irregular piece of flat whalebone with an off-centre hole through its thickness. Two sides are curved and worn while the third side is cut straight. ML 168 mm MW 100 mm MT 27 mm
7851	722	8	Piece broken diagonally across at one end and broken at the other rounded edge. A large hole is bored through the bone at mid-point, elliptical in shape c30 x 23 mm. ML 95 mm MW 50 mm MT 21 mm

SF	Context	Phase	Description
7880	1115	7	Fragment of a mattock. One piece has a worn rounded end and the opposite end has been cut diagonally on one side, and shows the curve of a hole on the other. ML 93 mm MW 27 mm MT 17 mm
Miscellaneous Artefacts			
850	179	8	Piece of a vertebra with parts of 2 articulation surfaces present. Peg shaped with a head and a shaft. ML 107 mm MW 47 mm MT 29 mm
2523	923	8	Thoracic vertebra of whale with neural spine removed. Both ends are concave through its use as a chopping block. Many cut marks at both ends. ML 160 mm MW 246 mm MT 98 mm
4502	1353	8	Flat and rectangular flake, very slightly curved and broken diagonally at one end. The other end is cut but worn thin. The sides are also worn. ML 137 mm MW 43 mm MT 7 mm
7020	1830	7	Triangular but broken piece of bone, triangular in section and with 2 smoothed surfaces. On one side is a 3 mm deep groove 5 mm wide and 26 mm long. Fragmentary toggle? ML 78 mm MW 28 mm MT 17 mm
7021	1830	7	Cut piece of bone with flat sides and angular edges. A deep groove runs the length of one side. It has a rounded profile. Ends broken and surface partly unfinished with cut marks. ML 114 mm MW 20 mm MT 21 mm Groove 4 mm wide and 7 mm MD
7248	1284	5/6	Hollowed piece of bone with a rounded and worn end and a pointed end also worn. Surface cut marks. Second piece is triangular forming a blunt point, with a deep gouge. With cut marks, may be a waste piece. ML 172 mm MW 61 mm MT 36 mm
7285	1994	4	Rectangular slab of Whale vertebra, one side cut and the other hacked. There are traces of saw cuts on the longest side leaving an irregular broken bone. The surface is notched and there are cut marks on one short side. ML 133 mm MW 57 mm MT 12 mm

Pumice Pebbles

SF	Context	Phase	Description
59	16	8	Brown-grey pumice with slightly smoothed lower surface. No wear marks. ML 45 mm
193	207	7	Irregular shaped and unworked piece. ML 31 mm
1288	636	8	Rounded pebble, lower surface smoothed. ML 37.5 mm
2539	883	7	Large irregular piece. Part of upper and lower surface smoothed. ML 58 mm
2250	826	7/8	Missing
2556	912	8	Smoothed on both surfaces. ML 34 mm
2631	955	7	Slightly smoothed and hollowed on one surface. ML 42 mm
3277	826	7/8	Highly smoothed and rounded pebble. ML 45 mm
3814	1229	7	Triangular piece, slightly worn all over and especially at apex. End opposite apex, smoothed. ML 35.5 mm
3854	510	8	Irregular and unworked piece ML 45 mm
4072	1098	8	One piece with a flattened surface. ML 40 mm Triangular piece, smoothed on all surfaces. ML 42 mm
4138	1107	8	Rounded and smoothed pebble. ML 27 mm
4250	1185	7/8	Hollowed on 2 surfaces and partly on a third. Worn thin in middle where broken. MW 33 mm
4287	25	7	Roughly smoothed pebble. ML 56 mm
4489	1340	7	Rounded and smoothed pebble. ML 45 mm
5173	1491	7	Irregular rounded pebble, with one surface worn smooth. ML 67 mm

SF	Context	Phase	Description
5232	1470	7	Rounded pebble, worn smooth on one edge. ML 39 mm
5402	1692	7	Rounded pebble, worn into facets around edges. ML 45 mm
5631	1251	7	Rounded pebble, smoothed along one edge. ML 49 mm
6798	1960	4	Irregular pebble. Upper surface roughly smoothed and hollowed. ML 50 mm
6808	1555	7	Small, smooth, elongated pebble. ML 33 mm
6996	2046	3	Irregular shaped piece. Lower surface flattened and smoothed. ML 46.5 mm
7257	1976	1	Irregular piece. ML 69 mm
7375	2057	1	Large rounded piece, slightly smoothed on one surface. ML 58 mm
7408	2072	1	Large pebble, smoothed on one surface, and hollowed with a linear notch on the opposite surface. ML 66 mm
7418	2072	1	Irregular pebble. ML 44 mm Another pebble, slightly smoothed and rounded. ML 45 mm
7541	1281	7	Smoothed but irregular piece. Slight crosswise smoothed hollow on one surface. ML 52 mm
7883	2027	4	Brown-grey pumice pebble. Lower surface smooth and concave. ML 52 mm
7884	221	8	Unworked irregular shaped piece. Grey colour. ML 30 mm

FLINT AND CHERT ARTEFACTS

Arrowhead

SF No	Context	Phase	Description
7353	2016	2	A small, squat leaf-shaped arrowhead, type 4a (Green 1980) made on a flake of dark grey chert. Shallow invasive retouch (pressure flaking) occurs all over both dorsal and ventral surfaces. ML 15mm MW 13mm MT 3.3mm

Knife

13	1	9	Part of a flake of pale grey flint retouched along ventral surface of left side and showing wear along right edge. Hinge fracture at base. Possibly the tip of a knife. ML 22mm MW 21.5mm MT 8mm

Scrapers

293	335	9	Thumb-scraper, possibly Neolithic or Early Bronze Age, in brown flint. Semi-abrupt retouch round three-quarters of the surface with thinning of the distal end of the ventral surface. ML 18mm MW 22mm MT 6mm
4026	1107	8	Possible small button-scraper of red chert with fine semi-abrupt retouch round 2/3 of right side. ML 15mm MW 11.5mm MT 3mm
4249	1185	7/8	Button-scraper on a flake of dark, honey-coloured flint. Semi-invasive retouch on the right side of the dorsal surface. Negative bulb of percussion present. Flaking scars on proximal end of dorsal surface. ML 19mm MW 20mm MT 4.3mm
5656	1721	7	Thumb-scraper made on a thick flake or possibly a core rejuvenation flake, of honey-coloured chert. Invasive retouch on the dorsal surface could, possibly be pressure flaking. ML 22mm MW 22mm MT 11.5mm
6589	1865	7	a. Thumb-scraper made on worn flint pebble. Pale grey chert with white mottle. White cortex on dorsal surface. Semi-abrupt retouch round 2/3 of edge. ML 25mm MW 23mm MT 8mm b. Thumb-scraper on worn flake of grey chert with worn white cortex on dorsal surface. Semi-abrupt retouch on the distal end. ML 17mm MW 18mm MT 4mm

SF No	Context	Phase	Description
6945	2059	2/3	e. Possible thumb-scraper on pale brown chert flake with a little white mottle. Semi-abrupt retouch round 2/3 of edge. ML 13mm MW 16mm MT 8.5mm
7374	2057	2/3	Small thumb-or button-scraper made on a thick flake of grey flint, burnt, with cortex on the dorsal surface. Semi-abrupt retouch round 3/4 of the edge. ML 16mm MW 16mm MT 7.5mm
7389	2046	3	End-scraper on small coarse flint flake, possibly burnt. Retouch down left side. ML 26mm MW 17mm MT 18mm
7390	2072	1/2	a. End-scraper in grey chert with paler mottle. Semi-abrupt retouch round 3/4 of the edge. Bulb of percussion present. ML 39mm MW 27mm MT 6.3mm
			b. Thumb-scraper made on a broken flake of grey chert with pale mottle. Semi-abrupt retouch at working edge which is undercut from use. There is a hinge fracture at the base and blade scars are present on the right side of the ventral surface causing thinning of the tool in this area. ML 27mm MW 29mm MT 8.5mm
			c. Possible distal portion of broken end-scraper in grey chert with some white mottle. Semi-abrupt retouch at distal end and abrupt retouch on the right side where some cortex remains. Base snapped. ML 22mm MW 37mm MT 3.6mm
7406	2072	1/2	Large end-scraper in grey chert with paler mottle. There is abrupt retouch at the distal end but semi-abrupt retouch down the whole of the right side which may indicate multi-purpose use. ML 73mm MW 35mm MT 16.5mm
7547	2059	2/3	e. Grey chert flake with potlid scar on dorsal surface and semi-abrupt retouch on two sides to make a thumb-scraper. ML 20mm MW 15mm MT 5.5mm

Struck flakes with retouch and/or wear

SF No	Context	Phase	Description
350	368	8	Two small struck chips of a. grey chert with white mottle. ML 6mm MW 10mm MT 2.5mm b. a plain grey chip with slight evidence of burning. ML 7mm MW 11mm MT 2mm
691	434	8	Struck flake of corticated pale grey chert. ML 19mm MW 9mm MT 3.6mm
1040	1	9	Very calcined struck flake. ML 22mm MW 38mm MT 8.7mm
1359	1	9	Struck flake, pale red in colour. ML 11mm MW 6mm MT 0.8mm
2020	1	9	Flint pebble of honey-coloured flint with three small flaking scars on one side. ML mm MW mm MT mm
4075	1098	8	Struck flake of dark amber translucent flint with cortex down the right side. Very light retouch down the left side, probably wear. Bulb of percussion present and flake scars on the dorsal surface. ML 31mm MW 21mm MT 6mm
6162	1126	8	Struck flake of brown flint with black cortex. Wear down the whole of the left side on the ventral surface. No bulb of percussion present but undulations visible. ML 25mm MW 5mm MT 4mm
6441	1208	7	Struck flake of honey-coloured chert with flaking scars on both surfaces. ML 21mm MW 12.5mm MT 3.5mm
6926	2046	3	Struck flake of pale brown chert with a little mottle. Possibly slightly burnt. ML 19mm MW 20mm MT 5mm
7389	2057	2/3	Struck flake of pale brown chert with invasive retouch on the left side. ML 21mm MW 12mm MT 2.5mm
7390	2072	1/2	d. Broken flake with semi-abrupt lateral retouch on the right side, of pale brown translucent flint. Hinge fracture at the distal end and left side snapped in two places. ML 31mm MW 29mm MT 8mm
7423	2070	3	a. Struck flake of pale brown chert with a little lighter mottle. Wear at the tip. ML 22mm MW 16mm MT 3mm b. Struck flake of slightly burnt flint. ML 24mm MW 19mm MT 3mm

Struck flakes (cont'd)

SF No	Context	Phase	Description
7547	2059	2/3	a. Struck flake in grey chert with white mottle. ML 14mm MW 19mm MT 3.5mm b. Struck flake of grey flint. ML 19mm MW 16mm MT 4.2mm c. Struck flake of grey chert. ML 22mm MW 12mm MT 4mm d. Struck flake of pale grey flint ML 14mm MW 11mm MT 3mm

Natural flint fragments

214	210	8	Natural flake of grey chert
609	424	8	Chert fragment
684	1	9	Flint fragment
696	514	8	Chert fragment
865	1	9	Flint fragment
706	439	9	Flint fragment
1444	684	2/3	Fragment of burnt pebble, probably flint
1675	226	8	Chert fragment
2359	1	9	Flint fragment found near SF 2020. Some possible plough damage.
6036	757	7	Pale brown chert chip
6883	1240	8	Small flake of honey-coloured chert, possibly struck. ML 6mm MW 11mm MT 1.5mm
6945	2059	2/3	3 fragments of which 2 are flawed flakes, one burnt, and one small nodule. Plough damage evident.
7387	2055	3	7 small chert chips showing some evidence of burning.
7872	2056	3	Natural fragment.
7537	1894	6	Small chert chips showing evidence of burning.

Howe Excavation 1978-1982

Metal Finds

Lead

SF	Context	Phase	Description
69	60	5/6	Four pieces of lead associated with 4 small fragments of iron. Large irregular rounded stud, which has been squashed, probably a decorative head to an iron pin. ML 22 mm MW 24 mm MT c10 mm

Iron

7107	1868	5/6	Bent square shafted nail with corroded head. ML 34.5 mm MW 3-11 mm
7288	1987	5/6	Unconserved lump. ML 30 mm MW 22 mm
50	35	7	Heavily decayed nail, with broad rounded head and square shaft. Shaft bent through 90° and the point is bent over. ML 78 mm MW 7.5 mm MT 7.5 mm MD of head c24 mm
2031	763	7	Bent hook, wire of pin. ML 33 mm
2442	876	7	Square ended tweezers made from one piece of metal. Slightly curved and splayed at tweezer end. Opposite end is formed into a ring. (illus 130) ML 58 mm MW 9 mm MD of ring c12 mm
2624	883	7	Fragmentary nail. ML 33 mm
2640	883	7	Fragmentary strap or blank. ML 26 mm + 37 mm MW 6 mm
2709	1017	7	Open and elongated 'ring' - spur? MW across ring 59 mm MT 8 mm ML of ring 50 mm
2801	360	7	Unconserved lump. ML 51 mm MW 23 mm
3101	883	7	Unconserved lump.

SF	Context	Phase	Description
3392	1078	7	Blade in 2 pieces. ML 57 mm MW 10 mm
4164	805	7	Solid and heavy piece, with narrow upturned end c20 mm wide. No distinguishing marks. Part of agricultural implement. ML 226 mm MW 50 mm MT c17 mm
4437	1329	7	Thin bent bar. ML 28 + 14 mm MW 7 mm
4701	1326	7	Five unconserved lumps.
4735	1443	7	Unconserved lump. ML 35 mm MW 17 mm
4822	1513	7	Flat and square ended chisel or chaser on a tapering square shank. (illus 130) ML 113 mm MW of chisel end 24 mm
4892	1427	7	Unconserved lump. ML 45 mm MW 37 mm
4924	1458	7	Roughly rounded pin, point missing. Large iron lump at head end. May have been a decorative dress pin. ML 81 mm MW 4 mm
5005	1527	7	Unconserved lump. ML 38 mm
5134	1466	7	Unconserved lump on glassy slag.
5153	1603	7	Three unconserved lumps.
5165	1491	7	Tanged knife with slightly curved blade. Bone handle missing, but tang terminates in a spike with a bone end. ML 185.5 mm ML of blade c90 mm MW of blade 15 mm MT c3.5 mm (illus 130)
5313	1491	7	Square bar or blank. ML 59 mm MW 4 mm

SF	Context	Phase	Description
5319	1583	7	Razor. Fragment of iron blade in a polished and grooved bone holder. Iron blade survives - ML 35 mm MW 15 mm MT 2 mm, heavily corroded. Blade was probably curved to fit into the curved holder. Bone - ML 77 mm MT 9 mm MW 17 mm At wide end, an iron pin secures the blade. The bone is grooved to a depth of 12 mm, and shallows to the pointed end. Groove is 1-2 mm wide. Securing pin lies 7 mm from wide end and is MD 3 mm. (illus 130)
5333	1662	7	Unconserved nail head with square sectioned body. ML 47 mm
5367	1373	7	Incomplete bent bar or staple. ML 40 mm MW 7 mm
5368	1689	7	Square shanked pink top missing. ML 31.5 mm MW 3 mm
5390	1597	7	Square shanked nail fragment. Head missing. ML 32 mm MW 2-3 mm
5502	1265	7	Bent iron pin surmounted by a spherical paste head. Shank may have had a T bar at the top, around which the paste was applied, revealed as a tack in the paste. Paste cracked and discoloured. ML 44 mm MD of head 10 mm MT of shank 3 mm (illus 130)
5774	1474	7	Unconserved imp.
5903	1481	7	Unconserved lump. ML 40 mm MW 27 mm
5960	1469	7	Unconserved lump. ML 30 mm MW 19 mm
6106	861	7	Unconserved lump. ML 35 mm MW 23 mm
6138	981	7	Red shaped blank. ML 39 mm HW 11.5 mm MT 7 mm
6547	1491	7	Fragmentary and square shafted point. ML 35 mm

SF	Context	Phase	Description
6593	1067	7	Unconserved lump. ML 44 mm MW 33Wmm MT 24 mm
7001	1558	7	Unconserved tool or chisel. ML 110 mm MW 32 mm
7117	1813	7	Three unconserved lumps.
7222	1952	7	Fragmentary square shafted nail. No head.
7343	2041	7	Spike or square sectioned nail, pointed at one end. ML 93 mm
7348	2041	7	Bar, rectangular in section. ML 89 mm
7502	1639	7	Unconserved lump.
7503	1362	7	Three unconserved lumps.
7504	1340	7	Twenty four unconserved lumps.
7505	883	7	Bar or nail in 2 pieces. ML 53 mm MW 13 mm
2142	770	7/8	Head of square shanked nail or fibula. Shank partly curved. ML 20 mm MW 14 mm
2352	769	7/8	Small nail in wood. ML 31 mm MW 12 mm
2573	894	7/8	Unconserved lump. ML 28 mm MW 20 mm
3282	894	7/8	Unconserved lump. ML 32 mm MW 22.5 mm
43	34	8	Four nails, 2 possible pieces of nail shank, one iron shank bonded to a thin iron plate, possibly a fish hook. ML 62 mm MW 10 mm MT 7 mm
48	8	8	Thin strip of metal looped over at one end. ML 59 mm MW 4 mm MT 1.5 mm
211	163	8	Fragmentary nail with bent end. ML 38 mm MW 3.5 mm MT 3 mm
212	257	8	Unconserved elongated oval chain-link. ML 72 mm MW 21 mm MT 9 mm

SF	Context	Phase	Description
284	291	8	Long, straight pin with drum head. Pin has a copper alloy or silver gilt band 2 mm wide encircling the shank 32 mm from the end. Either side of which is a 5 mm wide band of slanting incisions with copper inlay. The drum head has an applied and embossed disc on both its faces. They are decorated with 5 ring and dot designs. Around the circumference of the head are 2 opposing milled bands 2 mm wide and 5.5 mm long. ML 75 mm MD of shank 4 mm of head 10 mm MT of head c6 mm (illus 130)
380	405	8	Unconserved lump. ML 27 mm MW 18 mm MT 10 mm
382	405	8	Square headed nail or pin, with a rounded, pointed shank. ML 38 mm MW 5 mm
725	491	8	Small knife blade with part of tang, point missing. ML 66 mm MW 13 mm MT c6 mm (illus 130)
1289	378	8	Rivet or nail head. ML 11 mm MW 5 mm MT 2 mm
1503	615	8	Small triangular blade with a narrow point. ML 35 mm MW 9 mm
1803	493	8	Possible blade. ML 41 mm MW 17 mm
1995	734	8	Single pointed tooth of a wool comb. ML 82 mm MD 3 mm (illus 130)
1996	734	8	Bar or blank. ML 51 mm
2033	734	8	Fragmentary nail.
2065	786	8	Crescentic blade, possibly part of a razor. ML 65 mm MW 12 mm (illus 130)
2086	786	8	Round but flat headed nail, with rounded shank. ML 37 mm MT 3 mm MD of head 9 mm (illus 130)
2116	399	8	Nail or bar, rounded at one end, square at the other. ML 117 mm
2230	841	8	Unconserved lump. ML 27 mm MT 24 mm

SF	Context	Phase	Description
2287	715	8	Strap or bar. ML 57 mm MW 5 mm MT 4 mm
2320	715	8	Strap or bar. ML 30 mm MW 7 mm
2500	901	8	Length of wire with looped top folded over. ML 30 mm MW 40 mm
2538	924	8	Twisted nail (?) shank. ML 33 mm MW 3 mm MT 3 mm
2676	912	8	Iron ore. ML 73 mm MW 28 mm
2697	963	8	Hollow iron bubble. ML 35 mm MW 25 mm
2725	922	8	Fragmentary nail, needle or pin. ML 42 mm
3087	786	8	Unconserved nail I(?) ML 42 mm HW 10 mm
3641	1134	8	Unconserved lump in 2 pieces. ML 51 mm MW 24 mm
4257	715	8	Tanged knife blade. Handle missing. Blade is angled and cutting edge is eroded. Tang may have been rectangular in section. ML 120 mm MW 16 mm MT 5 mm MT of blade 8 mm (illus 130)
4286	1181	8	Square shanked but tapering bar or nail shank. ML 100 mm
4459	1359	8	Square sectioned fragmentary nail. ML 39 mm
4842	1410	8	Rounded pin shank. ML 21 mm MW 2 mm
5564	1319	8	Unconserved lump.
5650	1353	8	Unconserved bar or hook. ML 55 mm
5843	1410	8	Three unconserved pieces.
6190	783	8	Unconserved lump.
7506	856	8	Unconserved lump. ML 61 mm MW 51 mm MT 15.5 mm

SF	Context	Phase	Description
39	29	8-9	Thin plate, one side slightly curved, and one end curved. Other side straight and toothed or hinged. One end of curved side is bent over and adjoining end is straight. ML 174 mm MW 62 mm MT 1-3 mm
41	29	8-9	Unconserved lump. ML 55 mm MW 22 mm
216	143	8-9	Heavily corroded ring. ML 37-38 mm MT 6 mm
111	1	9	Incomplete blank or nail shank. ML 16 mm MD 2.5 mm
148	1	9	Complete but bent and twisted ring. ML 40 mm MW 45 mm MT 8 mm
202	168	9	Incomplete metal bar or nail shank. ML 30 mm MW 6 mm MT 2 mm
450	110	9	Unconserved lump. ML 22 mm MW 10 mm
997	496	9	Three pieces of metal plate (not joining), fabric impressions on one side. One piece has a small hole c4 mm diameter. ML of largest piece 25 mm MW 13 mm MT 2 mm
1051	180	9	Incomplete and reconstructed fragment, possibly a knife blade, but broken at either end. One edge is sharpened. ML 42 mm MW 9 mm MT 1-3 mm
2135	1	9	Bar clasp? ML 47 mm MW 23 mm
Copper Alloy			
7002	1764	5/6	Ring, probably from pin or brooch. Lozenge-shaped in section. Waisted central hole. Flattened at one point of surface where a pin may have been attached. MD 19 mm MD of hole 7 mm MT 6 mm (illus 134)

SF	Context	Phase	Description
7101	1868	5/6	Projecting ring-headed pin made of a single piece of wire forming a tapering and pointed shank and a flattened ring. Wire terminates at base of head. The ring head is plain except for a central raised ridge which runs round the circle. ML 91 mm MD of shank 3.5 mm MD of ring 18 mm (illus 134)
2630	807	6-9	Fragment of ring made from circular wire. One end pointed the other broken. ML 18 mm MD 2.5 mm
2347	876	7	Zoomorphic brooch in shape of an insect, with elongated representative eyes. Has large curved and rounded wings which are tinned and spring from the ribbed body. The catch-plate is long and curved allowing the body of the brooch to be raised. The body and tail are incised and the tail of the insect curves downwards to form a hinge. The copper pin of the brooch is fixed to the hinge by a small tack or securing peg, and is probably a replacement. ML 32 mm MW of wings 48 mm MT of wings 1 mm (illus 135)
2358	883	7	Reconstructed metal plate, formed of 2 thickness of metal. ML 31 mm MW 26.5 mm MT 2 mm
2369	876	7	Projecting ring headed pin of square sectioned wire, which gives the ring a ridged and flattened appearance. Shank in 2 pieces. MD of head 12 mm MT of wire 2.5 mm
2688	985	7	Repousse disc pin, with tapering 'u' shaped pin shank. The pin is attached to the back of a dish which has a beaded rim. The dish contains a decorative sheet which is attached to the dish by a central pin or boss. Three swirls radiating from the centre of the sheet to form the decoration. ML 58 mm MD of pin 3 mm MD of head 23 mm (illus 133)

SF	Context	Phase	Description
2929	973	7	Long thin pin with point. Broken off at head end. ML 57 mm MD 3 mm
4120	1051	7	Incomplete curved rectangular metal plate with rounded corners. Has 3 holes down one end, four along one side and one in each other corner and one off centre hole. Five holes were punched from one side and 3 from the other. May be a wrist guard. ML 77 mm MW 42.5 mm MT 0.25 mm
4396	1306	7	Circular pin head with central depression filled with yellow paste as if to hold a decorative piece. The rounded rim tapers to a conical base and broken pin shaft, which may have curved away from the pin head. (illus 134) MD 16 mm ML 13 mm MT of shaft 2 mm
4414	1334	7	Long bodkin with eye and point. Eye 6 mm long and 1 mm wide (illus 136) ML 62 mm MW 3.5 mm MT 1.5 mm
4547	1218	7	Two pieces of bent wire, bent at right angles and tapering. Perhaps 2 halves of a staple. ML 16 mm MW 4.5 mm MT 2 mm
4598	1403	7	Square sectioned pin, slightly splayed at the bent end. Tip missing. Formed of metal sheeting and not cast. Probably hollow. ML 40.5 mm MW 2 mm MT 1.5 mm
4704	1251	7	Half a plain cast ring, circular in section. Ridged slightly on internal surface. ML 19Wmm MT 2.5-3 mm
4775	1475	7	Long and thin bent pin which tapers gently to a fine point. The other end is notched to take a decorative terminal (missing). ML 248 mm MD 3.5 mm (illus 134)
4931	1545	7	Waste metal. ML 21 mm MW 21 mm

SF	Context	Phase	Description
4932	1456	7	Unusual pin. The pin shank is bent at its pointed end and is slightly square in section. The circular head is irregularly moulded, below which is an elbow stud. Both stud and head are decorated with cross-hatching. ML 60 mm MW of shank 2 mm MD of head 11 x 9 mm (illus 133)
5018	1216	7	Three small unconserved fragments of wire.
5034	1527	7	Thin metal plate, irregularly broken off at one end, other end tapers and is folded over. ML 25 mm MW 25 mm MT 1 mm
5064	1545	7	Two chain links and possibly a chain terminal. Links of interlocking bent wire. Terminal is a wider ring. ML 25 mm MD of chain wire 1.5 mm MW of terminal 4 mm (illus 132)
5099	1585	7	Fragment of ring semi-circular in shape. ML 23 mm MW 9 mm
5187	1595	7	Fragmentary plate ML 27 mm MW 28 mm MT 0.5-1 mm
5271	1470	7	Small fragmentary disc with punched hole. MD 10 mm MT 0.5 mm MD of hole 2 mm
5446	1271	7	*Incomplete projecting ring headed pin with two thirds of head missing. Seems to have been made of bent wire. Shank tapers to a point.* ML 72 mm MD of shank 3.5 mm (illus 134)
6110	861	7	Small penannular ring, not conserved. MD 13 mm MD of wire 2 mm
6868	1281	7	Three small unconserved fragments.
7023	1838	7	Two unconserved fragments.
7097	1332	7	*Projecting ring-headed pin with bent tapering shank. Cast and decorated on one side of head. Ring surface divided by incisions into raised buns.* ML 50 mm MD of shank 2 mm MD of head 17 mm (illus 133)
7245	1962	7	Three pieces of unconserved pin.
7636	1952	7	Two small unconserved fragments.

SF	Context	Phase	Description
2014	729	7-8	Projecting ring-headed pin made from one piece of wire. Tapering and pointed circular shank, bent at right-angles to form a small flattened circular head. ML 79 mm MW of shank 3 mm MD of head 10.5 mm (illus 134)
168	192	8	Small, flat-ended tweezers composed of 2 arms encircling a fragmentary suspension ring at the enclosed end. One piece of metal is bent around to form the tweezers. (illus 136) ML 30Wmm MW of end 4.5 mm MT 1 mm
603	424	8	Object with long handle or shank, which tapers in towards the middle. One end is rounded and contains a circular hole 0.5 mm from end. Other end of shank widens to 5 mm and continues in a right-angle to contain a square hole 4 x 3 mm. Made of folded metal sheeting, and holes punched after manufacture. ML 51 mm MW 5 mm MT 1.5 mm ML of square end 6 mm MD of round hole 2 mm. (illus 136) A key from a spring lock or padlock.
1111	623	8	Well preserved complete penannular brooch. Pin has a bent end to lie over brooch, and the pin head is in a barrel form. Brooch has zoomorphic terminals in the form of a snouted beast with raised eyes. Ears barely moulded. MD 32.5 mm ML of pin 39 mm MT of brooch 2.5 mm MT Of pin 2.5 mm (illus 133)
1422	284	8	Two pieces of chain link, unconserved.
1458	298	8	Unconserved fragments.
1502	615	8	Fragments of a circular and slightly raised stud.
1729	493	8	Decorated projected ring-headed pin with slightly tapering pointed shank. Has a large bead at the base of the head and 2 smaller ones either side of it. Upper part of the bead is corrugated. (illus 133) ML 50 mm MD of shank 2.5 mm ML of head 9 mm, MW of head 7.5 mm MT of head 1.5 mm
1773	609	8	Small fragment of chain link.

SF	Context	Phase	Description
2028	734	8	Tapering pin from a hinged brooch. ML 50.5 mm MD 1.5-4 mm
2045	785	8	Penannular brooch, a slightly flattened circle with decorated terminals. Pin tip is lost, but head is well moulded in the barrel form. Terminals of brooch are zoomorphic in the form of a snouted beast, with moulded ears and eyes. Reverse side of terminals (splayed), contains parallel and transverse parallel incised lines in a triangular design with centre incised dots. MD 35 mm ML of pin 34 mm MT of pin 2.5 mm MW of terminal 4.5 mm ML of terminal 12 mm MD of brooch wire 2.5 mm (illus 133)
2209	841	8	Fragment of a plain ring. Wire semi-circular in section. ML 9 mm MW 8.5 mm MD of wire 1.5 mm
2393	896	8	One fragment of chain link.
2423	896	8	Three tiny fragments.
2833	1041	8	Decorated hipped pin with broken point. Top of shank decorated with incised lines with central dots. Pin head lies above this decoration. It is circular in plan and hexagonal in section with the top of head flattened. Around centre of head is a line of incised linear dots. ML 50.5 mm MD of head 8 mm MD of shank 4 mm MDepth of head 5.5 mm (illus 134)
4531	1535	8	Reconstructed pin from brooch, tapers from a wedge-shape to a rounded point. ML 33.5 mm MW 4 mm MT 2.5 mm

SF	Context	Phase	Description
4559	1170	8	La Tene I fibula. A flattened brooch with 3 springs either side of the bow. The axis bar is iron and the linking spring chord is missing. The pin is round (MD 3 mm) and may have been applied separately to the head of the brooch at the springs. It is bent slightly at its tip to fit into the catch plate. The bow is c10 mm wide and narrows at both ends. A single incised line runs up either edge of the bow. The bow is bent to from a moulded catch-plate and a 'cobra-head' foot. The external surface of the catch-plate is decorated with 7 oblique but parallel incised lines. The foot is decorated with incised feathering, below the disc or 'cobra-head' (13.5 x 15 mm) the foot terminates in a 7 x 5 mm block, decorated with 5 horizontal incised lines. ML 83 mm MW of spring 26 mm (illus 135)
4610	1352	8	Piece of folded plate or sheeting.
4665	1402	8	Unconserved roundel, may have been a pin head. Part of the shank is visible. MD 11 mm MT c5 mm
6067	786	8	A small unconserved fragment.
6845	1353	8	Unconserved fragment.
1	1	9	Two thirds of a semi-oval decorated brooch Semi-circular in section. Fragment of one decorated arm or terminal present. Enclosed zig-zag design in a raised oval on a longer length of piece, surrounded by an incised band at either side. Enclosed dotted design on partial arm. ML 23 mm MW 17 mm MT 1 mm (illus 136)
108	1	9	A Bawbee of Charles II 1677-1679. No distinguishing marks on coin, although it may have had a thistle on one face when found. MD 25 mm MT 1 mm

SF	Context	Phase	Description
205	104	9	Spiral finger ring. One and a half coils of wire, irregular in shape. Ends of ring cut. Seems to be manufactured from folded sheeting made into the round and then twisted into a coil. MD 15 mm MD of thread 1.5 mm (illus 132)
319	1	9	Small coil, overlapping and extending c¼ beyond overlap. Both ends damaged. MD 10 mm MD of thread 1.5 mm (illus 132)
682	1	9	Fine needle or pin. Slightly bent, point flattened and damaged. Flattened head incomplete. ML 71 mm MT 1.75 mm (illus 136)
2132	1	9	
2927	816	9	Long tapering pin. Ribbed top is slightly thinner than main shank. Top ends in a plain irregular blob as if to house a further decorative piece. ML 82.5 mm MD 3 mm ML of ribbing 11.5 mm MD of top 2.5 mm (illus 134)
4199	1186	9	Four tiny fragments.
4312	1268	9	Square shanked pink tapering slightly to a point. Shank has an irregular anti-clockwise twist which stops 70 mm from the top. Squared top has a zoomorphic face on one side of a snouted beast with moulded eyes and ears. ML 183 mm MD 2 mm MT of head 4 mm MW of head 3.5 mm ML of beast 13.5 mm (illus 133)

Table 60mf SF 2197 - bulk and phase analysis (weight %)

	B1	B2	B3	B4	B5	FEOX1*	FEOX2	FEOX3
Na_2O	0.2	N.D	0.8	0.1	0.5	N.D	0.1	0.3
MgO	0.8	0.4	0.7	0.6	0.9	0.5	0.2	0.7
Al_2O_3	1.2	1.2	1.4	1.3	1.2	0.1	N.D	0.2
SiO_2	10.4	10.5	8.8	10.0	10.2	0.5	0.8	0.5
P_2O_5	0.5	0.8	0.2	0.8	1.0	N.D	N.D	N.D
S	0.3	0.2	0.1	0.3	0.3	N.D	N.D	N.D
K_2O	0.7	0.7	0.3	0.6	0.6	N.D	0.1	N.D
CaO	5.1	5.1	2.4	4.9	4.8	0.1	N.D	N.D
TiO_2	0.1	0.1	0.1	N.D	N.D	0.1	0.1	
V_2O_5	N.D	N.D	N.D	N.D	N.D	0.1	N.D	0.1
Cr_2O_6	N.D	N.D	N.D	N.D	N.D	N.D	0.1	0.1
MnO	1.7	1.6	1.6	1.6	1.6	1.7	1.5	1.6
FeO	81.6	81.6	79.4	81.1	80.2	97.1	96.7	96.2
CoO	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
NiO	N.D	N.D	0.1	0.1	N.D	N.D	0.1	0.1
CuO	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
Total	102.6	102.2	95.9	101.4	101.3	100.1	99.7	99.9

* FEOX = FREE IRON OXIDE

Table 61mf SF 5100 - bulk and phase analysis (weighting %)

	B1	B2	B3	B4	GLASS	FEOX
Na_2O	N.D	0.1	0.6	N.D	0.4	0.6
MgO	0.4	0.3	0.4	0.5	0.8	0.4
Al_2O_3	1.3	1.2	2.4	1.2	6.2	0.1
Sio_2	6.5	6.9	13.1	5.5	36.9	3.0
P_2O_5	0.4	0.3	0.7	0.4	2.4	0.7
S	0.2	0.2	0.2	0.3	0.5	0.1
K_2O	0.4	0.4	0.7	0.4	3.6	N.D
CaO	2.1	2.5	3.1	1.9	15.2	1.0
TiO_2	0.1	0.1	0.2	0.2	0.4	N.D
V_2O_5	N.D	N.D	N.D	N.D	N.D	N.D
Cr_2O_6	N.D	0.2	N.D	N.D	N.D	N.D
MnO	1.8	2.0	1.8	1.6	2.5	1.0
FeO	83.7	86.6	74.5	87.0	31.0	69.0
CoO	0.4	0.3	0.3	0.1	0.3	0.3
NiO	0.8	0.2	0.2	0.3	0.3	0.1
CuO	0.2	N.D	0.1	0.1	N.D	N.D
Total	98.3	101.3	98.3	99.5	100.6	76.2

A second sample (H5100/1) was analysed. It had a more 'flowed' morphology, and the mineral texture was fine iron oxide dendrites (mean=15%) with massive silicate (mean=80%) in a glassy matrix (mean=5%). The bulk analyses (Table 5) were typical of silicate slag and were characterised by high MnO contents, but they showed some variation. Bulk Analyses 1-3 were richer in iron oxide and MnO and lower in alkali oxides. This indicates that the sample derived from the smelting rather than the smithing process.

Table 62mf SF5100-1 - bulk and phase analysis

	B1	B2	B3	B4	B5	GLASS	FEOX
Na_2O	0.3	N.D	N.D	0.3	0.9	0.4	N.D
MgO	0.7	0.4	0.6	1.6	1.6	1.2	0.3
Al_2O_3	2.6	3.1	2.8	4.2	4.3	6.4	0.2
SiO_2	18.5	21.2	18.7	28.2	27.8	34.2	0.5
P_2O_5	0.8	0.8	0.9	1.7	1.6	2.0	N.D
S	0.5	0.5	0.6	0.4	0.5	0.5	0.1
K_2O	1.4	1.6	1.4	2.6	2.3	3.6	0.1
CaO	5.6	6.6	6.1	14.0	14.1	16.5	0.1
TiO_2	0.6	0.5	0.6	0.2	0.3	0.1	0.1
V_2O_5	N.D	N.D	N.D	N.D	N.D	N.D	N.D
Cr_2O_6	N.D	N.D	N.D	N.D	0.1	N.D	N.D
MnO	3.9	4.3	4.2	1.3	1.4	1.3	3.3
FeO	59.3	61.9	61.9	45.9	45.5	32.7	92.7
CoO	0.2	0.4	N.D	0.2	0.4	0.1	0.2
NiO	0.3	0.2	0.3	N.D	0.5	0.5	0.8
CuO	0.3	N.D	0.1	N.D	N.D	0.5	0.8
Total	95.0	101.0	98.2	100.6	101.3	99.5	98.4

Table 63mf SF 5309 - bulk and phase analysis

	B1	B2	B3	B4	B5	SIL	GLASS	FEOX
Na_2O	0.5	0.2	0.4	0.2	0.1	N.D	0.8	0.1
MgO	0.6	0.1	0.5	0.2	0/5	1.5	0.4	0.8
Al_2O_3	3.2	1.7	1.8	1.3	1.7	0.4	7.0	0.4
SiO_2	16.2	9.9	7.9	7.0	6.8	29.8	42.6	0.6
P_2O_5	0.4	0.2	0.2	0.1	N.D	0.9	1.1	N.D
S	0.5	0.3	0.2	0.3	0.1	0.2	0.7	N.D
K_2O	0.8	0.4	0.4	0.3	0.4	0.3	1.4	N.D
CaO	4.8	3.6	3.0	3.0	2.4	9.2	6.5	N.D
TiO_2	N.D	N.D	0.1	0.1	N.D	N.D	N.D	N.D
V_2O_5	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
Cr_2O_6	0.1	N.D	N.D	0.1	0.1	N.D	0.2	N.D
MnO	0.7	0.5	0.5	0.8	0.5	1.7	0.4	0.6
FeO	73.4	82.5	82.3	84.5	85.4	56.3	32.5	94.9
CoO	0.2	0.4	0.3	0.4	0.7	0.2	N.D	0.4
NiO	0.2	0.3	0.3	0.2	0.3	N.D	0.1	0.2
CuO	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
Total	101.6	100.1	97.9	98.5	99.0	100.5	93.7	98.0

Table 64mf SF 5982 - bulk and phase analysis

	B1	B2	B3		SIL	GLASS	FEOX
Na_2O	0.5	0.5	0.6	N.D	N.D	1.9	0.2
MgO	0.9	1.1	1.4		1.9	N.D	N.D
Al_2O_3	6.5	4.3	5.6		0.5	15.2	0.4
SiO_2	22.9	19.9	30.8		30.0	40.9	1.1
P_2O_5	1.1	0.2	0.4		0.1	1.9	N.D
S	0.4	0.2	N.D		N.D	0.4	N.D
K_2O	1.8	1.1	2.7		0.1	7.9	N.D
CaO	7.1	4.0	8.7		10.1	8.6	0.2
TiO_2	0.5	0.3	0.1		0.1	0.6	0.3
V_2O_5	N.D	N.D	N.D		N.D	N.D	N.D
Cr_2O_6	N.D	N.D	N.D		N.D	N.D	0.1
MnO	3.2	2.4	3.3		5.9	0.7	1.2
FeO	55.6	66.4	44.6		52.8	12.9	93.5
CoO	0.2	0.4	N.D		N.D	N.D	0.1
NiO	0.2	0.2	N.D		0.2	0.2	0.2
CuO	N.D	N.D	N.D		N.D	N.D	N.D
Total	100.9	101.0	98.2		101.7	91.2	97.3

Table 65mf SF 5245 - bulk and phase analysis

	B1	B2	B3	B4	B5	FEOX1	FEOX2	FEOX2
Na_2O	0.1	0.5.	N.D	0.1	0.2	0.2	0.2	0.1
MgO	0.3	0.6	0.6	0.6	0.4	0.4	0.3	0.5
Al_2O_3	1.1	1.7	3.3	2.8	2.7	0.2	0.4	0.4
SiO_2	1.9	2.7	11.3	8.7	6.4	0.4	0.2	0.3
P_2O_5	N.D	0.1	0.7	0.4	0.7	N.D	N.D	N.D
S	N.D	0.2	0.1	0.2	0.2	N.D	N.D	N.D
K_2O	N.D	N.D	N.D	0.5	0.1	N.D	N.D	N.D
CaO	0.4	0.5	2.5	4.4	2.6	N.D	0.1	0.1
TiO_2	0.2	N.D	0.5	0.1	0.2	N.D	N.D	N.D
V_2O_5	N.D	N.D	N.D	N.D	0.1	N.D	0.2	N.D
Cr_2O_6	0.1	0.1	N.D	N.D	0.1	N.D	0.1	N.D
MnO	1.2	0.4	1.3	1.8	0.6	1.5	0.8	1.0
FeO91.4	91.4	79.4	60.2	79.8	80.8	95.4	96.3	95.9
CoO	0.2	N.D	0.1	0.1	0.3	0.4	0.2	0.2
NiO	0.4	0.3	N.D	0.4	0.1	0.6	0.2	0.6
CuO	N.D	N.D	N.D	N.D	0.1	N.D	0.2	N.D
Total	97.3	86.5	80.7	99.9	95.5	99.1	99.0	99.1

Table 66mf SF 4106 - bulk and phase analysis

	B1	B2	B3	B4	B5	SIL	FEOX
Na_2O	0.1	0.3	0.3	0.1	N.D	N.D	0.5
MgO	0.6	0.7	0.3	0.8	0.4	0.4	0.3
Al_2O_3	2.3	2.3	1.8	2.0	1.4	0.4	0.6
SiO_2	15.8	13.2	9.4	10.1	7.8	29.0	0.6
P_2O_5	N.D	0.2	0.2	0.1	N.D	N.D	N.D
S	0.1	0.2	N.D	N.D	N.D	0.1	N.D
K_2O	0.1	0.2	0.1	0.1	0.1	N.D	N.D
CaO	0.7	0.9	0.9	0.8	0.8	1.0	N.D
TiO_2	N.D	N.D	N.D	0.1	N.D	N.D	N.D
V_2O_5	N.D	0.1	N.D	N.D	N.D	N.D	N.D
Cr_2O_6	N.D	N.D	N.D	0.2	0.1	0.1	N.D
MnO	1.6	1.9	1.4	1.6	1.5	2.5	1.0
FeO	73.6	78.6	82.6	80.8	85.7	63.7	96.1
CoO	0.8	0.7	1.0	0.8	0.9	0.5	1.2
NiO	0.2	0.4	0.2	N.D	0.3	0.3	0.4
CuO	N.D	N.D	N.D	0.1	N.D	0.1	0.2
Total	95.9	99.7	98.2	97.6	99.0	98.2	100.9

Table 67mf Summary of analyses of slag samples

Sample	Type	Volumetric: %FEOX	Mean Bulk Analysis $\%SiO_2$	%MnO	%Feo
H2197	Smith	70-80	10.0	1.6	80.8
H5100	Smith	70-80	8.0	1.7	83.0
H5100/1	?	20	19.5	4.1	61.0
H5309	Smith	85	9.6	0.6	81.6
H5928	Smelt	30	24.5	3.0	55.5
H5245	Smelt	80	6.2	1.1	78.3
H4106	Smelt	65	11.3	1.6	80.3

Table 68mf Detailed distribution of slag by phase

In Grammes

		Smith	Smelt	Ore	H/FL	FA/C
Phase 4						600
Phase 4/5						1
Phase 5/6	ramparts and levelling	20	55	30		
	burnt feature 1781 and 1954		100			630
	ditch fills				10	290
Phase 6					20	
Phase 7	broch tower floors features		5	150		150
	walls			100	25	30
	Workshop 1		5			80
	Workshop 2			160		10
Phase 7	NE B floors, rubble and furnace	535	545			80
	walls		95	20		
	SE B					
	NW B					10
Phase 7	S building walls		240			
	SW building earth floor and ash				130	46
	rubble					65
	E building and yard stone features and rubble		35	2901		
	clay and floor		40	185		240
	central entrance way rubble					50
	ditches		30			20

Table 68 contd

In Grammes

		Smith	Smelt	Ore	H/FL	FA/C
	X Trench					225
Phase 7 later	S buildings rubble		115	2180	50	209
	earth floor/clay floor		10	15		1
	hearth		120			16
	981 dump		150	1015	240	87
	SE buildings earth floor		15			1
	E buildings					
	SE yard 1403 clay		1630	50		30
	E yard walls	1160	110	165	100	210
	rubble and path	2746	4290	375	2825	190
	floor	100	230			
	NE building rubbles	32,170	8255	840	13,430	2600
	furnace and dump		3025		13,500	10,600
	hearths		8665			
	ash and floor		5220	405	320	
Phase 7/8	SE		10			
	W earth floor		80			
	Tower floor 3		80			
	floor 4			140		625
	tower	50				

Table 68 contd

In Grammes

		Smith	Smelt	Ore	H/FL	FA/C
Phase 8 early						
NE B and yard	hearth	25				
	dump					5
	rubble and walls	2100	955	1085		845
	surface flags - floor	4635	2310	120	435	260
	rubble	70				
SE E Workshop	earth floor		30			
S Workshop	rubble walls surface		665	360		715
	hearth		225			1
	earth floor/ash		2275			131
	dump		1580			
Broch Abandonment			50	12,550	126	
Phase 8 later						
Stage 5	walls		15			10
	ash and floors		50	30		1
Stage 6	flag ash and earth floor	245	165			44
	wall/rubble	1890	140			1016
	hearth		12			
Stage 7	earth floor and ash	150				4
	891-896 setting dump	24,795	6365		420	25
	rubble	65				
Stage 8	earth floor			25		3
	walls and rubble		142	10		8

Table 68 contd

In Grammes

		Smith	Smelt	Ore	H/FL	FA/C
Stage 9	earth floor					1
	rubble surface			30		10
Stage 10	earth floor		5		10	10
	rubble					
Stage 11						
Stage 12	earth floor/ paving	100	260			
	rubble		275			
Pict Abandonment		180	140		125	245

GLASS CATALOGUE **Illustrated in Glass section (8.8) in text.**

SF No	Context	Phase	Description
36	8	8	Fragment of transparent green bubbled glass vessel. Applied strip of pinched decoration in very similar glass metal to vessel wall. Possibly part of a bowl, possibly derived from the same vessel as SF 37. ML 37mm MW 25mm MT 0.5mm
37	8	8	Fragment of a transparent green bubbled glass vessel. Probably a rim fragment of a bowl. The edge is rouletted. ML 29mm MW 8mm MT 4mm
464	131	9	Transparent turquoise (copper-blue), slightly asymmetrical dumb-bell bead with streaks of opaque yellow glass passing across both ends. Around the area of the bead's waist are two separate streaks of opaque white glass. In the position of the waist is a short protrusion of glass which probably originates from pulling the glass around the bead at a mid-way point to produce the waist. ML 19.5mm MD of bead 9mm
2043	765	8	Opaque yellow annular bead with flat facets around both ends of the hole. ML 6mm MT 2mm MD of hole 2.5mm
2978	1098	8	Opaque yellow annular bead. Probably formed by winding opaque yellow filaments around a former. Superficial weathering makes it possible to discern a change in direction of one of the surface filaments. MD 9.5mm MT 3.5mm MD of hole 4mm
5077	1589	7	c30% of a translucent purple globular bead with an applied circumferential cable consisting of a helix of transparent purple and opaque white glass and an applied circumferential cable of opaque yellow and opaque white glass. Est MD 25mm MT 11.5mm MD of hole 6mm
5142	1545	7	half of a flattened annular nearly colourless bubbled transparent glass bead with several dark inclusions. Circumferential streaks of opaque white glass pass across both flat faces. Opaque yellow glass is applied in one area. Opaque red accretion lines the remnant of the hole. MD 24mm MT 5mm MD of hole 7mm

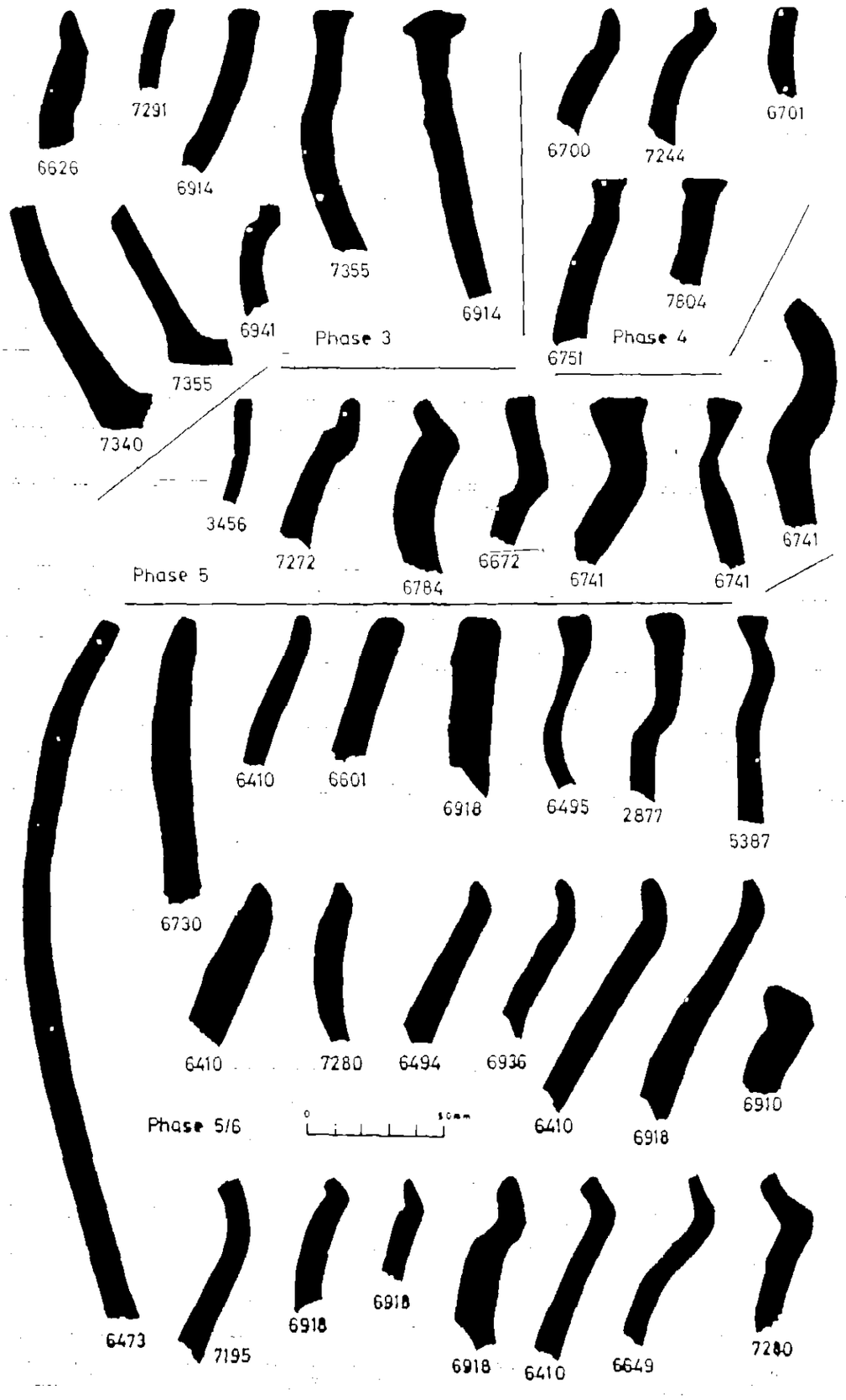
Table 69mf QUANTITIVE ELECTRON PROBE ANALYSES OF GLASS
(weight percent)

	BEAD 36	37	5077	5077	5077	5142	5142	2043	2978	464
COLOUR	tpg	tpg	tlp	opw	opy	tpc	opy	opy	opy	tlt
Na_2O	20.1	19.9	17.1	14.8	11.48	15.77	15.08	12.9	10.86	16.89
MgO	0.9	0.8	0.65	0.36	0.4	0.86	0.87	0.48	0.38	0.59
Al_2O_3	2.45	3.1	2.36	2.48	1.9	2.6	2.55	2.7	3.49	2.4
SiO_2	67.1	67.2	64.57	65.67	51.65	68.3	68.26	61.55	58.9	66.3
P_2O_5	0.07	0.07	0.07	0.1	0.06	0.15	0.2		0.05	0.1
S	0.24	0.2	0.3	0.6	0.3	0.24	0.2	0.5	0.78	0.36
K_2O	0.59	0.6	0.77	0.75	0.66	0.93	0.87	0.66	0.66	0.7
CaO	6.2	5.69	9.2	7.3	5.96	8.94	8.93	4.5	4.07	8.85
Sb_2O_3/Sb_2O_5				6.2	0.59			1.0	1.3	
SnO_2				mdl	0.17			0.1	0.1	0.4
TiO_2	0.1	0.1				0.07		0.07	mdl	
MnO	1.20	1.08	1.59	0.8	0.1	0.95	0.9	0.08	0.2	1.1
Fe_2O_3	0.79	0.8	0.26	0.3	1.16	0.97	0.87	0.55	1.37	0.39
NiO_2								0.07		
CuO										2.4
PbO				0.14	24.77	0.16	1.03	14.2	17.72	0.3

Abbreviations

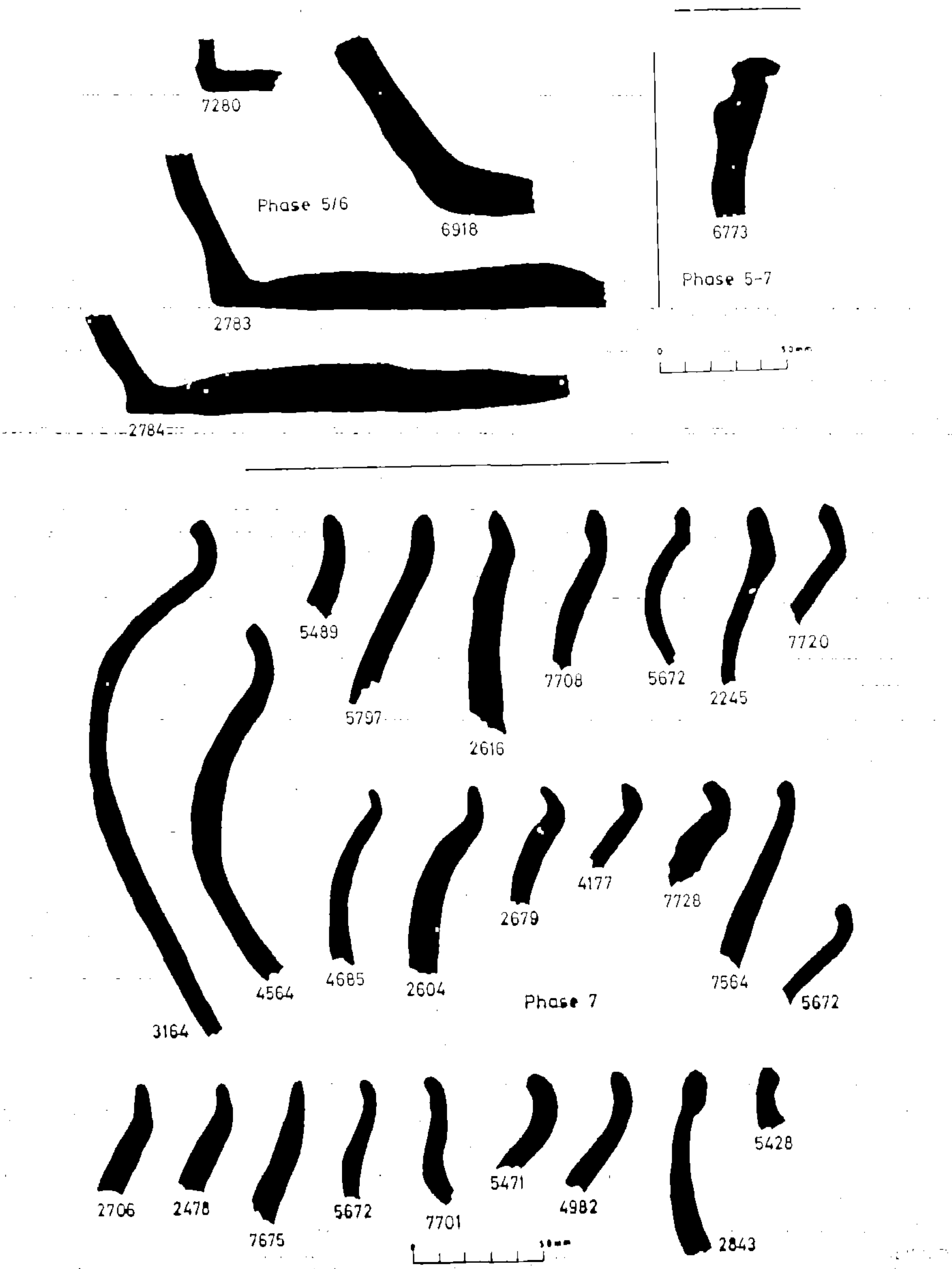
tpg - transparent green
tlp - translucent purple
opw - opaque white
opy - opaque yellow
tpc - transparent colourless
tlt - translucent torquoise
mdl - minimum detectable level

(for conditions of analysis see Henderson 1987)



illus 140a

3:F8



illus 140b

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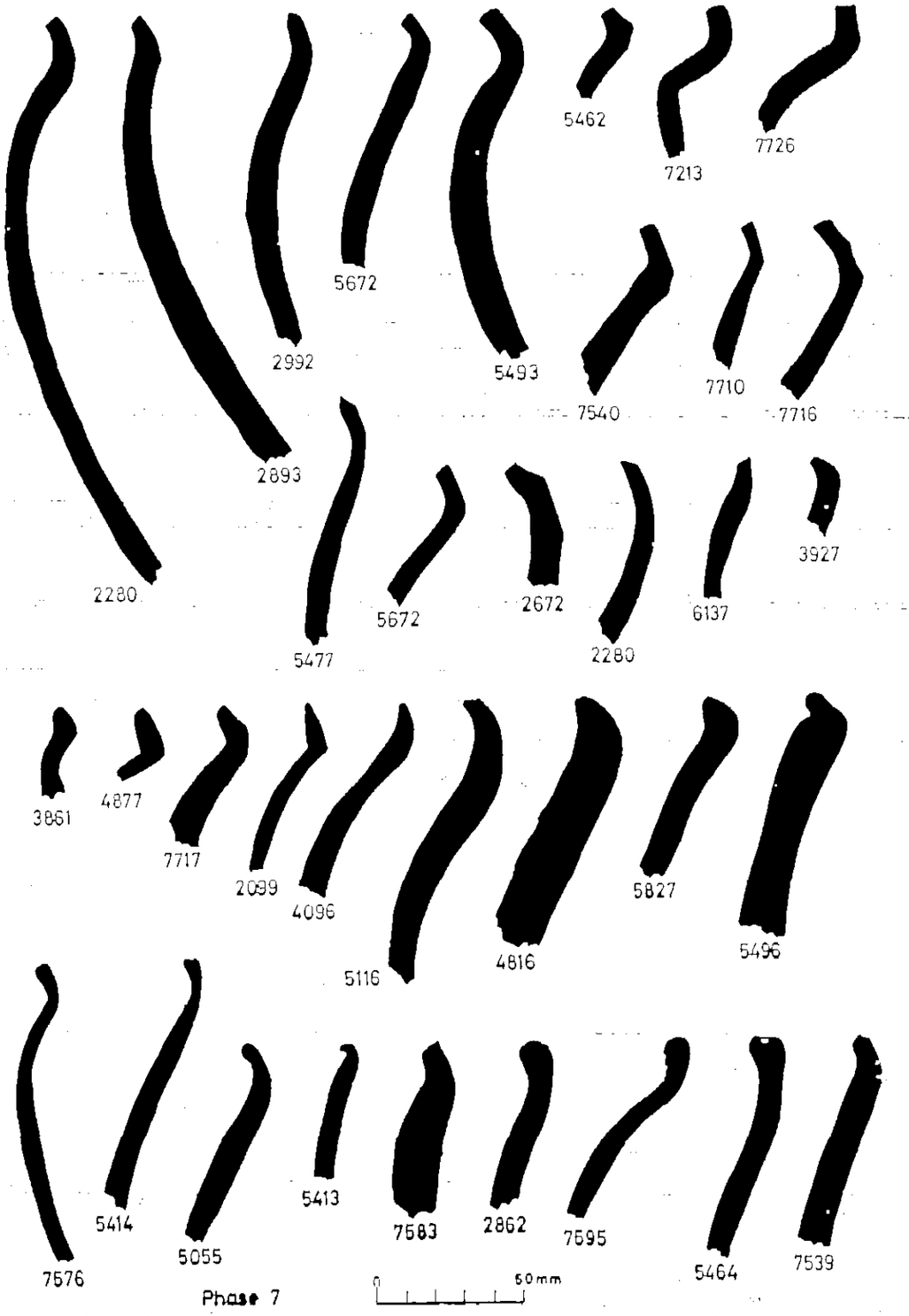
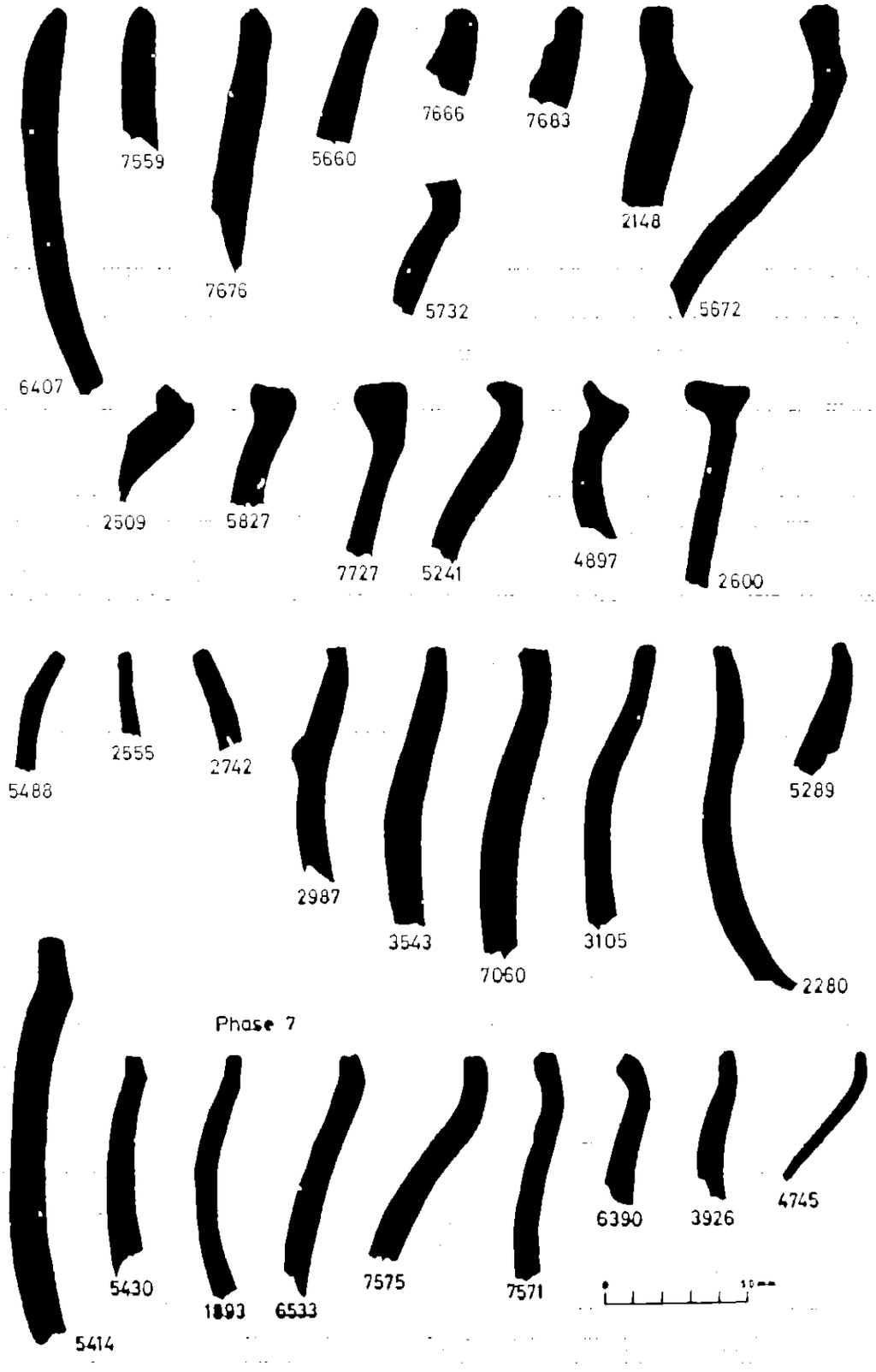


illus 140c

3:F10



illus 140d

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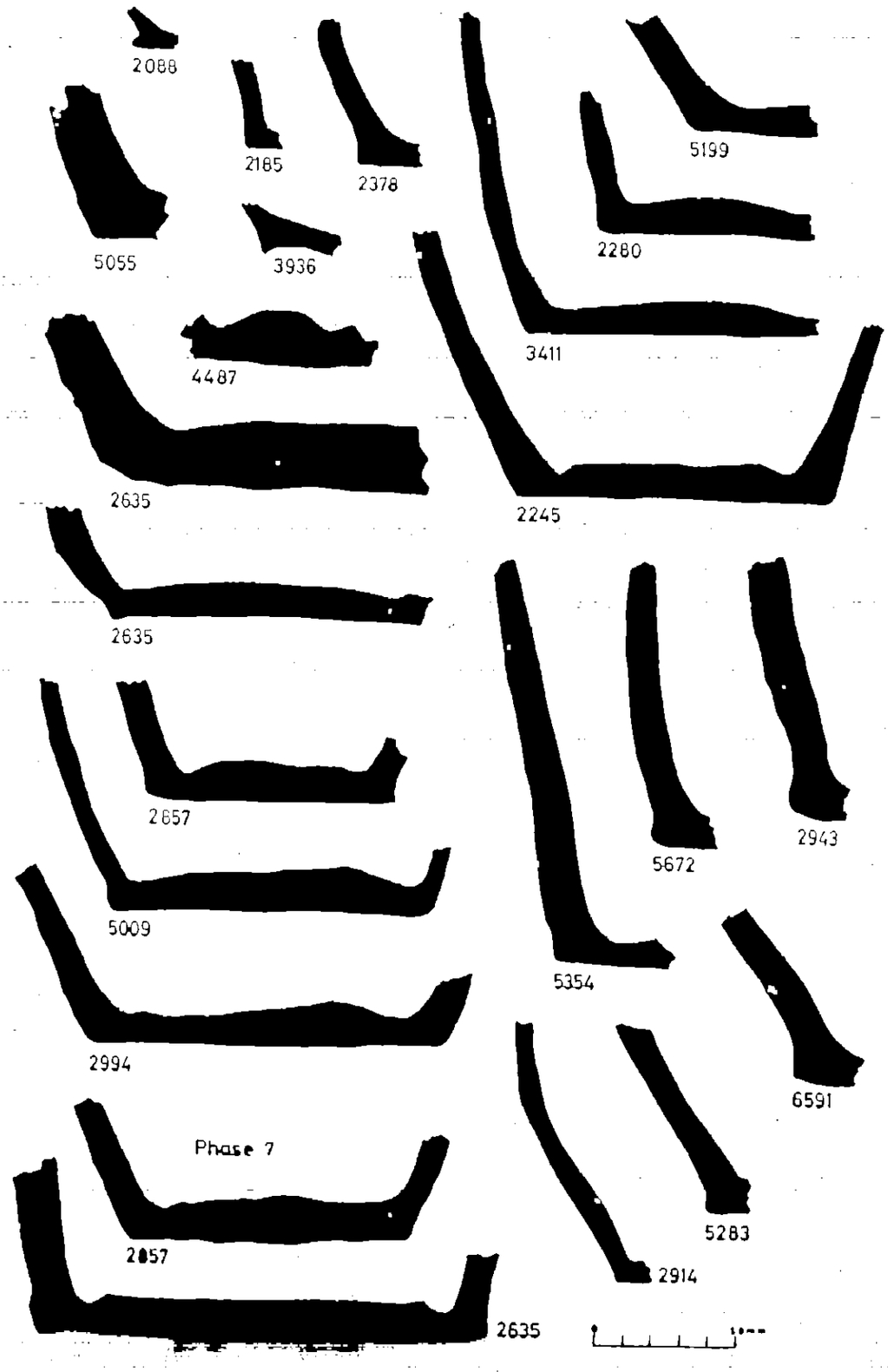

illus 140e

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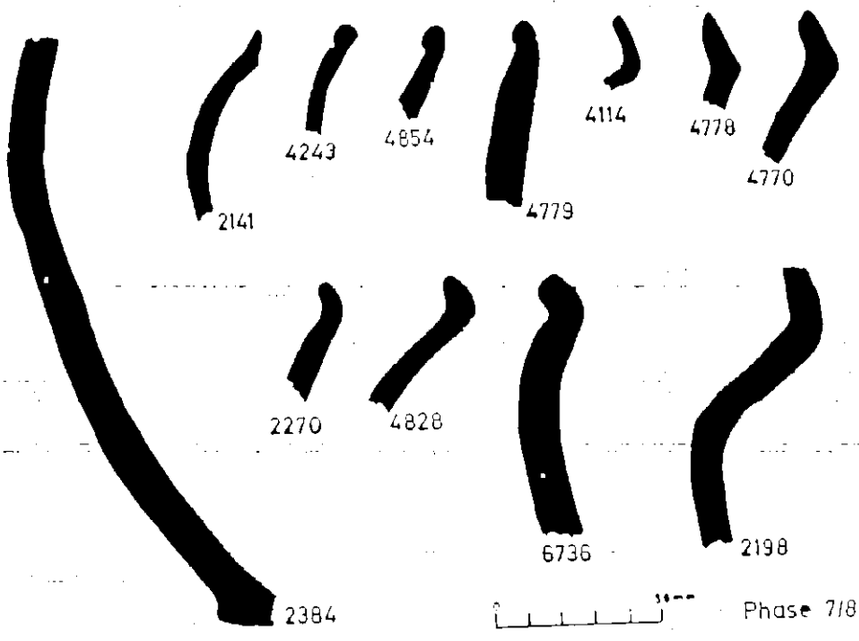
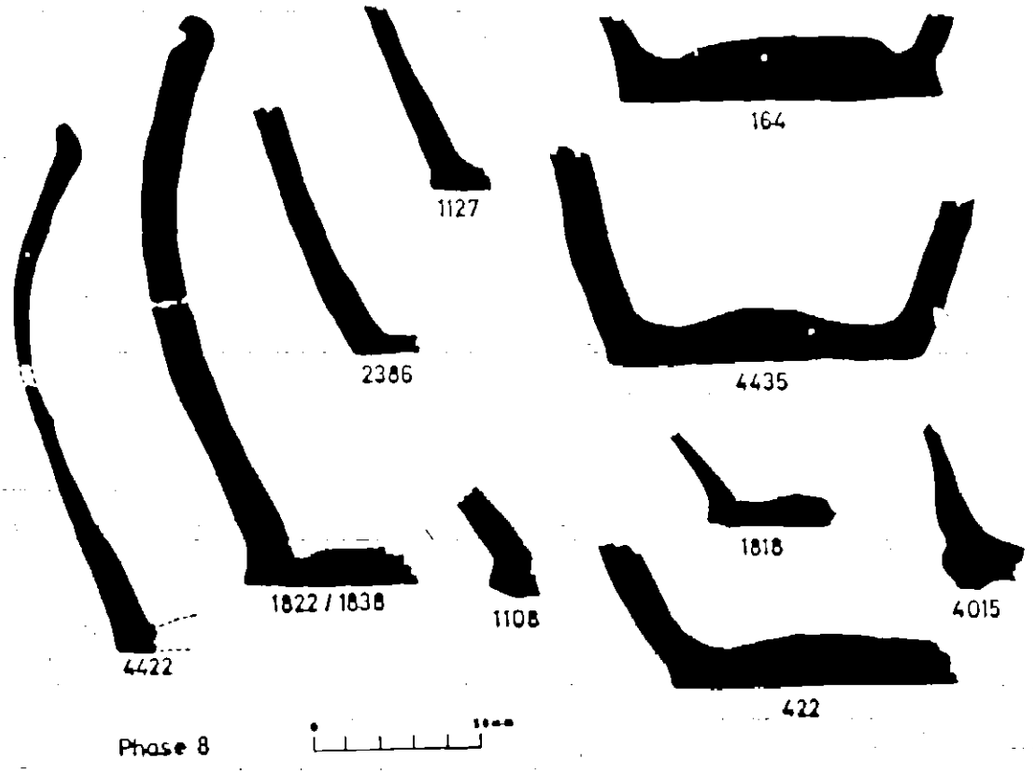
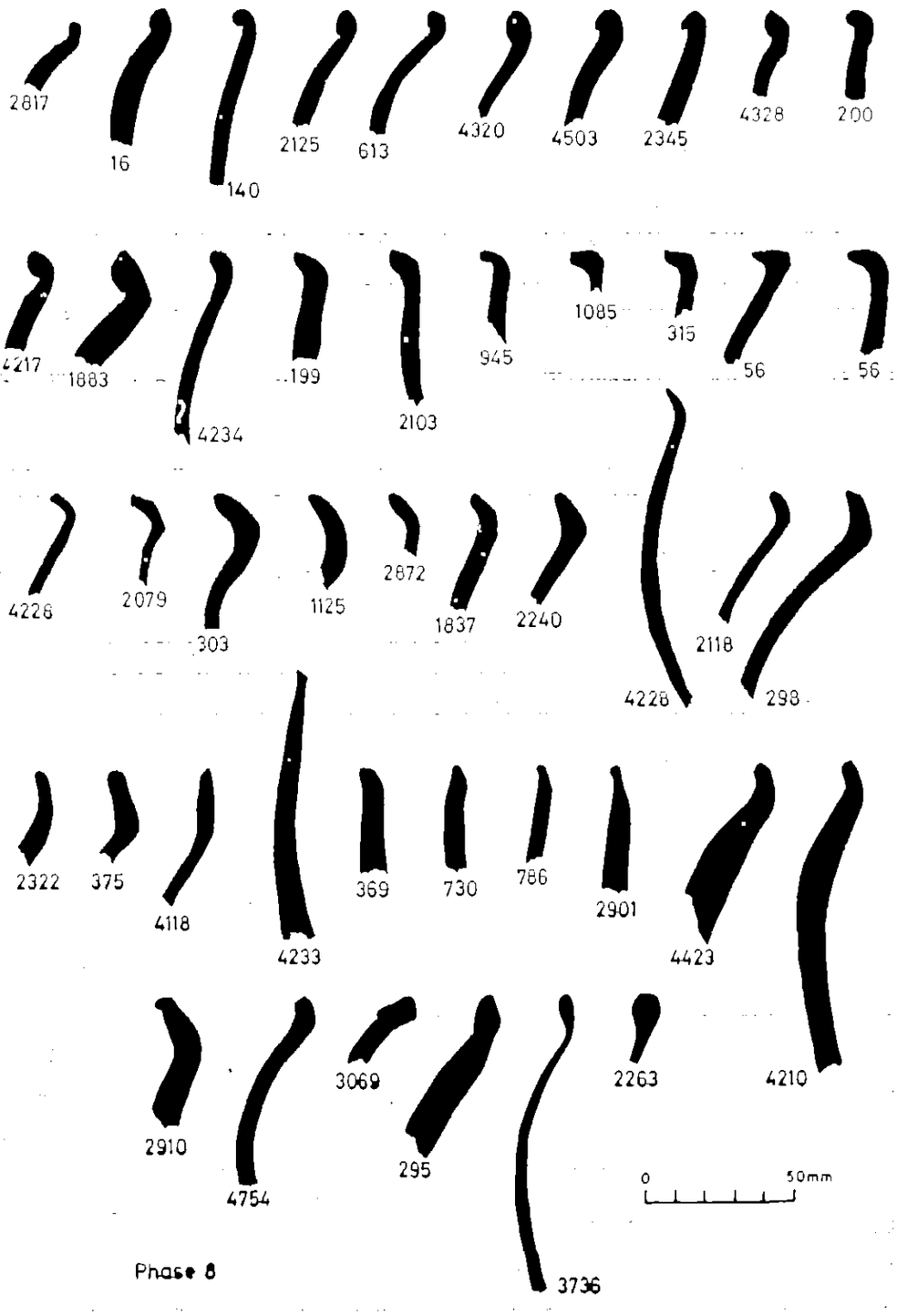




illus 140f

3:F13



illus 140a

3:F14

Table 71mf SIZE RANGE OF MINERAL FILLER
(as a percentage of total sherds and by phase)

PHASE	SIZE < than 1mm	S 1-3mm	M 4-7mm	L 8-10mm	S-M 1-7mm	S-L 1-10mm	M-L* 7-10mm	Total No Sherds
1/2		0.01						2
2		0.01			0.03		0.01-	9
2/3		0.03				0.11		24
3		0.13	0.16	0.17	0.15	0.5	0.57	300
3/4		0.07						13
4		0.33	0.33	0.22	0.08	0.22		207
5		0.10	0.16	0.02		0.02	0.16	81
5/6		3.15	2.18		1.99	1.22	0.19	1527
5/7		0.04			0.20			43
6			0.32				0.12	27
6/9					0.38			67
7		11.0	3.0	0.11	37.34	18.09	2.56	12612
7/8		0.95	1.38			0.06		419
8	0.59	8.24	0.63		1.20	0.01		1867
8/9					0.05			10
9								265
TOTAL								17473

*
S - small
M - medium
L - large

Table 72mf Rim Shapes (As a percentage of each phase and of the total sherds).

Phase	Rim Shape everted *A	everted B	straight A	straight B	inverted A	inverted B	lipped	beaded	Tshaped	X*	Total	% Total of all rims
2, 2/3	<1.0 [25.0]		<1.0 [25.0]	1.0 [25.0]						<1.0 [25.0]	4	<1.0
3	1.2 [40.9]	1.5 [22.7]	>1.0 [4.5]	6.5 [26.3]			1.6 [4.5]		>1.0 [1.0]		22	1.29
3/4, 4	<1.0 [23.0]		1.1 [15.4]	6.5 [46.1]	1.9 [7.7]					<1.0 [7.7]	13	<1.0
5	<1.0 [53.8]	<1.0 [15.4]		3.2 [23.0]		3.3 [7.7]					13	<1.0
5/6	7.9 [45.4]	8.3 [21.5]	10.1 [13.8]	6.5 [4.6]	7.5 [3.0]	16.7 [3.8]	3.7 [1.5]	3.0 [1.5]		4.8 [4.6]	130	7.6
6	<1.0 [50.0]		<1.0 [50.0]								2	<1.0
7	63.0 [41.7]	81.4 [24.4]	76.4 [12.0]	65.6 [5.4]	60.3 [2.8]	66.7 [1.7]	61.9 [3.4]	24.6 [1.4]	98 [1.4]	49.2 [5.5]	1128	66.0
7/8	5.2 [54.2]	1.5 [6.9]	2.8 [6.9]	4.3 [5.5]	9.4 [6.9]	3.3 [1.4]	7.9 [6.9]	7.7 [6.9]		2.4 [4.2]	72	4.2
8	18.3 [48.4]	6.8 [8.1]	6.2 [3.9]	6.5 [2.9]	20.7 [3.9]	10.0 [1.1]	22.2 [4.9]	64.6 [14.3]		28.6 [12.7]	283	16.6
6/9,9	2.7 [47.6]		1.7 [7.1]				3.2 [4.8]			13.5 [40.5]	42	2.4
% total of all rim types	[43.7]	[19.8]	[10.4]	[5.4]	[3.1]	[1.76]	[3.7]	[3.8]	[0.9]	[7.4]	1709	100.0

*

A - rounded
B - flattened
X - unclassified or broken

Howe Excavation 1978-1982

Other Fired Clay, Unfired Clay and Mortar

SF	Context	Phase	Description
130	126	9	Fragment of clay pipe bowl, undecorated. ML 18 mm MW 14 mm MT 3.5 mm
294	342	9	Irregular biconical bed with central perforation. Slightly flattened at apexes. Pottery slipped and well polished. Hole punched through after firing. ML 22 mm MH 14 mm MD of hole 2.5 mm (illus 107)
2155	826	7/8	Pottery sherd with slag adhesions. ML 36 mm MW 34 mm MT 13.5 mm
2244	811	8	Burnt or fired clay, a rough and irregular piece. Stones within matrix but no noticeable organic content. Munsell Colour 2.5 yr 6/8 light red.
2429	892	8	Burnt or fired clay. Rough and irregular piece. Stones within matrix. Munsell colour 2.5 yr 6/8 light red.
2988	981	7	White compound, possibly mortar. A mixture of broken shell, some larger fragments, a small quantity of cominuted charcoal and some yellow clay. Not analysed.
3523	1103	7	Burnt clay floor or luting. Small natural stones included. Munsell colour 10 yr 6/4 light yellowish brown.
4395	1259	8	Thumb-pressed little pot of yellow baked clay. Fire cracks around body. Roughly circular with a deep central depression which is smooth at the bottom. Base of artefact is rounded and shows signs of heat. Possibly a small crucible. MD 30 mm MH 17 mm MD of hole 24 mm MD of hole c15-18 mm.

SF	Context	Phase	Description
6546	1582	7	A mixture of dried clay and mud. Has been stabbed with cockleshell and/or a comb to produce random indentations, like a child's attempt at modelling. Two rounded pieces. Munsell colour 10 yr 5/2 greyish brown.
6713	1964	5/6	Two pieces of burnt clay and 2 pieces of badly eroded vessel, possibly fragments of a crucible. Surface of sherds is missing, but mica and quarts are present. Munsell colour 2.5 yr 6/8 light red to 7.5 yr 8/6 reddish yellow. One piece is a curved rim fragment, ML 30 mm MW 30.5 mm MT 6 mm. The other piece is probably part of the body of the vessel. There are no metal deposits on the pieces.
6949	415	9	Stem fragment of a clay pipe. End is unglazed. The stem is elliptical in section. MD 9 mm ML 43.5 mm
7208	1865	7	Semi-circular clay object. The slightly concave interior has a smooth shallow linear depression running the length of the object, blackened at one end. Outer surface is smoothed around the raised lip and rough beyond, and fired grey. Munsell colour 7.5 yr N6 grey, 5 yr 7/8 reddish yellow. 7.5 yr 7/4 pink - 6/4 light brown. (illus 154) ML 46.6 mm MW 41.5 mm
7875	1689	7	Well fired fragment of crucible, probably pear-shaped, shallow and wide. Impregnated with slaggy deposits. A grey clay with no visible temper, fired white/blue and cracked, especially on the interior. Two pieces. (illus 154) ML 44 mm MW 43 mm
7876	1865	7	Wedge shaped piece of burnt clay. Has small stone in matrix and parallel grass impressions on the triangular flat surface. Munsell colour 2.5 yr 5/8 red - 5 yr 6/6 reddish yellow.

Howe, Cairston, Stromness 1888 - 1889

Acc No	Description
GA 294	Grey-yellow micaceous sandstone whorl. Both faces flattened and sides smoothed and curved. Central hole, eliptical on one surface. MD 28.5 mm MT 14 mm MD of hole 8-10 mm
GA 295	Yellow micaceous and banded sandstone whorl. Surface only roughly smoothed. Central hole worn irregularly on one surface and slightly splayed on other. MD 35.5 mm MT 17.5 mm MD of hole 11-12 mm
GA 296	Yellow micaceous sandstone, irregular roundel. Sides cut and smoothed in irregular sections. Sides not vertical. Roughly flat top and bottom surfaces. MD 28 mm MH 15.5 mm
GA 297	Conical and hollow fragment. Sandy fabric with mica inclusion (no grits seen). Part of a tubular handle of earthenware porri. Two raised bands at narrow end, with a third band forming the narrow end, with an irregular splayed hollow. Orange slip with remnants of red-purple glaze. ML 55 mm MT of pottery 8 mm MD 28 mm
GA 298	Rounded and everted rim fragment. Gritty and slipped. MT 7.5 mm
GA 299	Curved length of antler. One end sawn off and smoothed. Other end slightly faceted. Surface generally smooth, some cut marks present. Pierced centrally through width. Underside of artifact the hole is round, and the top side of the implement has a square hole. Antler handle. ML 100 mm MT 17 mm MW 31 mm Square hole 7 x 8 mm Circular hole 6 mm in diameter.
GA 300	Elongated pebble of grey sandstone, oval in section. Smooth all over. May have some slight pecking at narrow end. Classified as unworked. ML 92 mm MD 18-20 mm
GA 301	Boar's tusk, broken at base. Upper end broken and sharpened. ML 84 mm

Acc No	Description
GA302	Antler tine, end sharpened to a point. Well polished. Other end has cut marks and is slightly hollowed; one face has a rounded notch cut into it. This end may have been slotted into something else, the inside is slightly smoothed. ML 110Wmm MW 19 mm MW of hole 10 mm ML of slot 9 mm MW of slot 5-8 mm
GA 303	Piece of coral, presumably would have been circular. Has a banded and vesicular structure. Lower surface concave. Sides roughly smoothed. Upper surface convex. Hollows filled with white and red deposits and rootlets. Probably found close to the topsoil. Originally described as a portion of a vessel of steatite. ML 77 mm MW 55 mm MT 27 mm
Stromness Museum	
4119	Blown bottle-green glass, but has a very dark appearance. The linen smoother is bun-shaped with rounded sides and a rounded top that has been slightly flattened with wear. The lower surface is well chipped and slightly hollow where the glass has been finished off. Partly chipped around edges. No other wear or pattern marks. MD 73 mm MT 31 mm

9.1 ANALYSIS OF HUMAN BONE

PHASE 3

The only human bone found in this phase of the site was a 1st cervical vertebra or atlas with the right transverse process (projecting part) missing. It was distinguished by marked waisting of the superior articular facets, that on the right side being almost divided in two.

PHASE 5

SF 5451 : The condition of the bones from this phase, was poor. They were very thin with poor muscle markings and appeared to belong to two adult skeletons of different ages and possibly of different sex, although they were found and excavated as one skeleton.

The smallness of all available articular surfaces (including the acetabula) of the pelvic girdle, indicated the female sex, but there was sufficient of the left os innominatum to show a deep sacro-sciatic notch of male shape with no pre-auricular sulcus (or groove). The tuberosities of the ischia were ununited (which occurs between the ages of 17 and 25), and the head of the femur had only just united with the diaphysis or shaft. The line of union was still very apparent. The age of the skeleton at death must therefore have been less than 19 and could have been as young as 16 (Stewart 1979). It is possible, that these bones belonged to a young adult male in his teens.

The left femoral head was very abraded, but union of the epiphysis and the diaphysis was complete, and the tuberosities were united with the shaft as were the epiphyses at the lower end of the humerus. The small size of these articular surfaces indicated female bones of c20+ years of age.

There was considerable flattening of the shafts of both femora. Acetabular creases were present on both sides and a small bony exostosis was noted on the middle of the posterior surface of the neck of the left femur. Both femora showed a roughness on the front of the neck, although that on the right side was very worn (Poirier's facet). Poirier (1892) and others originally thought this to be due to the extension of the cartilaginous surface of the head, as the result of exceptional use. Later authorities (Pearson and Bell 1919) considered it far too common a trait to have any significance, but Angel (1971) suggested that it and platymerial may be an adaptation to walking and running in rough country.

PHASE 5/6

These bones are few but could come from a minimum number of two adults, since they include one mandible (in two parts), which is complete save for the coracoid process, and two fragments and a lower first molar from a second lower jaw.

SF 5557 : This sample consisted of a tubercle and part shaft of a 2nd right rib, and a 3rd metacarpal from the right hand.

SF 5737 : This consisted of fragments of sk 11 which comprised a portion of occiput with the internal occipital protuberance and left lambdoid suture, and a portion with the right lambdoid suture and the left posterior portion of the parietal bone with lambda and one small fragment of tabular bone. There was an ossicle in the left lambda, but there was no sign of closure in the sutures.

Suture closure is an unreliable indicator of age but these bones might possibly come from a young adult. A navicular from the left wrist was associated with the skull fragments.

SF 5908 : Mandible 2 consisted of two fragments, which are associated with a lower 1st left molar, the odontoid peg and the superior articular surfaces of the 2nd cervical vertebra (axis) and the lower end of the diaphisis (shaft) of the left radius. Tooth-wear analysis indicated the age at death to be c17 - 25, but the fact that the ephyphsis was ununited at the end of the radius indicates an age of between 17 and 20.

SF 6463 : This was the upper 1/3rd of the shaft of a right femur which from its heavy gluteus maximus muscle markings, may possibly be considered male. There was also some flattening of the femur.

SF 6472 & 7104 : Mandible 1 was robust with a well developed angle of the jaw and a broad ascending ramus. It was probably male. Using Brothwell's (1981) assessment of age from tooth-wear, the age of death would appear to have been between 25 - 35 years. The lower left 3rd molar is however, unerupted and an age nearer 25 would appear more likely. The in situ teeth appear healthy and there is no marked alveolar resorption. Most of the teeth have been lost post mortem (which may occur more readily where alveolar infection has been present). The loose lower canine shows pulp exposure.

PHASE 6

SF 5926 : One external cuneiform from the right foot.

Phase 6-9

SF 3339 : This consisted of heads and a small part of the shafts of metacarpals 1, 3 and 4 from the left hand. They probably belonged to a young adult of about 18 - 20 years of age at the time of death, as the heads were united to the shafts, but the lines of fusion were still apparent.

Early Phase 7

SF 3355 : Two fragments of a shaft of left fibula.

SF 3362 : Two portions of a left humerus and fragments of a second right rib.

SF 3377 : These bones consisted of fragments of long bones and the talus of the left ankle. The bones were gracile, especially the ulna and could well be those of a female (Dwight 1894). The head and tuberiosities of the humerus were united to the shaft (which occurs between 18 and 30 years of age) (Brothwell 1981), and so they belonged to an adult.

SF 3390 : These bones included a 1st phalange and a small 7th cervical vertebra with the spinous process fused, which belonged to an adult of more than 25 years of age.

SF 3683 : These bones consisted of the shaft of a right ulna, the upper end and shaft of the 3rd right metacarpal and the calcaneum from the right heel with only the anterior surface present.

SF 3773 : The head, neck and upper shaft of a juvenile left femur (diaphisis only).

SF 4546 - adult skeleton (illus 156) : The bones of this skeleton were in a very fragmented condition, but on analysis, appeared to be fairly complete in number with the exception of the whole right lower limb, the left foot and both hands, even though some phalanges (finger or toe bones) were found. The skeleton was found lying on its left side with the arms and legs extended forward. Reconstruction of the shattered skull, showed that considerable distortion had taken place so that any cranial measurements must be considered suspect. Similarly, it was also found impossible to reconstruct the long bones sufficiently for measurements of length to be undertaken, so that stature could not be estimated.

Sex
The skeleton possessed both male and female characteristics but the reconstruction of the pelvis was not sufficient to enable the sciatic notch index to be calculated. However, its shape seemed indicative of a male, and the crest of the pubis was relatively massive. In the skull, the supra-orbital ridges were rounded and pronounced, the brow sloped back and the root of the left zygomatic process extended beyond the external auditory meatus or opening (the right side was broken). The mastoid process and nuchal crest were moderate. Discriminant function analysis of the jaw, placed it with an 85% probability, in the male category (Giles 1964).

The proportions of the manubrium to the gladiolus of the sternum were definitely male and are the chief factor in shaping the thorax, making it deeper and larger (Dwight 1894). The sternum is not a particularly significant indicator of sex, but in this instance, was worthy of note in view of the small size of the shoulder girdle. The left clavicle was only 126mm in length (<138mm is female, according to Genoves 1969), and the length of the left glenoid fossa of the scapula was only 38mm. Dwight considered the average male socket of the modern scapula to be 39.2mm and that of the average female 33.6mm. The accromion process was rather narrow, the left coracoid process had no noticeable knob on the end, and the process for the attachment of the teres major muscle at the lower angle was narrow. All of these are female characteristics.

Since the two principal sex indicators, the pelvis and the skull show male characteristics, the skeleton was probably that of a man with underdeveloped shoulders.

Age
Brothwell's (1981) classification of age from tooth-wear analysis, places the skeleton between 35 and 45 years. This is reinforced by the presence of a completely united hyoid bone from the base of the tongue, which is a sign of advanced age (probably between 45 and 50). The symphysial surface of the left os pubis was slightly eroded but indicated an age in excess of 30.

Non-metrical variations
The absence of the 3rd left molar, a possible lambdoid ossicle (bone-like plate), the presence of a 3rd trochanter for muscle attachment, plus hypotrochanteric fossae (geometric depressions) on both femora, partially divided superior facets on the first cervical vertebra (atlas) and a shallow vastus notch on the left patella were all noted. A platymeric index of 73.6 indicated considerable flattening of the femur.

The left clavicle was markedly flattened anterio-posteriorly at the sternal end of the shaft with an oval depression with a raised edge (49.4mm long x 15.5mm deep), where the attachments of the pectoralis major and the

sterno-cleidomastoid muscles occurred. It is possible that this might have been the result of specialized activity.

Pathological conditions
Osteophytes (bony outgrowths) were present on the 5th and 6th cervical vertebrae, the 9th and 11th thoracic vertebrae and on all the lumbar vertebrae (although confined to the transverse process on the 4th).

The maxillae were in a poor state of preservation, especially the alveolar margins, with only the 1st upper right molar in situ. Abscesses appeared at the roots of
7 6 2 1 | 4 5 7, and the associated loose teeth which were lost post mortem, all had pulp exposure. It is thought that earlier populations had a tendency to abscesses due to the exposure of the pulp (Brabant 1967). The upper 2nd molar on the right side was rotated and all the upper teeth appeared to be worn down to the gum line. There did not appear to be any formation of secondary dentine.

In the mandible, the was macroscopic porosity and loss of alveolar bone with a little subgingival calculus in the region of |4 5 6 7 8 and a little in 5 6|. No hypoplasia or lines or arrested enamel growth was noted, but mesial caries was found in 8 1 | 1. Brothwell (1962) gives a mean of 1:3 cases of caries in each individual in prehistoric times.

It should be noted that while congenital absence of |8 was confirmed by X-ray, the area of 8| was missing. Since neither |7 nor 7| exhibited wear on the distal portions, it seems likely that there was a congenital absence of 8| also. The 3rd molar is the commonest missing tooth (Salzmann 1957) and its absence became fairly common from Neolithic times onwards. Heredity is the most important determinant of hypodontia (Brothwell, Carbonell & Goose 1963), and is primarily determined by genetic factors with a fairly marked degree of penetrance (Grahnen 1956).

SF 4546/3773 - foetal skeleton : These bones lay close to the previous skeleton, and were those of a foetus, possibly female and about full term. The squamous and tympanic portions of the temporal bone, which normally unite shortly before birth, were still separate, and although there is damage to the upper part of the tympanic ring, close examination of the squamous portion failed to reveal indications that fusion had actually taken place. Using the formulae and tables devised by Fazekas and Kosa (1978) the foetus had a body length of 47.32cm and weight of 2500grammes. This according to their calculations makes the foetus c9 and a half lunar months.

Sex
Washburn (1948) states that the basic adaptation of the sciatic notch to bipedal locomotion, together with that of the lower ilium, had for obstetric reasons, to be accomplished differently in the two sexes. Sex differentiation is the direct result of prenatal testosterone concentrations in foetal males (Weaver 1980), so that sexual characteristics which in the rest of the skeleton develop after puberty, are present in the pelvis before birth. Boucher (1955) found significant sexual differences in some populations but not in others. Fazekas and Kosa however, found significant sex differences between the length and depth indices of male and female sciatic notches and, in a modern mid-European population, considered it possible to establish the sex in c44.2 - 59% of cases. Applying their calculations to this foetal skeleton, a sciatic incisure index of 25.5 was obtained, giving the probability that the foetus

might be female. Weaver considered the auricular surface elevation a satisfactory non-metrical indicator, as it almost certainly contributes to the increased pelvic width of infant females noted by Reynolds (1945). In this case the auricular surface was elevated along both the anterior and posterior edges and could be considered female.

SF 4736 & 4738 - infant skeleton (illus 157) : These finds were of infant bones found within the same yard as the previous two skeletons. They had been disturbed, probably by rodents as the left femur showed signs of having been gnawed. The bones appeared to belong to one infant skeleton, probably about full term, and have been treated as such. The width of the basilar portion of the occiput exceeds the length so that the foetus was more than 7 months and almost certainly viable (Fazekas and Kosa 1978). The two parts of the body of the sphenoid had united, which occurs during the 8th month of foetal life. The tympanic ring had also united with the petrus portion of the temporal bone, which occurs shortly before birth. A mean body length was obtained of 48cm, indicating a body weight of 2834.3grammes or 6.25pounds indicating an age of c10 lunar months. These results should however be treated with caution.

Sex
Using the sciatic notch index of 30.9, there is a probability that the skeleton is male. It should also be noted that only a small section of the posterior edge of the auricular surface was elevated (Weaver 1980) thus supporting the male attribution.

Non-metrical variations
Incipient waisting of the left superior articular facet of the atlas was noted.

SF 5677/5958/3951/6462/5445 - Child's skeleton : These bones were all found in the NE yard and can be considered to belong to the same skeleton. SF 3773 and 3135 may belong to the same skeleton as far as their dimensions are concerned but could not be confirmed with existing bones.

Age
Only fragments of the heads of the humerus, femur and the epyphisis of the lower end of the femur were available from the long bones, so an indication of age was obtained from the 2nd cervical vertebra (axis) where the apex of the odontoid process was entirely united. This is thought to occur about the 12th year. It was noted that the area between the base of the process and the body of the vertebra was still not ossified but this condition may continue to an advanced age. Examination of the skull revealed that the turbinated process of the spenoid had not united with the bone, which normally occurs between the 9th and 12th years.

The alveolar portions of the mandible and fragments of the maxillae were available together with a number of teeth lost post mortem. The deciduous molars and upper canines were present, the canines and the 2nd premolars were unerupted, also the 2nd molars and the 1st premolars had erupted and the roots of the 1st molar were complete on the right side and almost so on the left. This gives a dental age of c10 years. Taking both assessments into consideration (Miles 1963) and the fact that dental age is slightly more reliable as an indicator in the young, this juvenile was probably between 10 and 11 years old at the time of death.

Sex
Sexing of immature bones is notoriously difficult. The sexual dimorphism exhibited by the ossification of the bones of the wrist (Hunt & Gleiser

1955) can not be used in this case, owing to the absence of the epyphises of the radii, ulnae and the carpal bones. It was noted however, that a pre-auricular sulcus (groove) was present and a sciatic notch index of 51.16 was obtained. The skeleton is tentatively considered female.

Pathology
The 1st right upper deciduous molar had distal caries and the deciduous molars showed very great wear.

Non-metrical variations
A supra-orbital foramen was present on the left side.

SF 5690 : 1st phalange of the 4th digit on the right hand.

SF 5726 : An upper right third molar 8 with some calculus present formed this sample. The wear indicated and age of 35 - 45.

SF 6492 : This sample consisted of fragments of the body of a lumbar vertebra, 3 rib fragments and fragments of a left fibula and tarsal bones.

SF 6615 : This was an upper left third molar 18. The mediostinal crown diameter was only 9mm, but broken. Using Brothwell's (1981) formula for wear, a very tentative age of 25 - 35 is proposed.

Later Phase 7
SF 3121 : This was the lower end with the articular surface of a left tibia. The external surface is however missing. A squatting facet was present, and since the lower epyphisis was joined to the shaft the bone must have belonged to an adult over 18 years of age.

SF 3135 : This find consisted of 12 fragments of the right and left parietal bones of the skull, which when united appeared to have the dimensions of a juvenile skeleton. The sutures where entirely open which may indicate an early age although this is an unreliable indicator.

SF 3359 : This was a right clavicle. The maximum length of 151.6mm indicated a male (Genoves 1969), as did the perimeter at the middle of the diaphysis (34mm), and the weight of 24.1grammes. The maximum width of 20.8mm is however, slender for a male. The inner end of the clavicle was fused, so the age at death was over 25.

The region of the pectoralis major muscle attachment was markedly flattened and there was an indication of an oval area with raised borders in place of the usual roughened areas separated by smooth shaft. A rhomboid pit was present where the clavicle pressed on the 1st rib: Parsons (1916) noted this feature in 10% of his specimens.

SF 3446 : Two fragments of the mid-shaft of the right femur with a well marked linea spera were found.

SF 3454 : This sample consisted of the shaft of a left clavicle and the 2nd metacarpal of the right hand. The clavicle also showed signs of flattening and an oval depression with raised edges replaced the normal roughened area of muscle attachment. The diameter of the approximate centre of the diaphysis was 37mm, indicating that the bone might have belonged to a male skeleton.

SF 3694 : These bones consisted of a 4th thoracic vertebra, a fragment of the 1st sacral segment, the acetabulum (part of the right side with

portions of the ilium and ischium) and fragments of the crest and the articular surface of the ilium. They appear to be adult.

SF 3711 : The shaft only of a left femur was found. The muscle attachments for the gluteous maximus were so raised that the possibility of a third trochanter is postulated. The platymeric index of 80.6 indicated a marked degree of flattening of the femur. The probability is that the sex of the bone is male.

SF 3887 : One fragment of parietal bone.

Phase 7/8
SF 3031 : A shaft of an adult right radius.

Phase 8
SF 1257 : A single phalanx.

SF 1920 : This sample consisted of a mid-thoracic vertebra and a fragment of left ilium.

Phase 8/9
SF 51 : Only two bones, the lower end of a right ulna and the 1st phalange of the 2nd digit were found in rubble.

Phase 9
Most of the bones from this phase were intermixed by a gale after excavation and they had also been disturbed by recent burials of animal bones and picnic debris. However, the majority appear to belong to one skeleton. Many of the bones showed signs of having been gnawed by rodents and some had cut marks, possibly made during disturbance, or through plough damage.

SF 68/126/3644 : The bones were very fragmented due to their soft condition in the soil and their recent disturbance. They were probably a burial (possibly of Viking date, see above), and using the diameter of the head of the femur of 49.3mm, it is tentatively suggested that the skeleton was male (Pearson & Bell 1917). Using Brothwell's (1981) assessment of tooth war on the three molars, an age of between 25 - 35 years at death is suggested. A non-metrical variation was noted in the 1st cervical vertebra (atlas) where the superior articular facets were divided in two.

SF 448 : From ploughed rubble came part of the upper half of a r'ght tibia. The bone appeared gracile and the muscle attachments light. The platicnemia index of 70.4 is within normal limits and the bone is probably female.

SF 650 : Two fragments of a right radius.

SF 1749 : A single phalanx.

PATHOLOGY

Other than osteophytes (an abnormal bony outgrowth) on the vertebrae of SF 4546, and a bony exostosis on the neck of the left femur of SF 5451, no bone disease was found. The teeth and jaws however, exhibited considerable dental pathology.

Non-Metrical variations
Lambdoid ossicles (Wormian bones) were noted in three skulls SF 3887, 4546

and 5737. Skeleton SF 4546 also had a hypotrochanteric fossa on the femur, a congenital absence of the right upper third molar and a shallow vastus notch on the patella. The juvenile skeleton SF 5677, while having a supra-orbital notch on the right side, had a closed notch or supra-orbital foramen on the left. Acetabular creases were noted on both sides of the pelvis in SF 5451.

Three of the 1st cervical or atlas vertebrae from SF 6624, 4546 and 68, all showed either division or marked waisting of the superior articular facets. Incipient waisting was also noted in the atlas of the new-born infant SF 4736/4738, but it was not present in the juvenile skeleton.

The lower end of the tibia SF 3121, exhibited a squatting facet, and clavicles SF 4546, 3359 and 3454 were markedly flattened antero-posteriorly at the sternal end of the shaft. Here an oval depression with a raised edge replaced the normal roughened attachments for the pectoralis major and sterno-cleidomastoid muscles. These areas are usually separated by a smooth convex shaft. This moulding of the bone might possibly be due to the carrying of some form of back-pack from an early age (Dr Olaf Cuthbert pers comm).

Flattening of the femora was a very noticeable trait in the skeletons from the site, and only one adult femur did not show evidence of platymeria (the bone's response to muscular stress).

The main source of reference is Gray's Anatomy, seventeenth edition.