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EILEAN AN TIGHE: A POTTERY WORKSHOP OF THE SECOND MILLENNIUM B.C. BY SIR W. LINDSAY SCOTT, K.B.E., D.S.C., M.A., F.S.A., F.S.A.Scot.*

Read February 14, 1949.

Eilean an Tighe (pronounced *Ellen an Tiy-ah*) is an islet in Loch nan Geireann, an extensive and irregular sheet of water, broken by skerries, rocks and islands, which drains through a short channel into the Sound of Harris (fig. 1). The islet consists of a rock spine, and is some 150 feet long and 40 feet broad. At its western end it rises into a rocky boss 7 feet high and, in a hollow in this facing S.S.W., is the workshop here described (fig. 2).¹

The site was discovered by the late Dr Erskine Beveridge in the course of those intensive explorations of North Uist which are recorded in his valuable archæological and topographical record of that island. He noticed the remains of structures, from which Eilean an Tighe derives its name of *House Island*, and picked up on the shore a number of sherds of Western Neolithic pottery, a small polished axe, a broken polished adze and hammerstones, lumps of pumice and flint scrapers and flakes.² Dr Beveridge classified the structures as a rectangular building near the west point of the island, a round one on the rocky boss, two contiguous round ones on the middle of the spine and a doubtful building towards the south-east end. The first two structures are described below and shown to be relatively recent; the others have not been excavated but are probably also recent, since the scatter of Western Neolithic sherds along the shore stops short of them.

Conditions in the Second Millennium.

In the late eighteenth century Loch nan Geireann was dammed for a mill, which now stands ruined on its outflow. The water-level was probably raised some 5 feet, for 2 feet were lost when the sluice was removed about 1893, and examination of the channel suggests that the present water-level

¹ The site is in lat. 57° 38' 10" N., long. 7° 17' 26" W. The island is shown, but not named, on the 6-inch O.S. sheet: Hebrides, North Uist (Inverness-shire), Sheet XXXI.

² Erskine Beveridge, *North Uist*, 1911, 221-2; pls. facing pp. 220 and 222. A number of the sherds were described and illustrated by Dr Graham Callander in his paper on "Scottish Neolithic Pottery," *P.S.A.S.*, lxiii. 36 and 72-6. Dr Callander's recognition in 1928 that the sherds were of Western Neolithic ware deserves to be remembered.

* Owing to the lamented death of the author of this paper, its revision for the press has been undertaken by his son, Mr Neil Scott, with the kind assistance of Mrs H. N. Young, F.S.A., F.S.A.Scot.

is some 3 feet above that to be expected if the dam were wholly removed. Eilean an Tighe lies parallel to, and less than 200 feet from, the long promontory of Ard Reamhar, the coast of which opposite the island is divided by small rocky points into two shallow bays. Soundings showed 5 feet of water in the channel between the spit at the north-west point of the island and the rocky point lying due west of this, and 6 feet between the island

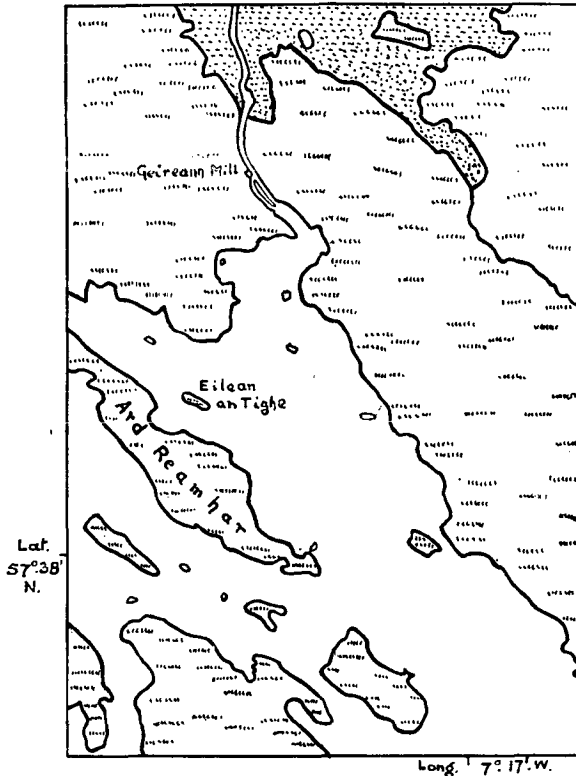


Fig. 1. North-east part of Loch nan Geireann.
(Reproduced from 6-inch Ordnance Survey map by permission.)

and the other two rocky points. In the second millennium B.C., therefore, Eilean an Tighe could have been approached from the promontory by a causeway, as well as from the loch by boat.¹

In that millennium the climate was drier than at present. The chamber tombs of Cletraval and Unival had no peat below them, and the modern growth of blanket peat cannot then have proceeded far. The pottery kilns here described were fired with birch and hazel and some willow or poplar (Appendix I), and the shores of the loch were evidently then fringed

¹ E. Beveridge, *op. cit.*, 222 and n. 2. I cannot confirm the causeway suspected to have run from the south-east corner of the island.

with these trees. The sea-level was lower; the rise since the beginning of the present era has been shown to be at the least 6 feet,¹ and, having regard to the position of the chamber tomb of Geirisclett, the level in the second millennium was at least as low. The spring tide rise is 11½ feet in the Sound of Harris,² and the second millennium coast-line may be broadly taken to have followed the low-water mark shown on the present Ordnance Survey maps.

The then landscape may be reconstructed as a broad bay lying between the Udal and Newton promontories, with behind it a deep belt of fertile, and presumably inhabited, machair land. Two streams meandered through the machair on each side of what is now the tidal island Oronsay; the western of these led up to Loch nan Geireann, a distance of some two miles, and was probably navigable by canoes up to the present mill, at least when the loch-level was high. The loch was a little smaller than the present loch, and was fringed with trees. Around its head were two, probably three, chamber tombs, and beyond these rough pasture extended over that central area of North Uist which is now uninhabited bog. Alongside Ard Reamhar, and connected with it by a causeway, lay Eilean an Tighe; the pottery workshop was sheltered from the north by its boss of rock and, lying by the loch side, was convenient for the water transport of timber. Where the habitation site was there is unfortunately no evidence; it may be now submerged.

The Secondary Buildings.

The north-eastern part of the pottery was overlain by a sub-rectangular building (fig. 2). This had dry-stone walls 4 feet thick at the base and a doorway 2 feet 6 inches wide; it measured internally 13 by 10 feet. Its foundation course was approximately on the 4-foot contour (fig. 2) and well above the pottery's working floor. Its wall stood to a maximum height of 3 feet and had probably never been substantially higher. It had no hearth. It produced an iron ferule, two shapeless scraps of iron, and bone scraps of which one is reported by Dr Wilfrid Jackson to be the left femur of a red deer or a young ox. The most likely view is that the building was a cow byre, of some period earlier than the damming of the loch. It was probably the "house" from which the island got its name.

Further to the north, on the top of the boss of rock, was a second rectangular building, the stone and turf walls of which were in part reduced to one course (fig. 2). Its internal dimensions were 10 by 9 feet, no doorway was certainly distinguishable, and there was no hearth. It was built upon the solid rock, save where considerable hollows occurred in the rock surface; inside the hut these had been levelled by a rough paving of slabs. The

¹ *P.P.S.*, 14 (1948), 71.

² At the Obbe (Leverburgh); see *Admiralty Tide Tables*, s.v. Stornoway.

south wall abutted on, but did not bond with, the north wall of the byre. The stones of this hut may have contributed to the walling of the byre, but, as its walls were only 2 feet 6 inches to 3 feet in thickness, they can never have been more than 3 or 4 feet in height. The hut produced numerous

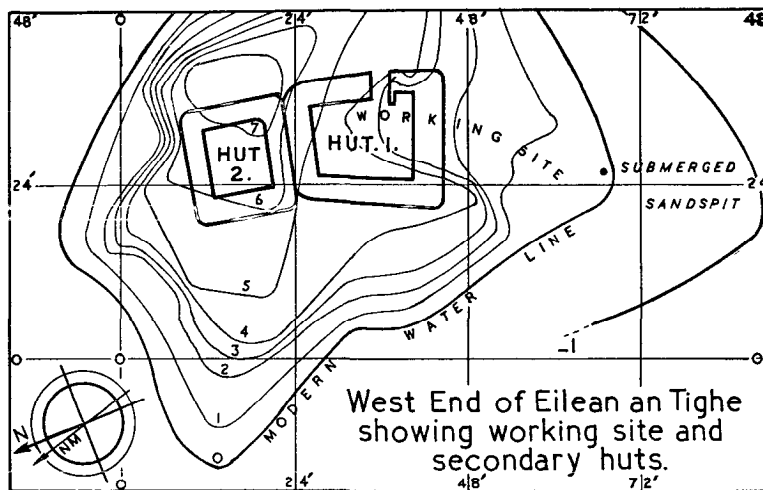


Fig. 2. General Site Plan. (26 ft. = 1 in.)

Western Neolithic sherds, and flint and stone objects apparently belonging to the pottery workshop. These occurred under and in the walls and in their immediate vicinity; the thin turf covering the rock in the centre of the building was almost sterile, as were the chinks in the paving of slabs. This distribution strongly suggests that the material was derived from turf dug from the site of the pottery and used to build the hut walls. It is indeed probable enough that, when the pottery was in operation, use was made of the rocky boss as a working place. It is not impossible that the hut was then built as a shelter; but the presence of sherds in the hut walls, implying that the pottery site was already turfed over, is against this view, and, despite the absence of any later finds, the more likely conclusion is that the hut was built at some later, and indeterminable, period. That it antedated the larger structure beside it is suggested by the skew position of the northern wall of the latter, which seems to have been adapted to abut on the smaller building.

The digging of turf and the heaving out of stones for the walls and roofs of these buildings had naturally disturbed the stratification of the site in their vicinity. Further south, and beyond the influence of this disturbance, there was in general too little depth of soil for records of strata to be of much value. Substantially, therefore, the pottery sequence established

below depends on the evidence to be given as to the sequence of construction of the three kilns, and on the position of sherds in relation to the three kilns.¹

The Pottery Workshop.

The working floor extended some 50 feet from the hollow on the south side of the rocky boss to the edge of the sand spit which ran out from the north-west point of the island. In level it sloped from $z=3' 9''$ against the boss to $z=-1'$ at the edge of the spit (Sect. I-I, fig. 11). Beyond the 1-foot contour, which is shown in fig. 2, the spit shelved steeply, and the great accumulation of sherds (representing the pottery's rubbish-heap) which had been found on the spit rapidly died out. Whether the site originally extended further in this direction we do not know, since this area had been under three feet of water, and subjected to the scour of the loch for at least a century.

The surface underlying the working floor was composed of rock, or of clay and sand filling hollows in the rock. On this surface were the kilns described below, and a deposit of soil containing some four thousand sherds, as well as stone, pumice and flint implements. The soil was of three sorts. First, in certain hollow parts of the structures there was loose earth which had blown and washed in; second, there was a compact dark soil free of burned matter; third, there was a highly compacted soil, varying in colour from black to red-brown, and full of burnt material. Specimens of this last examined by the late Dr H. H. Thomas were reported to be composed of mixed earth, ash and charcoal, the red-brown specimens containing less charcoal and the black specimens more. The areas in which this burned material was found are indicated approximately by diagonal hatching in red on fig. 10. Over considerable areas in the northern part of the site the soil was consolidated on its upper surface by iron deposited by water into a pan of the consistence of hard-set cement, and a similar consolidation occurred for four or five inches outwards from the vertical or sloping faces of the solid rock walls.

It will assist to disentangle the confusion of slabs, stone blocks and rock walls recorded in fig. 10 if reference is first made to the simplified plan of Kilns II and III at fig. 3. Kiln II, being the last kiln, is relatively complete. It partly overlaps with, and overlies, Kiln III, of which only the hearth (protected by a rock wall) and the south part of the oven survive reasonably whole. To some extent however the outlines of both structures can be traced, even when the stone is missing, by the banks of unburned earth (shown in fig. 3) which are the remains of the turf packing of their walls; the

¹ Position is recorded by rectangular co-ordinates in feet. The x - and y -axes are indicated by the grid on fig. 10; z -co-ordinates are heights above the loch-level on 15th June 1937. This level was some 15 feet above Ordnance Datum, and probably at least 6 inches below the present mean water-level of the loch.

hollows between the banks—the interiors of the kilns—naturally became silted with burnt material during the use of the site. Kiln I, though it will continue to be so called, may in fact not be an enclosed kiln, but merely the open hearth which is all of it that certainly survives.

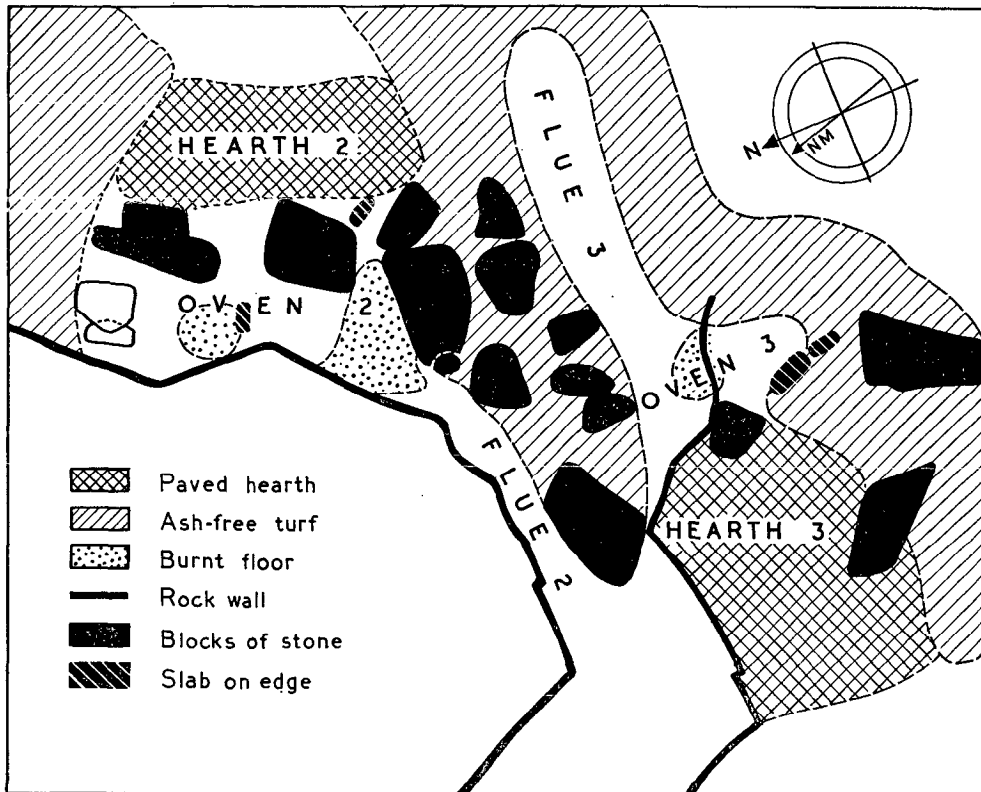


Fig. 3. Schematic Plan of Kilns II and III. (8 ft. = 1 in.)

The kilns are of the horizontal type and their plan seems to have been this. The fire was built on a large flat hearth, more or less effectually enclosed to assist the draught; in Kiln III there was a step up from the hearth to the oven, which would further help the draught. Against the middle of the back of the hearth stood a central block of stone to support the lintels of the roof, and round each side of this flame-ways led into the oven. From each of the back corners of the hearth there extended walls opening out to form an oven and then converging into a narrow flue. Slabs set vertically in the ovens may have served as baffles to keep the flames out of direct contact with the pots that were being fired. From the constriction at the back of the oven the flue ran for some feet as a narrow horizontal

passage to the vent into the open air. No traces remained of a vertical chimney and it is unlikely that one existed, for none have been found in ancient kilns; indeed the idea of using a vertical chimney to create a draught does not seem to arise before the Middle Ages. The Chinese horizontal kilns now operate with mere vents, the draught being started by partially heating the far end of the kiln with a small fire before lighting the fire on the kiln's hearth, and it is likely that this method was used at Eilean an Tighe.

The walls of the kilns were composed in some parts of the solid rock cut to a more or less vertical face; this had in part been artificial, and a detached block could be replaced in its original position in the rock wall. In other parts the walls were composed of blocks of stone covered with a layer of turf and capped with a layer of slabs; or again were composed of layers of turf and of horizontally laid slabs. The roof must have been of slabs rendered gastight with turves. While a number of slabs were tentatively interpreted as lintels, it was only in two cases that lintels were found in place. This was to be expected, since, over the oven, the roofing must have been removed after each firing in order to take out the pots; while, over the flue, partial removal must have been necessary in order to clean the flue of the ash carried into it, and perhaps also for the lighting in it of a fire to start the draught at the commencement of the next firing. A pile of lintels of a size to span the larger stretches was found to the south of Kiln III.

Kiln II (figs. 10 and 11; Pl. I, 1 and 2).—The hearth was composed of flat slabs fitting closely together and laid upon other layers of slabs. Many of those in the top layer were cracked by heat, and those in lower layers were partly disintegrated into grit. Evidently successive layers were laid as the previous ones became destroyed. Under the lowest layer were found large fragments of the undecorated cordoned pot Z39 (fig. 7). The effect of this superimposition of layers of slabs was that the top layer tilted a little downward towards the oven. Upon the hearth was a mound of burnt material, black below and red-brown above.

Immediately behind the hearth was the central block 46/29 with a slab lying on it; passages on each side of the block were free of stones. The right-hand passage, to the north of the central block, led into the north part of the oven, an area clear of stones and enclosed on the west by a nearly vertical rock wall and on the east by big blocks and superimposed slabs. The floor of this part of the oven was burned down to the undisturbed clay. In the mouth stood vertically the slab 45/27, perhaps a baffle to protect pots during firing from the direct blast of the hot gases. In the north corner of the oven at 43/28/3 were large parts of the Unstan bowl 0.48 (Pl. III, 2). The left-hand passage, lying to the south of the central block, led into the south part of the oven, an area enclosed on its south side by a wall composed of two big blocks, 48/29 and 49/27, covered with a layer of turf and capped

with a layer of slabs. The outer face of this wall was also composed of blocks, 50/30 and 51/28, capped with slabs, and the whole wall was no doubt packed and made gastight with turf. The floor of this southern part of the oven was also burned down to the undisturbed clay.

This southern wall of blocks and superimposed slabs continued eastward and converged towards the northern rock wall until the two nearly met at the constriction at 49/25 at a distance of 4 feet from the central block. From this point the flue of the kiln ran for 5 feet as a narrow channel between a vertically cut rock wall to the north and a wall of blocks to the south (Pl. I, 2). Just beyond the constriction two long slabs, 50/24 and 51/24, lay across the channel and were evidently lintels. The filling of the flue was loose earth without burnt matter. The irregular rock floor had been levelled up with slabs so as to provide a fairly smooth surface, perhaps to prevent eddies in the flue. At 52/21 the flue terminated with the sharp turn to the north of the vertical rock wall.

While, as will appear, Hearth III was enclosed on one side by a rock wall, Hearth II appears to be so open as to make the control of the draught and the starting of a fire a difficult matter. Fig. 3 throws light on this problem, and attention is drawn to the pattern made by the bank of unburnt earth on each side of the hearth. These banks of soil were compact, and the fact that they contained no burnt matter seems to show that they were in their present position when the kiln was first used, for otherwise they must have been mixed with, or underlain by, the ash which was so plentifully strewn around the hearth. We may infer that this soil originally composed walls of turf enclosing the hearth on each side, and thus controlling the draught. These walls, though they had to stand no great heat, may have been, in part at least, stone faced, for the line of well-fitted blocks from 36/29 to 39/30 would appear to be the outer face of such a wall. This line of blocks had been sheltered by the rock wall from subsequent disturbance, which had been severe between $x=40$ and $x=44$ owing to the construction over that area of the south wall of the byre.

Kiln III (figs. 10 and 11; Pl. II, 1).—Kiln III had been extensively wrecked in the building of Kiln II except where it was below the rock shelf on which the latter was built—that is, roughly, below the 1-foot contour. Long submergence in the loch had, moreover disintegrated many of the slabs at this lower level into fragments, and even into piles of coarse grit. (Rotten elements in the gneiss become thus disintegrated, and a façade orthostat of Cletraval chamber tomb which had become covered by a peat bog could be dug out with a shovel in the form of loose grit.) It will be seen from fig. 10 that the south-east edge of the site was below loch-level, and excavation had to be carried out by banking out the loch and baling the water as it seeped in.

The hearth of this kiln was protected on the north by a vertical rock

wall and on the south by a bank of ash-free turf. The control of the draught into the kiln was thus facilitated, and it was further much helped by the step up from the hearth to the oven. The hearth slabs had been supported on large levelling blocks where the solid rock sloped away on the southern side, and had been set at a fairly steep slope upward towards the rock wall to the east. A centre block smaller than that of Kiln II stood on the edge of the rock wall immediately above the hearth. To the south of the central block the flame-way into the oven was constricted by two substantial slabs on edge which presumably baffled the flames from direct contact with the pots in the oven. The oven in its southern part was levelled up with stones, and roughly paved, so that its floor was flush with the top of the low rock wall which ran across it; from the top of this slight wall the rock floor sloped upward, covered with a thin layer of undisturbed clay burned red.

The south wall of this oven, and the south wall of the flue beyond it, are not precisely determinable in terms of their stone structure, much of which must have been taken to build Kiln II, but can be approximately seen from the surviving turf structure shown in fig. 3. The large block 59/27 to the south of the oven is no doubt in its original position, but the pile of slabs immediately east of it (well seen in Pl. II, 1) are only the remains of a wall from which the larger stones have been pulled out. The same is true of the line of slabs from 54/27 to 54/31, which represent the remains of the stone structure of the south wall of the flue. Both these robbed walls correspond generally with the turf walls shown in fig. 3; and to the north of them were areas in which few or no slabs were found, but instead the ashy material thrown out from Hearth II into the cavity which the oven and flue of Kiln III presented when Kiln II was in use. It may be that the oven extended a little further to the south and east than the position of the turf wall suggests, for that wall now spreads over part of the oven's paved floor, but no doubt turf did tend to slip inwards when stone members of the wall were pulled out to build Kiln II.

The north walls of the oven and flue of Kiln III became, no doubt after remodelling, the south walls of the flue and oven of Kiln II. The northern flame-way can hardly have extended from the central block to the large block at 52/23, but was probably constricted, as the southern flame-way was, by slabs on edge. The northern part of the oven probably extended under a part of what became the south wall of Kiln II, for there was a small paved area at 51/27 which was covered with ashes and had on the paving a large part of an undecorated pot. We cannot hope however now to recover precisely the northern limits of either the oven or the flue.

It will be seen from fig. 10 that a number of large slabs overlay the structure to the south-east of the hearth, and that a pile of them lay to the south of the oven. Some of these were over 2 feet 6 inches in length and thin, eminently suitable for lintels; they lay tilted at all angles. They

probably show us the type of roofing employed for the kilns. They presumably belong to Kiln II rather than to Kiln III, having been thrown aside when it was opened up to get out the fired pots and to clean the flue before a fresh firing.

Kiln I.—The only clear feature surviving is the hearth, a large area centring in 36/36 piled with burnt matter and irregularly paved with slabs. Only isolated slabs are shown in fig. 10, the central part of the hearth having been reduced to grit. The position of this hearth under a rock wall accords with that of Hearth III, and the very large block at 38/39 might conceivably have served as part of the construction of an enclosed kiln. This however is quite uncertain and, on the evidence surviving, the hearth may well have been one for the open firing of pottery, a purpose for which its large size would render it suitable.

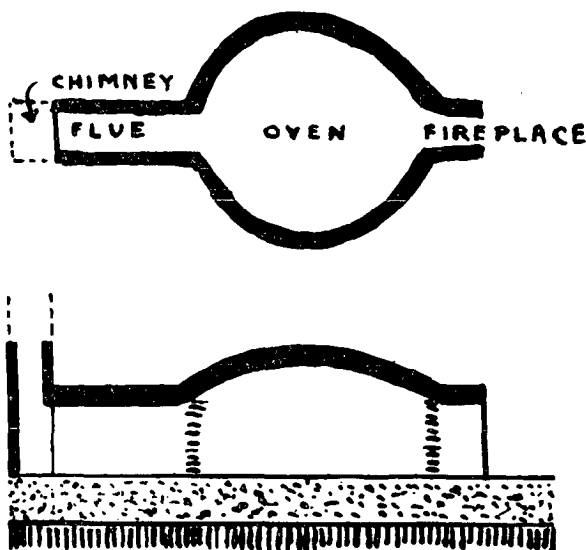


Fig. 4. Plan and elevation of Romano-British horizontal kiln at Farnham, Surrey, as reconstructed by Mr W. F. Grimes. (c. 10 ft. long.)
(Reproduced by permission from *Y Cymmrodor*.)

The Type of Kiln.—Kilns II and III are horizontal kilns, that is kilns in which the hot gases are drawn, either horizontally or up a short step, into the oven; and drawn out at the far end of the oven through a horizontal flue leading to a chimney or other vent. Such kilns are widely used in modern times, and have been the standard type in the Far East from at least the Later Han dynasty in the first two centuries of our era.¹ They have the advantage over the vertical kiln, in which the oven is an enlarged chimney through which the hot gases are drawn upward to a vent at the top,

¹ The early history of kilns is treated in the chapter on Pottery in the *History of Technology* forthcoming under the editorship of Drs Charles Singer and E. J. Holmyard.

that the flow of heat can better be controlled by damping and that the temperature is more even throughout the oven. In the Near East and Europe the relatively small number of pre-Roman kilns which have been excavated and adequately recorded have been of the vertical type, but in Roman times the horizontal kiln was in use, though it was exceptional. The Roman kilns in Britain have been studied by Mr W. F. Grimes, and fig. 4 shows a reconstruction by him of the plan and section of one of horizontal type at Farnham in Surrey. This kiln was built in part of clay and in part of ironstone slabs; another example was of ironstone slabs set in mortar. In method of operation these differ in no significant respect from the Eilean an Tighe kilns.¹ The latter are the only pre-Roman pottery kilns known in Britain, though corn-drying kilns are known.²

The Making of the Pots.

On the edge of Hearth I at 38/32 and 40/36 were piles of yellow clay. A technical report of this material is in Appendix II, and no similar clay was found elsewhere on the site. It is highly probable that the piles of clay were in use for pottery-making when the site was abandoned. We may infer that, at that stage, Kiln I was no longer in use.

It is explained in Appendix II that the pottery made implies the use of a turntable; the practices of moulding, scraping and burnishing over a slip; and the grinding of grit to a uniform size for use as tempering. The turntables were doubtless of wood, and the moulds old sherds, but the site is fortunate, and nearly unique, in producing a set of tools used for the other processes. As against this, bone tools, if used in decorating, have not survived. A catalogue of flint, stone and pumice objects is in Appendix III, with a table showing their distribution. The flint tools are widely spread over the site, and most of them are not specifically associated with pottery-making unless at second hand, for example in shaping wooden tools. The stone and pumice implements, on the other hand, are largely pottery-making tools, and they are concentrated in areas X1, Y, Z and 0. Such a distribution is less than decisive, but it is compatible with the supposition, which is itself inherently likely, that the potting was carried out on the southern part of the rock shelf, and thus clear of the kilns. At the last stage

¹ *Y Cymmrodor*, xli. 55 ff., and fig. 31, no. VII. The upward extension of the "chimney" shown in the reconstruction should be noted to be hypothetical; on all the evidence it may be assumed to be a mere vent. Comparison may be made with a further group of horizontal kilns recently excavated by Mr A. Clark, who tells me that the further inquiries he has made have not confirmed the method of operation which he suggested in *Surrey Arch. Coll.*, li. 29 ff. So far as I can judge, they would seem to have been operated similarly to the Farnham kilns and to the Chinese horizontal kiln, though I must not be understood as committing Mr Clark to this view.

² For corn-drying kilns see *Antiquity*, Dec. 1951, 196. In Western Europe pottery kilns are not recorded before the Iron Age; the "neolithic" kiln at La Terrière, Charente-Inférieure (*Bull. Soc. Préhist. Française*, xxxvi. 4, 202), was an open hearth.

of the site, when Kiln I had gone out of use, the piles of clay suggest work also in the hollow south of the rocky boss. Use may also have been made of the rocky boss itself, where there are more tools than can be accounted for by the removal of turf thither for the building of the secondary hut.

Specimens of the tools are shown in figs. 12 and 13. There are first grinders and pounders for reducing the grit used as tempering. These are heavy implements of the local rocks, and are either elongated and rounded at their ends by hammering or pecking, or are spherical and pecked all over their surface. Secondly there are knives and scrapers of stone used for thinning and shaping the roughly made pot when dried to a leather-hard condition. Some of the flint knives and scrapers may have been of similar use. Thirdly there are smoothing tools of pumice showing hollow facets and grooves, the result of holding them against the leather-hard pot as it was slowly rotated on the turntable; the grooves in these tools are caused by thus rubbing down rims. S2 is probably a tool of similar use made of soft and rather coarse stone. Finally there are burnishers; these are highly polished tools of stone, since the efficacy of burnishing depends, not only on the fineness of the clay used as a slip, but also on the smoothness of the burnishing tool. Burnishers of various shapes are required for work on the outside of a pot, on the inside, on the rim and on the hollow under the rim. Remarkable is the plano-convex burnisher S1, which is worked to a rectangular shape, highly polished all over and bevelled along the edges of the convex face.

Pl. IV, 2 shows two examples, both from area Z, of lumps of clay squeezed in the hand and fired. They doubtless were used as wads in packing the pots in the kiln.

The Sex of the Potters.—It is often, if insecurely, argued from modern primitive practice that potters were women, at least at a stage before the introduction of the wheel; and it has been argued that this can be proved from prints of women's fingers on pots.¹ The lumps of clay just mentioned were accordingly submitted to the Metropolitan Police Laboratory through the kindness of Sir Philip Game, and it was learned that to distinguish between the sexes from finger-impressions is impracticable. A conclusion can therefore only be drawn from the nature of the work involved. The initial collection of the fuel, and probably the clay, and the final sale of the pottery, are likely to have been men's work, since they would be carried out by canoe. The heavy work of building up the kiln before a firing, and the exacting and highly skilled work of the firing itself, would also seem appropriate to men. Women might have shared in the building of the pots, but it is not probable that they bore any large part in the work of the pottery, which seems more likely to have been the part-time employment of a single male potter.

¹ By M. V. Voyevodskii, "The Investigation of Pottery Technique," *Soviet-skaya Arkheologiya*, 1936, 51. I am indebted to Professor Childe for this reference. The argument from delicacy of finger is often seen.

The Output of the Pottery.—Rim sherds representing some 400 wasters were found on the site. No figures are available for the rubbish-heap, since it has been scoured away by the loch, but it is perhaps rather less than more likely that a broken or damaged pot would reach the heap without leaving any part of its rim on the site. In that event the total number of wasters would not exceed 800. Loss in firing would be high and perhaps, on modern analogy, as much as 30 or 40 per cent.; putting it as low as 20 per cent., or even 10 per cent., the saleable pots corresponding to 800 wasters would be 3200 or 7200. If the pottery operated for a century, the yearly output on these figures would be 32 or 72. Such a calculation can be varied widely and is too vague to yield a positive conclusion, but it does suggest negatively that the assumption of a long life for the pottery is not a likely one. The pottery sequence, to be discussed below, may perhaps extend in time over two generations, or three; it is not likely to extend over more than three generations.

The Pottery Sequence.

The discovery of kilns succeeding one another in time provides us with a means of ordering successive types of Western Neolithic pottery in the sequence of their dates of introduction at Eilean an Tighe. The data are the structural evidence for the relative dates of the kilns, which is given above, and the evidence provided by the analysis of the kilns' products, which is undertaken in Appendix II. Since the pottery is fully discussed in that Appendix, only the broader conclusions reached will be set out here.

On structural grounds we know that Kiln III preceded Kiln II, which must have put it out of use; that Kiln II was in use at the abandonment of the site; and that Kiln I, which may not have been an enclosed kiln but merely an open hearth, went out of use before Kiln II. Appendix II supplements this structural evidence by typological evidence that Kiln III preceded Kiln I, and that Kiln I went out of use substantially earlier than Kiln II; while it supports the alternative that Kiln I was an open hearth by the evidence that the pots fired in it were small. We thus have the sequence: Kiln III; Kiln I, probably an open hearth, and the early period of Kiln II; the later period of Kiln II. If it is rightly concluded that open firing was undertaken in Kiln I during the early period of Kiln II, it was presumably also undertaken during the later period of that kiln, as also during the period of use of Kiln III, but in other open hearths perhaps now sunk beneath the loch.

On this basis we can distinguish three stages in the manufacture of pottery at Eilean an Tighe. At the first the pottery was engaged in making plain pots and, to a small extent, pots with decoration on the rim. Some, perhaps a quarter, of the pots had simple rims, and these were small—that is of less than 8-inch internal rim diameter. The remainder of the pots

had some form of developed rim and, since some two-thirds of these were large—8 inches or more in internal rim diameter—the development of the rim was presumably designed to strengthen the vessel. The principal form of developed rim was the flat rim (with horizontal upper surface), but in-bevelled rims (with flattened internal bevel) were made; perhaps also, though less frequently, out-bevelled rims (with flattened external bevel). These flat rim surfaces result from the use of the turntable. The walls of the vessels were uncarinated and generally nearly upright, the bottoms being—as at all stages of the site—round; but some shallow bowls, and some jars sloping inward to a restricted neck, were already made at this stage. Horizontal cordons were occasionally used, presumably for strengthening. Horizontal ledge lugs were known but rare.

At the next stage plain vessels continued to be made, but at least half the pots were decorated. Some quarter of the pots have simple rims; they are still small, and nearly all are plain. Among the types of developed rim the flat rim is being displaced by the in-bevelled; the out-bevelled is still uncommon. In wall shape, carination begins to appear. Cordons continue to occur on plain vessels, though sparsely. A unique type of lug appears, decorated and with double piercing of the wall. A highly distinctive type of pot is the flanged bowl; this is hemispherical, some 6 inches in diameter, with a broad flattened rim, horizontal or slightly bevelled; the broad rim is elaborately decorated, commonly in concentric rings divided by narrow ridges; the body is decorated all over.

At the third, and last, stage as many as two-thirds of the pots are decorated, while decoration confined to the rim has disappeared. Some quarter of the pots have simple rims; they are still small, and are undecorated. In plain vessels the standard type of developed rim is now the in-bevelled, but on decorated pots out-bevelled rims have been introduced and have largely displaced all other types. Among the shapes made, two new and distinctive types are the ridged jar and the Unstan bowl. The former is a large and deep jar, some 8 inches in internal rim diameter, with wall commonly sloping inwards and sometimes sharply so; the rim is out-bevelled, or occasionally flat, and is covered with decoration; the upper part of the wall is ridged externally, perhaps for strength, and the ridges divide the strongly marked decoration into zones; the lower part of the body may be roughened by scoring or jabbing, but is undecorated. The Unstan bowl is a broad and very shallow vessel up to 10 inches in diameter, with a sharp carination where the base joins the nearly vertical rim; the rim only is decorated, and has a broad band of pattern outlined by groups of horizontal lines. These vessels are outstandingly thin, fine in texture and perfect in decoration. Save in these bowls carination is still rare. Cordons continue to occur sparsely on plain pots, and decorated vessels now sometimes have a fine cordon luted on. Lugs continue to be very rare.

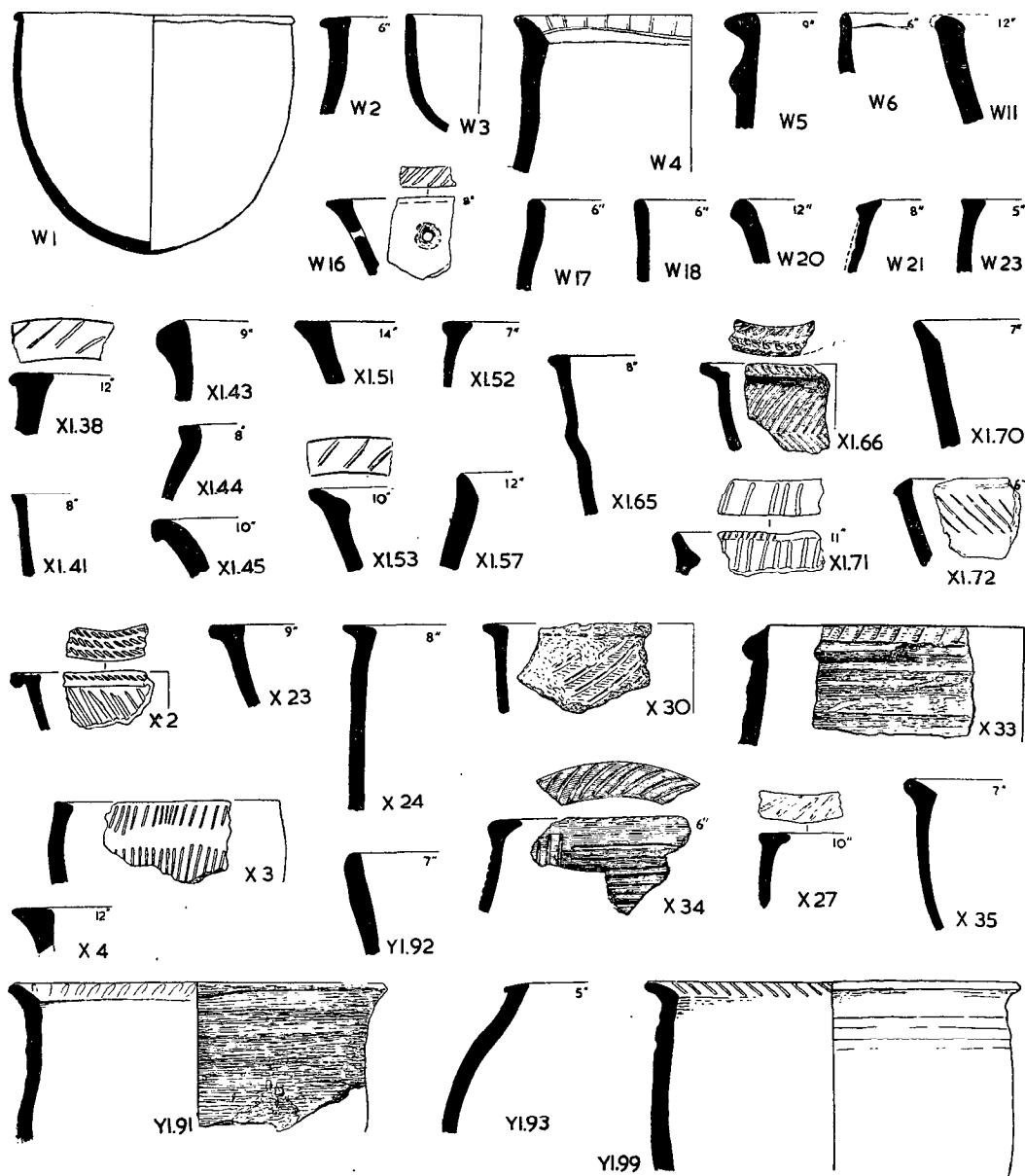


Fig. 5. Pottery from Kiln III. (1/4)

The decorative technique almost universally used was grooving. At the first stage the decoration of the rim, to the extent that it occurred, consisted of transverse or diagonal grooves. Broad shallow grooves of the nature of finger-tip fluting occur at the first stage on the rim and later on the body, but they are exceptional. Narrow grooving occurs in the later stages and merges into incision, but it is common only on Unstan bowls; in these stages rare examples occur of a very fine incision. Though used for roughening, dots and jabs are used in decoration only twice. Techniques of the nature of stab-and-drag appear only in the last stage, and then only on five vessels, two of which are Unstan bowls. The patterns used in decoration were rectilinear until the last stage, when curvilinear patterns were introduced.

The development recorded above is one of increasing differentiation of production and increasing elaboration in ornament. Initially the wares were in large part deep bowls and jars, undecorated; they were made in various sizes, but, size apart, they were serviceable as general-purpose utensils for cooking, storage and other purposes. Such types as shallow bowls and jars with constricted neck, initially rare, came in course of time to constitute a considerable part of the pottery's product, and developed into such specialised and highly decorated types as the heavy ridged jar and the extremely fine Unstan bowl—types of which the first was presumably designed for storage and the second perhaps for curd and cheese making. The deep and straight-sided pots which were still made in plain ware were then, it may be presumed, confined to use as cooking-pots. The small, plain bowls—perhaps porringers—were also still made, but they were supplemented by the highly elaborated flanged bowls.

This development appears to be one in demand rather than in the technique of production. From the beginning the Eilean an Tighe pottery was capable of making thin wares of fine texture and of building large pots; it was familiar with the techniques of moulding and burnishing, used the turntable and applied grooved decoration to rims. The transition to new and more varied types of vessel, and to wares more elaborately decorated, would seem to reflect the growth in wealth of the community. Initially the Uist settlers, faced with the heavy task of accumulating the capital equipment in buildings, implements and farm stock which an established community inherits from its forebears, had to be content in pottery with few and general-service vessels. It was only as wealth accumulated that they could afford a multiplicity of vessels specialised to particular uses, and of vessels on which the decoration represented a considerable addition to the cost. As the demand arose the community was in a position to meet it, whether from the traditions regarding shapes and decoration carried from the south by the initial settlers, or from the supplementary traditions carried by the later settlers as these arrived.

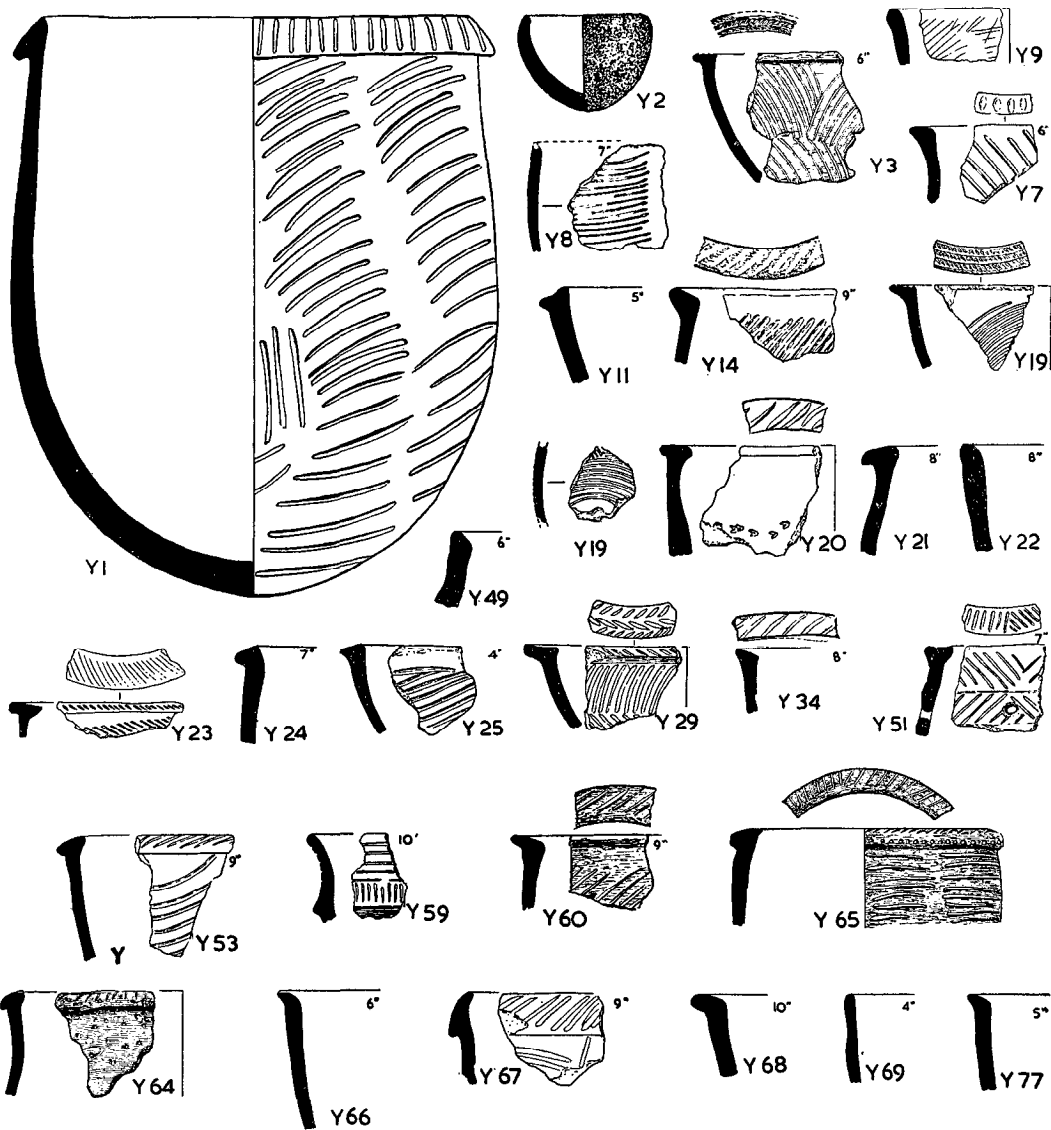


Fig. 6. Pottery from Kiln II. (1.)

The Eilean an Tighe sequence can be carried a little further on in time from the sequences of the chamber tombs of Unival and Cletraval. The requirements of the dead differ from those of the living, and the equipment of the tombs was largely confined to small vessels of the nature of cups and porringers. Cletraval¹ had indeed a plain cooking-pot, IC2, and as large a jar as IIIC1, but the tombs do not produce ridged storage jars nor the large unridged storage jars with out-bevelled rims (Pl. III, 1; fig. 9, 2.3); these last were taken into funerary use in the Isle of Man, but as cinerary urns. The tombs both produce typical flanged bowls, but not the larger and shallower Unstan bowls; with the curious exception of the Orkney tombs, all the large shallow bowls in Scotland come from habitation sites, and their dairy use gains some confirmation in that fact. That the later stages of the tombs extend in time beyond the Eilean an Tighe sequence is shown by the more common use of carination and of the decorative techniques of incision, including fine incision, lines of dashes and lines of dots. At Unival these, more developed, types of Western Neolithic pottery appeared to be contemporary with the deposit of a Rinyo I dish with grooved and dotted decoration, and to precede the deposits of a plain B beaker and a Rinyo II jar. If the period of use of that tomb has been correctly calculated from the number of burials identified, its life extended beyond that of the Eilean an Tighe workshop for fifty to a hundred years.

The aim of the present paper is to establish on detailed evidence the pottery sequence revealed by excavation in Uist. It may however be recalled that, in discussing the Unival tomb, it was pointed out that the sequence can be related with varying degrees of precision to the pottery sequences identified in settlements stretching up the Atlantic Route from the Western Mediterranean. These correlations seemed to imply successive movements of colonisation from that more civilised sea to those stretches of the Atlantic coasts which were readily habitable; these movements extended over perhaps three centuries. To that discussion may now be added a note on the pottery sequence established for another outpost of the West Mediterranean Culture settled far up the Rhône on the western lakes of Switzerland.² The pottery now distinguished as Cortailod I consisted in the main of deep and nearly straight-sided pots, occasionally lugged, and of small and more or less hemispherical bowls; some shallow bowls were however made, and some vessels, including large storage vessels, had walls sloping in to a narrow neck. All this ware was plain. At the later stage, Cortailod II, carination became strongly developed, and, together with low-carinated vessels recalling Iberian types, there were hollow-necked carinated bowls and shallow thin-walled bowls of Unstan shape recalling, not only Iberian types, but also the hollow-necked and Unstan bowls discussed above. These carinated

¹ *P.S.A.S.*, lxi, 505, 511.

² V. von Gonzenbach, *Die Cortailodkultur in der Schweiz*, 1949.

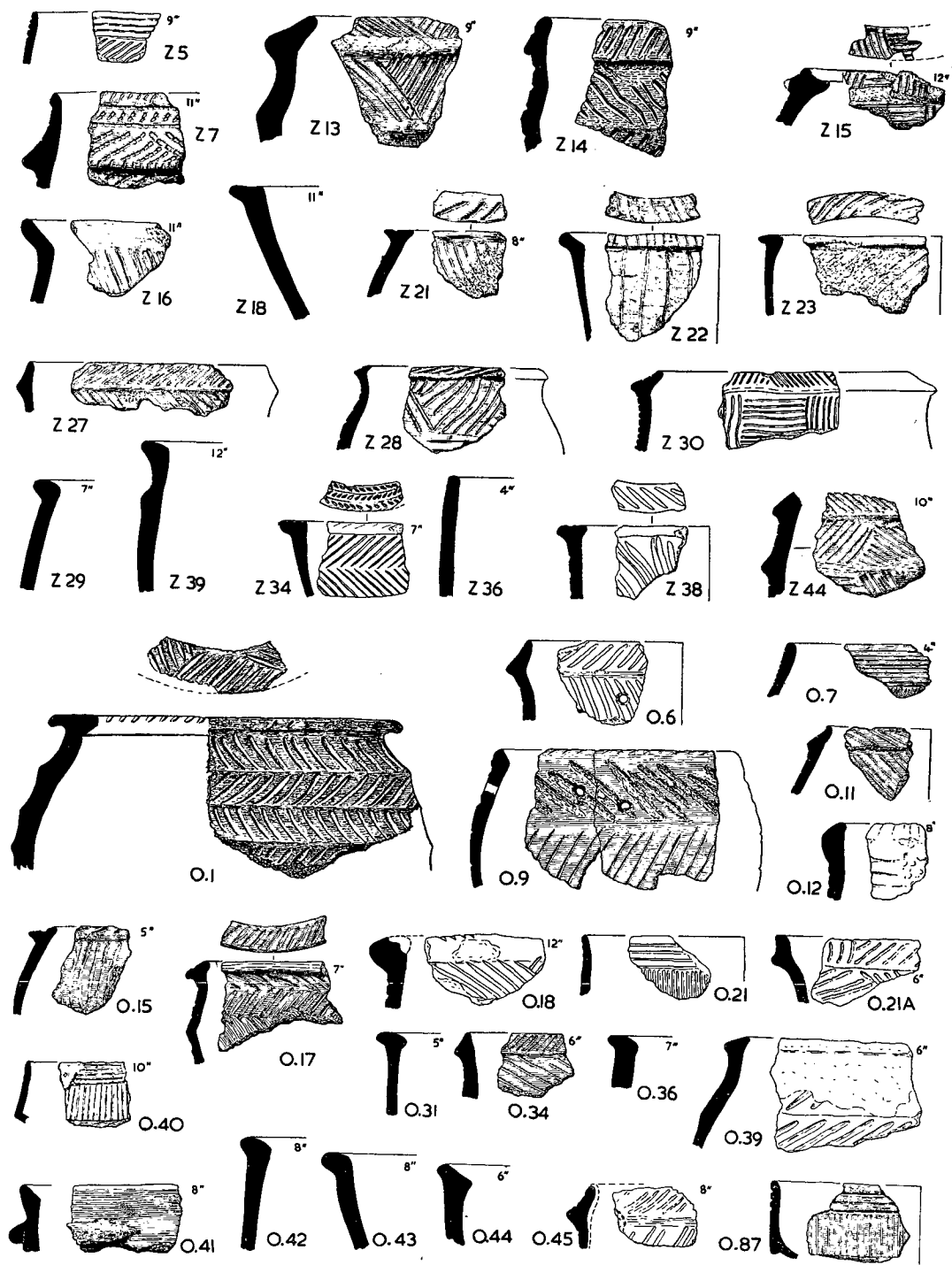


Fig. 7. Pottery from Kiln II. (†.)

types were decorated, a little barbarously, with bands of rectilinear pattern cut in birch bark and glued on with pitch. The sequence thus established in this remote mountain settlement supplements the less securely known sequences of the culturally advanced settlements from Languedoc to the Guadalquivir, and emphasises the parallelism already pointed out with Eilean an Tighe.

Conclusion.

The Western Neolithic pottery here studied was industrially produced in a small workshop; its potters used a turntable and knew the techniques of moulding and burnishing; its firing was in competent and moderately large kilns; and the shapes made were specialised to meet the needs of a culturally developed community. Technically the product was in advance of any wares subsequently known in Britain until the first century B.C., with the exception of some western B beakers, rare Rinyo I vessels, and a few incense cups; and these belong to the short period of time separating Eilean an Tighe from the Wessex Culture. The tombs associated with Western Neolithic pottery have long been recognised to imply a high degree of social organisation, and in studying Unival chamber tombs it was shown that the burial ritual of the Uist community followed closely that contemporaneously known in the Ægean. Far-ranging maritime settlement at a date which cannot be later than the mid-second millennium is certainly surprising, but the evidence seems secure that the communities which established a civilisation in Britain from Wessex to the Orkneys and the Moray Firth carried with them a provincial version of the West Mediterranean Culture of that era.

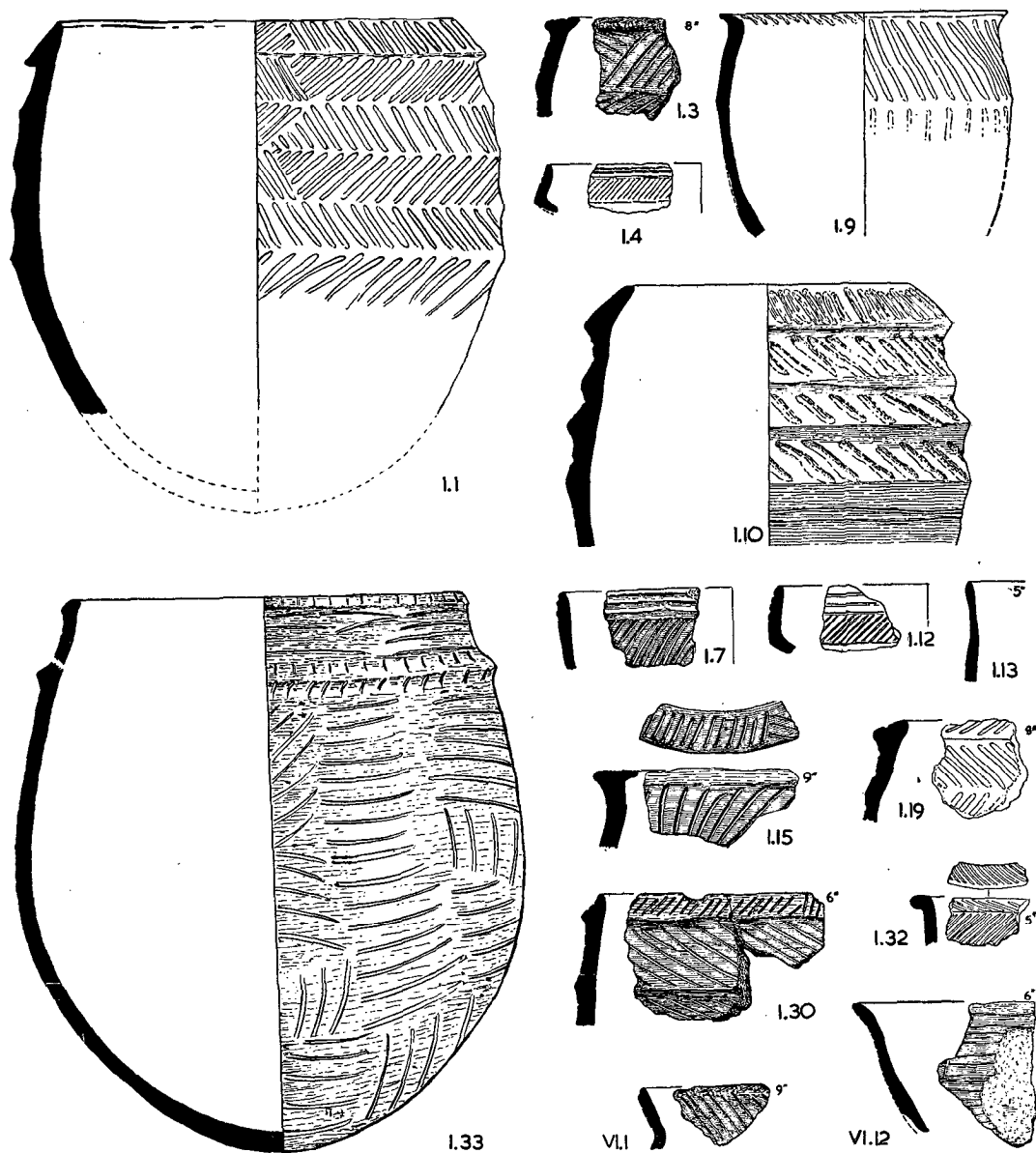


Fig. 8. Pottery from Kiln II, except VI.1 and VI.12. (4.)

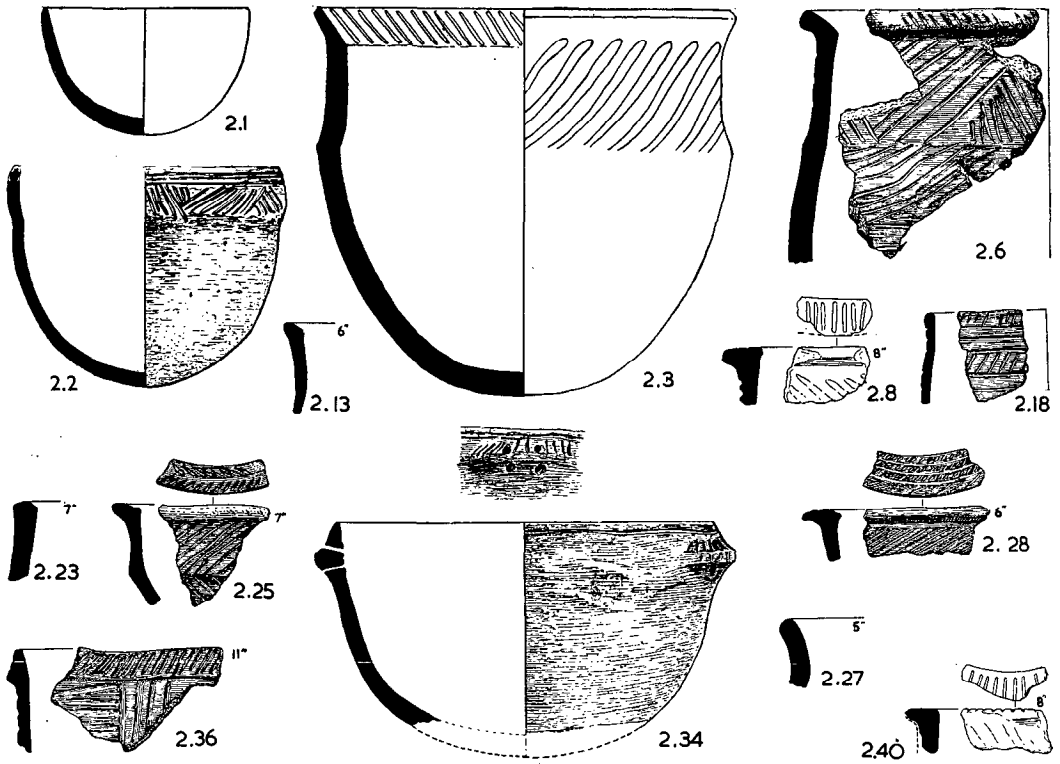


Fig. 9. Pottery from Kiln I. (¼.)

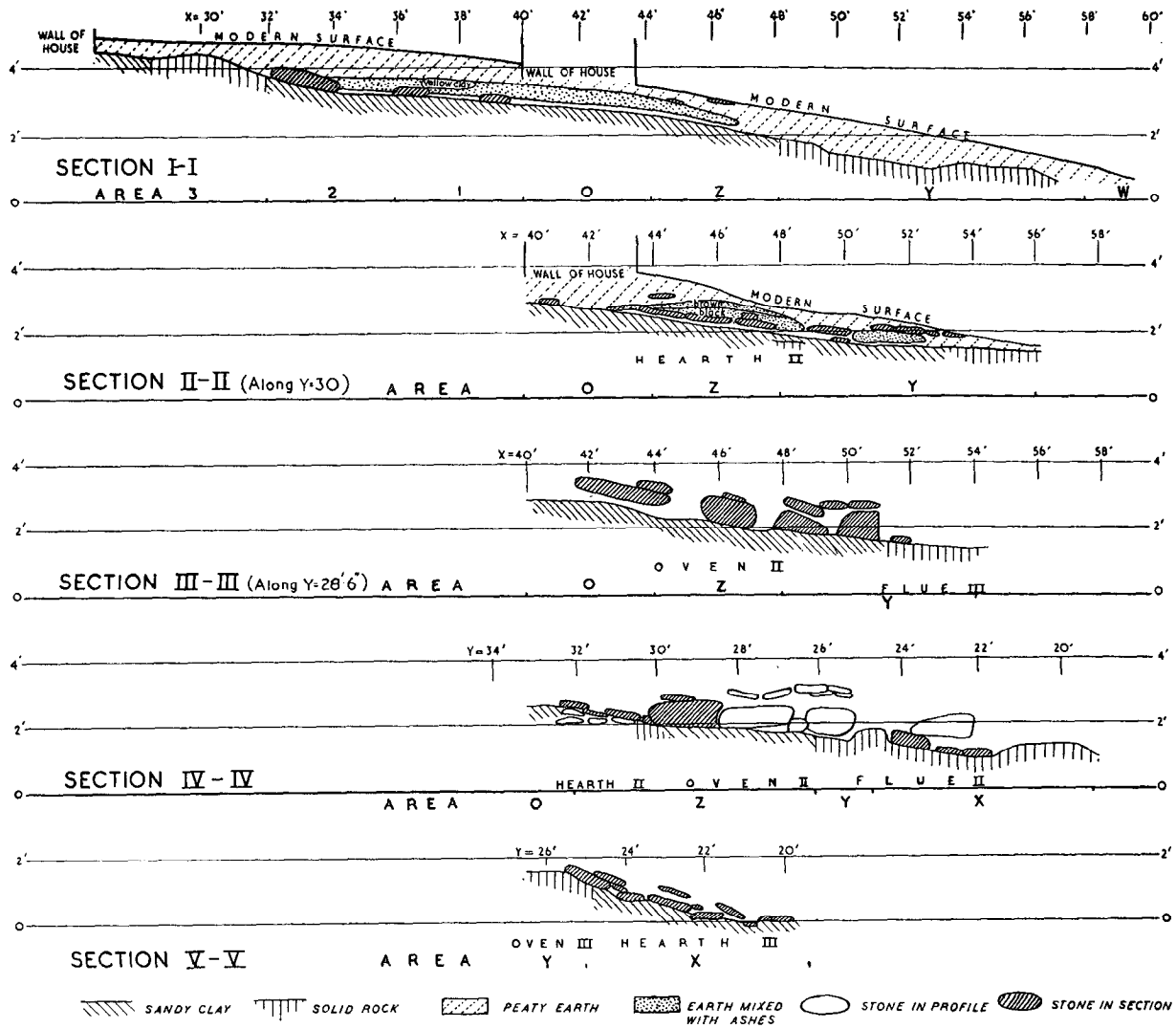


Fig. 11. Sections of kilns.

APPENDIX I.

Charcoal.

Mr M. Y. Orr of the Royal Botanic Garden, Edinburgh, has very kindly furnished a report on a large number of specimens of the charcoal found upon the site. His identifications are:

Area 2, Stratum B.		Hazel and Birch.
" 2	"	C. Hazel and Birch.
" 1	"	B. Scots Pine and Birch.
" 1	"	C. Hazel and Birch.
" 1	"	D. Hazel, Birch and Willow or Poplar. (It was impossible to distinguish between Willow and Poplar in these specimens.)
" 0	"	D. Hazel and Willow in equal proportions. One piece of root (not recent), possibly Birch.
" 0	"	C. Birch.
" 0	"	D. Birch.
" 0	"	E. Mainly Birch, with one Willow and one Poplar.
" Z	"	E. Willow, with one Hazel.
" Z	"	D. Birch.
" Y	"	D. Birch, with one Willow.
" X	"	D. Birch.

Mr Orr adds in regard to the specimens from Areas 0, Z, Y and X: "All the material, with the exception of the Birch specimen found in Sample 0, appeared to be pieces of stem, but it is not possible to be certain on this point when dealing with such small fragments."

It will be noted that the one specimen of Scots Pine came from an area within the byre and from above the pottery-working floor; it may be due to the byre occupation.¹ Excluding this, the trees represented are Birch and Hazel with some Willow and Poplar. These can be regarded as the tree growth of the lake edge.

APPENDIX II.

Analysis of the Pottery.

In Table I the pottery is analysed by shape and decoration and by area and stratum. Three hundred and sixty-five vessels are there identified by rim-sherds, and of these 141 (marked by a star) are identified by sherds exceeding 2 inches in dimension. All the vessels are wasters, broken or deformed in firing, and only those found trampled on the site are analysed. The quantity of material from the rubbish-heap is disregarded, since all stratification had been lost by its submergence in the loch; as also the sherds from the turf of the wall of the later hut (area V1). The areas into which the site was divided are marked on the plan. Since nothing of the kilns was visible before excavation, the areas could not be chosen to correspond to these, but in areas X and Y, sub-areas X1 and Y1 corre-

¹ According to Beveridge (*North Uist*, p. 180) there is evidence that the mediæval fort of Dun Ban, Caravat, had roof timbers of Scots Pine, which were obtained from Knock Cuien, near the south shore of Loch Caravat: "a statement," he adds, "which seems too precise, although it may be founded on local tradition." Scots Pine charcoal occurred in the Cleittraval aisled roundhouse farm.

sponding with the hearth and oven of Kiln III were isolated as these structures became apparent. In areas W and X the depth of soil was too slight to give stratification and, as will appear, the disturbance in the other areas was such as to render the stratification there recorded precarious.

The most effective analysis of the material is accordingly a horizontal one relating rim-sherds to the areas in which wasters from the several kilns were scattered. It has already been shown from structural evidence that Kilns I and III preceded Kiln II, and the pottery analysis will show that Kiln III also preceded Kiln I. (It will be remembered that Kiln I may have been an open hearth.) In view of the general scattering of sherds over the site an analysis must be a statistical one, but areas W, X1, X and Y1 should preserve relatively pure the material from Kiln III, and areas 2 and 3 that from Kiln I. The material from areas Y, Z, 0 and 1, though more mixed, should predominantly represent the scatter from Kiln II; and of this the sherds from areas Z and 0 should be the least contaminated.

There are two means of minimising the effect of general scatter. The first is the exclusion of superficial strata in those areas in which the depth of soil allows of recording by stratum. Experiment showed this method to be ineffectual; the rim-sherds in the several strata were too few, the floor was too irregular, and the disturbance of the site when in use, and by the building of the secondary huts, had been too great. Accordingly, though the full record is available, the classification by stratum is omitted in the table here printed (Table I). The other method is the segregation in the analysis of the larger (starred) sherds, which, though fewer in number, were less liable to have suffered casual disturbance from the time they were first thrown out of the kiln. In Table I and below the unstarred figures show the totals of all sherds in any category; the starred figures the totals of the larger, starred sherds.

The following table, extracted from Table I, shows that the earliest kiln, Kiln III, was used largely, and probably exclusively, for the firing of plain pots and of pots decorated on the rim only.

AREAS W, X1, X AND Y.

	Plain.		Rim only decorated.		Total.		Decorated.		Total.	
	I.		II.		I + II.		III.		I + II + III.	
Number .	68	26*	10	7*	78	33*	29	7*	107	40*
Proportion .	64%	65%	9%	18%	73%	83%	27%	17%	100%	100%

In this table some pots should probably be transferred from col. III to col. II, since, when insufficient of the wall remained to make sure that the decoration was limited to the rim, the pot was classed in col. III. Reference to Table I will show that of the pots from area W, which was beyond the range of any considerable scatter from Kiln II, all the 13 starred examples were either plain or decorated on the rim only; and the same is true of all the 11 examples, starred or unstarred, from area Y1, the oven of Kiln III. From the four areas jointly there were in

all only 7 starred decorated examples, and of these none represents a substantial part of a pot. It may be concluded that the decorated sherds from these four areas are part of the general scatter over the site, and that, at the period of use of Kiln III, decoration, to the extent that it was employed at all, was confined to decoration of the rim. This accords with observation in the excavation of these areas; the depth of soil precluded any useful record by measurement of the heights at which sherds were found, but decorated sherds were noted to occur above the original floors.

The rim-forms of pots fired in Kiln III are shown in the following table.

AREAS W, X1, X AND Y1: PLAIN AND RIM-ONLY-DECORATED VESSELS.

	Simple rim.	Thickened or everted rim.	Flat rim.	In-bevelled rim.	Out-bevelled rim.	All rims.
	I.	II.	III.	IV.	V.	I-V.
Number .	22 4*	12 5*	24 13*	15 7*	5 4*	78 33*
Proportion	28% 12%	15% 15%	32% 40%	19% 21%	6% 12%	100% 100%
Sizes* .	1:3:-:-	-:2:1:2	3:2:4:4	-:3:1:3	-:-:3:1	4:10:9:10

Note.—The figures for size show the number of starred pots of which the internal rim diameters fall within the following groups: under 6"; 6-8"; 8-10"; 10" and over. The diameters of the unstarred sherds are not generally determinable sufficiently closely to be quoted.

It will be seen that 58 per cent. of the pots were 8 inches or more in internal diameter and 30 per cent. were 10 inches or more. These larger vessels had their rims strengthened by thickening and flattening, the flat surface being most often horizontal (flat-rimmed), but sometimes forming an internal bevel (in-bevelled); the out-bevelled rim, which became common later, was hardly, if at all, developed at the stage of Kiln III. Simple rims were substantially confined to small pots.

The walls of the pots were generally nearly vertical, coming in to a round bottom—no flat-bottomed vessels occurred anywhere on the site. A restored example of a vertical-sided bowl is W(1). Wide, shallow bowls of the type presumably used for curd and cheese making were however made and in large sizes. X1(45), (51) and (53) are examples. The only vessel showing a carination, and that an abnormal one, is X1(65); here the wall, though bending outward, returns to its former curve. Shallow grooves on the outer surface below the rim occur in Y1(91), and a cordon below the rim in W(5). A type of jar sloping inward to a narrow neck, and presumably a storage jar, is represented by Y1(93) and becomes common at a later stage of the site. Broadly it may be said that the generality of pots from Kiln III were of the deep and relatively large type with nearly vertical sides, burnished to reduce porosity, which would serve either for cooking or for storage.

Comparison between the three kilns can be made by tabulating the plain and rim-only-decorated pots from the groups of areas which most closely represent the products of the three kilns; areas Z and O are extracted from the second column, and shown separately in the third column, as likely to show the products of Kiln II with least contamination from the products of Kilns III and I.

PLAIN AND RIM-ONLY-DECORATED POTS.

		W, X1, X, Y1 (Kiln III).	Y, Z, 0, 1 (Kiln II).	Z, 0 (Kiln II).	2, 3 (Kiln I).
Simple rims	Number .	22 4*	20 6*	6 2*	6 3*
	Proportion .	28% 12%	27% 24%	26% 18%	32% 50%
	Sizes .	1:3:-:-	4:1:1:-	1:1:-:-	1:2:-:-
Thickened and everted rims	Number .	12 5*	13 ..	2 ..	5 1*
	Proportion .	15% 15%	18% ..	9% ..	26% 17%
	Sizes .	-:2:1:2	..	..	1:-:-:-
Flat rims	Number .	24 13*	5 1*	3 1*	4 ..
	Proportion .	31% 40%	7% 4%	13% 9%	21% ..
	Sizes .	3:2:4:4	-:-:1:-	-:-:1:-	..
In-bevelled rims	Number .	15 7*	28 14*	10 8*	3 1*
	Proportion .	19% 21%	38% 56%	44% 73%	16% 17%
	Sizes .	-:3:1:3	3:5:3:3	1:3:2:2	-:1:-:-
Out-bevelled rims	Number .	5 4*	7 4*	2 ..	1 1*
	Proportion .	6% 12%	10% 16%	9% ..	5% 17%
	Sizes .	-:-:3:1	1:2:1:-	..	-:-:1:-
All rims	Number .	78 33*	73 25*	23 11*	19 6*
	Proportion .	100% 100%	100% 100%	100% 100%	100% 100%
	Sizes .	4:10:9:10	8:8:6:3	2:4:3:2	2:3:1:-
	Proportion of all pots from area	73% 83%	34% 29%	25% 26%	44% 40%

Looking at the last line of this table it will be seen that the proportion of plain and rim-only-decorated pots to total pots falls, in starred figures, from 83 per cent. in the Kiln III areas to 29 per cent. in the Kiln II areas and to 25 per cent. in the two areas which most clearly represent Kiln II. The proportion from Kiln I areas is intermediate. We know on structural grounds that Kiln II displaced Kiln III; and also that it displaced Kiln I, though not necessarily immediately. We can now infer on typological grounds that Kiln I was intermediate between Kilns III and II, though its period of use could have coincided with the later period of Kiln III or with the earlier period of Kiln II or with both those periods. The more detailed comparisons which follow will tend to show that Kiln I was in use, as an open hearth, during the earlier part of the life of Kiln II.

Looking at the proportions of the several rim-types, it will be seen that the flat-rimmed, and generally large, vessel which was predominant in Kiln III has been replaced by an in-bevelled type, which has become the standard large pot in Kiln II. Reference to the tables will show that the practice of decorating the rims of otherwise plain pots has ceased. Simple-rimmed pots continued to be made in Kiln II, but, as previously, they are small vessels. The out-bevelled rim, which became the dominant type among the large decorated pots from Kiln II, rarely occurs among the plain pots. The figures for Kiln I suggest that that kiln was used for firing small pots, most commonly simple-rimmed.

The shapes of the decorated pots from Kilns II and I can be studied in the

following table; in this table areas Z and 0 are extracted from the first column and shown as a sub-group in the second column, as giving the purest sample of Kiln II for comparison with the Kiln I areas 2 and 3.

DECORATED POTS: KILNS II AND I.

		Areas Y, Z, 0, 1 (Kiln II).		Areas Z, 0 (Kiln II).		Areas 2, 3 (Kiln I).	
Simple rims	Number . . .	6	..	..	..	3	2*
	Proportion . .	4%	..	..	..	12%	22%
	Sizes . . .	..	..	..	..	2:-:-:-	
Thickened and everted rims	Number . . .	14	5*	7	2*	1	..
	Proportion . .	10%	8%	10%	6%	4%	..
	Sizes . . .	1:3:-:1		-:1:-:1		..	
Flat rims	Number . . .	25	15*	8	5*	6	3*
	Proportion . .	18%	25%	11%	16%	25%	33%
	Sizes . . .	1:9:5:-		-:2:3:-		-:1:2:-	
In-bevelled rims	Number . . .	8	2*	5	1*	5	3*
	Proportion . .	6%	3%	7%	3%	21%	33%
	Sizes . . .	1:-:1:-		1:-:-:-		-:1:2:-	
Out-bevelled rims	Number . . .	56	29*	30	18*	4	1*
	Proportion . .	39%	48%	43%	56%	17%	11%
	Sizes . . .	4:10:10:5		3:7:4:4		-:-:-:1	
Unstan bowl types	Number . . .	33	10*	20	6*	5	..
	Proportion . .	23%	16%	29%	19%	21%	..
	Sizes . . .	1:4:4:1		1:1:4:-		..	
All types	Number . . .	142	61*	70	32*	24	9*
	Proportion . .	100%	100%	100%	100%	100%	100%
	Sizes . . .	8:26:20:7		5:11:11:5		2:2:4:1	

It will be seen that the dominant type of decorated pot in Kiln II is one with out-bevelled rim; these pots are generally large, and include straight-sided storage jars such as Y1 from 51/32 (Pl. II, 2 and fig. 6), as well as a class of ridged storage jars to be studied below. Flat-rimmed pots occur commonly in all areas, though they have diminished in areas Z and 0, and are of only medium size; they include a class of flanged bowl which is also to be studied below. Pots with in-bevelled rims, which are common in Kiln I, have almost disappeared in Kiln II; the small, simple-rimmed pot hardly occurs in Kiln II, and in neither kiln are pots with thickened or everted rims common. The Unstan bowl type will be studied below.

It appears from the starred figures for areas 2 and 3 in the last two tables that a third of the pots attributable to Kiln I were simple-rimmed small vessels. Small pots can be effectually fired on an open hearth, since they can be well covered by the fuel; they suffer less than large pots do by that unevenness of firing temperature which, rather than low-firing temperature, is the weakness of open firing. Some larger pots (6 inches diameter and over) were however fired

in Kiln I, and of the six starred examples two are flat-rimmed, two in-bevelled and two out-bevelled. The numbers are small, but the notable rarity of the types which are dominant in Kiln II, namely in-bevelled plain types and out-bevelled decorated types, should imply that the kiln went out of use much earlier than Kiln II. At the same time its plain types do not correspond with those of Kiln III, in which flat-rimmed vessels predominated. The most likely conclusion is that Kiln I was an open hearth, used, mainly for small pots, during the early period of the use of Kiln II.

Three classes of decorated vessels are sufficiently distinctive to be recognised from their fragments and isolated as specific types. They are first, the hemispherical bowl some 6 inches in internal diameter with broad flange rim; the rim is commonly a flat rim, but sometimes slightly bevelled, and is covered with decoration, usually in concentric rows; the body of the bowl is covered with decoration. Characteristic examples are Y3, Y19 (fig. 6) and Z34 (fig. 7); a restored example is vessel 11 from Unival chamber tomb. The second class is the ridged storage jar, a large and deep vessel with the wall commonly slightly in-sloping and sometimes strongly so; the upper part of the wall is strengthened by ridges, which divide the decoration into zones, and the decorated rim is usually out-bevelled, though sometimes flat. Examples are 1.1, which is restored (Pl. IV, 1), 1.30 (fig. 8) and 0.1 (fig. 7). The third class is the Unstan bowl, a very shallow vessel with sharp carination and nearly vertical rim and usually 7 to 9 inches in diameter; both base and rim are extremely thin, and the rim is covered with decoration. A restored example is 0.48 (Pl. III, 2). These delicate bowls may have served for curd or cheese making.

The distribution of these three classes is as follows.

DISTRIBUTION OF FLANGED BOWLS, RIDGED JARS AND UNSTAN BOWLS.

		W, X1, X, Y1.	Y, Z, 0, 1.	2, 3.	All areas.
Flange-rim bowls	Number .	5 2*	12 8*	2 1*	19 11*
	Proportion .	26% 18%	63% 73%	11% 9%	100% 100%
	Sizes .	1:1:-:-	1:5:2:-	-:1:-:-	2:7:2:-
Ridged jars	Number .	.. ..	13 13*	.. ..	13 13*
	Proportion .	.. ..	100% 100%	.. ..	100% 100%
	Sizes .	.. ..	-:5:6:2	.. ..	-:5:6:2
Unstan bowls	Number .	3 ..	33 10*	5 ..	41 10*
	Proportion .	7% ..	81% 100%	12% ..	100% 100%
	Sizes .	.. ..	1:4:4:1	.. ..	1:4:4:1

The occurrence of flanged bowls in all areas might imply that they were made throughout the history of the site. None however come from area Y1 and no starred example from area W—that is from the areas which show with least contamination the scatter from Kiln III; the reasons already given for believing that that kiln produced only plain and rim-only-decorated pots seem to hold good. It is probable that the flanged bowl belongs only to Kilns I and II; perhaps only to Kiln II, for 8 out of the 11 starred examples derive from areas Y and Z. The ridged jars derive wholly from areas Z, 0 and 1 and were evidently fired in Kiln II. Minute fragments of Unstan bowls were found scattered in all areas except Y1, but starred examples were limited to the four areas in column 2, half

of them from area 0. In this area at 43/28/3, that is in the right-hand corner of the oven of Kiln II, the sherds of the restored bowl 0(48) were found in a group, and it may be inferred that Unstan bowls were fired in Kiln II only, and up to the date of the site's abandonment.

The following table correlating rim-form, size and decoration from all areas gives an overall picture of the products of the kilns and emphasises some of the conclusions already reached above.

ALL AREAS: RIM-FORM, SIZE AND DECORATION.

		Plain.	Rim only decorated.	Decorated.	Total.
		I.	II.	III.	I + II + III.
Simple rims	Number .	47 12*	1 1*	11 2*	59 15*
	Proportion .	80% 80%	2% 7%	19% 13%	100% 100%
	Sizes .	6:5:1:-	-:1:-:-	2:-:-:-	8:6:1:-
Thickened and everted rims	Number .	29 6*	1 ..	18 5*	48 11*
	Proportion .	60% 55%	2% ..	38% 45%	100% 100%
	Sizes .	1:2:1:2	..	1:3:-:1	2:5:1:3
Flat rims	Number .	28 11*	5 3*	41 22*	74 36*
	Proportion .	38% 31%	7% 8%	55% 62%	100% 100%
	Sizes .	3:2:4:2	-:-:1:2	2:12:8:-	5:14:13:4
In-bevelled rims	Number .	38 17*	8 5*	18 7*	64 29*
	Proportion .	59% 59%	12% 17%	28% 24%	100% 100%
	Sizes .	3:6:3:5	-:3:1:1	2:1:3:1	5:10:7:7
Out-bevelled rims	Number .	11 7*	2 2*	66 31*	79 40*
	Proportion .	14% 17%	3% 5%	84% 78%	100% 100%
	Sizes .	1:1:5:-	-:1:-:1	4:11:10:6	5:13:15:7
Unstan bowl types	Number .	.. ..	.. ..	41 10*	41 10*
	Proportion .	.. ..	.. ..	100% 100%	110% 100%
	Sizes .	.. ..	.. ..	1:4:4:1	1:4:4:1
All rims	Number .	153 53*	17 11*	195 77*	365 141*
	Proportion .	42% 38%	5% 8%	54% 55%	100% 100%
	Sizes .	14:16:14:9	-:5:2:4	12:31:25:9	26:52:41:22

It will be seen that the largest groups are those with flat, in-bevelled and out-bevelled rims. Attention may be drawn to the concentration of the simple-rimmed group on small, undecorated pots (cups and porringers); of the in-bevelled-rim group on large vessels for cooking or storage, and either plain or decorated on the rim only; and of the out-bevelled-rim group on similar vessels, but decorated. (As this table does not distinguish between areas, the proportions of starred sherds, though given for completeness, do not differ substantially from the proportions of all sherds in the same category, and have no separate significance.)

Of special techniques used in building the pots mention has been made above of ridging; in this technique the wall is thickened to form a ridge on the outside

of the pot, the direction of the wall remaining unchanged. Analogous to this is the false carination on X1.65 already mentioned; here a ridge is made by bending the wall out and in again, after which the direction of the wall continues as before.

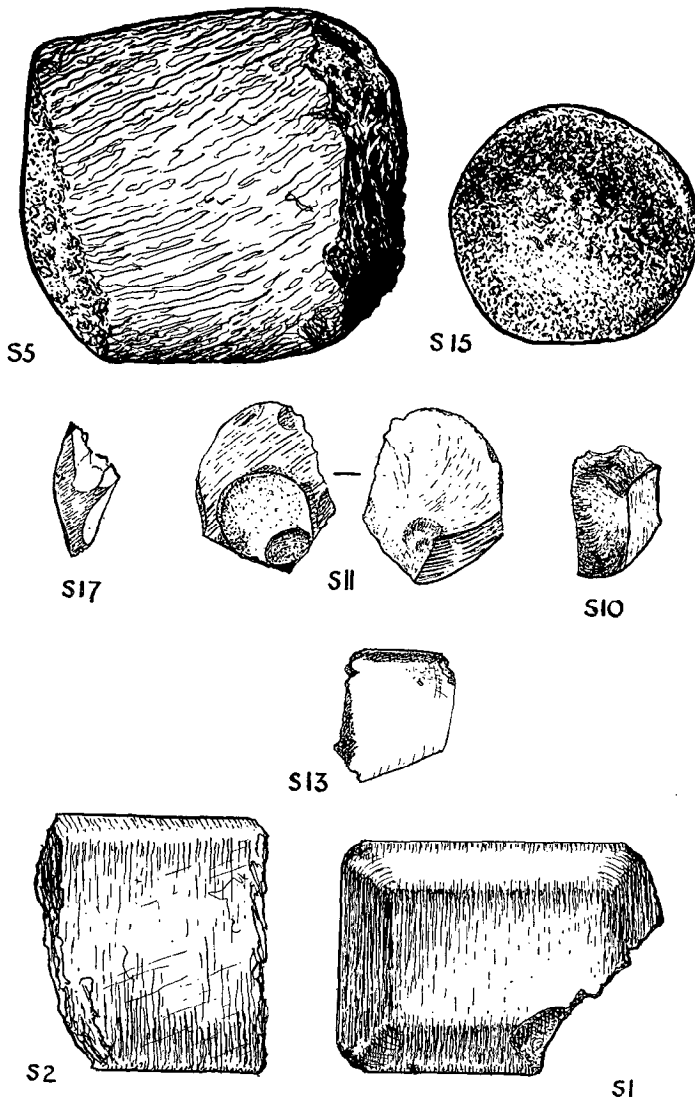


Fig. 12. Pottery-making implements: pounders, scrapers and burnishers. ($\frac{1}{2}$.)

True carination, in which the direction of the wall is sharply altered, occurs in two pots from area 0 with walls bending sharply inward to a narrow neck, in a bowl from area 2 which is otherwise like a flanged bowl, and in the hollow-necked restored pot 2(3). This last (Pl. III, 1) is the only definite example from the site of the deep bowl with hollow neck which is a characteristic Western Neolithic

type. There are two small bowls represented only by carinated shoulder sherds from areas Z and 1. Generally it may be said that carination only occurs in decorated vessels, and that it is very rare except in Unstan bowls. These were made in two parts, the base being pressed out to a remarkable thinness in a mould, while the nearly vertical rim was shaped and decorated on a turntable; when the two parts had been dried leather-hard they were luted together with slip, the sharp carination at the junction concealing any imperfection in fit.

A number of plain pots have a single horizontal cordon. Examples are W(5) and Z(39), the latter from below the hearth of Kiln II and evidently preceding that kiln. The use of cordons, no doubt as a means of strengthening heavy pots, continued during the life of the site, and scattered examples in which the rim is missing come from areas X1, Y, 0, 2 and 3. Exceptionally finer cordons may be luted on to decorated pots, examples being the large jar 1(33) and a fragment without rim from area Z. Lugs are rare; horizontal ledge lugs occur on a plain pot from area X1 and on 0(41), while the bowl 2(34) has an abnormal decorated lug with a double piercing of the wall.

The decorative technique almost universally used is grooving, the grooves being usually sharply and deeply cut. Wider and shallower grooving of the nature of finger-tip fluting occurs thrice on rims: on Y1(91), Y(7) and an unstarred pot from area Y. Two similar broad and shallow grooves below the rim occur on Y1(91) and on Y1(99). Diagonal fluting appears on the hollow neck of 2(2) and on the body of 0(39). Sometimes the grooving is narrow and merges into incised technique, examples being X(3), Y(8), Y(9) and three unstarred sherds from areas Y and 1, but incision occurs freely only on Unstan bowls. Examples of abnormal techniques which occur only quite exceptionally are shown in Pl. V, 1 and 2). There are six examples of very fine incision from areas Y, 1 and 2. Dots and jabs are substantially used only for roughening the bottoms of large pots, but occur with decorative intent on the outer edge of the rim-bevel of Y(65) and of a sherd from area 0; the erratic jabs on the otherwise plain wall of Y(20) may have a decorative purpose; the all-over impressions on a sherd from area 0 are presumably mere roughening. A sherd from the rubbish-heap shows parallel lines punctuated by dots, another parallel lines of dashes and another lines of jabs. Finally there are four examples of techniques of the stab-and-drag type, and a fifth was found by Dr Beveridge and illustrated by him opposite p. 222 of his book. A bold use of this technique is seen on Z(7) and a sherd from area Y; two sherds of Unstan bowls from areas Z and 2 have grooves made by partial lifting of the grooving tool, though not sufficiently to make the grooves look discontinuous when seen in a normal light.

Patterns are ordinarily rectilinear, but significant use of curvilinear decoration occurs on pots from areas X, Y, Z and 1. All presumably derive from Kiln II.

It has been said that the bases of the Unstan bowls were moulded and the rims made on a turntable. Moulding seems to have been in use throughout the history of the site, characteristic examples of the method being not only Unstan and flanged bowls, but also the plain bowl X(35). This last is of fine fabric with small grits, burnished inside and out over a black slip; the regularity and thinness of its wall shows that it was pressed into a mould, the rim being made separately and luted on. The use of the turntable appears also to have extended over the life of the site, though many pots were made without it. Its use is most easily identified in decoration; the groups of horizontal lines on Unstan bowls, and the ridges dividing the concentric decoration on the rims of flanged bowls, could not be so firmly and accurately drawn without a turntable. In a number of cases

however the flat or bevelled rims of plain vessels clearly deriving from Kiln III have been trimmed on a turntable; examples are the bowl X(35) mentioned above and, from area X1, (38), (57), (51) and (70). These differ from the rims shaped by hand in that, though they are not always regular, their departures from regularity are gradual, caused by the shaping tool being allowed to sag as the pot revolved, with the result that the angle of the bevel slowly changes. In

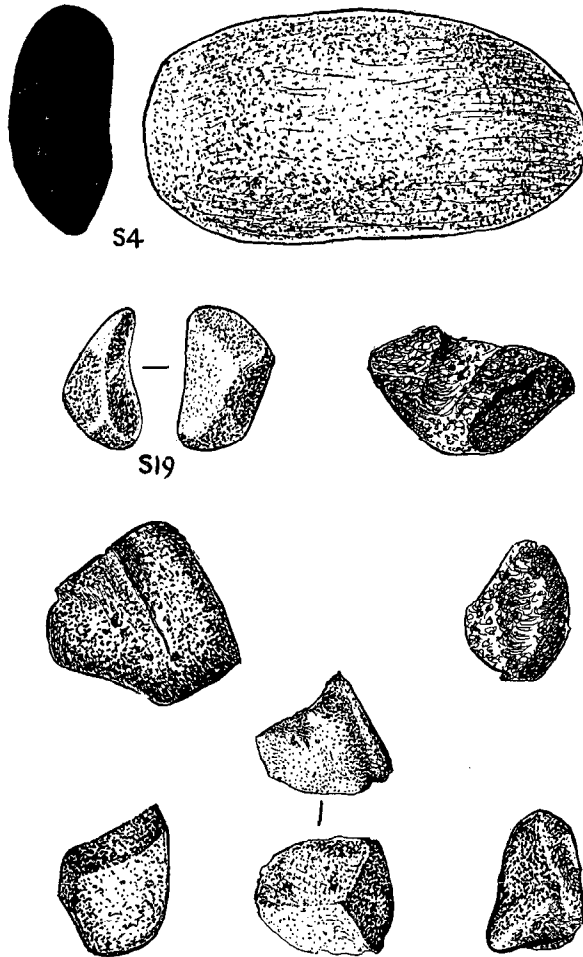


Fig. 13. Pottery-making implements: pounder, and pumice tools. ($\frac{1}{2}$.)

some cases, such as X1(47), striæ left by the shaping tool are seen on the flat rim surface. Probably all the flattened rims coming to thin edges overhanging the wall either inwards or outwards demand the use of a turntable.

Burnishing is more difficult to study, since very many sherds have suffered some measure of surface disintegration whilst lying in the soil; the disintegration is virtually complete on sherds from the rubbish-heap and lying below the loch-level. These sherds apart, the examination of the material shows that burnishing

of the exterior took place on nearly all pots, no doubt to diminish their porosity. It was done on a slip of fine clay, which conceals the grit in the body, and, on decorated pots, over the decoration. It was presumably done when the pot was leather-hard and one would expect the turntable to be used; the marks of the burnishing tool, though generally horizontal, do not however show this decisively. The slipping and burnishing of the inside of pots is less common, and the slip is often thinner and the burnishing less complete. Unstan bowls and other wares of fine hard pottery seem always to be burnished inside, as do also ridged storage jars—presumably to prevent fermentation developing in the milk or grain placed in them. Large, plain pots capable of being used either for cooking or for storage are often burnished inside, but by no means universally; and the same seems to be true of flanged bowls. In the case of cooking-pots internal burnishing was perhaps of the less importance in that the pores would in any event rapidly fill up with grease.

The grit used in the making of the pots was examined by Dr Phemister, whose report is in Volume LXXVI of the *Proceedings* at p. 131. The grit derived from the native rocks and was doubtless obtained from the loch beach. As noted by Dr Phemister the grit was intentionally ground fine, and the sizes varied between different types of vessel. Only the smallest sizes were used for fine wares; the coarser grits used for the large pots were generally fairly uniform, though occasionally a few large fragments got in. In the case of cooking-pots a gritty body would reduce the risk of breakage on the hearth.

The source of the clay used is not known, though it was presumably on the shores of the loch. A specimen of the two piles of clay found on the site was examined by the late Dr H. H. Thomas, who reported it to be a tufaceous clay either formed in a marshy spot or washed subsequently by water; it was free of charcoal and ash. While it was not possible to show that it had been washed by human agency, the piles are obviously of human origin, and it is highly probable that they represent material awaiting use by the potter at the time the site was abandoned.

APPENDIX III.

Catalogue of Objects of Flint, Stone and Pumice.

I am much indebted to Dr Charles McBurney for examining and describing the objects listed below; as also to Dr P. A. Sabine for identifying the sources of a number of stone objects.

Flint, Chert and Quartz.

<i>Number.</i>	<i>Area.</i>	
F1	Y	End-scraper of dark flint.
F2	Y	End-scraper of white flint with cortex.
F3	0D	Fragment of trimmed blade of light grey flint, perhaps knife.
F4	Y	<i>Lames écaillées</i> ("chisel flakes").
F7	0	Fragment of small trimmed blade subsequently turned into <i>a lame écaillée.</i>
F8	X	<i>Lame écaillée</i> showing heavy signs of use ($1" \times \frac{5}{8}"$).

TABLE I.—ANALYSIS OF RIM SHERDS BY AREA, RIM SHAPE AND RIM DIAMETER.

		I. Undecorated.						II. Decorated on rim only.						Totals I + II.	III. Decorated.						Totals I + II + III.		
		Simple rims.	Thickened and everted rims.	Flat rims.	In-bevelled rims.	Out-bevelled rims.	All rims.	Simple rims.	Thickened and everted rims.	Flat rims.	In-bevelled rims.	Out-bevelled rims.	All rims.		Simple rims.	Thickened and everted rims.	Flat rims.	In-bevelled rims.	Out-bevelled rims.	Unstan bowls.	All rims.		
W	Number	4 3*	4 3*	6 3*	1 1*	2 1*	17 11*	.. ..	.. ..	1 1*	2 1*	.. ..	3 2*	20 13*	.. ..	.. ..	3 ..	1 ..	1 ..	1 ..	6 ..	26 13*	
	Proportion	24% 27%	24% 27%	35% 27%	6% 9%	12% 9%	65% 85%	.. ..	.. ..	33% 50%	67% 50%	.. ..	12% 15%	77% 100%	.. ..	.. ..	50% ..	17% ..	17% ..	17% ..	23% ..	100% 100%	
	Sizes	1:2:-:-	-:2:-:1	2:-:1:-	-:-:-:1	-:-:1:-	3:4:2:2	.. ..	.. ..	-:-:1:-	-:1:-:-	.. ..	-:1:1:-	3:5:3:2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	3:5:3:2	
XI	Number	6 ..	5 2*	7 3*	3 2*	2 2*	23 9*	.. ..	.. ..	1 1*	1 1*	.. ..	2 2*	25 11*	2 ..	1 ..	2 ..	2 2*	3 1*	.. ..	10 3*	35 14*	
	Proportion	26% ..	22% 22%	30% 33%	13% 22%	9% 22%	66% 64%	.. ..	.. ..	50% 50%	50% 50%	.. ..	6% 14%	72% 78%	20% ..	10% ..	20% ..	20% 67%	30% 33%	.. ..	28% 22%	100% 100%	
	Sizes . . . . .	.. ..	-:-:1:1	-:2:-:1	-:-:1:1	-:-:2:-	-:2:4:3	.. ..	.. ..	-:-:-:1	-:-:-:1	.. ..	-:-:-:2	-:2:4:5	.. ..	.. ..	.. ..	1:-:-:1	-:1:-:-	.. ..	1:1:-:1	1:3:4:6	
X	Number	8 ..	2 ..	5 3*	3 1*	.. ..	18 4*	.. ..	1 ..	1 1*	1 ..	1 1*	4 2*	22 6*	.. ..	2 ..	5 4*	2 ..	2 ..	2 ..	13 4*	35 10*	
	Proportion	44% ..	11% ..	28% 75%	17% 25%	.. ..	52% 40%	.. ..	25% ..	25% 50%	25% ..	25% 50%	11% 20%	63% 60%	.. ..	15% ..	39% 100%	15% ..	15% ..	15% ..	37% 40%	100% 100%	
	Sizes . . . . .	.. ..	.. ..	-:-:2:1	-:1:-:-	.. ..	-:1:2:1	.. ..	.. ..	-:-:-:1	.. ..	-:-:-:1	-:-:-:2	-:1:2:3	.. ..	.. ..	1:2:1:-	.. ..	.. ..	.. ..	1:2:1:-	1:3:3:3	
YI	Number	4 1*	.. ..	3 1*	3 ..	.. ..	10 2*	.. ..	.. ..	.. ..	1 1*	.. ..	1 1*	11 3*	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	11 3*	
	Proportion	40% 50%	.. ..	30% 50%	30% ..	.. ..	91% 67%	.. ..	.. ..	.. ..	100% 100%	.. ..	9% 33%	100% 100%	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	100% 100%	
	Sizes	-:1:-:-	.. ..	1:-:-:-	.. ..	.. ..	1:1:-:-	.. ..	.. ..	.. ..	-:1:-:-	.. ..	-:1:-:-	1:2:-:-	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1:2:-:-	
W	Number	22 4*	11 5*	21 10*	10 4*	4 3*	68 26*	.. ..	1 ..	3 3*	5 3*	1 1*	10 7*	78 33*	2 ..	3 ..	10 4*	5 2*	6 1*	3 ..	29 7*	107 40*	
XI	Proportion	32% 15%	16% 19%	31% 38%	15% 15%	6% 12%	64% 65%	.. ..	10% ..	30% 43%	50% 43%	10% 14%	9% 18%	73% 83%	7% ..	10% ..	35% 57%	17% 29%	21% 14%	10% ..	27% 17%	100% 100%	
X	Sizes	1:3:-:-	-:2:1:2	3:2:3:2	-:1:1:2	-:-:3:-	4:8:8:6	.. ..	.. ..	-:-:1:2	-:2:-:1	-:-:-:1	-:2:1:4	4:10:9:10	.. ..	.. ..	1:2:1:-	1:-:-:1	-:1:-:-	.. ..	2:3:1:1	6:13:10:11	
YI	Sizes . . . . .	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Y	Number	8 3*	10 ..	1 ..	11 4*	4 3*	34 10*	.. ..	.. ..	1 ..	3 2*	1 1*	5 3*	39 13*	5 ..	5 2*	15 8*	3 1*	14 5*	5 1*	47 17*	86 30*	
	Proportion	24% 30%	29% ..	3% ..	32% 40%	12% 30%	40% 34%	.. ..	.. ..	20% ..	60% 67%	20% 33%	6% 10%	45% 43%	11% ..	11% 12%	32% 47%	6% 6%	30% 29%	11% 6%	55% 57%	100% 100%	
	Sizes	2:-:1:-	.. ..	.. ..	2:1:-:1	1:1:1:-	5:2:2:1	.. ..	.. ..	.. ..	-:1:1:-	-:1:1:-	-:2:1:-	5:4:3:1	.. ..	1:1:-:-	1:6:1:-	-:-:1:-	1:1:3:-	-:-:-:1	3:8:5:1	8:12:8:2	
Z	Number	3 2*	1 ..	2 ..	4 3*	1 ..	11 5*	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	11 5*	.. ..	5 2*	6 4*	1 ..	14 8*	6 1*	32 15*	43 20*	
	Proportion	27% 40%	9% ..	18% ..	36% 60%	9% ..	26% 25%	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	26% 25%	.. ..	16% 13%	19% 27%	3% ..	44% 53%	19% 7%	74% 75%	100% 100%	
	Sizes	1:1:-:-	.. ..	.. ..	-:1:-:2	.. ..	1:2:-:2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1:2:-:2	.. ..	-:1:-:1	-:2:2:-	.. ..	1:2:2:3	-:-:1:-	1:5:5:4	2:7:5:6	
0	Number	3 ..	1 ..	1 1*	6 5*	1 ..	12 6*	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	12 6*	.. ..	2 ..	2 1*	4 1*	16 10*	14 5*	38 17*	50 23*	
	Proportion	25% ..	8% ..	8% 17%	50% 83%	8% ..	24% 26%	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	24% 26%	.. ..	5% ..	5% 6%	11% 6%	42% 59%	37% 29%	76% 74%	100% 100%	
	Sizes . . . . .	.. ..	.. ..	-:-:1:-	1:2:2:-	.. ..	1:2:3:-	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1:2:3:-	.. ..	.. ..	-:-:1:-	1:-:-:-	2:5:2:1	1:1:3:-	4:6:6:1	5:8:9:1	
1	Number	6 1*	1 ..	.. ..	4 ..	.. ..	11 1*	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	11 1*	1 ..	2 1*	2 2*	.. ..	12 6*	8 3*	25 12*	36 13*	
	Proportion	55% 100%	9% ..	.. ..	36% ..	.. ..	31% 8%	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	31% 8%	4% ..	8% 8%	8% 17%	.. ..	48% 50%	32% 25%	69% 92%	100% 100%	
	Sizes	1:-:-:-	.. ..	.. ..	.. ..	.. ..	1:-:-:-	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	1:-:-:-	.. ..	-:1:-:-	-:1:1:-	.. ..	-:2:3:1	-:3:-:-	-:7:4:1	1:7:4:1	
Z	Number	6 2*	2 ..	3 1*	10 8*	2 ..	23 11*	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	23 11*	.. ..	7 2*	8 5*	5 1*	30 18*	20 6*	70 32*	93 43*	
	Proportion	26% 18%	9% ..	13% 9%	43% 73%	9% ..	25% 26%	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	25% 26%	.. ..	10% 6%	11% 16%	7% 3%	43% 56%	29% 19%	75% 74%	100% 100%	
	Sizes	1:1:-:-	.. ..	-:-:1:-	1:3:2:2	.. ..	2:4:3:2	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	2:4:3:2	.. ..	-:1:-:1	-:2:3:-	1:-:-:-	3:7:4:4	1:1:4:-	5:11:11:5	7:15:14:7	
Y	Number	20 6*	13 ..	4 1*	25 12*	6 3*	68 22*	.. ..	.. ..	1 ..	3 2*	1 1*	5 3*	73 25*	6 ..	14 5*	25 15*	8 2*	56 29*	33 10*	142 61*	215 86*	
	Proportion	29% 27%	22% ..	6% 5%	37% 54%	7% 14%	32% 26%	.. ..	.. ..	20% ..	60% 67%	20% 33%	2% 3%	34% 29%	4% ..	10% 8%	18% 25%	6% 3%	39% 48%	23% 16%	66% 71%	100% 100%	
	Sizes	4:1:1:-	.. ..	-:-:1:-	3:4:2:3	1:1:1:-	8:6:5:3	.. ..	.. ..	.. ..	-:1:1:-	-:1:1:-	-:2:1:-	8:8:6:3	.. ..	1:3:-:1	1:9:5:-	1:-:1:-	4:10:10:5	1:4:4:1	8:26:20:7	16:34:26:10	
2	Number	5 2*	5 1*	3 ..	3 1*	1 1*	17 5*	.. ..	.. ..	1 ..	.. ..	.. ..	2 1*	19 6*	3 2*	1 ..	6 3*	5 3*	4 1*	5 ..	24 9*	43 15*	
	Proportion	29% 40%	29% 20%	18% ..	18% 20%	6% 20%	40% 33%	.. ..	.. ..	50% ..	.. ..	.. ..	5% 7%	44% 40%	12% 22%	4% ..	25% 33%	21% 33%	17% 11%	21% ..	56% 60%	100% 100%	
	Sizes	1:1:-:-	1:-:-:-	.. ..	-:1:-:-	-:-:1:-	2:2:1:-	.. ..	.. ..	.. ..	.. ..	.. ..	-:1:-:-	2:3:1:-	2:-:-:-	.. ..	-:1-2:-	-:1:2:-	-:-:-:1	.. ..	2:2:4:1	4:5:5:1	

NOTE.

Numbers.—The unstarred numbers give the total vessels under each category; the starred numbers give the totals, included in the former totals, of vessels represented by rim sherds 2 inches or more in dimension.

Proportions.—The proportions given in columns other than Total columns are the percentages of the totals for the group (I or II or III); the proportions in the Total columns are the percentages of the totals for the three groups (I + II + III).

Sizes.—The figures give the numbers of vessels of which the internal rim diameters fall within each of the following groups: under 6 inches; 6-8 inches; 8-10 inches; 10 inches and over. Only starred vessels are included since the smaller rim sherds give no useful rim diameter.

- F 9 1D Medial fragment of leaf-shaped arrow-head, tip and base missing ($\frac{3}{4}$ " wide and perhaps originally $1\frac{1}{4}$ " long).
- F10 1D Core made on thick broken flake ($1\frac{3}{4}$ " \times $1\frac{3}{8}$ " \times $\frac{3}{4}$ "). Dorsal surface used for removals about $\frac{3}{4}$ "—mainly thick coarse bladelets struck with hard hammer-stone.
- F11 VI Scrapers or scraper-utilised flakelets. The first five range from an end-scraper on a cortical flake to a minute nose-scraper, and three are certainly trimmed by pressure with a pointed bone flaker of some kind (1 " \times $1\frac{1}{8}$ " to $\frac{3}{4}$ " \times $\frac{3}{4}$ "). The last two are small flakelets with similar trimming or utilisation; one, struck from a core similar to F10, shows traces of heavy polished utilisation prior to being struck off core.
- F12 A
- F13 2B
- F14 2A
- F15 2C
- F16 2C
- F17 Y
- F19 2C A small trimmed flakelet (1 " \times $\frac{5}{8}$ ") showing polished utilisation identical with above.
- F20 2B Small fragment of thick flake showing accentuated point comparable to group F11 to F18, or possibly a borer.
- F21 VI Thick triangular flake ($1\frac{1}{2}$ " \times $1\frac{1}{8}$ ") with deep rough scars removing bulb, and traces of utilisation along one margin.
- F22 2C Rectangular flake with wedge section, with one long margin battered with use and the opposite pressure-trimmed ($1\frac{7}{8}$ " \times $1\frac{1}{8}$ ").
- F23 X Fragments of large thin cortical flakes with one carefully trimmed margin.
- F24 VI
- F25 1D Small side-scraper on triangular flake ($1\frac{1}{2}$ " \times $1\frac{1}{4}$ ").
- F26 XI Narrow cortical flake with trimming by pressure down both margins ($1\frac{1}{2}$ " \times $\frac{3}{4}$ ").
- F27 XI Narrow flakelet similarly treated ($1\frac{5}{8}$ " \times $\frac{1}{2}$ ").
 Thirty-nine small flakes and fragments without secondary fractures of any kind, and one flake of chert, varying from $1\frac{1}{2}$ " to $\frac{1}{4}$ " in length. Two of the flakes are possibly *lames écaillées*. Some flakes are burnt.
 Very numerous flakes of quartz, of which some are certainly humanly struck.

Stone (fig. 12).

- | Number. | Area. | |
|---------|-------|---|
| S1 | VI | Nearly rectangular plano-convex object of fine-grained argillaceous siltstone polished all over and bevelled along the edges of the convex face. Two flakes about 1 inch long have been struck from one end across the flat face, one showing signs of utilisation—perhaps gouging or scraping—around the sharp edge. The convex surface shows signs of hammering, which has resulted in removing one corner of the specimen. Subsequent to the removal of the two flakes, but not of the corner, there has been some rubbing of the flat face. One corner shows signs of use as a hammer-stone. The flaking probably took place in antiquity. (This rock has perhaps been slightly metamorphosed and might be matched among the Torridonian pebbles found in the drift of the Hebrides.) ($3\frac{1}{2}$ " \times $2\frac{1}{2}$ " \times $\frac{3}{4}$ ".) |

Number.	Area.	Stone. (fig. 12)—contd.
S 2	2A	Flat parallel-sided object of banded sandy phyllite with both ends broken off; polished all over both faces and its unbroken edges. (This specimen may have been derived from the drift, its ultimate source being the mainland.) ($2\frac{3}{4}$ " broad, $\frac{3}{4}$ " thick.)
S 3	ZE	Flat oval pebble of altered dolerite possibly regularised by grinding. (This may have been derived from one of the local minor quartz dolerite intrusions and is perhaps an altered tholeite.) ($2" \times 1\frac{1}{8}" \times \frac{3}{4}"$.)
S 4	Y	Flat oval pebble of medium-grained arkosic sandstone polished all over and its flat faces slightly hollowed; probably a rubbing implement. (This specimen may have been derived from the Torridonian deposits in the Stornoway district or from boulders of Torridonian sandstone in the drift; these being originally derived from the mainland.) ($4\frac{3}{4}" \times 2\frac{1}{2}" \times 1\frac{1}{4}"$.)
S 5	Z	Three heavy elongated cobbles (one broken) with convex rounded surface artificially produced by hammering or pecking at both ends ($5\frac{1}{4}" \times 3\frac{3}{4}" \times 2\frac{1}{2}"$; $3\frac{3}{4}" \times 3" \times 2"$; $3\frac{1}{4}" \times 4" \times 3"$).
S 6		
S 7		
S 8	ZD	Possible unfinished example of the same ($3\frac{3}{4}" \times 3" \times 2\frac{1}{4}"$).
S 9	0	Struck flake of mylonitised gneiss veined by flinty-crush. (Unsectioned specimen; can be matched locally.) ($2\frac{1}{2}"$ long.)
S10	0D	Struck flake of flinty-crush. (This rock can be matched amongst the flinty-crush belt of the eastern side of the Outer Hebrides.) ($1\frac{1}{2}"$ long.)
S11	Y	Struck flake of fine-grained argillaceous siltstone from artificially polished object showing traces of trimming into a scraper. (This rock can probably be matched among the Torridonian pebbles in the drift of the Hebrides.) ($1\frac{3}{4}"$ long.)
S12	0D	Struck flake of serpentinised peridotite from artificially polished object. (Rocks of the type of this and the next specimen may be matched with types occurring as minor intrusions in the Lewisian gneiss of Harris and North Uist.) ($1\frac{1}{2}"$ long.)
S13	Z	Fragment of polished axe of serpentinised peridotite. (Provenance as S12.) (Originally more than $1\frac{3}{8}"$ wide, $1\frac{3}{4}"$ long and $\frac{1}{2}"$ thick.)
S14	Y	Hammer-stone of vein quartz or quartzite, probably used for flaking. (Unsectioned specimen; can be matched locally.) ($2" \times 1\frac{1}{2}" \times \frac{7}{8}"$.)
S15	1B	Globular implement of granitic gneiss apparently artificially pecked over its whole surface ($2\frac{5}{8}" \times 2\frac{5}{8}" \times 2\frac{1}{4}"$).
S16	ZD	Similar implement of quartz, broken ($3\frac{1}{4}" \times 3" \times 1\frac{1}{2}"$).
S17	X	Small fragment of thick flake of porcellanite showing accentuated point comparable with group F11 to F18 above, or possibly a borer; apparently a fragment of a large polished and ground object, perhaps an axe. (This specimen contains abundant aggregates of fine-grained often opaque hæmatite and perhaps spinel set in an exceedingly fine-grained groundmass containing abundant needles of mullite or sillimanite. The rock closely resembles porcellanites from Tievebulliagh, Co. Antrim, and from Rathlin Island.) ($1\frac{3}{8}"$ long.)

- S18 X1 Flat pebble with characteristic hammer-stone utilisation on margin at two points ($2\frac{1}{2}'' \times 2\frac{1}{4}'' \times \frac{3}{8}''$).
- S19 X1 Pebble of soft and rather coarse stone hollowed by artificial abrasion ($1\frac{1}{2}'' \times 1'' \times \frac{3}{4}''$).

Pumice (fig. 13).

Twenty-nine pumice objects with rounded and sometimes concave surfaces and grooves due to artificial abrasion.

General Note by Dr McBurney.—The flaking technique is crude and shows no signs of true blade-making with a punch in the normal Upper Palæolithic to Neolithic fashion. The flakelets are all struck with a hard percutor, no doubt similar to the one preserved (S14). The trimming however is characteristically "Neolithic" in its use of pressure flaking in minute regular squills, undoubtedly carried out with some sort of hand-punch or flaker similar to that in use among the Esquimaux and Australian Blackfellows.

The polished utilisation is interesting as it can only have resulted from rubbing against some relatively soft substance such as wood or leather. True intentional grinding is only to be detected on S17, where the technique, curvature and raw material all suggest that it is a very small re-worked piece of a ground axe.

The most characteristic tools of the series are the pressure-flaked thumb-nail and nose scrapers, clearly forming a single class quite distinct from the larger and less standardised flake-scrapers, followed by the *lames écaillées*, and the single specimen of leaf-shaped arrow-head.

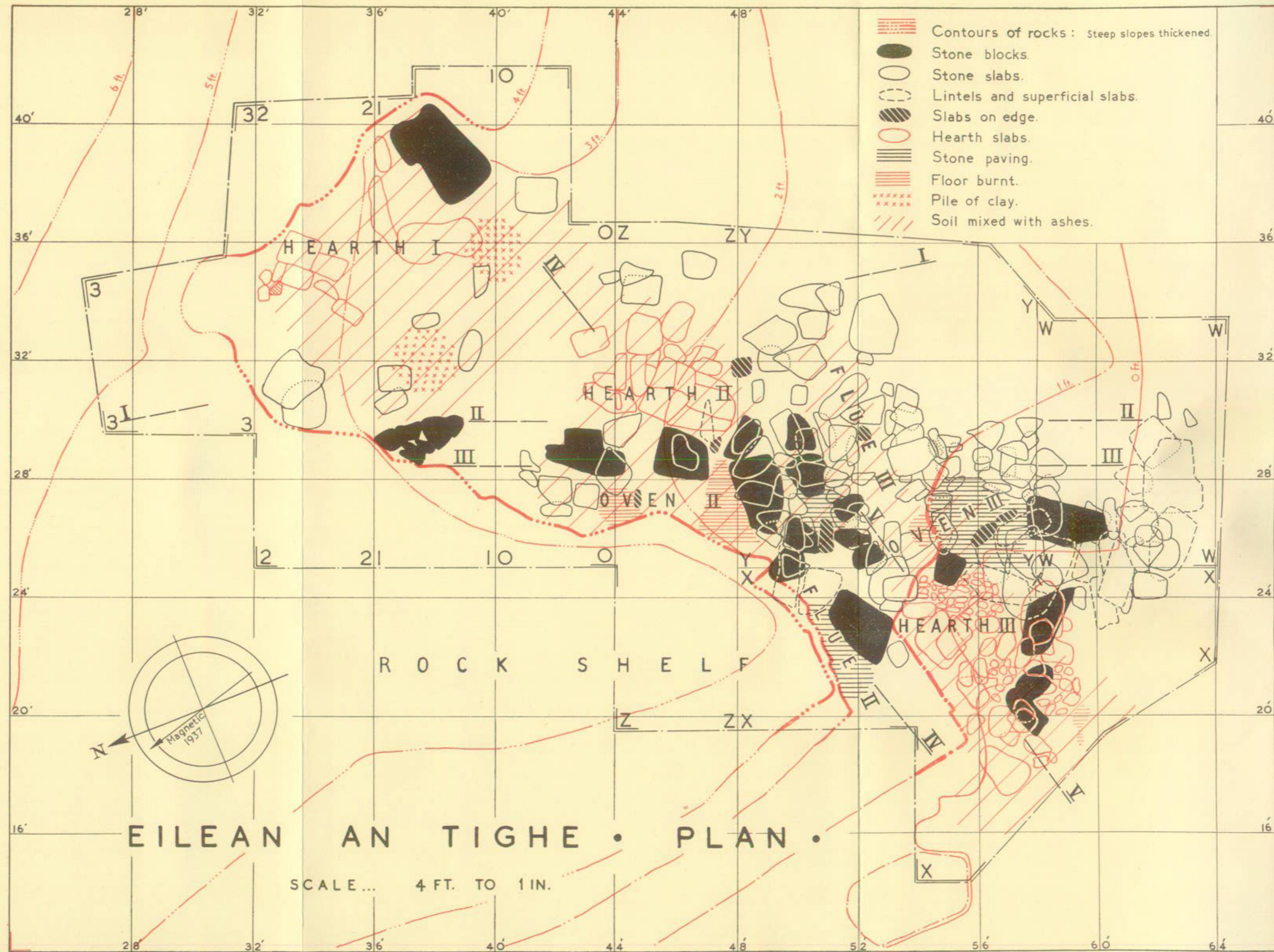
Distribution.

The distribution of flint flakes shows merely a general scatter over the site. The distribution of tools is as follows.

DISTRIBUTION BY AREA OF TOOLS OF FLINT, STONE AND PUMICE.

	W.	X.	X1.	Y.	Z.	0.	1.	2.	3.	VI.
Flint	2	2	5	..	3	3	7	..	4
Stone	1	2	3	5	3	1	1	..	1
Pumice	1	3	5	4	8	..	..	..	6

Flint tools are thus fairly distributed over the site, including the rocky boss (area VI). Stone and pumice tools are concentrated in areas X1, Y, Z and 0 and, in the case of pumice tools, in area VI.

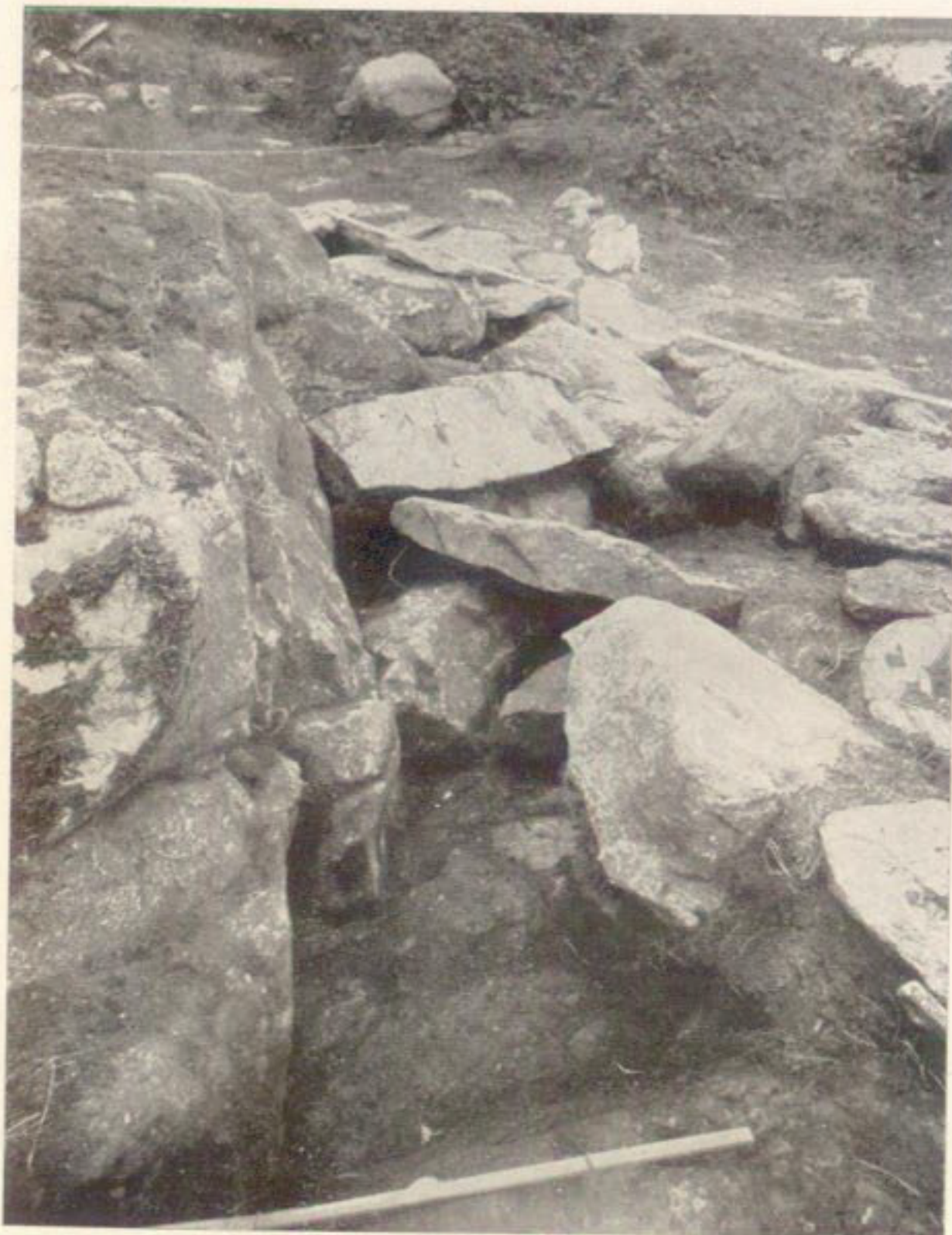


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Fig. 10. Plan of kilns, with contour superimposed.



1. Kiln II reduced to its main structural elements, looking west; rock shelf behind.
(Tape is along Y = 30.)



2. Flue of Kiln II looking east towards the hearth;
on the left the rock shelf.



1. South part of oven of Kiln III during excavation, looking south; in foreground the south wall of the flue of Kiln II.



2. Storage jar from Kiln II (fig. 6, Y1). ($\frac{1}{3}$.)



1. Storage jar from Kiln I (fig. 9, 2.3). ($\frac{1}{3}$.)



2. Unstan bowl from Kiln II (0.48). ($\frac{1}{3}$.)
[See p. 7.]



1. Ridged storage jar (fig. 8, 1.1). ($\frac{1}{3}$.)



2. Clay wads from Kiln II (area Z). ($\frac{3}{4}$.)



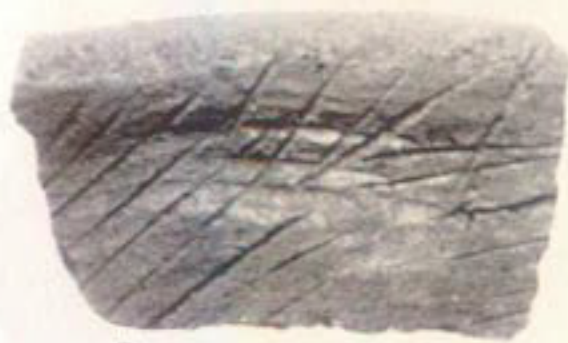
1



6



2



3



4



5



1. Abnormal techniques. Fine incision: nos. 1 and 3, area Y; nos. 2, 4 and 5, area 1.
 Roughening: no. 6, area O. (3.)



1



3



4



2



5

2. Abnormal techniques. Dotted: no. 1, rubbish heap; no. 2, area Y. Stab-and-drag types:
 no. 3, area Y; no. 4, area 2; no. 5, area Z. (3.)

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