

VIII.

A STONE AGE SITE AT WOODEND LOCH, NEAR
COATBRIDGE.*Read May 10, 1948.*

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I. THE SITE. By J. M. DAVIDSON.

In January 1932 Mr William McLean, Low Palacecraig, by Airdrie, exhibited to the Glasgow Archæological Society some 18 flint and chert chips which he had picked up about twenty years previously on the north side of Woodend Loch, in the parish of Old Monkland, about two miles north-west of Coatbridge. He discovered no more on later visits to the place, but he retained his finds for their geological interest.

Some time later I went over the ground carefully and picked up a few flakes both of flint and chert. I have since kept the site under constant observation and think I have established an important station. All credit, however, must go to Mr McLean for being the first to recognise the presence of flint and chert in unusual surroundings.

The country to the north and east of Glasgow, south of the Kelvin valley, is for the most part covered with boulder-clay arranged in smooth, gently rounded ridges or drumlins, whose long axes have a general west and east direction, inclining slightly north of east towards Lenzie and Chryston and south of east as they approach Coatbridge.¹

Woodend Loch is one of a cluster of five, all situated within an area of about two square miles, some seven to nine miles east of Glasgow (fig. 1). In extent Woodend is only exceeded by the Bishop Loch. The surrounding country is gently rolling, characterised by the smoothly rounded knolls referred to, these seldom rising much above the 300-foot contour. Many of the knolls are tree-clad, and the lower levels are marked by bog and peat.

¹ *The Economic Geology of the Central Coalfield of Scotland, Area J* (1926), p. 156.

The arable land rests upon boulder-clay which is commonly deepest on the ridges and sometimes thin or, sometimes over small spaces, absent in the intervening hollows.¹

The loch lies at the southern base of a drumlin crowned by Woodend

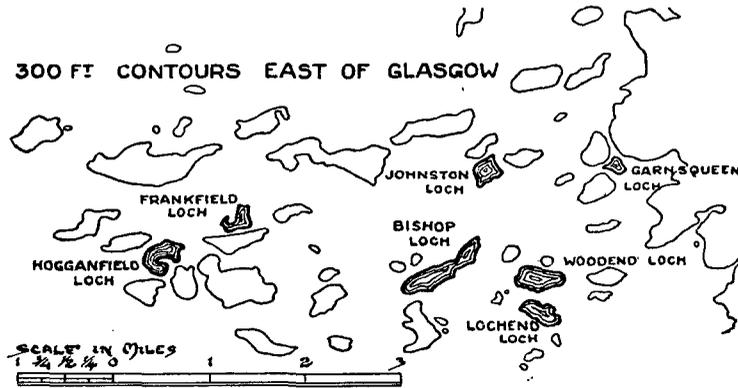
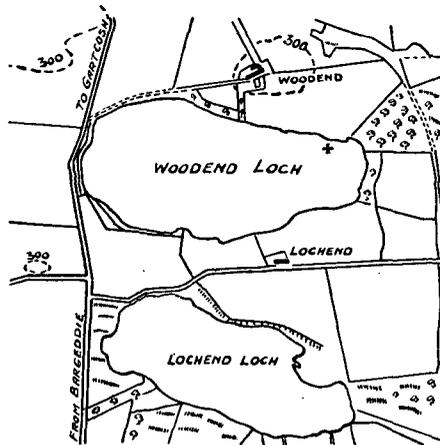


Fig. 1.

Farm. It is roughly oval in shape, the major axis running east and west, being about half a mile long and the minor axis about a quarter of a mile wide.



By permission of H.M. Ordnance Survey.

Fig. 2.

Its area is slightly more than 50 acres. Water-level is noted as 253 feet above O.D.²

Woodend Loch (fig. 2 and Pl. XVII, 1) and the neighbouring sheets are larger examples of the drift-dammed tarns which were formed in Central

¹ *The Economic Geology of the Central Coalfield of Scotland, Area J* (1926), p. 156.

² Ordnance Survey Map of Scotland, one inch to the mile, 1932, Sheet 73.



1. Woodend Loch from North: site in central foreground.

[Photo: Dr J. K. St Joseph.]



2. The \times at the water's edge indicates the position of the site.

Scotland during the final stages of the Glacial Period.¹ Countless of these lochans east of Glasgow are now filled with peat.² A considerable part of the area wherein lies Woodend Loch is covered with peat, proved in places to be 15 and 23 feet thick, and observed to abound in roots of Scots fir (*Pinus sylvestris*) and oak.³

Mr McLean told me that he had picked up his specimens along a band bordering the loch at its north-east end from the point where a belt of trees extends from Woodend Farm to the water's edge as far as the east end of the loch, say 350 yards. The area of my discoveries, however, is much more localised, being covered by a loch marginal length of about 100 yards to a width of some 10 yards, the central portion of the site being about 250 yards east of the woodland strip (Pl. XVII, 2).

The level of the water has varied about 18 inches during the period of my investigation. Since the north bank of the loch is comparatively flat over some 40 yards between high-water mark and the foot of the drumlin, a rise in water-level floods part of this area which is always swampy. In such conditions of high water research was at its worst. On the other hand, with an appreciable fall of water-level a considerable area of sand and shingle became exposed, and on this most of the finds were made. Hence, due to the proximity of the water, conditions though never very favourable improved when the water was low. A great number of pieces were recovered from the bed of the loch itself, some being reached from the bank, others by improvised stepping-stones and many more by wading; but even so conditions varied greatly. If the slightest wind were blowing, sufficient only to ripple the surface, it was well-nigh impossible to detect minute relics on the gravel bed six or nine inches under water. On the other hand, when the surface was mirror-calm the clear water helped through an apparent magnification of the pebbles at the bottom. For long, also, a slimy silt was driven on the northern shore and made examination impossible. Besides, the steady growth of plants on the water bordering the shore hampered the exploration, as did water-borne debris deposited on the margin. During the period of observation the shingle was rarely above water, but when this shrank the search was still carried on, with the result that over many years I have made a fair accumulation of over 800 stone articles. Seldom was scrutiny entirely unrewarded, but the finds were more numerous after stormy weather when wave action stirred the gravelly bed. Low-water periods after heavy rainfall were also propitious, because the exposed surface was washed anew and revealed new facets, much as a gentle wind on the Culbin Sands causes fresh surfaces to be exposed and brings renewed hope to the searcher.

The sparse sand appears to be derived from a grey sandstone flat bed

¹ *Mem. Geol. Survey, Scotland*, Glasgow District (1925), p. 237.

² *Ibid.*, p. 234.

³ *Ibid.*

which outcrops in the loch. A number of the relics are stained brown, indicating that the relic bed had become overlaid with a peat growth.

Few materials served the manufacturers of the artifacts. They include flint of various shades, brown, green and black chert, and mudstone, the first apparently being scarce in the locality. Dr James Phemister has recognised the chert as radiolarian. The dearth of flint compelled the extensive use of chert at Woodend. This material is neither so tractable nor so serviceable as flint, and considering that the nodules of chert are mostly battered pieces, apparently from boulder-clay, one could hardly find a less promising stock for the manufacture of tools. Thus, variety of basic materials so common in Scottish stone industries has had to give way to expediency in utilising what was available.

A few early specimens were submitted to Mr A. D. Lacaille, who, recognising the significance of the site, urged that it be explored "to the last chip." Permission was readily granted by the Directors of Woodend Minerals, Ltd., the landowners, and by Mr James Dunbar, Woodend Farm, the tenant. To them thanks are due for their generous co-operation.

Several sections were cut, but owing to the proximity of the loch, even in the most favourable conditions, the removal of the turf was at once followed by such an infiltration of water as to render deeper digging hopeless. It may therefore be stated that all the relics were recovered either on the surface or within a few inches of it.

Owing to the continued high level of the water, conditions have for some years rendered systematic excavation impossible.

Several features, however, already emerge. They are interesting, because the aspect of the industry as a whole proclaims that the economy of the settlers on the shores of Woodend Loch was that of Mesolithic food-gatherers.

The site is on the sunny southern exposure of a gently sloping hill on the edge of a small inland loch. In discussing the nature of the sites occupied by the Mesolithic people, Dr J. G. D. Clark writes: ¹ "At least it is quite certain that sandy regions were peculiarly adapted for the mode of life pursued by the people who made the microlithic industries of Britain—whereas the sandy areas definitely attracted the Mesolithic peoples and the clay lands definitely repelled them." The Woodend site is in sharp contrast to this dictum. Lacaille, on the other hand, has noted ² that "up till now (1936) microliths recorded from Scottish sites have consisted of finds from the surface of rich agricultural lands, or in sandy areas," with the qualification that some Tweedside implements exposed by the plough are stated to have come from 12 inches of sandy clay resting upon gravel. At the same time he reports his discoveries by excavation of microliths in sand overlying

¹ *The Mesolithic Age in Britain* (1932), pp. 88-9.

² *Proc. Soc. Ant. Scot.*, vol. lxx. (1935-36), p. 422.

river gravel at Birkwood, Banchory. Despite the present lack of stratification at Woodend, the occurrence of stained artifacts suggests grounds for pollen-analysis, the more so that the thick local peat contains remains of trees. This method has yet to be applied to certain investigations connected with the early colonisation of Scotland.

The possibility that the artifacts may have been washed down from a settlement on the southern exposure of the hill overlooking the loch cannot be completely disregarded.

Phemister suggests that the raw materials may have been obtained from far separated localities. The presence of flint together with relatively large quantities of radiolarian chert appears to favour this opinion. The nearest source of supply of this stone is the band formation in southern Lanarkshire, part of the Lower Silurian (Ordovician) found locally from Ballantrae to Berwickshire.

II. PETROLOGY. By JAMES PHEMISTER.

Certain of the chert fragments for examination have been sliced and compared with our collection of radiolarian cherts from the Southern Uplands, and of silicified limestones from the Carboniferous limestone of the Midland Valley.

In general, the green and blackish chert chips from Dryburgh, Ballantrae and Woodend Loch are of a more translucent and clear variety than the great majority of our specimens of Ordovician chert, which are usually dull on fracture. Nevertheless, thin sections made from one chip from each of your localities agree in all essentials with the radiolarian chert sections in our collection. The Woodend Loch chips which you sent include also another type of chert. It is translucent, blackish, and contains organisms which Dr C. F. Stubblefield has identified from the hand-specimen as rectangular sections of crinoid stem columnals and annular sections of sponge spicules. Unfortunately, neither the chips nor their sections show anything by which Dr Stubblefield can determine the geological age of this chert, though he thinks it more probable that it is Carboniferous than Ordovician.

It would therefore appear possible that the Woodend Loch workshop obtained its material from far separated localities, unless the assemblages of different types of chert had already been affected by material agencies. In this connection it is necessary to point out that radiolarian chert is recorded as erratic in the boulder-clay of the Glasgow district (see *Geol. Surv. Mem.*, Glasgow District, 1925, p. 220). Thus, suitable material for working may have been picked from local boulder-clay and gravels.

I have cut your mudstone from Woodend Loch, but found no peculiarity in it which can lead to any identification or comparison. It is a mudstone of

pale colour, the largest particles in it being 0.03 mm. long. Quartz is abundant in it, and so the description "mudstone" is more appropriate than "shale" or "claystone."

III. THE INDUSTRY. By A. D. LACAILLE.

Up till now there has been no record from around Glasgow of stone artifacts assignable on stratigraphy or facies to any of the Early Post-Glacial cultures that have been recognised elsewhere in Scotland. Yet, for reasons we shall see, this region ought to yield examples to amplify our distribution maps and help to solve a number of problems connected with the diffusion of strains antedating the Scottish Neolithic. It is pleasing, therefore, that a collection has been made from a site in the Middle Clyde basin.

That the group has been assembled is particularly gratifying to the present contributor since, in addressing the Glasgow Archæological Society in April 1935¹ on certain industries of Mesolithic facies, he expressed the hope that researches would be instituted in that district.

Owing to the generally inferior quality of the available raw material, we are faced with a set of poor aspect. Nevertheless, apart from improvised tools, none of the artifacts is really atypical. Hence, several suggest a number of cultural links and other considerations. In time, by the application of modern methods and with new discoveries, the Woodend series will be properly assessed and fall into its place.

Since the site came under investigation every piece has been picked up. A fair picture, therefore, can be drawn of the industry and a representative selection figured (figs. 3-5). This includes some specimens of special interest, a few being particularly significant.

The Woodend series is made up of 771 objects. Of these, 385 are definable artifacts, 140 being of green chert and 87 of black chert, 43 of mudstone and 115 of flint. Chips, flake-fragments and rejected struck lumps number 386, thus: 248 green chert and black chert, 83 mudstone and 55 flint. The analysis of the whole group is shown in Table I, p. 84.

The size and quality of the raw material are reflected by the products, mainly flakes and their derivatives. A brown staining indicative of a long sojourn in or under peat has affected a few of the mudstone and all the flint, but none of the chert specimens. Whereas some of the mudstone examples show signs of age, their contemporaries made in other materials are unscathed and in the same state as when they were dropped by their manufacturers and users.

Cores.—1. The knappers seem to have tried out many of the raw nodules. Determining which were tractable, they detached flakes as best they could. Thus we find that most of our cores are of the multi-platform variety. A

¹ *Trans. Glas. Arch. Soc.*, vol. xi. part i. (1937), p. 73.

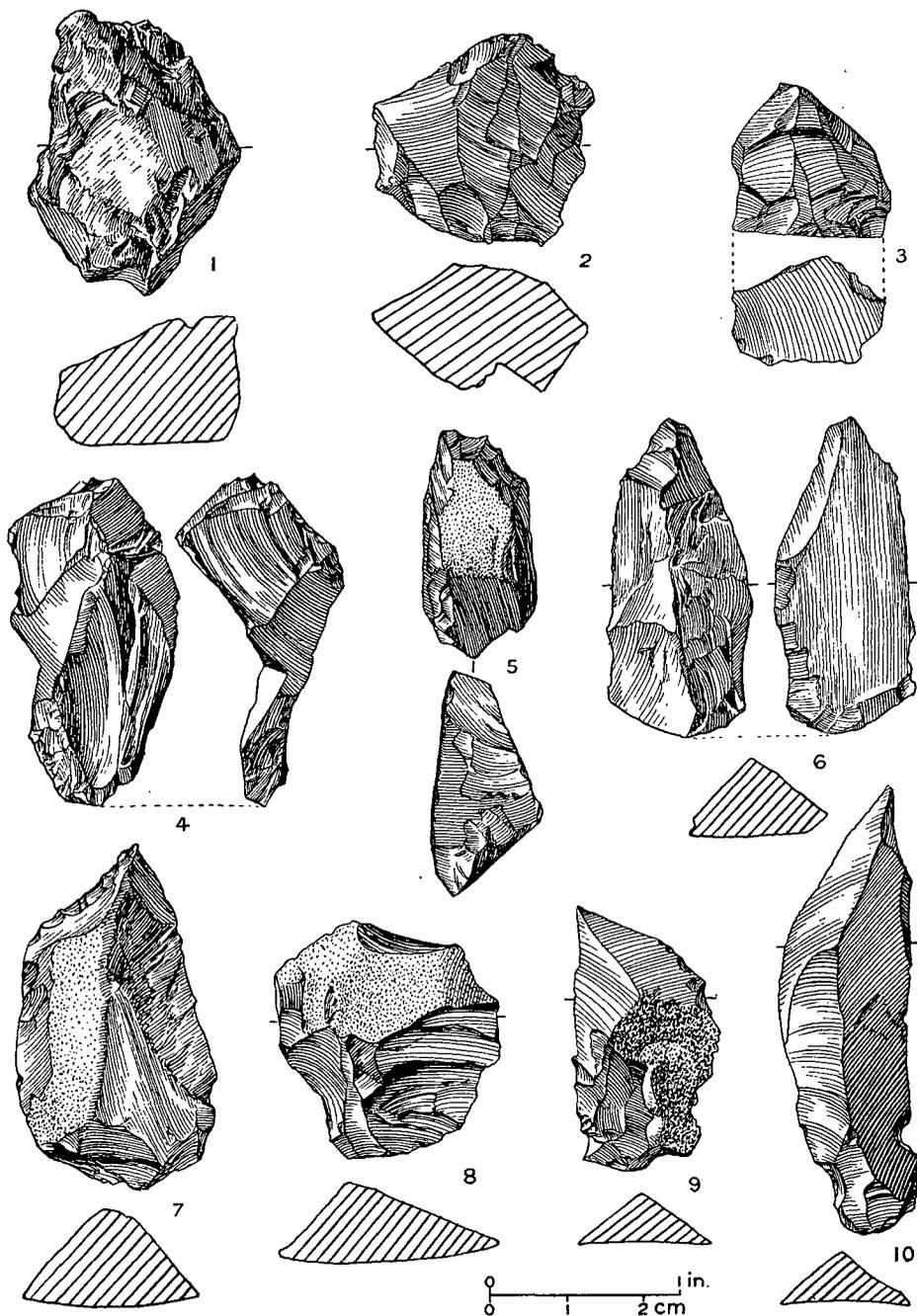


Fig. 3. Woodend Loch site: 1, nodule; 2, 3, cores; 4, core-trimming; 5, 6, picks; 7, split nodule, retouched to point; 8, 9, primary flakes; 10, pointed flake, notched at sides.

TABLE I.—ANALYSIS OF THE WOODEND LOCH INDUSTRY.

		Chert.	Flint.	Mud-stone.	Totals.
Cores	{multi-platform	12	..	..	12
	{single-platform	..	1	..	1
Core-Tools	{picks	..	..	2	2
	{perforators	1	..	..	1
Core-trimmings		29	1	10	40
Flakes	{primary and scarred	71	37	13	121
	{ " " broken {tips	32	14	2	48
	{ " " " {butt-ends	7	16	2	25
	{ with faceted butts	..	1	..	1
Blades	{whole or almost so	34	11	7	52
	{fragments	6	13	1	20
Retouched flakes	{plain	2	..	..	2
	{notched (<i>lames-à-coche</i>)	1	1	..	2
and blades	{ "Larne picks"	1	..	..	1
	{tanged	1	..	1	2
<i>Tranchets</i>		1	..	..	1
Scrapers	{ "thumb-nail"	2	3	1	6
	{end-	7	3	1	11
	{side-	2	1	..	3
Microlithic elements	{compound	3	..	2	5
	{microliths	10	7	1	18
	{micro-burins	2	5	..	7
Gravers	{notched flakes	2	..	..	2
		1	..	..	1
Perforators		..	1	..	1
Totals of definable artifacts		227	115	43	385
Miscellaneous waste (chips; flake-, struck core, and pebble-, fragments)		248	55	83	386
Grand totals		475	170	126	771

characteristic nodule, such as might have been taken from boulder-clay, is illustrated, No. 1, together with another reduced to a core, No. 2, by the removal of flakes from different platforms. Still, when good stone presented itself, the artisan was able to effect the regular removal of flakes. This is evidenced by the pyramidal core of flint, No. 3. It exemplifies the type of core most usually current in a well-developed industry producing fine flakes and blades in the best sorts of stone.

Considering the material, then, it is not surprising that core-trimmings are common in the Woodend collection. They are diversified, and include thick-ridged flakes and pieces struck obliquely or at right angles to the original platforms. In a manner, their abundance and varied shapes and sizes proclaim that the tool-makers sought to utilise to the utmost what material could be got. No. 4 represents a ridged flake the removal of which involved the top and flank of a partly flaked down nodule of green chert. Objects of this kind are always interesting from the technological standpoint,

for they demonstrate the ingenuity of the craftsman, especially when compelled to use poor stone.

2. If the settlers at Woodend converted cores into scrapers by retouching the edges, no specimen has so far been found. However, they did not overlook the possibilities of some thick pieces, as is shown by three examples figured here. A nodule of mudstone, No. 5, has been boldly trimmed along the margins of its steep sides to a pick-like end. Were this piece alone it might not call for further comment, but the presence of a kindred object, No. 6, permits us to place it in a well-defined category of tools. This No. 6, of mudstone, is an unmistakable pick made in a sliced long nodule. It is flaked over the greater part of the upper surface and slightly along an edge of the nether or separation surface to a narrow and fairly thin point. The two implements belong to a class of artifact (mostly worked over one face of coarse flakes) which is a feature in the littoral Mesolithic (Larnian) contexts of north-eastern Ireland and survives in the regional Early Neolithic industries.

The perforator, No. 7, carefully made in the upper half of a split nodule of green chert, may be said to belong to the same category. For similar tools one has also to go to the Early Post-Glacial (Litorina) raised beach of north-eastern Ireland and its equivalent at Campbeltown, Argyll. They occur among the Early Mesolithic industries of Kintyre,¹ in the comparable Early Larnian groups and in the Late Larnian series of County Antrim.²

Primary Flakes and Blades.—1. Although varying in length from 2 cm. to 6 cm., most are about 3 cm. long, and the majority are narrow. Primary pieces consist of corticated *débitage*, e.g. No. 8 of black chert and No. 9 of flint, and pieces struck from cores, as Nos. 11, 12 and 13, respectively of flint, dark green and light green chert. Many of our flakes served with little or no retouch. Thus the flint flake, No. 10, which came away from the core with a fortuitous sharp point, attracted and was notched on both sides near the lower end, probably for hafting. In Nos. 14 and 15, light green and black chert, the right edge is worn, the upper in the case of the thicker dark specimen.

2. The set Nos. 16–20 illustrates well the excellent parallel-sided blades that the Woodend knappers could strike off when the material allowed. Although No. 16, dark green chert, is now broken, when complete was probably quite long, and an unusually large piece for a site where the stone available normally occurred in small nodules. Its companions, respectively of black chert, light green chert and mudstone, are typical. They are worthy of artisans accustomed to working in better material. No. 20, its upper part missing, exhibits considerable wear along the left edge. The

¹ W. J. McCallien and A. D. Lacaille in *Proc. Soc. Ant. Scot.*, vol. lxxv. (1940–41), pp. 74–5, and fig. 4, Nos. 38 and 39.

² W. J. Knowles in *Journ. Roy. Anthr. Inst.*, vol. xlv. (1914), p. 100, and figs. 19, 20, 23, 24 and 29, H. L. Movius, jr., in *Journ. Roy. Soc. Ant. Ireland*, vol. lxxvii. (1937), p. 194, and fig. 4, Nos. 17 and 19.

wide, short No. 21, though contrasting so in size with the delicate long specimen No. 22, yet bears the same feature, namely denticulations along the right edge. Despite their regularity these marks do not betoken true saws, for the attractive indentations are due to wear only.

Many broken flakes and blades have been collected at Woodend. As at some Upper Palæolithic sites where flint was scarce, numbers may have been snapped intentionally in order to use the material as economically as possible.

Retouched Flakes and Blades.—The industry is quite rich in boldly and finely retouched flake-implements. Though simple forms predominate, a few are particularly noteworthy, and give rise to speculation on the age of what is regarded as a homogeneous industry.

1. Among the retouched blades is the middle part of a thick mudstone specimen, No. 23, blunted along the left edge and worked to shallow notches in several places on the right. It is easy to see in this relic, incomplete though it be, a survival of the Aurignacian steeply dressed blade or its notched variant (*lame-à-coche*). This type appears in many Scottish industries of Mesolithic facies, including those of the Tweed valley. Our earliest datable examples, however, have been found in contexts from deposits of the Early Post-Glacial raised beach at the Albyn Distillery, Campbeltown.¹ Their counterparts are present among the products of Early and Late Larnian Culture in north-eastern Ireland.²

2. The next piece, No. 24, of black chert, is outstanding because it is the first specimen of a "Larne pick" to be recorded as found *inland* in Scotland. Until examples were recognised in the Early Mesolithic assemblage recovered by McCallien at the Albyn Distillery, Campbeltown,³ the type had not been reported outside Ireland. The form owes its name to the locality where it abounds at coastal sites. It consists characteristically of a plunging flake retouched at the pointed or bulbar end and sometimes along the edges. That this peculiar sort of implement, which is regarded as the type tool of the Irish Mesolithic (Larnian),⁴ should also be found inland and beside water points to its having answered a need common to strand-loopers and obtaining in certain environments.

3. No. 25, although incomplete, is fortunately preserved in its lower part the width of which has been reduced by trimming on the left edge. Presumably this working was applied to provide the flake with a sort of tang, perhaps for hafting. Thus, we have another type of artifact matching that found in its crudest form in the Mesolithic littoral industries of the Hiberno-Scottish province.⁵ A kindred specimen is represented by No. 26,

¹ McCallien and Lacaille, *op. cit.*, p. 75, and fig. 4, Nos. 45 and 46.

² Hallam L. Movius, *The Irish Stone Age* (1942), p. 155 ff.

³ McCallien and Lacaille, *op. cit.*, pp. 80-1, and fig. 6, Nos. 68 and 69.

⁴ Movius, *op. cit.* (1942), p. 166.

⁵ *Ibid.*, p. 161.

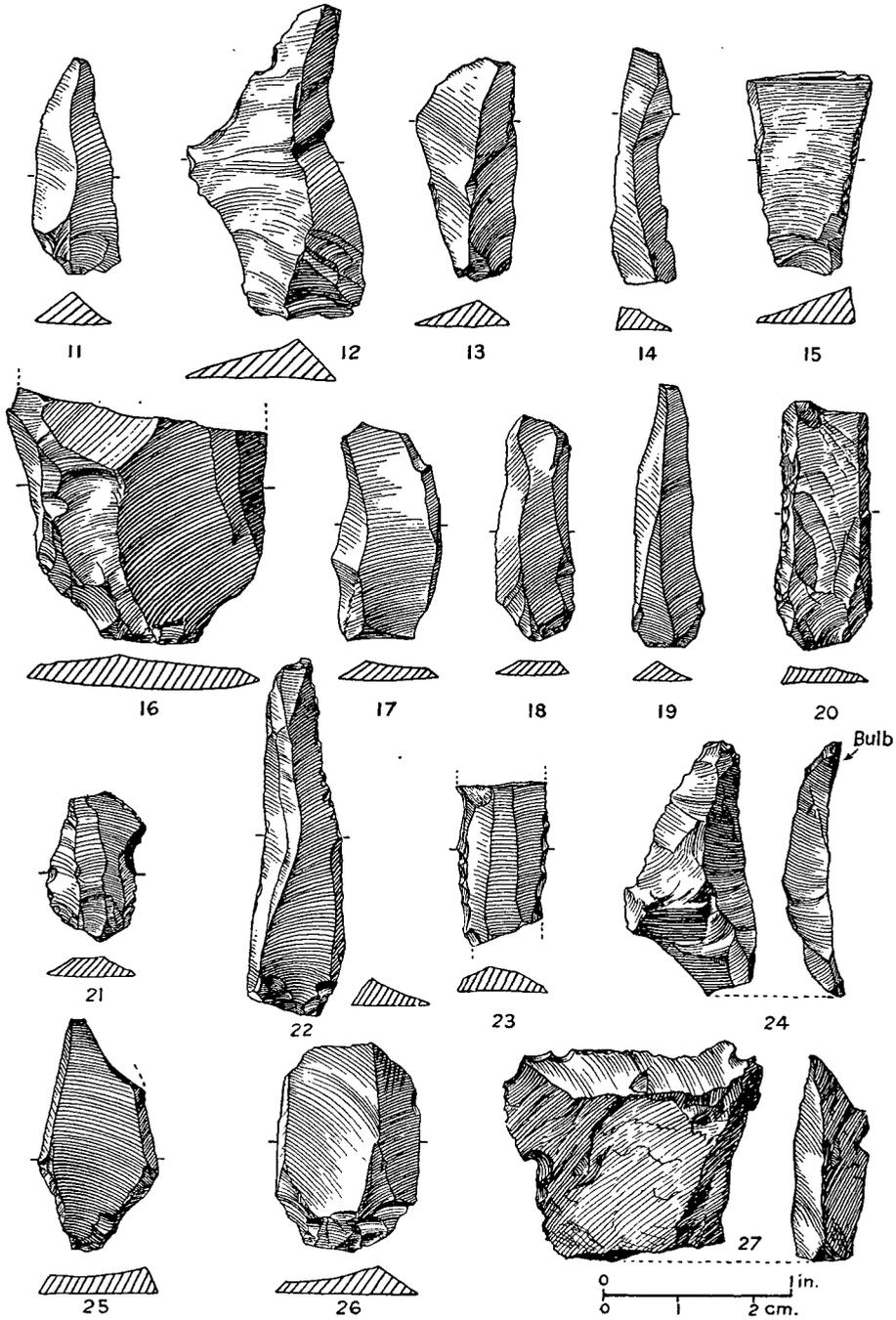


Fig. 4. Woodend Loch site: 11-15, flakes; 16-23, blades; 24, "Larne pick"; 25, leaf-shaped point with constricted base (injured); 26, blade, exhibiting flat retouch at base; 27, tranchet.

of mudstone. The treatment, however, has been more lavish than in No. 25, for the dressing involves both edges at the lower end, and flat retouch has aimed at reducing the thickness of the butt.

It is true that the Early Mesolithic industries of Kintyre include pointed flakes carefully retouched along the margins, but these artifacts do not rank with our Nos. 25 and 26. These are among the first Scottish implements comparing with Bann points, and with their prototypes, which have been brought to the notice of a learned society. I have described more evolved forms belonging to this class from the Ayrshire coast.¹ Suffice it to say, meantime, that the type has a wide geographical range. Besides being distributed on both sides of the North Channel, it is known in the Isle of Man,² and I have reason to believe that it occurs on at least one mainland beach in the West Highlands.

4. Despite the fact that No. 27 is without a fellow in the Woodend series, it is a telling specimen. It is a simple *tranchet* whose characteristic cutting-edge has been achieved by removing a narrow flake transversely to the long axis of the wide but relatively short parent flake. I have already reported *tranchets* from Loch Lomondside,³ but these were heavier pieces, flaked all over and reminiscent of Baltic Forest Culture. Our No. 27, however, belongs to quite another facies, which has been recognised at Ballantrae. There the examples are counterparts of Irish littoral Early Neolithic artifacts, presumably links with the Campignian of France.⁴

Scrapers.—Not unexpectedly, scrapers are numerically the best represented tool-forms at Woodend. They are of different types, but the end-scraper predominates. All the rocks used at the station went to the making of these tools. As a rule their treatment is of the simplest. Thus, the scrapers from Woodend contrast strikingly with the finely dressed implements, especially those from sandy areas, usually assignable on the score of their workmanship to Bronze Age lithic craft.

Few of the Woodend scrapers are made in sizable flakes, and, although it is not always possible to say if the tools were broken after manufacture, yet it is evident that some specimens were made in any convenient piece. This would point to the fact that the local artisans husbanded the best material for certain implements.

1. Taking the end-scrapers first, we see in No. 28, of light green chert, the "thumb-nail" type at the end of a short flake. No. 29, of mottled brown flint, also wrought at the end of a small flake, bears the same kind of fairly steep and rather bold trimming. The black chert object, No. 30, matches the two foregoing as regards the parent material, but its retouch consists merely of edge-blunting. On the other hand, the next in this list, No. 31,

¹ *Proc. Soc. Ant. Scot.*, vol. lxxix. (1944-45), pp. 94-5, and fig. 3, Nos. 31-36.

² J. G. D. Clark, *Proc. Prehist. Soc.* (1935), pp. 74-7, and fig. 6, Nos. 1-5.

³ *Proc. Soc. Ant. Scot.*, vol. lxxiv. (1939-40), pp. 6-9.

⁴ Summarised by Movius, *op. cit.* (1942), pp. 214-9.

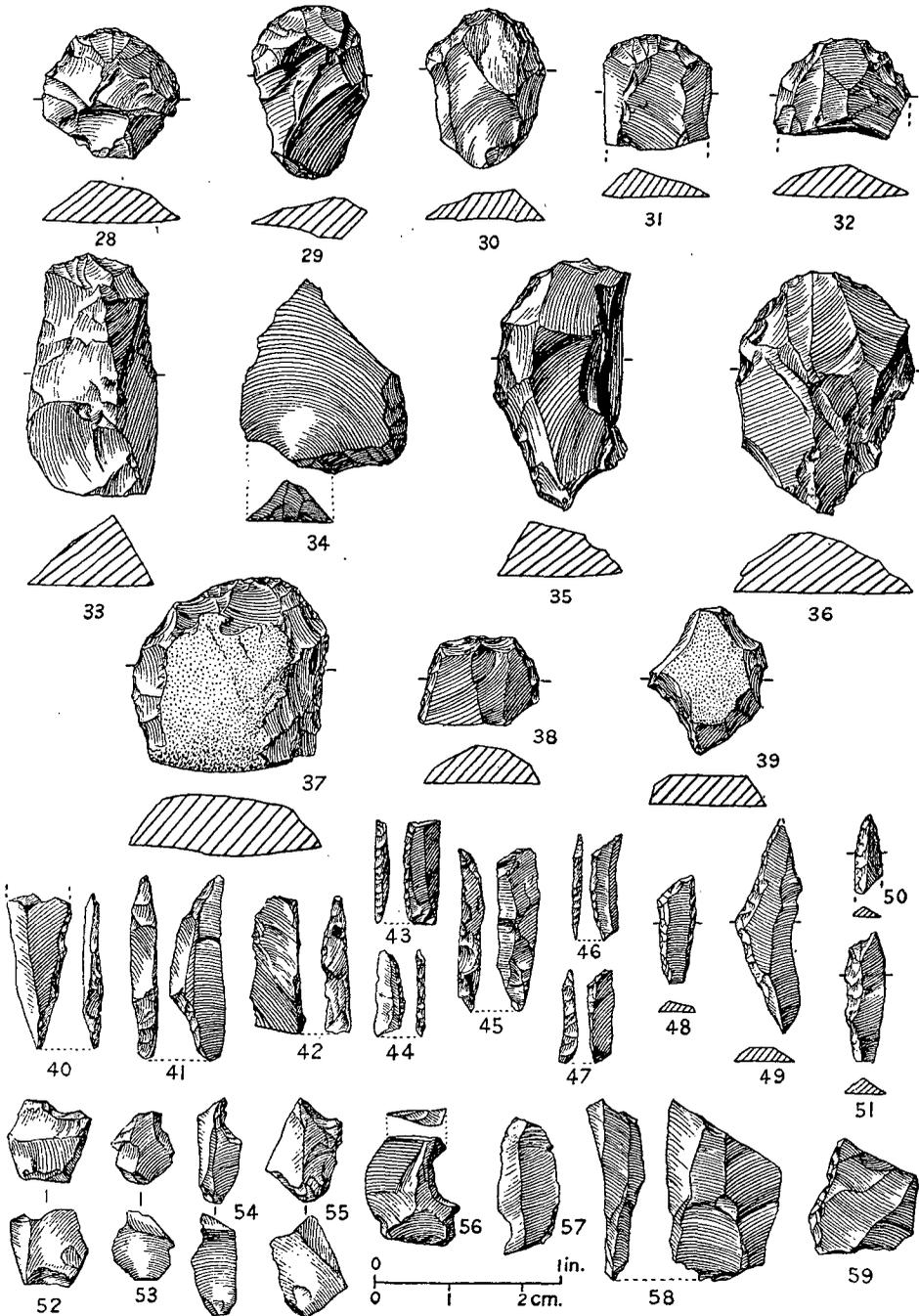


Fig. 5. Woodend Loch site: 28-39, scrapers; 40-57, microlithic elements; 58, graver; 59, perforator.

of flint, is somewhat more finely and more steeply trimmed. This piece seems to have been broken. When complete it was probably a good example of an end-scrapers-on-blade. The accompanying scraper, of black chert, No. 32, however, appears rather to have been made in a flake-fragment. Actually it has three working-edges, that in the middle being steep, and those on either side dressed less elementarily and giving the tool the look of being shouldered. No. 33 is of black chert, and apparently a trimming-flake struck off a core. Its upper end is simply dressed to a rounded working-edge. The steep right side and the inclined left flank provide so good a grip that in No. 33 we have a peculiarly efficient implement.

2. Besides exemplifying a rare shape, the nosed-scrapers No. 34, of flint, is remarkable for its carefully worked edge. In fact, the specimen is primarily a side-scrapers executed on the right side of the bulbar face of a broken flake with a most pronounced swelling of percussion. So symmetrical is the shape of the dressed part that it can hardly be doubted that the implement is as complete as when it left the hands of the manufacturer. Not only is this piece noteworthy for its sloping and really delicate retouch, but also for its faceted butt. This is reminiscent of Levalloisian technique, applied in this instance to impart a scraper-edge to the lower end. Hence we are confronted with a compound tool that includes a butt-end scraper, a form noticed rarely among post-Palæolithic industrial products. Retouching of the butt has long been noted as a feature of commonplace tools in Early Neolithic series in north-eastern Ireland, for example at Glenarm, Co. Antrim.¹

3. No. 35, banded, and brown like the other flints from Woodend, typifies the simple side-scrapers. This example is abruptly trimmed and appears to have seen much service. Being made in a split and resolved flake detached from a multi-platform core, it ensamples the economical use of material. It will be observed that the dressing extends a little round the upper end. This feature is evident too in the next specimen, a side-scrapers of black chert, No. 36, which bears scars of injury on the nether surface at the upper end also, possibly from an attempt to trim. At its lower end, dressing on the lateral edges has reduced the width, probably for the hafting of the finished article.

4. No. 37, fashioned in the upper half of a corticated pebble of light green chert, is a well-made compound scraper whose working-edge involves two lateral and the upper margins. Although morphologically the counterpart of our delicately trimmed pebble-scrapers that especially characterise series from our sandy sites, yet the workmanship expended upon it immediately differentiates No. 37 from these abundant tools of the Bronze Age. Dressing resembling that on No. 37, however, is found in the scrapers of the same

¹ Movius, in *Journ. Roy. Soc. Ant. Ireland*, vol. lxxvii. (1937), p. 206, and fig. 11, Nos. 75 and 76.

shape, made in portions of pebbles, present in the Mesolithic littoral industries on both sides of the North Channel.

5. The last scrapers (Nos. 38 and 39) we need notice are small and of mudstone. No. 38 is dressed steeply on three edges, but it cannot be said if it represents a flake broken before retouch was applied. Its working-end is engrailed like that of its neighbour, No. 39, made in a chip. As the two sides of this artifact are slightly hollowed, we may consider that this scraping-tool combines the end and concave form. These two implements are matched by Early and Late Mesolithic examples from coastal sites in north-eastern Ireland and south-western Scotland.

Microoliths.—The fact that the collection is strong in a microlithic element adds much to the interest of the group from Woodend. Most of the small specimens are still whole, and the lot selected for illustration is representative. The range is not wide, but the features of its constituents are as definitive as they are informative. Despite the poor quality of the stone used here in the manufacture of most of the microliths, the execution of the diminutive artifacts is good.

The question of the material that went to the manufacture of the microliths described is interesting, because one would have expected flint examples to be more numerous. It is all the more unexpected because Tardenoisian micro-burin technique obtained at Woodend. Chert is far less responsive than flint to that method of dividing flakes and preparing the so-called pygmy implements.

1. No. 40 (shown downward because of the disposition of the concentric ripples), of flint, though injured in its upper part, was evidently produced by blunting obliquely the right edge of a blade. In the next artifact, No. 41, of light green chert, the left edge has been abruptly dressed so that the upper part forms an arc and the lower an angle. The piece, therefore, is not to be taken for a geometric form but an elaborated variant of No. 40. The ends of No. 42, of green chert, are wanting. Hence it is impossible to assert what was the shape of the complete implement, the right edge of which is blunted by somewhat coarse working. Originally it may have been like No. 43 of the same material, and transversely truncated and dressed across the top. No. 43, however, has been blunted down the left edge.

The set Nos. 44–48 consists of sub-triangular artifacts. The first specimen, No. 44, is of dark flint, and bears most delicate dressing for almost the whole length of the right edge and completely so across the obliquely truncated base. No. 45, of light green chert, is rather a large example of this kind. In its case the trimming extends almost the whole length of the left edge as well as at the oblique upper end. Nos. 46 and 47, respectively of grey and dark flint, have been similarly treated, but with the difference that the abrupt retouch expended upon them is of the finest. More working

has been given to No. 48, of mudstone, for it involves the two long edges besides that of the truncation.

No. 49, of flint, tends to the isosceles triangular shape without trimming on the long edge. Its neighbour, No. 50, of green chert, a scalene triangle, is the smallest artifact recovered on the shores of Woodend Loch. All its three edges have been included in the retouching process. This carries so far up the flanks toward the ridge that the piece appears to have been flaked all over the upper surface.

Finally we have in No. 51, of light green chert, a form blunted along the lower part of the right edge, wholly down the left and on the edge of the truncated top, which terminates in an exceedingly minute point on the right. Evidently this piece is akin to the sub-triangular microliths.

2. No fewer than nine of the figured microliths, Nos. 40, 44-51, are certainly made in sections of blades divided by micro-burin technique. This establishes Woodend as yet another Scottish site where a method associated with Tardenoisian technique was practised. Save for No. 40, in the preparation of which micro-burin technique was used, it cannot be said how the other broken microliths were manufactured.

The microliths Nos. 41-43 retain the bulb of percussion of the parent, although in some the feature has been all but removed by the lateral retouch. These specimens, therefore, were made in the simple style that is expressed in Upper Palæolithic flake implements with steeply dressed edges. Such pieces are of course common at all our microlithic sites.

Several micro-burins have been collected at Woodend. They are waste resulting from the specialised process of cutting flakes and preparing microliths that is associated with Tardenoisian method. The drawings of the representatives Nos. 52-56 show the characteristic scar on the same plane as the bulb of percussion, with the remains of the notch on the opposite side. The first three examples are of flint, the fourth of light green chert, and the fifth of black chert.

No. 57 might at first glance be taken for a micro-burin. Actually it is the residue of a blade preparatively notched for division by micro-burin technique and fractured by a misapplied blow. This did not fall within the notch as the artisan intended but on the face of the blade. The piece has other claims to notice. In the first place, it differs from its companions in that it consists of the upper and not the bulbar end of a flake. Secondly, the notching shows that it was worked abnormally from the bulbar face.¹ Lastly, the left edge just below the upper angle bears signs of wear if not of retouch.

Being of black chert, Nos. 56 and 57 would be interesting if only because they prove that yet another material used in this industry was responsive to micro-burin technique.

¹ The significance of such pieces is discussed in my "Scottish Micro-burins," *Proc. Soc. Ant. Scot.*, vol. lxxvi. (1941-42), pp. 103-19.

The shapely, finely dressed microliths and the geometric forms rank our Woodend group with the more advanced British Tardenoisian facies which is characterised by narrow products such as are found in the Tweed and Dee valleys and at Ballantrae. Hence the facies of the set is more developed than that represented by the few pieces recovered at Campbeltown. As at other sites, our microliths are part of a comprehensive assemblage. That they are earlier than the Shewalton Moor series appears from the complete absence of more evolved geometric shapes and any implements usually associated with Bronze Age craft.

Graver and Perforator.—Considering that numbers of microliths barbed the bone heads of fishing-gear or weapons of the chase, it is likely that at a lacustrine site like Woodend some of ours were so used. Howbeit, a tool of black chert, No. 58, indicates that the working of bone, if not the working of small wood too, was among the industrial activities of the place. It is a good example of angle-graver manufactured in a broken flake. Its cutting-edge is formed by the intersection of two graver-facets, that on the left being backed against a short one imposed on the convenient obliquely fractured edge. Another implement, No. 59, of flint, steeply retouched on both sides of a flake-fragment to a short chisel-like working-end, belongs to a category of perforators. It might conceivably have served as a graver also.

The Cultural Affinities of the Woodend Industry.—There is much that is new to Scottish archæology in the Woodend industry. It is unfortunate, therefore, that at this juncture the industry cannot be critically dated since palæobotanical and other natural factors are wanting. Meantime, typology and other aspects are helpful guides.

As indicated in the foregoing, three cultural facies appear. These are (a) the Larnian of the Hiberno-Scottish province and (b) the Tardenoisian, both Mesolithic, and (c) the Early Neolithic of north-eastern Ireland. They are represented respectively by: (i) artifacts of shapes current on the coasts of north-eastern Ireland and south-western Scotland; (ii) microliths and micro-burins of the types met with at several Scottish sites, the nearest to Woodend being those of the Tweed Valley and Ballantrae, Ayrshire; (iii) ingredients abundant in north-eastern Ireland, and objects from Ballantrae.

1. Primary flakes and blades, and in the present connection cores too, are not always informative. Nevertheless, the Woodend examples have that Upper Palæolithic aspect which is manifest in the similar basic material of the datable Mesolithic industries from deposits of the Early Post-Glacial raised beach on the Scottish and Irish sides of the North Channel. Besides, they resemble the flakes and blades ascribable to the microlithic industries of the Tweed Valley and other regions. Of course this is not surprising, because the forerunners of both facies lie in Upper Palæolithic cultures which are so well represented in the Creswell Crags, Derbyshire. Thence a late and decadent but still predominantly Upper Palæolithic facies spread

during the Post-Glacial emergence of the land, and developed as a provincial culture on the shores of the North Channel.

2. The "Larne pick" (No. 24) found by Davidson is an important item. Alone it would be an interesting discovery from an inland site. But, found with other forms similar to those prevalent in north-eastern Ireland and as yet but feebly represented in Scotland, it becomes significant. Different views have been expressed on the origin of the type. Some would compare it with the "Asturian pick" of the Iberian Mesolithic.¹ Others regard it, I think more properly, as a local specialisation peculiar to the littoral culture of north-eastern Ireland.² Indeed, it so abounds in Antrim that it is held as the type tool of the regional Mesolithic. Its range is long, extending from the Early Larnian of the Late Boreal-Early Atlantic climatic phase to at least the Early Neolithic of the Sub-Boreal.

Implement evidence allows the present contributor to say that the Albyn Distillery, Campbeltown, is not the only coastal station on the mainland of Great Britain which has yielded counterparts. Sites on the south coast of Ayrshire afford examples. The presence of the form in the Tweed valley,³ and its occurrence and association at Woodend with other objects common in north-eastern Ireland and now known in south-western Scotland, may suggest an infiltration inland of elements of littoral cultures.

The small thick picks Nos. 5 and 6 must have answered the same needs at Woodend as at the coastal sites on the North Channel where comparable examples so long persisted. As a type this sort of pick is associated with the "Larne pick," so that on the available evidence we have to consider that both forms were devised by the Mesolithic artisans of north-eastern Ireland.

3. The pseudo-Levalloisian treatment apparent in at least one of our well-retouched tools, No. 34, affords yet another link with industries in Antrim. So distinctive are the features of this specimen that it can be ranged at once with similarly executed objects from the Early Neolithic (Glenarm 2) horizon in north-eastern Ireland assignable to the very Late Atlantic-Early-Sub-Boreal climatic phase.⁴

4. Connections with north-eastern Ireland are further suggested by the presence of a *tranchet* (No. 27) at Woodend. Occurring in the first-named region with, and in the same conditions as, the implements with faceted butts, the form makes its first appearance in the Early Neolithic of north-eastern Ireland. It is represented in Scotland in at least one locality on the south Ayrshire coast.

5. This early Neolithic and littoral culture has been well studied in Ireland. Since it includes neither pottery nor polished implements, it may

¹ C. B. Whelan, in *Journ. Roy. Anthr. Inst.*, vol. ix. (1930), pp. 169-84.

² Movius, *op. cit.* (1937), p. 196.

³ Recorded in a forthcoming report by the present contributor.

⁴ Movius, *loc. cit.* (1937).

be regarded as typologically in a Late Mesolithic tradition. It belonged to settlers on the Early Post-Glacial beach after the emergence following the marine transgression that we equate with the Litorina Sea of the Baltic area. In Ireland its beginnings go back, therefore, to about 2500 B.C. Thus the culture would be contemporaneous with the full Neolithic of England, and its exponents the predecessors of the long-cairn builders. The products of their industries are found locally in humus and in sandy tracts overlying the Early Post-Glacial raised beach, and on platforms cut by the Post-Glacial (Litorina) sea. Objects comparable with the type-forms of the Irish Early Neolithic have not so far been noted from the Tweed valley, or indeed from any of our prolific sites in the North Sea basin. Some, however, have been glimpsed in a burial of the Late Bronze Age in Strathearn.¹

6. From the foregoing it seems that these particular implements, which are so common in Ireland as to lead us to consider them as typical of that country, reached Woodend from the south-west. Support is lent to this opinion since *tranchets* and kindred tools abundant in Antrim, and deriving as is thought from the archaic Campignian as represented at Champlat (Aisne),² occur at Ballantrae. It is thought that the Champlat industry may be placed between the Middle and Late Tardenoisian, that is to say at the end of the French Middle Mesolithic. Discoveries show that its forms had spread in England during Late Mesolithic times.³ That implements of Champlat facies only reached the shores of north-east Ireland and south-west Scotland so much later is simply explained by the remote position of these regions.

7. The Tardenoisian, which is represented in the post-Pleistocene layers at stations in the Creswell Crags, can be traced northward by relics at sites in the Pennines and on the English east coast as far as Northumberland. Beyond the Tweed it spread in the North Sea basin, as is testified by sites in sandy areas and river valleys. The inland extension of Tardenoisian strains which concern us most is that proclaimed by collections assembled in the Tweed valley.

The absence of micro-burins from Ireland indicates that true Tardenoisian industry did not reach that country. Such diminutive steeply retouched artifacts as have been discovered there are made in the Upper Palæolithic style. Their chronological span is long, the earliest being sparingly represented in Larnian industries recovered from deposits laid down during the Early Atlantic climatic phase. Now the Albyn Distillery site, Campbeltown, which has yielded an Early Mesolithic (Larnian) industry in sediments referable to the same climatic phase, includes true Tardenoisian elements

¹ Lacaille, in *Proc. Soc. Ant. Scot.*, vol. lxxvii. (1942-43), pp. 179-82.

² E. Octobon, in *Bulletin de la Société Préhistorique Française*, vol. xxviii. (1931), pp. 172-84.

³ Clark, in *Proc. First Int. Cong. Prehist. and Protohist. Sciences*, London (1932), pp. 96-8.

with micro-burins. Thus this facies reached Scotland earlier than was formerly thought.

It cannot yet be said whether Tardenoisian strains reached central and the west of Scotland from north-east England by the Tyne Gap and the valleys of rivers draining into the Solway or by routes now submerged. Meantime, from the artifact evidence yielded by Tweedside it has to be presumed that they gained those regions by the upper reaches of the Tweed, through the Biggar Gap and so into Clydesdale. They may also have penetrated to the west by the lower Forth basin and the Central Plain. But such is the geographical position of Woodend that the site with its well-defined Tardenoisian element may equally well mark a stage on either land-route, so that, lacking further evidence, more cannot be said at present on this score. The first of these routes, involving the haughs and terraces of the Clyde valley, provided migrants and settlers with an environment and attractions similar to those offered by the Tweed valley. Here, then, is a field of inquiry which ought to reward the searcher and prove illuminating and profitable to Scottish archaeology.¹

The diffusion of the Tardenoisian during the Early Atlantic climatic phase could hardly have been extensive, since the transgression of the Post-Glacial (Litorina) sea so enlarged the great estuaries as to make them formidable barriers. It could not have been until after the land had emerged in Late Atlantic times that Tardenoisian cultural elements were able to spread widely in Scotland. By then microlithic industries were well developed. The Woodend microlithic group, although only part of a comprehensive industry, is fairly representative of an advanced stage.

8. The flake implements from Woodend, with retouched and pinched butts, call for attention also. Some think that the type, which attains its full development in the classic tanged point of the Bann culture of north-eastern Ireland, derives ultimately from a Baltic centre. If so, objects of this class should have been recognised in the large collections from the Tweed valley where core tools of Baltic type have been found.² But no specimen has been reported from what was probably a main land-route to suggest the westward march of the tanged point. Since at Woodend there appear examples of other well-defined forms which are so numerous in north-eastern Ireland, we are compelled meantime to favour the alternative opinion that the characteristic tanged point is a product of that region.

These Scottish implements with trimmed butts, having something of Baltic shapes, are identical with artifacts exemplifying an early stage in the evolution of a form that long obtained in the north-eastern counties of Ireland. The prototypes are present in the Early Larnian and persist in

¹ This opinion is well supported by recent discoveries which, it is hoped, will soon be reported.

² Lacaille, in *Proc. Soc. Ant. Scot.*, vol. lxxvii. (1939-40), pp. 8-10, and fig. 2.

industries of the late phase of the culture. In the Irish Early Neolithic the tanged form developed and culminated in the characteristic artifact of the full Bann culture, which grew upon that of the Mesolithic survivors who were driven inland by well-equipped Neolithic people.

The Late Stone Age invaders arrived with their full culture in south-western Scotland, and pushing up the estuaries settled on the fertile lands.¹ Little resistance could be offered them by the small native communities of strand-loopers living in a Mesolithic economy. Some of these folk were absorbed; others sought new occupation-sites on the coast or inland, and, as the steadily increasing artifact evidence shows, the old way of life long persisted in backwaters and isolated spots.

At this juncture there exist no grounds for seeing in the Woodend industry the relics of a migration inland and settlement before advancing well-equipped Neolithic people. Rather should we consider that the assemblage testifies to the sojourn of a few hunters and fishers. That these were in at least the same stage of cultural development as the Early Neolithic colonists on both sides of the North Channel would appear from the post-Mesolithic forms in the group we have examined.

Conclusions.—1. Such as it stands, the series of stone artifacts from Woodend points to the stay of hunters and fishers on the shores of the loch. These people made their gear on the spot from what material the locality afforded. Preferring flint when they could get it, their mainstay for the manufacture of implements was chert eked out by mudstone. Their economy was essentially that of Mesolithic food-gatherers.

2. The Mesolithic forms and the tools of littoral Early Neolithic type indicate that the culture represented at Woodend is earlier than that of the Megalithic invaders. This artifact evidence proclaims the stone industry, first recognised by McLean and so profitably followed by Davidson, to belong to a complex known until now only at coastal sites on both sides of the North Channel.

3. A few implement-forms in the Woodend industry are belated importations from the Middle Mesolithic of Western Europe into a peripheral region. The ancestry of the majority of the artifacts, however, can be traced directly to English Upper Palæolithic culture (Creswellian) whose roots lie in the Aurignacian of the Continent.

4. Since sites in south-western Scotland have yielded comparable assemblages and nothing so far indicates the existence of similar groups in the North Sea basin, it looks as if Woodend was reached ultimately from the former region.

5. The series so patiently brought together throws light on an obscure phase in the early colonisation of Scotland. It calls for further researches in a wide area offering great possibilities. Such investigations involve

¹ V. Gordon Childe, in *The Scottish Geographical Magazine*, vol. 50 (January 1934), pp. 18-9.
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several realms of science and demand the collaboration of workers in the different fields of inquiry.

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