V.

THE CAMPBELTOWN RAISED BEACH AND ITS CONTAINED STONE INDUSTRY.

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1. Introduction.

The flint implements of the Campbeltown raised beach are well known to scientists all over the world. The original discovery of the flints was made by a local naturalist, Alexander Gray, to whom we are indebted for recognizing their importance and for bringing the discovery before archæologists in a paper [2] to this Society.

Many years after the publication of Gray's paper the Abbé H. Breuil described [3] and illustrated some of the Campbeltown flints and discussed their bearing on general lines.

Although referred to from time to time in geological and archæological works, nothing further was done about the Campbeltown industry until a few years ago, when our friend, Mr Latimer McInnes, of Campbeltown, who was associated with Gray in the original discovery, collected some flints from the locality which forms the subject of the present communication.

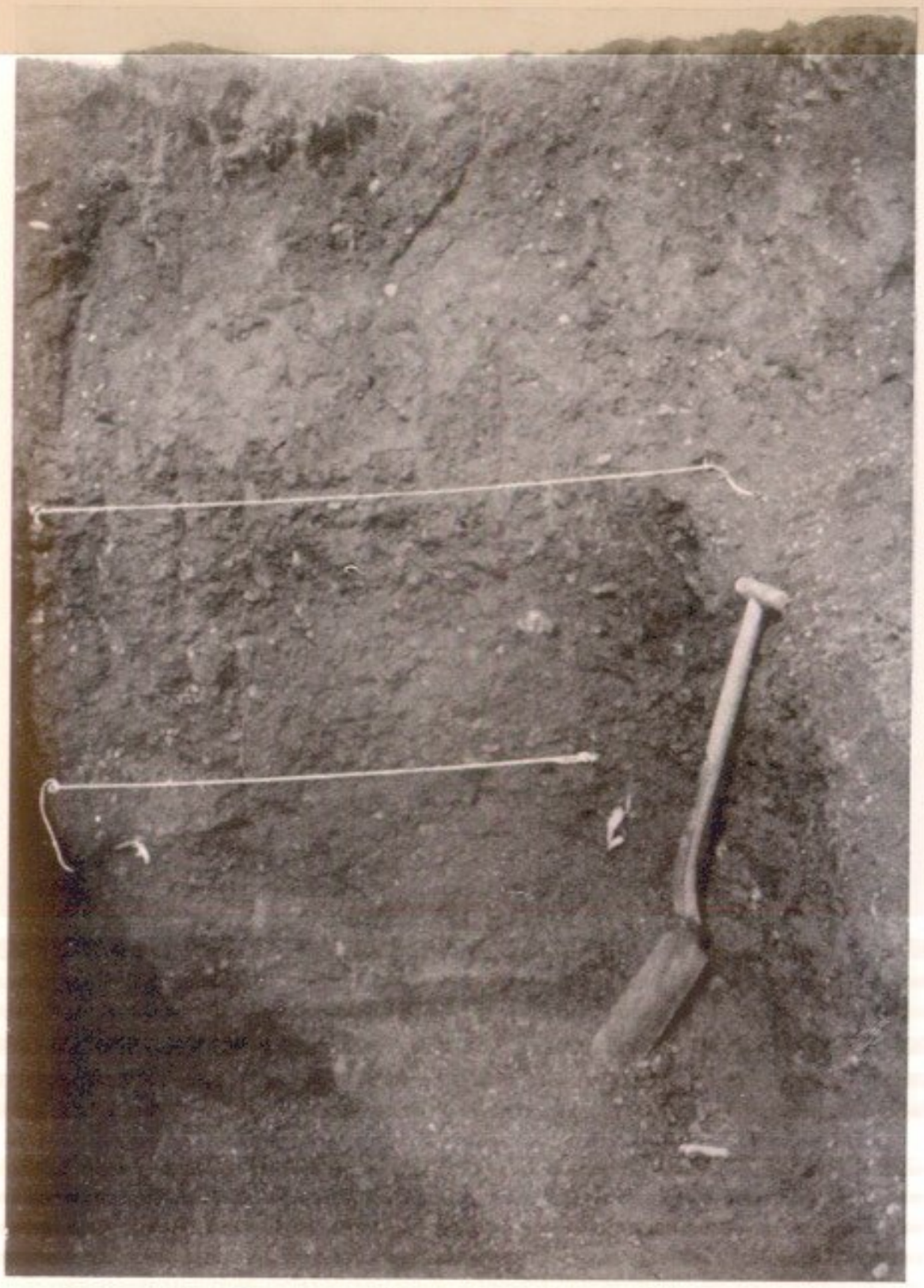
The writers' special interest in Campbeltown was awakened many years ago: for one of us during a geological study of Kintyre; for the other during investigations of the lithic industries of Scotland.

In 1935 the writer (W. J. McC.) approached Professor T. H. Bryce with the suggestion that Glasgow University should make a further excavation at Campbeltown. The reason for this was twofold: firstly, to make a collection for the Hunterian Museum; and, secondly, because it was felt that the implements which had been illustrated from the beach were apparently not altogether as typical as one would like. The suggestion was warmly received by Professor Bryce and it was left to the writer to carry it out. With the help of Mr McInnes and Mr Mackenzie of Campbeltown Museum, and of two workmen, he was able to start field work in April 1935, leave from official duties at the University having been kindly granted by Dr (then Professor) E. B. Bailey.

[1] Sections 1, 2, 3, 4, 5, and 6 by W. J. McC.; 7, 8, 9, and 11 by A. D. L.; 10 largely by A. D. L.; 12 by W. J. McC. and A. D. L.

[2] "Notice of the discovery of a cinerary urn of the Bronze Age, and of worked flints underneath it, at Dalaruan; also of an old flint working-place in the 30-foot raised beach at Millknowe, Campbeltown," *Proc. Soc. Ant. Scot.*, vol. xxviii. (1893–94), pp. 263–74.

[3] "The Pre-Neolithic Industries of Scotland," *Proc. Soc. Ant. Scot.*, vol. lvi. (1921–22), pp. 261–5.



1. Small trench in raised beach, Albyn Distillery, Campbeltown. Main implementiferous level between the strings.

2. General view of the raised beach, Albyn Distillery, Campbeltown.

W. J. McCallien and A. D. Lacaille.

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2. Historical.

As already remarked, we are indebted to Gray for first bringing to notice the subject of the Campbeltown raised beach flints. Since his time, local collectors have continued their explorations at long intervals, and among these workers special mention must be made of Mr Latimer McInnes, who has never ceased to be interested in Kintyre problems, whether of language, botany, geology, or archæology.

Gray in his paper of 1894 points out that extensive excavation in the beach material had been carried out continuously for many years, but, unfortunately, nothing is known of the thousands of tons of material, undoubtedly rich in archæological relics, which were removed during that time. In 1886, Gray found half of an urn of Bronze Age type in a sand-pit at Glebe Street, Campbeltown, and it was this find, perhaps more than anything else, which encouraged him to continue the researches which culminated in the discovery of the now famous Campbeltown flints. Some time after this, the finding of pieces of an earthenware vessel at Dalaruan was reported to Gray. The workmen engaged at this place had thoroughly mixed the sand with the remaining pieces of the vessel. In his search for these other fragments, Gray turned over the sand covering the place where the urn had fallen, and after three hours' work he had recovered eight or nine pieces of the broken urn, besides collecting a number of bones and "what I had not expected to find," as he wrote afterwards, a dozen small white chipped flints. This find led to an organized search by members of the Kintyre Scientific Society, the forerunner of the present Kintyre Antiquarian Society. On the first Saturday afternoon they found 132 flints, and Gray wrote that some of the chips looked as if they had been burned.

It is necessary for us at this stage to consider carefully the stratigraphical conclusions arrived at by Gray, because, as we shall indicate later, they differ in detail from those arrived at during the present investigation. Gray was indeed particularly fortunate that, when he was engaged in the study, large-scale commercial excavations were being made. The succession of the beach material from which he collected his flints was as follows:—

	Ft.	Ins.
4. Dark loamy soil	2	6
3. Sandy gravel with a few large rolled stones	2	0
2. Fine sand with occasional small rolled stones	2	2
1. Fine gritty shingle and sand	1	2
	7	10

According to Gray all the flints were collected *in situ* in the lowest stratum (1, above), but later he found flints in the other layers, and it was his opinion that they were distributed all through the deposit.

Gray was also of the opinion that the people who made and used the flints "lived there when the sea rolled up to or over the old beach, which they [*i.e.* the Bronze Age people] now converted into a cemetery." He emphasizes the view expressed in the first part of this quotation by continuing: "That the sea washed over the old beach, at least during storms or exceptionally high tides, at the time when some of the flints were dropped there, is sufficiently evident from the fact that a few of them, after dressing, have been tossed about in the sea till their sharp edges and angles had been worn quite smooth."

The majority of the flints collected by Gray and his colleagues are, however, still as sharp-edged and angular as when first broken.

It has already been mentioned that a party was organized to make a thorough search for flints. On returning home from this search one of the party, Mr Watson, picked up flints in beach material known to have been taken from Millknowe. Gray then visited this site, and found flints in great abundance from the lower part of the deep black soil downwards to a depth of 4 feet into the shingle, and about 7 feet from the land-surface. The section at this part was as follows:—

	Ft.	Ins.
4. Black loam	3	0
3. Shingle, very little sand	2	0
2. Thin dark-coloured band thinning out on both sides	0	3–6
1. Shingle	2	0
	7	6

The thin black band (No. 2) was interpreted as an old camp site, and because Gray recorded 2 feet of shingle (No. 3) over this layer he naturally continued to speak of the flints as occurring *in* the beach material. Although this is contrary to the general experience of the present writer, he is prepared to accept it, having discussed the question carefully with Gray in the field, and knowing Gray to be a trustworthy naturalist. He also accepts Gray's conclusions regarding the site mentioned above.

It is unfortunate that no map was included in Gray's paper to show the exact localities from which he obtained flints, but one of us has been fortunate in getting first-hand information on this point from Gray himself.

The Abbé Breuil's classic paper appeared in our *Proceedings* in 1922, and we need not apologize for referring to it fairly fully here, as it is the

only work extant on the typology and age of the Campbeltown raised beach culture.

Breuil emphasizes first of all that the Campbeltown tools are different (1) from those of the Neolithic industry of Scotland; (2) from the true Tardenoisian (not then very well known, it is true); and (3) from the characteristic tools from the Oban caves and other Azilian deposits of Western Scotland. The Campbeltown artifacts taken as a whole, he says, consist of flakes showing a Magdalenian aspect.[1] These flakes were detached from nuclei and cores, the angles of which are sometimes battered; many show no re-working, but numerous notches resulting from use; a small number are re-worked into end-scrapers; and one of those illustrated by Breuil shows a small point in the centre of its semicircular end. Very rarely does the re-chipping extend to both sides or to a single edge with the other side remaining sharp. The re-working of the side seems to have been for the purpose of removing the edge and transforming it into the back. No graver was at this time seen, but a flake was mentioned as being typical of a spall detached during the fabrication of such a tool. Only one well-defined scaled flake was seen; several large tools were the result of transforming cores into tools; one geometric implement worked on two sides was illustrated (fig. 1, No. 1, of Breuil's paper).

According to Breuil, "the thick patination of the flint does not belie the impression given by the Upper Palæolithic aspect of the tools themselves." Unfortunately, although the question of patination is one we need not discuss, it seems obvious from the present set of artifacts that the patination gives little indication of age, but is in many cases undoubtedly that of the original pebbles from which the tools have been made. This point is well brought out in a few specimens with a broad zone of typical white patination at one end, the other being more or less unpatinated flint, and in others where a strip of freshly exposed flint runs across an otherwise white heavily patinated implement.

Breuil also pointed out that since the Campbeltown industry occurred in the 25–30-foot beach it must be approximately of the same age as the "Azilian" of Oban, the latter occurring in the caves behind the 25-foot beach. With the material at his disposal, however, he could not state precisely that this set of implements was really Azilian.

Until the present excavation no recognizable artifact except flint was known from the Campbeltown sites. One of us (A. D. L.) has repeatedly drawn attention to the existence in Scotland of quartz implements where flint was not available; and it is regrettable to think of the enormous number of quartz artifacts from Campbeltown which must have escaped recognition and are now lost for all time. During the present brief examination 271 quartz artifacts and 8 of schistose grit have been collected.

[1] *Op. cit.*, p. 261.

A few broken, but unworked, pieces of agate have also been found and two fragments of shell.

3. The Albyn Distillery Site.

Fig. 1 is a sketch-map of Campbeltown showing the position of the Albyn Distillery site, and Pl. XXIV, 2 gives a general view of the raised beach during the excavation.

One main trench and several smaller cuts were made in the undisturbed beach deposits, and all the material was riddled and carefully examined.

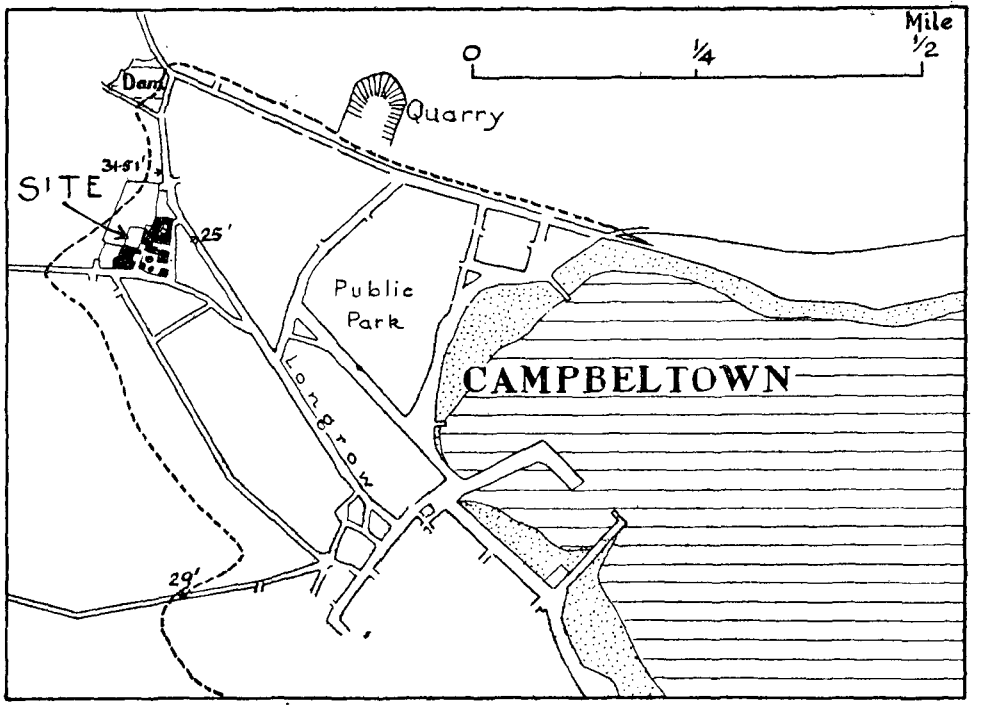

Fig. 1. Index map showing the position of the Albyn Distillery site.

A pit, 7 feet long and 3 feet wide, was excavated in the low ground adjoining the distillery. Flints, similar in character to those recovered lower down and described later, were found in the top 6 inches of soil, but the remainder of the pit consisted of barren sands and gravels with layers of hard pan. The pit was carried down to a depth of 8 feet in the vain hope of reaching the base of the beach material. There are, however, several natural sections in the Campbeltown area showing the 25-foot beach gravels resting directly upon the Boulder Clay without the intervention of any peat bed.

The following section was exposed in the main trench (where the men are seen working, Pl. XXIV, 2):

	Depth. Ft.	Ins.	
4. Dark soil	1	8	
3. Brown soil, resorted Boulder Clay	3	4	
2. Dark layer rich in flints . .	3	7	
1. Gravel and sand in thin beds to .	7	0	Base not reached.

The artifacts were obtained from the 3-inch dirt band (No. 2) and the topmost part of the underlying gravels as well as from the overlying soil. On one occasion a thin dark implementiferous layer was found at a depth of 1 foot 6 inches below No. 2 bed. This did not extend far in any direction and was completely removed in the digging. It was the only dirt band found within the beach, but appears to have been similar to some that Gray found in the original excavations.

Summing up this part of the description we may say that the relics, which form the subject of the present paper, were mostly obtained from a 3-inch layer lying on or at the top of the raised beach deposits, and at a depth of 3 feet 4 inches below the present surface.

4. Height above Sea-Level.

It is well known that the height above sea-level of the so-called 25-foot raised beach of Western Scotland varies considerably from place to place. It is generally believed that it attains its greatest elevation of 30–35 feet above high-water mark near the head of Loch Linnhe and that it falls to the north-west and south-west, reaching sea-level east of Lewis. The equivalent beach lies about 5 feet above sea-level near Dublin. Gray originally estimated the height of the beach at Campbeltown as 30 feet.

The height from which the present collection was made was measured from a bench-mark on a nearby house as 32 feet 2 inches. This is by no means the maximum height of the beach here, for it extends much farther inland and rises many feet higher, but the greatest elevation could not be determined without further excavation.

5. Origin of the Flint.

The source of the Kintyre flints seems always to have been a problem. Some think the flint nodules, which furnished the raw material for the artifacts in the Campbeltown beach, were transported from Antrim by floating seaweed.[1] The other view, expressed by Professor V. Gordon

[1] *Cf.* John Smith referring to flint implements in the Stevenston district, *Prehistoric Man in Ayrshire* (1895), p. 42.

Childe,[1] is that the flint was carried from Antrim by ice during the Ice Age. There is, however, no geological evidence to support such a drift, as the ice movement was in the other direction, namely, from the Firth of Clyde towards Antrim.

We have both given considerable thought to this matter, and have come to the conclusion that human transport is the most likely explanation. This automatically implies intercourse between the beach dwellers on the two sides of the North Channel, intercourse which we shall see is also proved by the workmanship of the flints themselves. While this does not wholly account for the absence of heavy flints from Campbeltown, it may well be a partial explanation.

6. Age of the 25-Foot Beach.

In a previous communication [2] to this Society the writer discussed the age of this beach. Palæobotanical studies indicate that the peat beds beneath the 25-foot beach deposits in both Scotland and Ireland are of Boreal—Early Atlantic age. The formation of the 25-foot beach is assigned to some phase of the Atlantic period. The implements found within the beach gravels at Glenarm on the Antrim coast are believed by Dr Hallam L. Movius, jr.,[3] to belong to the earlier part of the Atlantic in most cases, although the making of the beach probably extended into the Late Atlantic.

As we shall have occasion later to refer to recent work on the Antrim beaches and their contained industries, we need merely mention here that polliniferous horizons have been found in the Post-Glacial deposits at Cushendun which help to establish the age of the raised beach from a climatic and palæobotanical point of view. The horizons which have yielded pollen are Deposits C, E, and F of Table I, p. 62. These are characterized by the lack of Alder, the decline of the Pine pollen-curve from a high maximum, and the high percentage of Hazel. According to Professor Knud Jessen, the age of E and F is lower part of Zone V b, which contains the so-called Boreal Hazel maximum. Deposit C is dated as belonging to the upper part of Zone V b of Northern Ireland. The maximum of the marine transgression occurred after the formation of the Upper (Lagoon) Silt, Deposit C. In other parts of North-Eastern Ireland the marine deposits cover pollen-bearing beds belonging to the central part of Jessen's Zone VI. This applies to Portrush and Coleraine, for example. For further details on these problems the reader is referred to

[1] *The Prehistory of Scotland* (1935), p. 13.

[2] "Late Glacial and Early Post-Glacial Scotland," *Proc. Soc. Ant. Scot.*, vol. lxxi. (1936–37), pp. 174–206; also G. Erdtman, *Journ. of Ecology*, vol. xvii. (1929), pp. 112–26.

[3] "A Stone Age Site at Glenarm, Co. Antrim," *Journ. Roy. Soc. Ant. Ire.*, vol. lxvii. (1937), pp. 181–220.

the relevant section of the report on the Harvard Archæological Expedition's excavations at Cushendun.[1]

Campbeltown has so far yielded no palæobotanical evidence of age, but in the Machrihanish district, a few miles to the west, the writer discovered a peat bed intercalated with sands and gravels. The peat has been studied by Dr Su Ting, and a report may be expected from him.

The Antrim equivalent of the Campbeltown beach has long been known for the artifacts it contains, but so much has been written about the Northern Irish industries, and so many opinions expressed concerning their age, that the different views are not easily reconciled. However, much has been done to remedy this state of affairs, and the latest investigations of the Harvard University Mission under the direction of Dr Movius promise to establish an exact culture sequence, so crowning the work of such workers as Messrs G. V. Du Noyer, W. J. Knowles, G. Coffey, R. Ll. Praeger, C. Blake Whelan, and J. P. T. Burchell.

The following is a very brief summary of Movius's main conclusions. The section of the superficial deposits at Cushendun is interpreted as follows:—

TABLE I

Surface Humus	Deposit	A	Horizon 4
Upper (Raised Beach) Gravel	,,	B	,, 3
Upper (Lagoon) Silt	,,	C	
Lower (Marine) Gravel	,,	D	,, 2
Lower (Lagoon) Silt	,,	E	,, 1
Swamp Peat	,,	F	
Resorted Boulder Clay	,,	G	
Laminated Clay	,,	H	

This section differs somewhat from those previously published by earlier inquirers at the same locality. The differences in the interpretations are dealt with by Movius and need not be considered here.

As indicated in the table, there are four superimposed archæological horizons in these sediments. The artifacts from Horizons 1 and 2 belong to small blade industries assigned to the Early Mesolithic. Those from the Upper (Raised Beach) Gravel, Deposit B, are assigned to the Late Mesolithic and show the development of the Irish Mesolithic towards crudely worked heavy artifacts. The Surface Humus contains a Neolithic industry. Movius believes that the industrial products of Horizons 1, 2, and 3 constitute a provincial Mesolithic culture which he has called the *Larnian*. He groups the artifacts from Horizons 1 and 2 as Early Larnian, and he assigns those from Horizon 3 to the Late Larnian.

[1] "An Early Post-Glacial Archæological Site at Cushendun, Co. Antrim," *Proc. Roy. Irish Acad.*, vol. xlvi. C (1940), pp. 1–84.

As the products of the older archæological horizons of Cushendun will be so frequently referred to for comparisons with artifacts from the Albyn Distillery site, further comment may be permitted here. The majority of the components of the blade industry from the Lower (Lagoon) Silt (Deposit E, Horizon 1) are sharp, and all exhibit varying degrees of bluish to black patination. The Lower (Marine) Gravel (Deposit D, Horizon 2) contains a typologically comparable industry rich in its variety of uninjured tool-forms. These usually bear a porcellanous patina sometimes accompanied by ferruginous or manganese staining, or showing little or no surface alteration. It is this industry which has already been equated with that of Campbeltown, and the similarities are brought out in the following pages. Similar geological and archæological evidence has been obtained at Larne and Island Magee.[1]

The Late Mesolithic, as has been pointed out above, is represented at Cushendun by the materials from the Upper (Raised Beach) Gravel (Deposit B). Relics, referable to the same culture-phase and occurring in analogous conditions, are particularly abundant at Larne. By their inclusion of a heavier equipment, these industries differ markedly in general facies from those ascribed to the Early Mesolithic.

The raised beach industry recovered at Glenarm, Co. Antrim, is correlated with that from the deposits of the Upper (Raised Beach) Gravel at Cushendun. Moreover, Movius has demonstrated the existence of two cultures at Glenarm. That represented by the artifacts found within the beach gravels is called Glenarm 1 to distinguish it from Glenarm 2, which is the industry from the overlying surface humus. This latter industry, lacking in pottery and ground-stone tools, nevertheless has Early Neolithic affinities. Hence, Glenarm 2, post-dating the emergence of the beach, is assignable to Late or Early Sub-Boreal time, *ca.* 2500 B.C., and is therefore coeval with full English Neolithic.

Glenarm 1, on the other hand, is essentially a heavily rolled, coarse, unretouched industry with some unrolled artifacts. Most of the material was built into the beach during the period of emergence. Movius's conclusion may be quoted here[2]: ". . . the flake industry of Glenarm 1 seems to represent the final breakdown of Upper Palæolithic tradition, and it definitely forms a part of the same culture to which the Mesolithic of Scotland may be referred. The types are crude and generalized, and retouched artifacts are very rare; in fact, its entire nature indicates a peripheral culture which has lost its vitality, surviving in a favourable region where the flint supply was abundant." As regards the age of the industrial material, Movius writes[3]: "It was evidently derived from sites on the foreshore during the sinking of the land and at the time of maximum submergence; and it was re-deposited by the storm waves during the

[1] H. L. Movius, *op. cit.* (1937), p. 209. [2] *Ibid.*, p. 210. [3] *Ibid.*, p. 212.

period of emergence. Some of the material in the beach appeared to be *in situ*, however, indicating occupation contemporary with its formation."

Further references will be made to the Antrim industries in later sections.

That the Antrim sites should differ somewhat from Campbeltown is only what one would expect considering the marked geographical and geological differences in the settings of the beaches on the two sides of the North Channel. Cushendun and Glenarm lie at the mouths of deep glens on a coast characterized by strong long-shore currents and with abundant supplies of flint both as pebbles and *in situ* in the Chalk. Campbeltown lies at the head of a large bay with no important river flowing into it and with no local supply of flint whatsoever.

7. The Industry of the Raised Beach.

Mr Alexander Gray's discoveries of stone artifacts in the raised beach at Campbeltown over forty-five years ago only received the just appreciation of their importance with the publication in 1922 of Breuil's classic paper already cited. Unfortunately, the French authority's statement that the appearance of the representative specimens in the National Museum and Kelvingrove Art Galleries and Museum was that of "a poor Upper Palæolithic series, chiefly consisting of flakes showing a Magdalenian aspect" led some inquirers to refer to these Scottish products, and also comparable artifacts from raised beach deposits in Northern Ireland, as of Magdalenian *age*.[1] Hence it is well to insist that Breuil used the terms in a purely *cultural* sense only. Still, the relics of the food-gatherers who settled on Campbeltown beach constitute the earliest evidence so far obtained of the colonization of this part of Scotland.

When we examine the question of the typology and cultural affinities of the Campbeltown industry represented by McCallien's collection, we are faced, not with a selected series, but with a whole assemblage revealing aspects hitherto unsuspected at this Scottish 25-foot raised beach site.

Extensive and detailed study has been devoted in recent years to the stratigraphy and typology of the artifacts from the Antrim beaches. These investigations have brought to light many points of great interest and importance, which were unknown when artifacts from Campbeltown were last discussed in these *Proceedings*.[2] We have made free use of this new information, not only as contained in published reports, but from discussions by letter and in conversation. We gratefully acknowledge the help and stimulus given to the present study by the results obtained by workers in Ireland.

One of us (W. J. McC.) has had the advantage of being shown the

[1] *Infra*, pp. 87–8.

[2] H. Breuil, *op. cit.*, pp. 261–5.

Larne section by Dr Movius during his recent excavations, and the other (A. D. L.) has been able to examine Mr Burchell's artifacts from Northern Ireland and also large collections from the Antrim beach belonging to the Wellcome Historical Medical Museum, London. At this juncture we would both express our deep sense of indebtedness to Dr Movius for having most generously furnished us with photostats of illustrations to appear in his forthcoming work on the cultural development represented in the raised beach deposits at Cushendun. We also acknowledge with gratitude a preview of his paper on the Cushendun site. Without this and his many helpful suggestions the present communication would have fallen far short of the demands of this Scottish industry, a detailed examination of which we feel is necessary to assess the cultural aspects of the relics of the earliest occupation of this part of Scotland. The opportunity is also taken warmly to thank Mr C. Blake Whelan, Belfast, for help and encouragement so kindly given.

With these documents and other information at our disposal we can make a close study of the industry before us. Its importance to Scottish archæology and the fact that it includes so many forms never brought to the notice of the Society are sufficient excuse for the extended comments evoked by inspection of the series recovered by McCallien in the raised beach.

8. Materials.

No less than 1235 objects attesting man's attention were extracted from the raised beach near the Albyn Distillery. Of these, 724 are definable artifacts, 559 being of flint, 157 of quartz, and 8 of schistose grit. The remainder consist of chips, flake-fragments, struck and rejected small scarred flint and quartz pebbles, 397 being of flint and 114 quartz. The analysis of the whole assemblage is given in Table II, p. 66.

An outstanding feature is that very many flint chips seem to have been utilized. This indicates that flint was so much prized here that it was used to the utmost.

The small size of the constituents of this Scottish collection impresses one who has inspected the normal, heavier and larger, but typologically similar series from Northern Irish raised beach deposits. For all that, the aspect of our lot is not affected, and the drawing of comparisons between groups from the Irish seaboard is not difficult. Moreover, as those native rocks, which were also employed in the Campbeltown industry, occur in their raw state as pebbles seldom larger than the imported flint, the facies of the whole group is homogeneous.

The great majority of the industrial relics are undamaged but altered of surface, their edges being sharp and angular. The rolled condition of a few flints (*e.g.* No. 1), however, indicates that these suffered a fair amount

TABLE II

ANALYSIS OF THE ALBYN DISTILLERY INDUSTRY

		Flint	Quartz	Schistose Grit	Totals
Flakes	primary (retaining crust), struck from pebbles	26	11	..	37
	do. do. flake-scarred	50	7	..	57
	struck from cores, under 1·5 cm.	16	1	..	17
	1·5 to 2·5 cm.	117	29	..	146
	do. with worn edges	24	33	1	58
	2·5 cm. to 4 cm.	40	17	4	61
	do. with worn edges	35	16	..	51
	do. with trimmed edges	2	3	..	5
	4 to 6·5 cm.	5	..	2	7
	do. with worn edges	5	..	..	5
	do. with trimmed edges	1	..	..	1
	broken (butt-ends)	28	..	..	28
	do. with worn edges	3	1	..	4
	do. with trimmed edges	1	..	..	1
	broken (tips)	31	..	..	31
	do. with worn edges	9	..	..	9
Microliths	obliquely truncated and abruptly retouched flakes	1	1	..	2
	do. do. retaining bulb of percussion	1	..	..	1
Micro-burins		2	..	..	2
Flakes, apparently divided by micro-burin technique		1	1	..	2
End-scrapers (on flakes)		9	3	..	12
Side-scrapers (on flakes)		6	4	..	10
Side-scrapers (bifacially worked in small nodules)		2	..	..	2
Concave scrapers (on flakes)		3	1	1	5
Notched flakes (*lames à coche*)		2	..	..	2
Perforators		..	1	..	1
Perforator-concave-scrapers		2	..	..	2
Cores	*struck pebbles*	10	3	..	13
	single-platform	20	3	..	23
	do. with worn edges	3	1	..	4
	multi-platform	11	..	..	11
	do. with worn edges	3	..	..	3
	prismatic	..	7	..	7
	discoidal	1	..	..	1
	do. with worn edges	1	..	..	1
	segmental, with worn edges	1	1	..	2
Core-scrapers		6	1	..	7
Core-trimmings		57	1	..	58
"Thumb-nail" scrapers (on flakes)		9	2	..	11
Steep end-scrapers (on pieces of nodules)		5	5	..	10
Thick flakes (cores), edge-injured by attempts to reduce		2	..	..	2
Picks	Larne type	2	..	..	2
	tranchet (*cf.* Baltic type)	..	1	..	1
Scalpriform flakes (bifacially worked)		1	1	..	2
Gravers	"ordinary" (*bec-de-flûte*), on flakes	1	..	..	1
	core and nodule	3	1	..	4
Graver-spalls		1	1	..	2
Total of definable artifacts		559	157	8	724
Miscellaneous waste (chips; sundry flake-, struck core- and pebble-fragments)		397	114	..	511
Grand Totals		956	271	8	1235

of wave-action before finally coming to rest in the present site. Such *état physique* might be taken to point to the greater antiquity of the specimens bearing the signs of injury; but it has to be remembered that wave-action is not uniform everywhere in one deposit. Besides, odd rolled pieces may be carried by streams or tidal currents into a context little affected by waves. Furthermore, no typological differences whatever are discernible between our artifacts, whether rolled or unscathed. Discussing the occurrence of these uncommon blemished examples with Dr Movius, we are informed by him that he has found rare objects in similarly rolled condition associated with the very fresh-looking Early Mesolithic products from the lower gravels at Cushendun.[1]

Numbers of the Campbeltown flints exhibit varying degrees of patination, and somewhat similar whitening appears on one of the schistose grit flakes. The surface-change is usually creamy white or dully porcellanous, sometimes so affecting the artifact that it looks rotted, or sometimes appearing as streaking or mottling. The question of patination has already been referred to (*supra*, p. 58), and so it suffices to recall that these signs of surface-change are never reliable guides to age. They are, nevertheless, interesting in our present study because comparable artifacts, entirely or partly patinated, occur with unpatinated examples in the lower gravels of the Antrim beach.[2]

A few of the worked flints and quartzes from the Albyn Distillery site bear these reddish-brown stains and adhesions of "iron-pan," that commonly appear on artifacts from the stratified and highly ferruginous gravel overlying the Lower Lagoon Silt at Cushendun.[3]

In regard to ferruginous staining of flint Mr S. Hazzledine Warren remarks: "Upon some sea-beaches ochreous patination is general, on others it may be observed only along the narrow track of land-springs that are discharged across the foreshore." [4] This explanation is particularly interesting when it is recalled that the stratified and ferruginous layers intercalated between the Lower and Upper Lagoon Silts at Cushendun have been interpreted as fluviatile in origin, their deposition being held to mark a steady sinking of the land.[5]

Many of McCallien's finds are heat-crackled, a feature that is commonest among the waste, and one that indicates their derivation from an occupation-site.

[1] Letter to the writer, dated Harvard University, 9th December 1938.

[2] J. P. T. Burchell, "Early Neanthropic Man and his relation to the Ice Age," in *Proc. Prehist. Soc. of East Anglia*, vol. vi. pt. iv. (1931), pp. 282–7; also C. Blake Whelan, "The Palæolithic Question in Ireland," *Rep. XVI Int. Geol. Cong.*, Washington, 1933, pp. 1215–6.

[3] J. P. T. Burchell, *loc. cit.*

[4] In *op. cit.*, *infra* (p. 85); *Journ. Roy. Anthr. Inst.*, vol. lxiv. (1934), p. 108.

[5] See Professor Jessen in Cushendun report; *op. cit.*, *supra* (1940), pp. 38–51.

9. Typology.

Of course the past and recent collections include accommodation-tools in their repertory. But other forms in our series bring out hitherto unsuspected features—that the Campbeltown culture derives basically from an Upper Palæolithic one, and the influence of later elements, which also shows, does not impair the predominating aspect.

Flakes.—These constitute the essential element of the raised beach industry, and are the most numerous of the artifacts. They vary from 1 cm. to 6·5 cm. in length, the most numerous series between 1·5 and 2·5 cm., and the majority narrow. Next in numerical importance are flakes, and implements derived from flakes, between 2·5 and 4 cm. in length, flint and quartz being about equally represented.

Whatever the rock, the simplest flakes consist of corticed *débitage* (No. 2). Numbers of flakes, scarred on the crusted surface, testify to further preparation of nodules (No. 3).

The parallel scars on the delicate flint flakes (Nos. 4–12), detached from repeatedly struck cores, are evidence of a well-developed technique, which is also expressed in many short thick flakes of flint and quartz such as Nos. 13 and 14 (quartz).

Quartz flakes, of which No. 15 represents the commonest type, occur in so similar a range that they may be grouped with the normal flints.

As so few flakes of schistose grit have been found, it need only be mentioned that these, compared with the flints, are wide in proportion to their length, as, for example, No. 16.[1]

Although the beach-folk produced well-made implements, they were partial to the use of primary flakes; consequently, very many of the flakes are worn on the edge (Nos. 12, 17–19, flint), relatively few being retouched. In the case of quartz flakes it has been observed that the rock used here is of such indifferent quality that it is very difficult to distinguish utilized edges from those bearing the real signs of trimming.

[1] Except for a flake-fragment from Birkwood, Banchory [*Proc. Soc. Ant. Scot.*, vol. lxx. (1935–36), p. 429, and fig. 3, No. 12], these artifacts of schistose grit are, it is thought, the first figured instances of Scottish prehistoric products manufactured in this rock. Although the writer has already noticed implements of schistose grit from Freswick Bay and Golspie in the north, and has picked up rude cores and flakes struck in it at Shewalton, Ayrshire, no opportunity has until now offered to mention these stray observations and discoveries.

Though possessing the inherent property of conchoidal fracture, schistose grit splits rather erratically under intentional blows, and few qualities are amenable to delicate retouch. Some flakes bear quite fair bulbs of percussion, but others exhibit only a vague diffused swelling. This rock is more tractable than the commoner varieties of quartzite, and in many respects it compares with the grit extensively used by prehistoric communities in the region of Paris. Our schistose grit, however, is not so brittle as the particular grade of grit employed in the very active early Neolithic industry of the Forêt de Montmorency, products of which the writer gifted to the National Museum [*Proceedings*, vol. lxxii. (1937–38), p. 130]. In point of fracture it appears that, although not so tractable, schistose grit most closely resembles the Greensand chert used in Palæolithic and later industries in the south-western English counties.

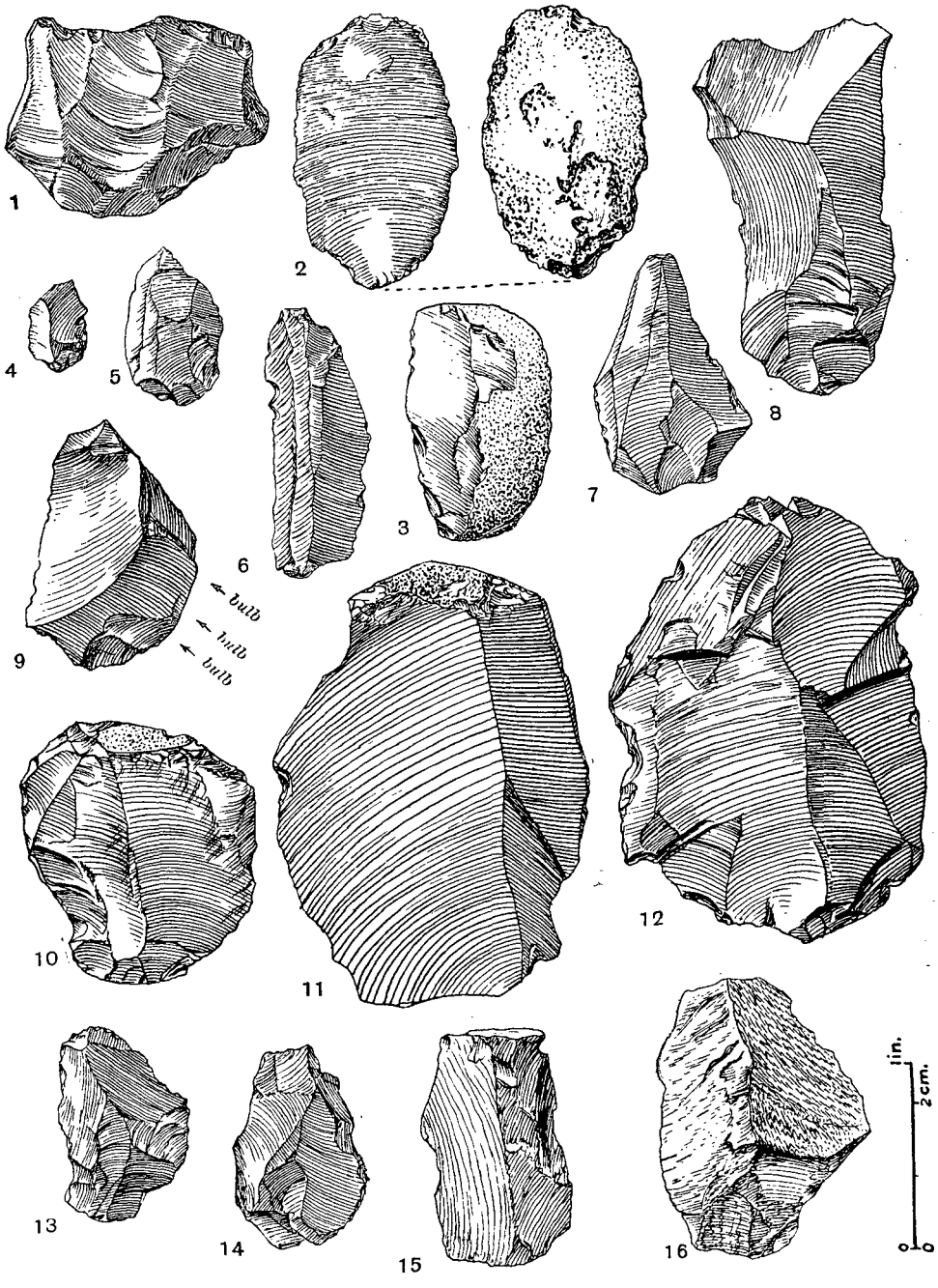

Fig. 2. The Albyn Distillery industry: flakes.

Broken flakes occur, bulbar fragments and upper ends being fairly equally represented. Alteration of surface undergone by many is so complete that the transverse steep scar is similarly affected, an indication that the flakes were fractured not long after production, and most probably as a result of usage.

Upper Palæolithic stations have yielded great numbers of broken flakes and flake-implements. Study of the injured surfaces of such objects will often reveal how the specimens were fractured, whether with the bulbar surface in compression or tension,[1] so giving an idea how the piece was employed. Whatever be deduced from examination, it stands out that these examples from the raised beach are in themselves further testimony to the very general use of flakes at the site to which flint was brought, as lateral margins of many of these broken examples are worn by service, *e.g.* Nos. 20–21. One, not figured, has been noted to bear slight edge retouch.

As broken flakes in this group are invariably of flint, the use of such affords further indication of the value set upon this material. (These specimens are to be distinguished from a few obliquely truncated narrow flakes retouched on the transverse edge, to which reference will be made, *infra*.

Retouched Flakes.—In contradistinction to the great number of utilized flakes, there are but few whose long edges bear retouches. On some of these the dressing is quite delicate (Nos. 22–24) and reminiscent of Upper Palæolithic workmanship.

No. 25, of quartz, is noteworthy because of the trimming on the longest edge. Instead of this being improved by ordinary retouching, the desired feature has been achieved by removing narrow longitudinal slivers. Evidence of precisely similar treatment of quartz flakes has already been noticed by the writer in the products of many quartz industries.[2] It is thought the method was adopted to obtain some uniformity of edge in rock of uncertain quality.

Microliths and Micro-burins.—In addition to the flakes referred to in the foregoing paragraphs are two narrow and short specimens, Nos. 26 and 27, respectively of flint and quartz. They are obliquely truncated and steeply trimmed along their transverse edge in the manner of microliths. The first is rudely retouched; but the second, its lower end also truncated, has the added feature of being dressed along the longer lateral margin on the bulbar face.

Though only blunted along part of its curving back, No. 28 can be included in the microlith class, especially since the implement is the upper

[1] A. S. Barnes, "The Flint Implements of the Type-Station of La Madeleine," in *Proc. Prehist. Soc. of East Anglia*, vol. vi., pt. iv. (1931), pp. 316–29.

[2] "Aspects of Intentional Fracture . . .," in *Trans. Glas. Arch. Soc.*, vol. ix., pt. iv. (1939–40), p. 327.

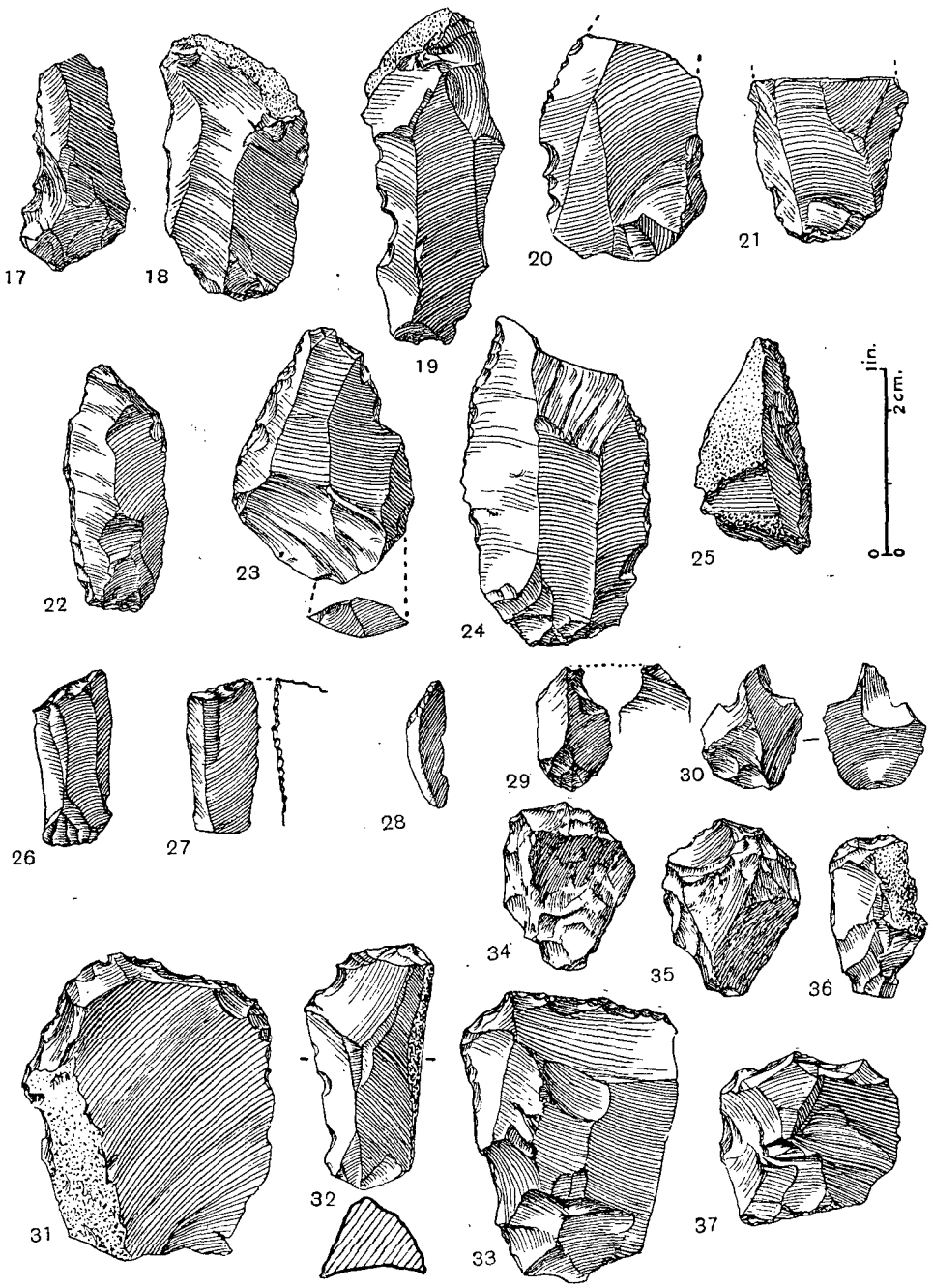

Fig. 3. The Albyn Distillery industry: utilized and retouched flakes, microliths, micro-burins and end-scrapers.

end of a flake deprived of the bulb, doubtless by micro-burin technique. This last specimen particularly, a small steeply dressed subtriangular artifact and a narrow rod, also of flint and similarly battered along an edge (which two artifacts were identified in Gray's series by the Abbé Breuil),[1] establish the microlithic element in the Campbeltown raised beach industries.

As proof that the specialized technique present in Tardenoisian microlithic industries was not unknown to the settlers on our beach, we can record two micro-burins from the excavations. Both are of normal type, with the notch on the right. In the first, No. 29, the characteristic micro-burin facet on the bulbar face is seen at its best, as the knapper, in dividing the flake, accurately hit the critical spot at the base of the prepared notch. In the second specimen, No. 30, the more pronounced scar and the nick in its side point to the delivery of an ill-directed and rather heavy blow. The spreading of the scar also points to the rather indifferent quality of the flint, which, already predisposed to faulty fracture, would break as shown when subjected to accidental added stress.[2] One small quartz flake, laterally notched, appears to have been fractured by micro-burin technique. The material, however, did not allow of the production of a typical facet such as results in flint.

Micro-burins have not previously been recovered in these conditions in Scotland, although one has been picked up on the surface of the raised beach near Stranraer.[3] Another comes from the shell-mound resting on it at Caisteal nan Gillean, Oronsay.[4]

Irish raised beach deposits have so far yielded no micro-burins; but Burchell claims microliths from stratified ferruginous gravels overlying the Lower Lagoon Silt at Cushendun.[5] Movius, too, reports the sporadic occurrence of steeply dressed artifacts in his Early Mesolithic Horizon 2 at the same place in Co. Antrim, and figures a battered back blade in his series.[6] He also informs us that in an Early Mesolithic context a microlith was found at Rough Island.[7] It would therefore appear that rare as such small forms have proved, they definitely have a place in the early industries of the raised beach.

The abruptly retouched Irish and Scottish forms call for some consideration, as the indications of different methods used in their preparation

[1] *Op. cit.*, p. 263, and fig. 1, Nos. 1 and 2.

[2] *Cf.* Ed. Vignard's "éclatement vibratoire" referred to in his "Les microburins du Sébilien," in *Compte-Rendu du Congrès Préhistorique de France*, Xème Session, 1934, Périgueux, pp. 82–3, and pl. viii. No. 6.

[3] V. Gordon Childe, *op. cit.* (1935), p. 20.

[4] H. Breuil, *op. cit.*, pp. 265–6, and fig. 3, No. 1.

[5] *Op. cit.* (1931), pp. 283–4, and fig. 37.

[6] *Op. cit.* (1940), p. 57, and fig. 14, Nos. 54–55; and letter dated Harvard University, 8th February 1940.

[7] Published since; "Report on a Stone Age Excavation at Rough Island, Strangford Lough, County Down," *Journ. Roy. Soc. Ant. Ire.*, vol. lxx. (1940), p. 125, and fig. 5, No. 24.

bear upon the dating of our relics. While the small steeply dressed artifacts generally enhance the Upper Palæolithic aspect of the raised beach early industries on both sides of the North Channel, two sorts of specimens are found in the Kintyre beach. These two varieties, when viewed from the standpoint of technology, shed fresh light on our industry and point to its complex character. Thus, micro-burins and flakes truncated by micro-burin technique occur with blades *à dos abattu* retaining the bulb of percussion. We accordingly have proof of the penetration into the Argyll industry of so-called Tardenoisian methods, which were exercised concurrently with the simpler Upper Palæolithic style. On the Irish shore the steeply trimmed pieces and the absence of the micro-burin indicate that the pure Upper Palæolithic treatment of these objects persisted, and that the raised beach industries received no stimulus from the Tardenoisian. It is also interesting to note that up till now the micro-burin has not been reported from Ireland even among the microlithic forms which are common as surface-finds in the northern part of that country. Indeed, as most of these are worked in complete flakes, they seem to be the successors of the Northern Irish raised beach forms.

End-scrapers on Flakes.—Instances of these well-represented forms are figured as Nos. 31 and 32. Several retain patches of cortex, and some are manufactured at the end of short external flakes. Others, again, are fashioned at the end of flakes quite large for this industry, bearing many truncated facets; of these No. 33 is typical.

The dressing differs in character from that of the great majority of Scottish surface-found implements. In the specimens here shown the fairly steep and short retouches are delicate enough, though consisting of the strict minimum necessary to obtain the desired edge. Most end-scrapers on flakes of the raised beach industry are neatly rounded off at one corner only, the full horse-shoe arc, *e.g.* No. 31, being a rarity.

Thick, short, and much-faceted flakes of the type (Nos. 15 and 16) mentioned on p. 68 provided material for the preparation of small scrapers classable with the last-named variety. Illustrated examples, Nos. 34, 35, and 36, the first two quartz and the third flint, are steeply trimmed along the greater part of their round edges.

A few similar but larger flake-implements engrailed at the end, and not retouched in the familiar manner, may be assigned to the general group of end-scrapers (No. 37). Similar implements have been collected by Burchell from the stratified ferruginous gravels at Cushendun.[1]

Side-scrapers.—As a distinct form the side-scraper is fairly well represented by examples with convex working-edges. These tools are generally

[1] *Op. cit.* (1931), p. 283, and fig. 35.

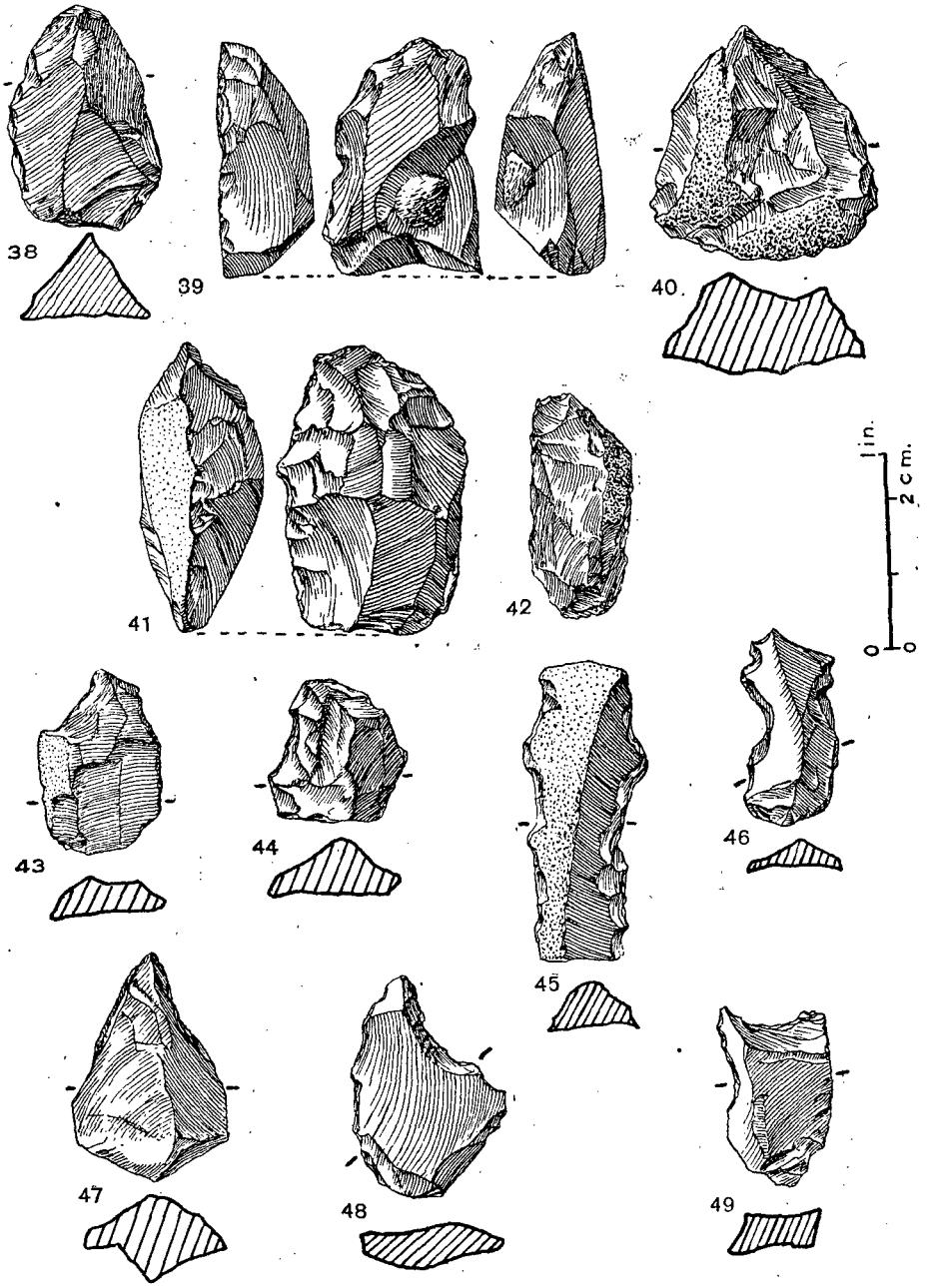

Fig. 4. The Albyn Distillery industry: side-scrapers, hollow-scrapers, notched flakes (*lames à coche*) and perforators.

prepared on thick flakes of triangular section in the case of flint, as Nos. 38–39, and on convenient portions of quartz pebbles, *e.g.* No. 40. The first specimen (No. 38) compares closely with instances noted in contexts from the raised beach at Larne [1] and in the late Mesolithic of Glenarm, Co. Antrim.[2] We understand, however, that the side-scraper is rather a scarce form of tool in the Early Mesolithic industries of the Northern Irish raised beach.[3]

Two finely flaked core-tools, Nos. 41 and 42, may be included in this list.

Hollow-scrapers.—Variants may be grouped in this fairly representative series. The simplest consist of flakes with a wide lateral notch, usually on the left (No. 43, schistose grit, and No. 44, quartz). Considering the rock of which it is made, the second of these shows remarkably delicate retouch.

Notched Flakes.—Two notched flint flakes, Nos. 45 and 46, so closely resemble the typical small Aurignacian *lame à coche* that they must be regarded as additional elements of Upper Palæolithic tradition surviving in the Campbeltown raised beach industry. These objects were perhaps intended to serve in much the same way as the side hollow scrapers mentioned in the foregoing paragraph. In any case, the thickness and coarse resolved trimming categorically distinguish these irregularly notched flakes from those prepared for division by micro-burin technique. Considering the common ancestry of the Scottish and Northern Irish raised beach industries, it is not surprising that Antrim Mesolithic horizons yield many similar implements.[4]

Perforators.—A quartz flake with thick and slightly retouched tip, No. 47, which perhaps served as a perforator, may be comprised in this section. No. 48, flint, is a piercing-tool also adapted for use as a hollow-scraper by rudimentary trimming of the fortuitous concave margin of a thin core-rejuvenation flake, worked by trimming the projecting spur. This specimen possesses the added feature of being dressed on the opposite edge. Another flint example, No. 49, is more definite. That its purpose was not solely restricted to perforating is testified by shallow hollows with finely retouched edges on the right of the worked tapering beak and on the left side. The hollows, it will be observed, do not differ from those characterizing the objects grouped as hollow-scrapers.

Specimens resembling these Scottish pointed implements occur in the Mesolithic industries of the Antrim beach, the site excavated at Glenarm by the Third Harvard Archæological Expedition to Ireland having yielded many.[5] Even closer parallels to our Argyll examples occur in the lower

[1] W. J. Knowles in *Journ. Roy. Anthr. Inst.*, vol. xliv. (1914), p. 100, and figs. 19, 20, 23, 24, and 29.

[2] H. L. Movius, *op. cit.* (1937), p. 194, and fig. 4, No. 15.

[3] Letter from Dr Movius to the author, dated Harvard University, 8th February 1940.

[4] *E.g.* at Glenarm, *op. cit.* (1937), pp. 194–6, fig. 4, Nos. 17 and 19.

[5] H. L. Movius, *op. cit.* (1937), p. 198, and fig. 6, Nos. 31–33.

and upper gravel layers at Cushendun respectively yielding the earlier and later Mesolithic series (Movius's Horizons 2 and 3).[1]

It is conceivable that these distinctive forms may be the forerunners of the fine hollow-scrapers which are typical of Northern Ireland.[2]

Cores.—Struck nodules and cores of schistose grit are absent, but flint examples are numerous and varied. The poor quality of much of the flint is reflected by so many pebbles bearing ill-defined scars, abrasions, and other indications of unsuccessful attempts to detach suitable flakes. Still, well-flaked specimens of flint are not wanting, the conical sort with single platform being common (No. 50). As is well known, this shape is one usually associated in this country with industries which included the production of delicate flakes. Though many cores from here are flaked all round, several consist merely of pebbles from which only some flakes were removed, *e.g.* No. 51, flint, and No. 52, quartz. Some much flake-scarred examples, as No. 53, were struck in two or even more planes.

From a few round or flattish nodules flakes were detached so regularly all round from both surfaces as to leave a discoidal core (No. 54). In other cases the flaking reduced the core to segmental form, as No. 55, flint, and No. 56, quartz. In respect of the latter variant, it will be recalled that the Abbé Breuil commented on cores from Campbeltown, which he thought had probably been used as accommodation-tools. He likened them to hatchets of the kind believed to have been employed throughout the "reindeer period" for cutting bone or as wedges.[3] Now, as the edges of the circular core and of the larger segmental ("tea-cosy") one (Nos. 54 and 55) show signs of wear, the artifacts may perhaps fall into the category to which our Honorary Fellow drew attention. These specimens are particularly mentioned, because, despite the fact that no worked bone is to be recorded so far from the Campbeltown raised beach, stone implements to be considered later in this communication indicate that bone-working was practised by the settlers here.

Core-scrapers.—Although the Albyn Distillery site has yielded varied and numerous cores, it has not produced many true core-scrapers. This may perhaps be accounted for by the fact that, where so many accommodation-tools were used, the convenience of the edges of steep cores was not ignored, and, consequently, numbers of flaked-down nuclei served without marginal retouch. No. 57 is an example of the most common sort of

[1] Cushendun report (1940), *cit. supra*, pp. 57 and 63, fig. 14, Nos. 51–52, and fig. 18, Nos. 104–105.

[2] *A Guide to Antiquities of the Stone Age* (British Museum, 1926), fig. 114, p. 117.

[3] *Op. cit.*, p. 265.

Concerning the use of cores as wedges, the present contributor may mention that the late Mr W. J. Lewis Abbott showed him remarkable finds from a kitchen-midden at Hastings, Sussex. These relics consisted of two cannon-bones in each of which a small flint core was so firmly infixed as to be immovable. The longitudinal cracks extending from the end of the tightly fitting flints proclaimed that these could only have been driven in for the purpose of splitting the bone. See also *Natural Science*, vol. xi. (July and August, 1897), p. 45, and pl. vi.

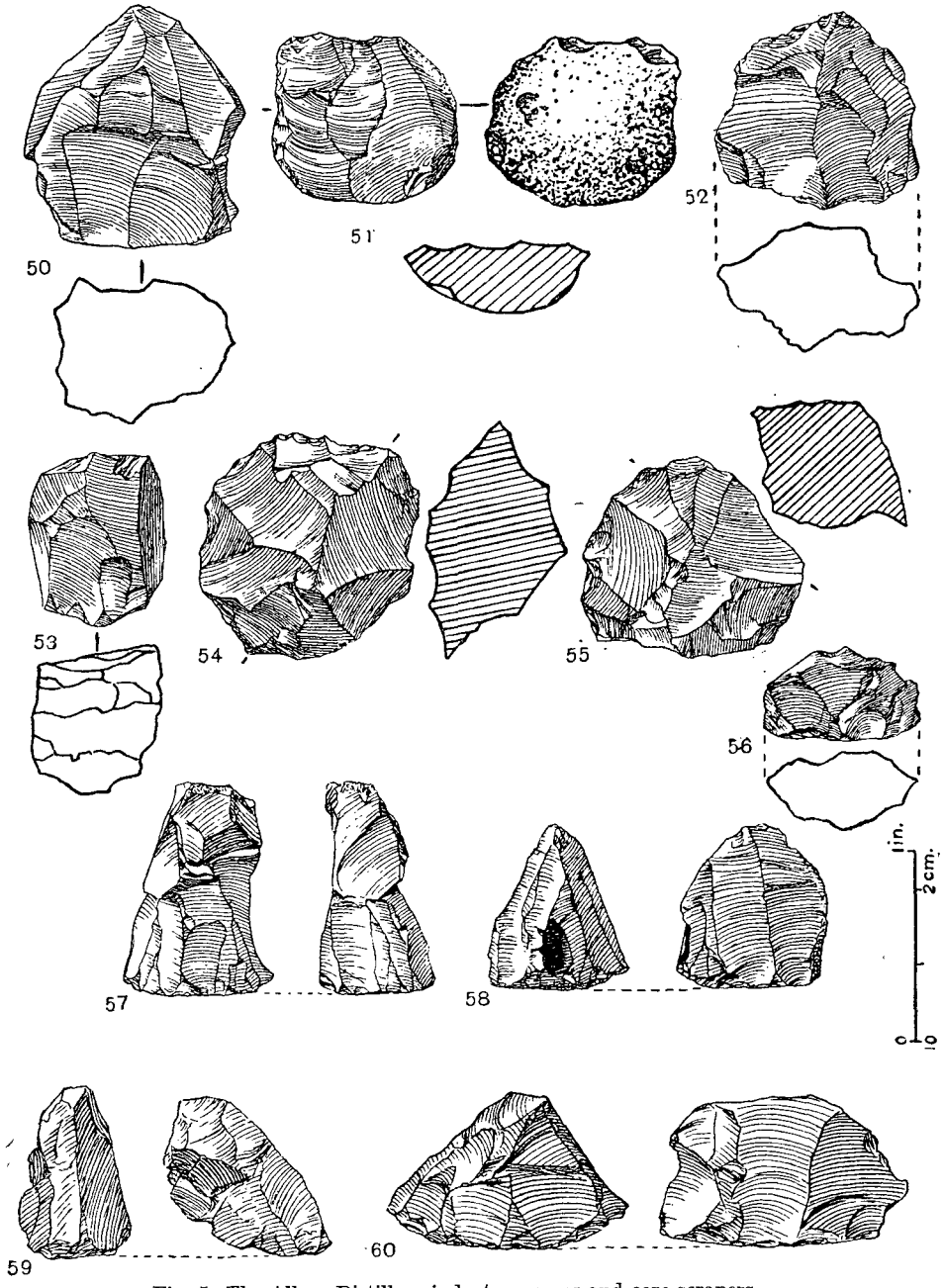

Fig. 5. The Albyn Distillery industry: cores and core-scrapers.

well-flaked conical flint core whose edge, though showing no signs of trimming, yet testifies to service.

With the foregoing are figured two cores, one of flint, No. 58, and one of quartz, No. 59, both transformed by delicate edge-dressing into scrapers of the type so abundant in phases of Upper Palæolithic culture and in Mesolithic industries preserving elements of Aurignacian tradition.

Another specimen, of flint, No. 60, but more finely edge-dressed and belonging to this category, is actually the upper part of a core. Just as obviously as its companions, this object is fashioned in Upper Palæolithic style, and it closely resembles one of the core-scrapers figured by Breuil to stress the Upper Palæolithic aspects in Gray's collections from the Campbeltown raised beach.[1]

Core-scrapers are prominent in the Early Mesolithic contexts from the Antrim raised beach. The different workers in Northern Ireland mention and figure numbers matching those taken from the Argyll deposits which are illustrated in these pages.

Core-trimmings, etc.—The lower part of a core, No. 61, calls for notice as a curiosity. At first it reminds one of a Levallois core, an illusion created by the wide flake-scar with its marked hollow of percussion. Actually these features result from the removal, in the plane of the original platform by a deft blow, of the upper part of a core.

Shapely cores of quartz are rare, as the nature of the rock seldom permitted of the removal of more than a few flakes from the nodule. There are several true quartz cores, however, besides those figured here. They consist of elongated narrow prismatic objects owing their shape to the fact that only a few flakes could be detached in the length of small pebbles. A core-rejuvenation flake, No. 62, struck from the same plane as the original platform of a core, shows, nevertheless, that sometimes this rock was sufficiently tractable to stand up to repeated flaking. This piece and the small segmental quartz core, No. 56, indicate how the quality of this rock may vary at one site.

No large flint cores have been recovered by McCallien; and, so far as we know, Gray's collections included none, although their presence in the beach would be indicated by the size and character of some of the flakes discovered [2] and by trimming or rejuvenation flakes. One of these, struck from the base of a core so as to remove the apex, is represented by No. 63.

In addition to Nos. 62–63 may be mentioned several flakes in the collection which at first sight might seem difficult to assign to their proper place. They are in fact core-trimmings, perhaps more appropriately to be considered in a technological study. Suffice it to say meantime that

[1] *Op. cit.*, p. 263, and fig. 2, No. 19.

[2] H. Breuil, *ibid.*, pp. 261–3, and fig. 1, Nos. 7, 14, and 16; also Nos. 11–12, *supra*, p. 68.

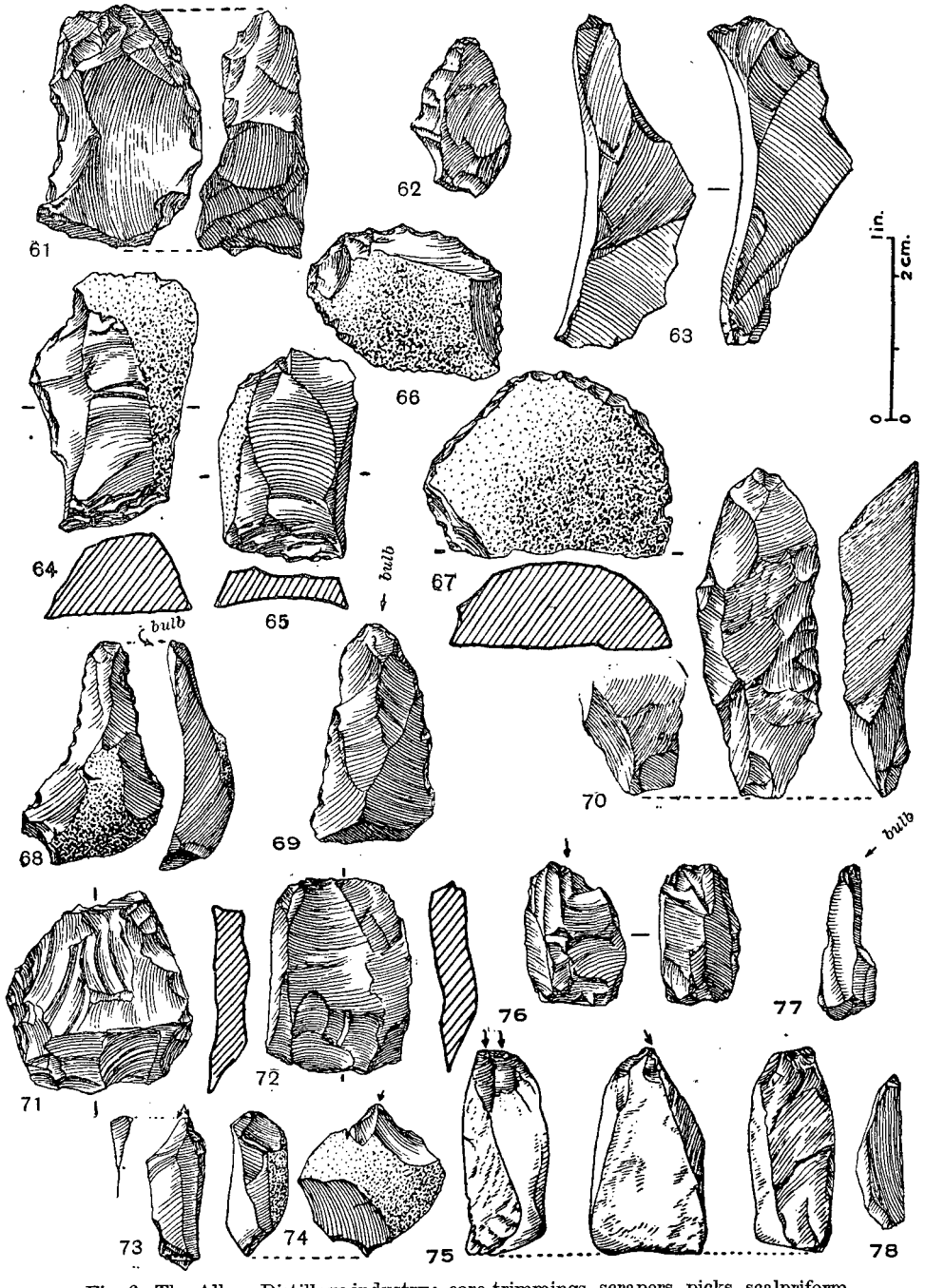

Fig. 6. The Albyn Distillery industry: core-trimmings, scrapers, picks, scalpriform flakes, gravers and graver-spalls.

the principal variants consist of (*a*) thick pieces struck either at right angles or obliquely to the original platform, and (*b*) ridged flakes.

Cores so reduced as superficially to resemble flakes, and other objects which may be described as thick slices of nodules and cores, occur, *e.g.* Nos. 64–65. Some of these may have been used as implements without added treatment.

"Thumb-nail" and Steep Scrapers.—In addition to the various scrapers mentioned, and particularly in contradistinction to the core-scrapers, are several small flattish tools best described as "thumb-nail" scrapers, of which No. 66 is a typical example. The specimen figured is trimmed at the end of a primary flake struck from a flint pebble, much of the cortex of which remains. Implements of this kind may be compared with the steeper variety, in whose preparation advantage was taken of the curvilinear edge provided by splitting round pebbles. A finely retouched specimen of quartz has been selected for illustration (No. 67). The retouch on these scrapers, thick and thin alike, is similar to that seen on all the end-scrapers belonging to this industry.

In shape and workmanship these different round scrapers strictly match many found in the Early Mesolithic industry at Cushendun and other Antrim coastal sites. It may also be noted that the dressing applied to these tools, involving the edge only, is quite different from that on their morphological counterparts, which by their associations and character of workmanship are referable to Bronze Age culture. On the other hand, the objects from the raised beach industry closely resemble round scrapers from Azilian and Azilio-Tardenoisian stations.

Picks.—Crude implements peculiar to the Northern Irish raised beach, and prototypes of objects so characteristic of the industries of one place as to earn for them the name "Larne picks," consist of plunging or core-rejuvenation flakes retouched at the bulbar or pointed end on the upper surface and usually on the edges as well. Hitherto the type was unknown outside Ireland, and therefore it is interesting that this form of implement can now be recorded from the Campbeltown beach. The example here figured (No. 68) strictly matches characteristic Irish specimens which make their first sporadic appearance in the Early Mesolithic groups of the Antrim raised beach. Blake Whelan sees in these tools an affinity with the Asturian pick,[1] but, as Movius points out, the form is better regarded as a local specialization peculiar to the provincial culture of the raised beach.[2] In any case, our Argyll example provides yet another instance of an industrial product common to the culture which flourished on both shores of the Northern Channel.

A kindred but slightly less typical specimen, although similarly worked,

[1] *Journ. Roy. Anthr. Inst.*, vol. lx. (1930), pp. 169–84.
[2] *Op. cit.* (1937), p. 196, and fig. 5, Nos. 25–27.

may also be shown to stress the analogy (No. 69). As with most of the artifacts from the Argyll beach, the relics in question are much smaller than the majority of comparable objects from Northern Ireland.

A remarkably well-made narrow quartz tool, No. 70, calls for particular comment as probably the most interesting and important single specimen in the Albyn Distillery series. The implement is flaked bifacially in its lower part and on one face only in the upper. The working upper extremity appears to have been intended for service as a pick, but at the lower end the working edge is like that of a chisel. This specimen, occurring in association with certain other suggestive forms, cannot be dismissed merely as an odd intruder. It is particularly significant, although at first sight it might be considered cognate with the "Cushendun picks" and rostroid implements of the Irish Early Mesolithic (Movius's Horizon 2) from the deposits under the Antrim Upper Lagoon Silt. We incline to the opinion that our specimen owes its character to that Baltic influence which also manifests itself in some relics of the Mesolithic culture represented in other littoral sites in Argyll. The writer would add that Dr Movius agrees that, small as is this artifact, it may be taken as indicative of the penetration of Forest Culture into our area.[1] Moreover, as such and as a distinct type, the piece would be the earliest example showing Forest Culture influence in the lithic element of Scottish industries. That this influence appears otherwise is well known from the artifacts of osseous material found in Argyll caves and shell-mounds, which can all be assigned to the Atlantic climatic period.

Until now, the Scottish stone implements showing some Baltic strain have been identified only among surface-finds, and, from the circumstances of their discovery, are not strictly datable. In respect of the Campbeltown quartz pick, however, there must exist a great difference in age between the deposit within the beach from which it was extracted and the shell-mounds resting upon the equivalent beach in Oronsay yielding barbed bone points whose Baltic traits have so often been stressed. It therefore seems needless to add that this quartz tool throws new light on Scottish stone industries.

Scalpriform Flakes.—A small thick flake, of flint (No. 71), found during the recent excavation in the raised beach, gives rise to some speculation. This bifacially flaked specimen can hardly be viewed in the same light as rejuvenation flakes or simple cores. The use to which it was put involved its lower edge. The outline of this is fairly straight, a result obtained by the deliberate detaching of squamous flakes. It is suggested this specimen was used to cut or work bone, or even wood of small section. Otherwise, the equipment of the Campbeltown raised beach industry comprises but few implements for such operations.

[1] Letter, dated Harvard University, 8th February 1940.

In Antrim a crude form of small *tranchet* has been identified in the Early Neolithic industry at Glenarm [1] and at Cushendun,[2] but we understand that no form approaching the *tranchet* appears in Northern Ireland until Post-Mesolithic times. Nevertheless, we venture to advance the opinion that the object, represented by No. 71, may well have been used in the same way as the small *tranchet* peculiar to the Irish littoral Early Neolithic culture-phase. Further inquiry in Ireland may show that instances occur in Mesolithic industries which compare with the Scottish specimen. A quartz flake, No. 72, may be cognate.[3] Superficially this artifact is not unlike the reduced cores Nos. 64–65, and especially the latter. However, the rather fine flaking of the lower edge appears to be distinguishable from the signs of bruising due to blows dealt to thin down the two cores.

Gravers.—In addition to the implements already mentioned, which suggest bone-working, a place is occupied in the present series by forms usually associated with such activity. Few can be recorded, however, and these are poor objects. Yet, the recognition by the Abbé Breuil in the Campbeltown collection, preserved in the National Museum, of a large spall detached from a graver in the making is sufficient indication that fair gravers ought not to be wanting.[4]

The gravers from the recent excavations are of the simplest. Their working-edge was achieved by the bilateral removal of graver-spalls, or by backing one or more graver-facets against a convenient edge of a flake or core. No. 73 is an example of the "ordinary" or *bec-de-flûte* variety, its narrow characteristic working-end formed by a graver-facet backed against another at the upper extremity of a small flint flake. No. 74, a small flaked nodule, may be included here on the score of the terminal chisel-like edge, obtained by backing a short facet on the left against a flattish one.

Quartz occasionally served for this tool-form, and a worked pebble of the hyaline variety is shown by No. 75 as an example of a multi-faceted graver. Actually, this is but an elaboration of its flint companion (No. 74). The chief interest in the quartz implement lies, of course, in the fact that it exemplifies the employment of material generally believed too intractable to permit one to expect good results from the striking required to remove so many fine spalls.

[1] H. L. Movius, *op. cit.* (1937), p. 204, and figs. 64–8.

[2] Fig. No. 118, H. L. Movius, Cushendun report, *op. cit.* (1940), pp. 65–6.

[3] One of us (A. D. L.), in examining vast collections of quartz artifacts from a Late Neolithic occupation-site in the Anglo-Egyptian Sudan, separated numbers of relics which compare with these Scottish artifacts. Some Sudan specimens are in a fresh condition, just as when prepared, and others have been damaged from use. The fact that the African examples are made in quartz, the rock employed to the virtual exclusion of all others for the larger implements, argues for the deliberate manufacture of the type to answer some definite local need.

[4] *Proc. Soc. Ant. Scot.*, vol. lvi. p. 263, and fig. 1, No. 11.

One more graver selected to represent this series consists of a diminutive flint core worked to a wide graver-edge (No. 76).

Waste spalls of flint and quartz resulting from graver manufacture are figured in Nos. 77 and 78 respectively.

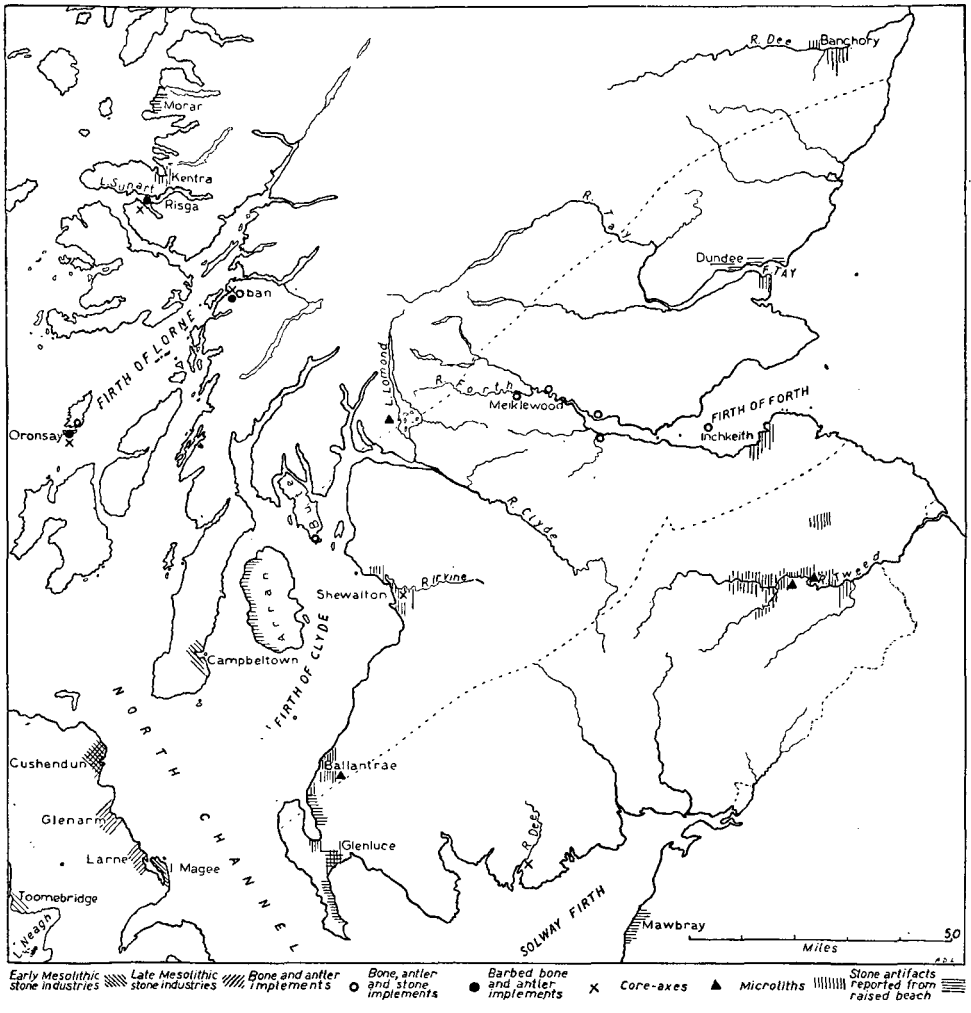

Fig. 7. Sketch map showing the Midland Valley (boundaries dotted) and the distribution of artifacts of Mesolithic facies, according to available data.

Though no large graver can meantime be noted, the examples found near the Albyn Distillery are well made considering their size and the materials. Degenerate as a few of these pieces will appear to those familiar with the excellent tools occurring occasionally in other Mesolithic contexts,

the Campbeltown gravers do not compare unfavourably with some belonging to later Upper Palæolithic industries or with those present in Azilian series.[1]

Such forms, claimed to be gravers, as have been illustrated by Burchell, from Irish Early Mesolithic and other contexts of the raised beach are not convincing and may be referred to the category our French colleagues designate *burins de fortune*. Actually, gravers are very rare in the Northern Irish raised beach Mesolithic industry. The fact that these tools occur in Argyll argues for a somewhat greater cultural development on the Scottish side of the Channel.

10. Cultural Affinities.

So far as Ireland is concerned, none of the archæologists, who have been so active lately, has failed to emphasize the similarities existing between certain of the lithic products of the beach at Cushendun, and elsewhere along the Antrim coast, and those made classic by the Abbé Breuil in his paper on the pre-Neolithic industries of Scotland. This review of the Campbeltown industry, however, in the light of present knowledge and of much new material, shows that some associations have not been made known, with the result that students of Scottish and Irish Mesolithic cultures have not had the opportunity of determining the closer connexion between the raised beach industries on the two sides of the North Channel. An advance in this direction may now be made.

The examples in the Albyn Distillery collection, which match certain Irish types not previously observed among the Scottish beach artifacts, have already been mentioned, and attention has been drawn to those features which suggest a link with products of cultures also believed to have exerted an influence on certain aspects of stone-working in Scottish stone industries.

There has been controversy on the subject of the cultural age and chronological position of our raised beach industries. It will be useful, therefore, at this stage to give a brief review of some of the different opinions which have been expressed and to comment on these.

1. Some authorities have gone so far as to suggest that in some localities in the South of Scotland the 25-foot raised beach is referable to the Bronze Age;[2] others have considered it Neolithic. The Bronze Age view may safely be dismissed at once; and on archæological evidence attribution to the Neolithic does not stand the tests of typology and

[1] The generally indifferent character of Scottish gravers has been commented on by the writer in a paper communicated to this Society, *Proc. Soc. Ant. Scot.*, vol. lxxii. (1937–38), pp. 180–92.

[2] *E.g.* J. W. Gregory, "Some Caves and a Rock-Shelter at Loch Ryan and Portpatrick, Galloway" (J. W. Gregory, James Ritchie, W. Q. Kennedy, and Duncan Leitch), *Proc. Soc. Ant. Scot.*, vol. lxiv. (1929–30), pp. 260–4.

general culture. Nevertheless, the tendency among geologists has been to speak of the raised beach, which is so conspicuous a feature of Western Scotland, as Early Neolithic,[1] but conversations on this point seem to suggest that this term may actually mean something a little older than true (Scottish) Neolithic.

2. The industries have frequently been called Azilian on the score of the bone-work and some of the stone artifacts recovered in the Argyll shell-mounds resting upon, and in the caves and rock-shelters in cliffs behind, the raised beach. Breuil, however, noticed that the Campbeltown stone implements differed from those of Oban and Oronsay discussed by him.[2] By some it has been urged that such a designation might be acceptable if qualified as *Scottish Azilian*,[3] but among the stone artifacts we have considered in the foregoing section the Azilian aspect is by no means marked.

(*a*) Besides, other considerations would lead us to use the term "Azilian" with caution, even in a restricted sense, in referring to Scottish raised beach relics. Of these we may mention the unmistakable signs of the permeation of Baltic influence in some of the Oronsay and Oban bone-work,[4] and, as we believe, also in a few stone implements, one being particularly suggestive, from the Albyn Distillery site.[5]

This influence, manifesting itself in Oronsay and at Oban, in situations indicative of very Late Atlantic time (*i.e.* after the transgression maximum), may well have infiltrated to the West from the Lower Forth region, which was reached during Atlantic or even Late Boreal times by a few immigrants, possibly from across the North Sea.[6] Baltic features, deriving from those which had reached England early in the Boreal period by way of the southern part of the North Sea fen,[7] became firmly established in that

[1] *E.g.* W. B. Wright, *The Quaternary Ice Age* (1937 edition), pp. 385–7.

[2] *Op. cit.*, p. 261.

[3] See, for example, W. J. McCallien in *Proc. Soc. Ant. Scot.*, vol. lxxi. (1936–37), p. 203.

[4] H. Breuil, *op. cit.*, pp. 280–1.

[5] *Supra*, p. 81.

[6] V. Gordon Childe, *op. cit.* (1935), pp. 17–19.

Having examined the kit of tools and barbed points of bone and antler from Oronsay shell-mounds, and having considered Childe's convincing arguments for the Baltic aspect in the island industry first noted by Breuil (*op. cit.*, p. 279), we can also draw attention to a significant implement from Oronsay which seems to have escaped notice. This is a perforated antler adze we have recently inspected in the Hunterian Museum, Glasgow. The specimen resembles the classic example from the Forth valley at Meiklewood, near Stirling [Childe, *op. cit.* (1935), fig. 2 A, p. 18].

Dr Clark's suggestion that the very numerous utilized long pebbles recovered in the Oronsay shell-mounds may have served in the same way as the Baltic kitchen-midden axes ought not to be overlooked [*The Mesolithic Age in Britain* (1932), pp. 14–15]. Similar objects have been found at different places in Britain, usually where material suitable for the production of large stone implements was not obtainable, *e.g.* Cornwall, Wales, Inchkeith. The Abbé Breuil, however, sees in these tools flaking-instruments employed in the preparation of stone (*op. cit.*, pp. 267–70, and fig. 4, Nos. 2–8).

[7] S. H. Warren, J. G. D. Clark, H. and M. E. Godwin, and W. A. Macfadyen, "An Early Mesolithic Site at Broxbourne sealed under Boreal Peat," in *Journ. Roy. Anthr. Inst.*, vol. lxiv. (1934), pp. 101–28; also A. Leslie Armstrong, *Man*, 1922, No. 75.

country by the succeeding Atlantic period,[1] during which they may also have penetrated into Scotland from south of the Cheviots. In this connexion a lithic industry, referred by Dr C. T. Trechmann to Maglemosean culture and assigned by him to the Early Atlantic period, from the Hartlepool forest bed,[2] certainly ought not to be overlooked.

(*b*) Sensible of the weight of authoritative opinion for an Azilian aspect in the barbed points of the Argyll shell-mounds and caves, we admit that there seems to exist no chronological difficulty for the extension toward Scotland of Azilian strains appearing in what has been described as the hybrid bone-work of Oronsay and Oban. It is thought possible that true French Azilian culture, which may be assigned to Boreal or earlier times, may have spread northward by sea-routes from the classic region to Western Scotland, where its vestiges would suggest the remarkable coalescence of French epipalæolithic and Scandinavian Forest Culture elements. It can be appreciated that with long halts at favourable shore-sites in new conditions, and probably under the influence of different contacts, many of the industrial traditions of Le Mas d'Azil faded with the passing of the ages to mere lingering echoes.

The Argyll middens and caves, containing these bone artifacts, respectively rest upon and lie behind a beach equatable with the Littorina transgression of the Baltic. Their contents, therefore, are later than the Ancylus Maglemosean, and they approximate to the third stage of Baltic Forest Culture (Ertebølle).[3] Now, in Baltic chronology, which cannot yet be applied with certainty to our deposits, the period of the Littorina raised beach may be taken as 5000–2500 B.C.,[4] the maximum transgression in Denmark taking place about 4500 B.C.[5] It is therefore interesting to recall that in an authoritative work, published in 1919, Azilian man was spoken of as having entered Scotland at least tens of thousands of years ago.[6]

3. To call the Campbeltown industry Azilio-Tardenoisian, as one of us (W. J. McC.) has done in a recent book,[7] appears to the senior author to be stressing a coalescence at best but faintly suggested in a mixture of various elements. Among these one has to consider the elements most frequently urged by different authors as dominant, and mentioned below.

[1] Papers on the Lower Halstow site by J. P. T. Burchell, in *Proc. Prehist. Soc. East Anglia*, vol. v., pt. i. (1925), pp. 73–8; *ibid.*, pt. ii. (1926), pp. 217–23; *ibid.*, pt. iii. (1927), pp. 288–96.

[2] "Mesolithic Flints from the Submerged Forest at West Hartlepool," in *Proc. Prehist. Soc.*, N.S., vol. ii., pt. ii. (1936), pp. 161–8.

[3] V. Gordon Childe, "The Forest Cultures of Northern Europe . . ." in *Journ. Roy. Anthr. Inst.*, vol. lxi. (1931), p. 333.

[4] J. G. D. Clark, *The Mesolithic Settlement of Northern Europe*, p. 221.

[5] K. Jessen, *Det Kgl. Danske Videnskabernes Selskab.* Biologiske Meddelelser, xii. 1, Copenhagen, 1935, p. 41.

[6] J. W. Gregory, *Geology of To-day*, London, 1919, p. 319.

[7] *The Geology of the Glasgow District* (Blackie, 1938), p. 148; also *Proc. Soc. Ant. Scot.*, vol. lxxi. (1936–37), p. 203.

In what concerns Tardenoisian influence, however, we have better evidence, as, though not marked by numbers in the Argyll raised beach industries, it is manifested by some stone artifacts, including that most significant cultural index, the micro-burin. The precursors of these forms, which testify to the absorption in Scotland of yet another industrial element during the Atlantic climatic period, are believed to have first reached England in Late Boreal times.[1]

4. The products of the Campbeltown raised beach and the comparable industrial relics from Antrim deposits have been referred to phases of the Upper Palæolithic.[2] This attribution is doubtless based on too broad an interpretation of the Abbé Breuil's generalization of the facies of the stone artifacts examined by him. Yet, a few years before Breuil had the opportunity of inspecting our Scottish series, the Oronsay shell-mounds were stated by the late Professor J. W. Gregory to belong to a final phase of the Upper Palæolithic.[3] Nor is it so long since this geologist expressed the opinion that it was possible that in some localities in South-Western Scotland and Northern Ireland the raised beach might be referable to an Upper Palæolithic age.[4] But in the light of new knowledge, and for geological reasons, attribution of the so-called 25-foot raised beach and its contained industries to a phase of the Upper Palæolithic may now with confidence be set aside.[5]

Nevertheless, Upper Palæolithic characteristics, which appear in the industries of the raised beach, must be considered in the light of their extension toward Scotland. They persisted in the upper layers of Creswell,[6] and, although becoming debased with the northward trend of Mesolithic culture, were to some extent preserved in English microlithic (Tardenoisian) industries. Dr A. Raistrick has endeavoured to show that these reached the Pennines by Late Boreal times and the coast of Northumberland not long after.[7] Unfortunately, this claim, which is attractive when one considers the problem of the march of these industries toward Scotland, has not been everywhere accepted.[8]

From the foregoing observations it may now be seen that the Upper

[1] J. G. D. Clark, "Report on Recent Excavations at Peacock's Farm, Shippea Hill, Cambridgeshire," in *Antiq. Journ.*, vol. xv. (1935), pp. 284–319.

[2] *E.g.* J. P. T. Burchell, (*a*) *op. cit.* (1931), pp. 271–84; (*b*) *Nature*, 14th May 1932.
Mr Burchell revised this opinion in his endeavour to correlate the Antrim industries with phases of Baltic Forest Culture.—"Some Littoral Sites of Early Post-Glacial Times located in Northern Ireland," *Proc. Prehist. Soc. of East Anglia*, vol. vii., pt iii. (1934), pp. 366–72.

[3] *Op. cit.* (1919), pp. 318–19.

[4] *Op. cit.* (1929–30), p. 264.

[5] W. J. McCallien, *op. cit.* (1936–37), p. 198.

[6] A. Leslie Armstrong, "Excavations at Mother Grundy's Parlour, Creswell Crags, Derbyshire," in *Journ. Roy. Anthr. Inst.*, vol. lv. (1925), pp. 161 and 174, fig. 13.

[7] "Mesolithic Sites of the North-East Coast of England," in *Proc. Prehist. Soc. of East Anglia*, vol. vii., pt. ii. (1933), p. 197.

[8] H. Godwin and J. G. D. Clark, "The Age of the Pennine Peats," *Man*, 1934, Nos. 68 and 69.

Palæolithic tradition, so often stressed as being strong in the Argyll raised beach industry, was not the only influence which left a mark upon the lithic products of the settlers in what must be regarded as a refuge area, embracing a considerable part of South-Western Scotland and much of Northern Ireland.

5. How the various categories of artifacts constituting our raised beach industry compare with those belonging to diverse cultures has been noticed in the preceding section on the typology of our series. Analogies with Irish objects have been particularly stressed as furnishing the most obvious parallels, and we may now briefly mention the different Antrim cultural facies.

It has been determined beyond doubt that the Campbeltown groups in most of their component classes compare strictly with those of the Antrim series assignable on geological and allied grounds to the Early Atlantic period, and for archæological reasons to Early Mesolithic culture. In Northern Ireland the products of the two Mesolithic culture-phases are typologically distinguishable. The early facies is characterized by delicate blades and fine tools. The later series, though still possessing traits testifying to its remote Upper Palæolithic ancestry, yet shows marked differences due to the infusion of new elements.[1] Its constituents are coarser with a tendency to heavier equipment produced to cope with changing conditions. The core-axe, which seems to have been introduced into Ireland about this time, is thought to indicate the infiltration into that country of Forest Culture elements. In Antrim, not unexpectedly, however, there appear to have been several local developments, as seems attested by a number of forms so distinctive as to have earned for these types designations from places where they have been recovered in abundance.

For the Early Post-Glacial culture represented by the Early and Late Mesolithic industries of the Antrim raised beach Movius proposes the name *Larnian* after the classic site. Agreeing with him that in South-Western Scotland and North-Eastern Ireland there exists an indigenous Mesolithic province, and considering the identity of the Antrim early implemental series with the Argyll industrial relics, we may safely group the Campbeltown culture with his Early Larnian.

Attention is nevertheless drawn to the fact that on the Scottish coast no industry has yet been found which is stratigraphically separable as the equivalent of the elementary Early Larnian of the Lower Lagoon Silt. Moreover, the Campbeltown equipment is demonstrably somewhat more comprehensive and advanced culturally than Movius's evolved Early Larnian from the gravels between the Lower and Upper Lagoon Silts of Cushendun, etc. (Horizon 2). This fact is attested by the presence

[1] *E.g.* Glenarm 1; H. L. Movius, *op. cit.* (1937), pp. 209–10.

in the Argyll industries of such artifacts as gravers, micro-burins, trimmed obliquely truncated flakes, and, most important of all, a pick very strongly suggestive of Forest Culture. Apart from the few objects mentioned, which so far have not been identified among the Early Larnian products of Northern Ireland, it is in this facies that all our own artifacts find exact parallels. We may, therefore, on the evidence collected in Antrim and Argyll, regard the Campbeltown lithic material as expressive of a culture-phase somewhat later than Movius's Horizon 2 of the Irish Early Larnian, wherein the influence of Forest Culture has not yet been detected. The testimony of the Argyll beach, too, suggests that this Baltic influence was in reality more widespread in Scotland, even in relatively Early Atlantic times, than has been thought.

We scarcely envisage the continual arrival of bands of colonists, each one with its own industrial traditions, but rather the coming of people with a hybrid lithic culture composed of elements acquired by contacts and devised by necessity. Still, it also appears that from all the different cultural elements mentioned the beach-folk developed a provincial culture of their own. Further, the similarity in facies of the industrial groups proclaims that the communities on the Argyll and Antrim sides of the North Channel had the same needs bred of analogous conditions during the submergence in the Atlantic climatic period.

The raised beach industry of Campbeltown may, therefore, be said to comprise a specialized equipment, and, though deriving basically from the English Upper Palæolithic (Creswellian), it shows features of other cultures. As we have suggested, it is thought that some forms were dictated by requirements and evolved locally.

11. Development of Mesolithic Raised Beach Culture.

Because of changing climatic conditions, the cultural trend towards the end of the Irish Mesolithic is, we know, to heavier equipment. This is illustrated by certain flake-implements and more particularly by core-tools such as the typical "Larne axe," forms which may well point to the farther extension of Forest Culture. Research in Scottish littoral deposits, however, is not sufficiently advanced to permit us to assess the full significance of some objects from the raised beach on our side of the North Channel, which suggest the penetration of Baltic shapes and methods.

A factor too important to be ignored in South-Western Scotland is the dearth of material suitable for the manufacture by flaking of the larger tool-types such as occur in Irish Late Mesolithic industries. Nevertheless, there are indications which suggest that evidence of similar development in Scotland ought to exist. In this connexion, the relatively

large, thick, rolled, and often deeply porcellanized flints, which from time to time have been collected from the surface of the so-called 25-foot raised beach on our seaboards, invite investigation.

The large bone and antler tools and hybrid barbed points from the Argyll islands and caves definitely indicate such development after the maximum transgression, even as they mark the advance of Baltic Forest Culture. The writer may mention his own discoveries of flaked stone tools with tranchet-like cutting-edges, and his recognition of core-tools among surface-finds from Loch Lomondside and the Tweed valley. These objects, however, by their associations are assignable to late stone industries (probably belonging to an early metal age),[1] although the implements are certainly made in the tradition of Mesolithic prototypes, of which the raised beach and other deposits of the West may yet be shown to contain numbers.

So far, then, as we read the archæological and other evidence afforded by discoveries on the Irish and Scottish seaboards, it appears that, whereas the Early Mesolithic industries of the raised beach in Antrim and Argyll may be grouped together, different finds from West and South-Western Scotland point to the existence of two approximately contemporary facies in our Late Mesolithic culture. One of these would be marked by its lithic products, as in Ireland (? Late Larnian), and the other is distinguished by its bone and antler tools and hunting-gear, for which facies Movius proposes the name *Obanian*.[2]

The field of research offered by the Littorina or Atlantic raised beach in Scotland is virtually untouched, and its archæological possibilities are far indeed from being tested. We are, therefore, fully confident future inquiry will show that on our coasts the Mesolithic industries boast a wide distribution. It may be, too, that the Scottish contribution will eventually prove as informative as the quota furnished by Northern Ireland.

In the present state of knowledge we have no means of ascertaining how long the exponents of our early littoral culture survived. It is fairly sure, however, that these folk could offer little resistance to the "Neolithic" invaders with a full culture,[3] whose spread is attested in this apparently favoured region comprising the western shores of Arran, those of the Solway Firth,[4] and both sides of the North Channel.

12. Summary and Conclusions.

A.—At Campbeltown relics of a stone industry are distributed throughout the upper part of the raised beach deposits, but locally they

[1] *Trans. Glas. Arch. Soc.*, vol. ix., pt. iv. (1939–40), p. 328; and *Proc. Soc. Ant. Scot.*, vol. lxxiv. pp. 6–10.

[2] *Op. cit.* (1940), p. 76.

[3] See V. Gordon Childe's "Neolithic Settlement in the West of Scotland" in *The Scottish Geographical Magazine*, vol. 50 (January 1934), pp. 18–19.

[4] Finds of core-axes mentioned in *Mem. Geol. Survey, Carlisle and Silloth* (1926), p. 79.

are concentrated. They originate from shore occupation-sites dating back to the period of rising sea-level, and they were incorporated into the beach formation during the emergence.

The rolled and/or heavily patinated condition of some of the lithic products suggests they are older than their unscathed companions; yet no typological difference whatever can be detected between the altered and unchanged artifacts.

B.—Though flint, derived from the chalk of Northern Ireland and imported into Argyll, went to the manufacture of most of the artifacts recovered, local native rocks were also employed. Thus, quartz was very freely used and a few implements were fashioned in schistose grit.

C.—All the artifacts are of pre-Neolithic character, there being a complete absence of elements suggestive of true Neolithic culture among the industrial relics from the Campbeltown raised beach deposits. For these reasons, and because of geological and allied ascription of the raised beach on both sides of the North Channel to the Atlantic climatic period, the collection assembled by McCallien is assigned to Mesolithic culture.

D.—The Campbeltown industry may be grouped with the Mesolithic of Northern Ireland, called *Larnian* by Dr Hallam L. Movius, jr., to designate the Early Post-Glacial culture so typically represented at the Curran, Larne, and at Cushendun, Co. Antrim.

Our Scottish series most closely resembles the Early Larnian from Movius's archæological Horizons 1 and 2 at Cushendun, and more particularly the second (the gravel intercalated between the Lower and Upper Lagoon Silts of the Antrim raised beach) with its distinctive tool-forms which find exact parallels in McCallien's and Gray's collections.

E.—The Argyll artifacts, like those referable to the Early Mesolithic group of Antrim, have their ancestry in the English Upper Palæolithic (Creswellian), and consequently have their roots in the Aurignacian, industrial vestiges of which are retained in the assemblage. The Scottish series, however, is stronger than the Irish in later elements, such as some types met with in the upper layers of Creswell. For example, the micro-burin and forms prepared by micro-burin technique proclaim the penetration of Tardenoisian culture into the Scottish raised beach industry and also that its elements reached Scotland at an earlier period than was formerly suspected.

Although no worked bone was obtained at Campbeltown, the infiltration of Baltic Forest Culture is suggested by a few objects, a small pick being particularly significant. The presence of these different forms also indicates that the Argyll stone industry is culturally more advanced and is possibly of lesser antiquity than the second stage of Movius's Early Larnian, which it otherwise so clearly resembles.

F.—Climatic conditions on the coasts of Northern Ireland and South-

Western Scotland in the Early Post-Glacial period being alike, and human needs being similar, these factors dictated the development of a local provincial culture. So far, only the more complex sections of the Antrim raised beach provide adequate proof of the evolution of this pre-Neolithic culture, but it is confidently expected that future researches in the Scottish littoral deposits will afford equally conclusive evidence.

APPENDIX.

It appears that the Mesolithic industry recovered from the Campbeltown raised beach deposits, which are assignable to Early Atlantic times, antedates the advanced bone and antler industries from the Argyll shell-mounds and caves respectively resting upon and behind the equivalent raised beach. The situation of these shell-mounds and caves points to occupation during the period of emergence in Late Atlantic times following the maximum transgression of the sea; and their archæological contents prove the deeper penetration of Forest Culture into Scotland.