

## IV.

## AN ORANSAY SHELL-MOUND—A SCOTTISH PRE-NEOLITHIC SITE.

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The title of this paper indicates that the culture revealed by the excavations in the Oransay Shell-Mound belongs to a stage intermediate between the Palæolithic and Neolithic periods. The description of the site as post-Palæolithic would have been equally admissible—the point which it is important to emphasise being that the Oransay culture must be recognised as bearing an extremely close affinity to that of the Pyrenees Grotto at Mas d'Azil, excavated by the late M. Piette,<sup>1</sup> a culture which that learned archæologist assigned to the *hiatus* which had been assumed between the Palæolithic and Neolithic periods. That the existence of such a *hiatus* is to be interpreted literally is supposed to receive confirmation from the fact that in the Continental caves the remains of the two periods are separated by layers of stalagmite, which must have taken an immense time to form ; but the supposition lies at hand that the caves were deserted for some reason or other and only re-occupied when a later culture had supervened. That the culture discovered by M. Piette represents a transition stage between the two great stone-age periods is clearly shown by the position of the Mas d'Azil relic bed, which was intercalated between those of the Magdalenian and early Neolithic periods, from each of which it was separated by a sterile stratum of fluvatile deposit and loam containing masses of *Helix nemoralis*.

<sup>1</sup> See E. Piette, *Les subdivisions de l'époque Magdalénienne et de l'époque Néolithique*, Angers, 1889 ; E. Cartailhac, " Les fouilles de M. Piette dans la grotte du Mas d'Azil," *Anthropologie*, 1891, p. 141 ; and E. Piette, " Vestiges de la période de transition dans la grotte du Mas d'Azil," *Bulletin de la Société d'Anthropologie de Paris*, 1895, p. 235.

Previous to these excavations, MM. Boule and Cartailhac had found evidence of a similar culture in a cave at Reilhac associated with the fauna characteristic of the close of the Palæolithic and commencement of the Neolithic age. Further, M. Renault found evidence of the same culture at Montfort, Arriège, in the upper part of layers of the age of the reindeer, *i.e.* late Palæolithic; and at Tourasse, Haute-Garonne, it was found in layers where the remains of reindeer were rare and those of red-deer plentiful.

To this Continental culture as a whole, M. Piette has given the name Azilian, and the chronological position which he thus establishes has been generally accepted by Continental and British authorities.

At first sight it might appear somewhat hazardous to attempt to establish a uniformity of culture in sites whose external conditions are so dissimilar as Mas d'Azil and Oransay—the former yielding its evidence from an inland cave, the latter from a mound on the shore—but for the determination of archaeological horizons one of the most important data is the character of the implements associated with the sites, and in this respect these two distant occupations are in harmony. The characteristic implements of both sites are flat harpoons of bone and deer-horn, sometimes with one, sometimes with two rows of barbs, and generally perforated near the base. Other implements common to both sites are shoe-horn-like chisels of deer-horn and bone pins, along with pieces of pumice stone on which they were fashioned. The painted pebbles, however, which are such a remarkable feature in the Continental sites, have not as yet been found in the Scottish sites, and, on the other hand, the convex faceted chisels (*limpet gouges*) common to all Scottish sites<sup>1</sup> must be regarded as absent on the Continental sites, although somewhat similarly shaped instruments occurred at Mas d'Azil, and possibly at other inland sites.

Evidence of this culture in Scotland was first indicated, although

<sup>1</sup> See note, p. 55.

not recognised, in the excavations of Mr Symington Grieve in Oransay in 1879-82, when he explored from a natural history standpoint the hill of Caisteal-nan-Gillean, where he found the bones of the great auk.<sup>1</sup> The late Mr Galloway continued these excavations and examined two other sites, but it was not until his collection was purchased by this Society after his death and reported on by Dr Joseph Anderson that the archæological value of the site was recognised and the affinity of its culture to the Azilian was demonstrated.<sup>2</sup> That the west coast of Scotland is tolerably rich in the evidence of such culture received further proof a few years later, when this Society explored the M'Arthur Cave in Oban,<sup>3</sup> an exploration which was followed by similar discoveries in the Druimvargie rock-shelter in the same neighbourhood. It is to be noted, however, that the relics found in other Oban caves do not belong to this period, in spite of the grouping together of the human remains from all these sites, which were reported on by Sir William Turner—in fact, it is very doubtful if any of the human remains were found in the Azilian layer.

In the course of these Oban excavations the stratification seemed to suggest that the sea had not permanently retired from the 30 feet level at the time of the occupation. Dr Anderson refused to consider the evidence as sufficient to raise such a suggestion to the position of a scientific fact. In this refusal he was amply justified, because the shell refuse intercalated in the gravels occurred not as a definite layer, but in lenticular patches which, as Dr Anderson suggested, might have been deposited in pockets in the shingle; and further, the reports of the excavations fail to give any indication that the shingles themselves contained any implements or food remains.

The problem, therefore, presented itself to me of attempting to find such extensive and intensive evidence as would establish incontro-

<sup>1</sup> "Notice of the Discovery of Remains of the Great Auk or Garefowl (*Alca impennis*, L.) on the Island of Oransay, Argyllshire," *Linnean Soc. Journ.*, vol. xvi.

<sup>2</sup> *Proc. Soc. Antiq. Scot.*, vol. xxxii. p. 298.

<sup>3</sup> *Ibid.*, vol. xxix. pp. 211 and 410.

vertibly the position for which the uncorroborated testimony of the Oban caves offered but nebulous and insecure grounds.

The object of this paper, therefore, is to demonstrate from the shell-mounds of Oransay the existence of human habitation on or about the line of the 25-30 feet beach at a time when the sea had not permanently retired from that level, and, incidentally, to reveal the Azilian nature of the culture indicated in the occupation, and thus to correlate it directly with that of the Oban caves.<sup>1</sup>

The island of Oransay lies about 39 miles S.W. of Oban, adjacent to the larger island of Colonsay, from which it is separated by a channel narrow at the eastern end, and expanding to a breadth of about 1 mile in the centre. From this broader portion the tide recedes at low water, and this affords easy communication between the islands. The nearest point in the island of Islay is about

<sup>1</sup> The localities in Great Britain in which traces of Azilian culture have been found are as follows:—

1. *Oransay*.—Five sites, yielding harpoons and limpet gouges (for the identification of the latter, see p. 95). The eleven harpoons from the site on Caisteal-nan-Gillean are said to have been lost at the Fisheries Exhibition in London in 1883. Of these five sites, two were selected as burial-places during the Viking period.

2. *Oban*.—Two sites—the M'Arthur Cave and the Druimvargie rock-shelter—yielding nine harpoons and numerous limpet gouges, now in the Nat. Mus. Antiq., Edinburgh.

3. *Kirkcudbright*.—A harpoon now in the Kirkcudbright Museum was found in the river Dee.

4. *Colonsay*.—Limpet gouges from three sites, one of which, in close proximity to the neolithic floor discovered by Messrs Peach and Wright (*Geol. Mag.*, vol. x., 1911, p. 164), was discovered by the writer in the autumn of 1911.

5. *Tiree*.—Limpet gouge found by the writer on the sands at Ballevullin in the summer of 1911.

6. *Inchkeith*.—Doubtful. See *Proc. Soc. Antiq. Scot.*, vol. xxxii. p. 304.

7. *Whitburn* (Co. Durham).—A harpoon found on the shore is now in the Black Gate Museum, Newcastle-on-Tyne.

8. *Settle* (W. Riding, Yorks.).—Harpoon, now in the School Museum at Giggleswick.

9. *Dale* (Pembrokeshire).—See note, p. 95.

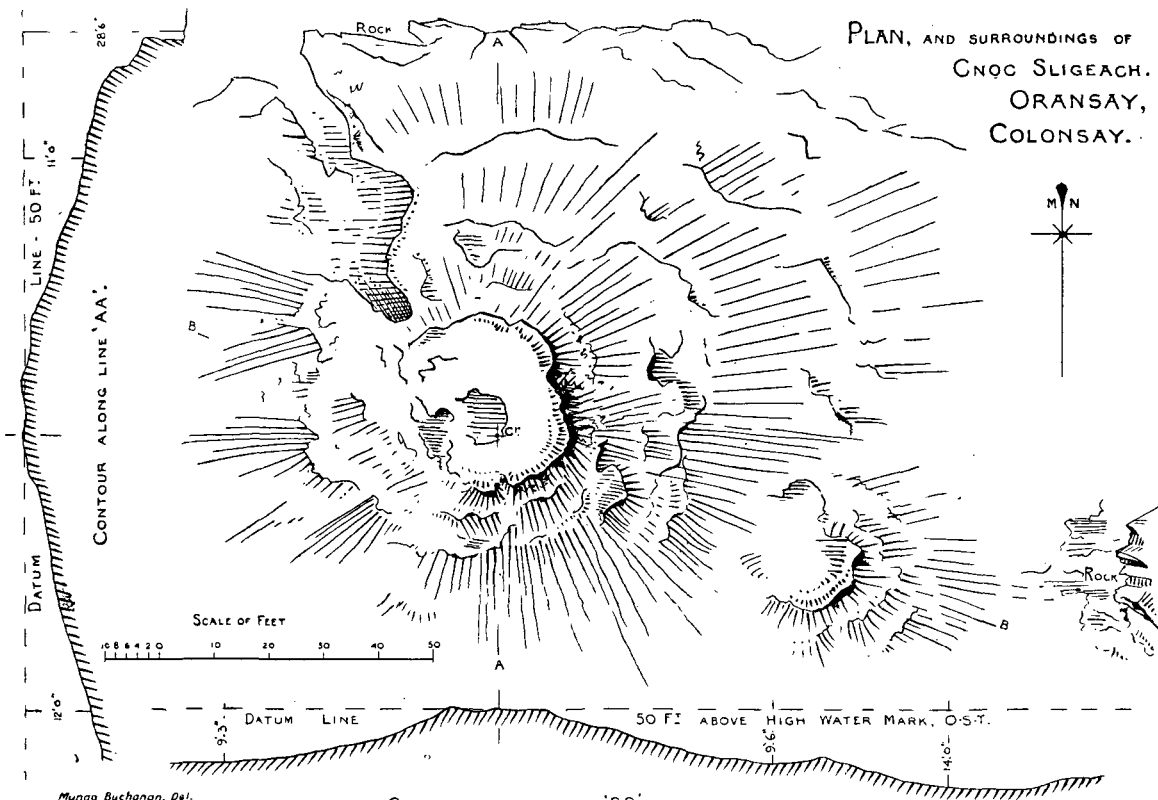
If the painted pebbles found in the Wester Broch, Keiss, Orkney, are to be accepted as Azilian in nature, it seems to point to the assumption that the broch occupies the site of an old Azilian station. See *Proc. Soc. Antiq. Scot.*, vol. xxxv. p. 119.

6 miles distant, and from there it is but a short crossing to the mainland.

Having on a previous visit to the island been struck by the fact that a seam of shells showed itself in a large rabbit-burrow on the E.S.E. side of a sand-hill, at an altitude of about 40 feet O.D., tailing down towards a point at which, if continuous, it would end in the 25-30 feet raised beach, I made arrangements for excavations on a comprehensive scale, after having obtained the permission of the proprietor of the island, the Rt. Hon. Lord Strathcona. I was fortunate in securing the co-operation of Mr Ludovic M.L. Mann, who witnessed and assisted in the excavations, and associates himself entirely with the conclusions at which I arrived.

The above-mentioned shell-mound, which formed the basis of the excavations, lies on the E.S.E. flank of Cnoc Sligeach, a hill of turf-covered sand standing on a base of rock 650 feet from the present shore-line. The apex of the hill is approximately 54 feet above O.D. The longer axis lies W.N.W.-E.S.E., and is roughly 300 feet, the shorter axis being about 160 feet. There are other sites of occupation on the hill, one of them being situated on the flat circular area on the summit. It was on this highest mound that the late Mr Galloway carried out an excavation limited to a very small area. We are confronted at the very outset with the question how it came about that this exposed hill-top was chosen as the site of a habitation by a people to whom other and favourable sites were available, premising that the configuration of the land has not altered. Would a people whose staple diet is indicated by the food refuse to have been fish and shell-fish have been at the trouble to convey these to this exposed summit, particularly as we have reason to believe that the shell-fish were eaten raw? No tolerable reason can be given for such a supposition, and, on the contrary, it will be demonstrated in the course of the account of the excavations that the sea was at a higher level and washed the hill round the greater part of its circumference, so that

PLAN, AND SURROUNDINGS OF  
CNOÇ SLIGEACH.  
ORANSAY,  
COLONSAY.



Mungo Buchanan. Del.

CONTOUR ALONG LINE 'BB'

Fig. 1. Cnoc Sligeach, Plan and Contours.

the present rock was merely a peninsula, the neck of which was formed by the storm ridge of the 25-30 feet beach. This storm ridge would afford dry access to the rest of the island.

In regard to the configuration of the summit, it must be premised that the same conditions which are now operative in the formation of the sand-dunes bordering the present shore-line were at work then, and that consequently those dunes which were on the then existing shore-line would form a wind-screen on the N.W., N., and N.E. sides, from 10 to 20 feet higher than the present summit. The latter would thus constitute the floor of a hollow,<sup>1</sup> which would afford quite an excellent situation for a hut, and the kitchen-midden refuse deposited on it during the occupation formed a coping which prevented wind-denudation of the underlying sand; while the sandy heights surrounding it without this protection were denuded by the action of the wind, thus accounting for the present relative positions of shell-layer and surrounding ground.

The general topography of the hill will be best understood by an examination of figs. 2-7, which, taken together, will give an adequate idea both of the situation of the shell-mounds and of the position of the hill generally with reference to the coast-line and the immediately surrounding ground. In regard to all the plans and illustrations, it is to be noted that the islands of Colonsay and Oransay have not been surveyed since 1873, and the bench marks have become unrecognisable. The datum line of 50 feet is based on the high-water mark on 14th July 1913, and is subject to correction to O.D., say + 4 feet;<sup>2</sup>

<sup>1</sup> "Colonsay and its Archæology," L. M'L. Mann, F.S.A. Scot., *Glasgow Herald*, Aug. 30, 1902, p. 7, col. 3.

<sup>2</sup> The Director-General of the Ordnance Survey writes: "The datum for the Colonsay bench marks is approximately mean sea-level. According to the Admiralty Tide Tables, the mean spring rise is 12 feet and mean neap rise  $7\frac{1}{4}$  feet, hence height of high-water ordinary spring tides would be about  $5\frac{1}{2}$  feet above the datum for the bench marks. The height of the water on the days mentioned would probably be about 4 feet above datum, but this value may be a foot or more out."



Fig. 2. Raised Beach and Mound to the West of Cnoc Sligeach.



Fig. 3. Showing Position of Cnoc Sligeach and the Coast-line, from E. by S.





Fig. 4. Showing the Higher Ground to the West of Cnoc Sligeach.



Fig. 5. Showing Position of the E.S.E. Occupation.

but the levels given are all in correct ratio. All orientation is magnetic—taken July 1913.

The first illustration (fig.1) shows Cnoc Sligeach in plan, with contours AA and BB. As already indicated, the upper shell-mound occupies the entire area of the top. To the E.S.E. is the lower mound, the direction of which slopes from the line BB to S. and S.W. To the W. of the upper shell-mound is a lower and flatter mound extending beyond the plan and terminating on sand on the top of the rock exposed on left centre of the picture (fig. 2). The storm ridge of the 25-30 feet beach runs from the higher land in the foreground and merges in the slope of the hill, and the altitude at this point is 34 feet O.D. Pits sunk at various points revealed the beach contouring along the face of the hill at an elevation of about 32 feet O.D., until it abutted on the rock shown in the centre of the picture.

In fig. 3, taken from the E. by S., the relative positions of Cnoc Sligeach and the present shore-line are indicated, while the line of the 15 feet beach is clearly marked immediately below the hill. The sand-dunes bordering the present shore-line are seen rising from the plateau and almost level with the horizon.

Fig. 4 shows the higher ground to the W. of Cnoc Sligeach, as seen from the top of the rock forming the S.E. end of the hill. On the middle left is a mound forming part of the 25-30 feet beach. The contour of this beach is along a line marked by the white sand, the box beyond the tripod and the bags seen in the foreground. During the period of the formation of this beach the sea would cover the low land between the western shell-mound, seen beyond the tripod, and the higher ground beyond, which could be reached on the land side only by the raised beach, which was at that time possibly wider owing to sandy deposits.

In fig. 5, a view from the N. by E., the position of the E.S.E. occupation is marked by the turf on the horizon to the left of the



Fig. 6. View from W.N.W. showing Sand-dunes at East End of Island.



Fig. 7. Configuration of Cnoc Sligeach on the North.

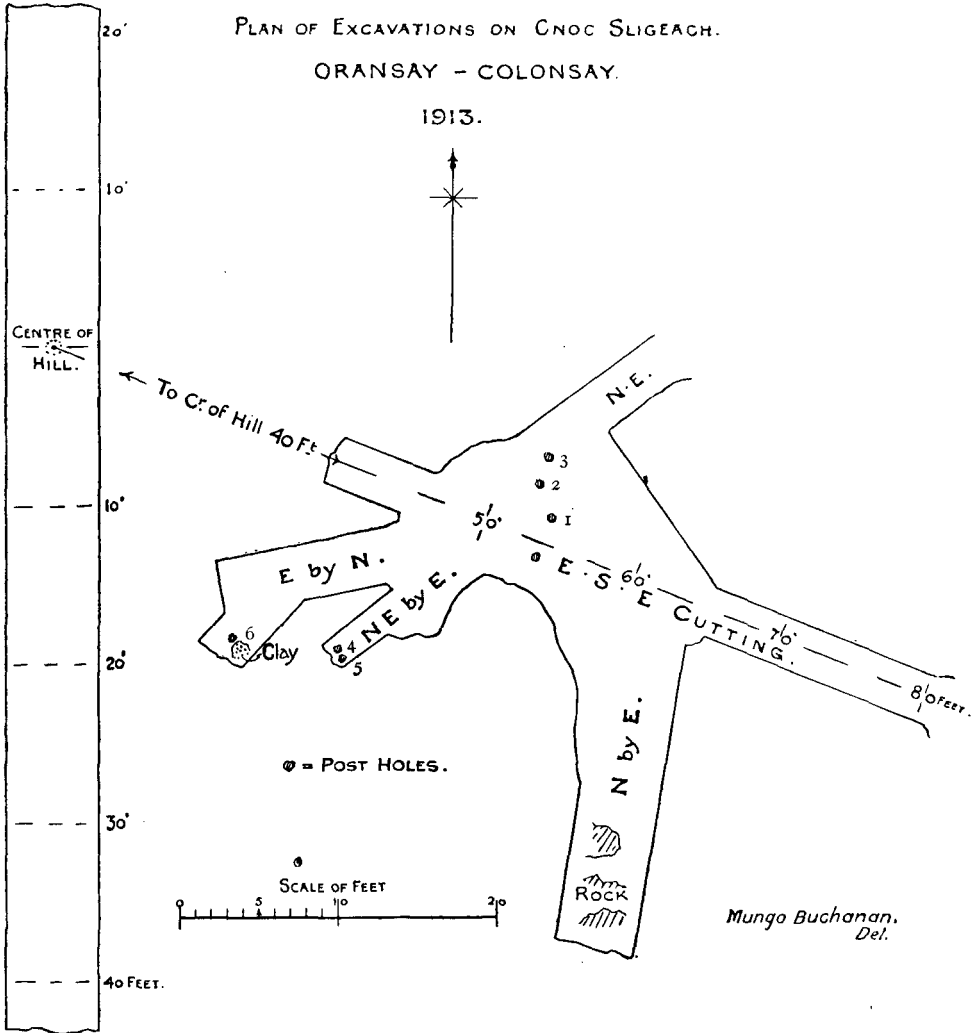


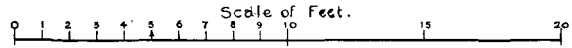
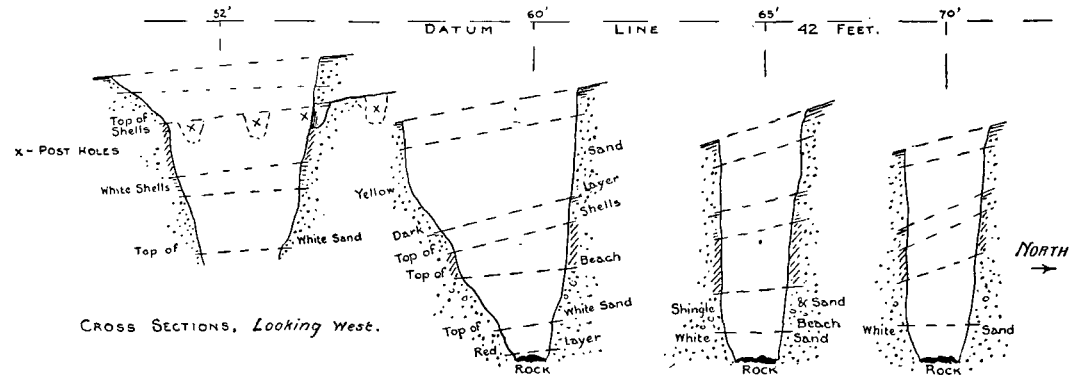
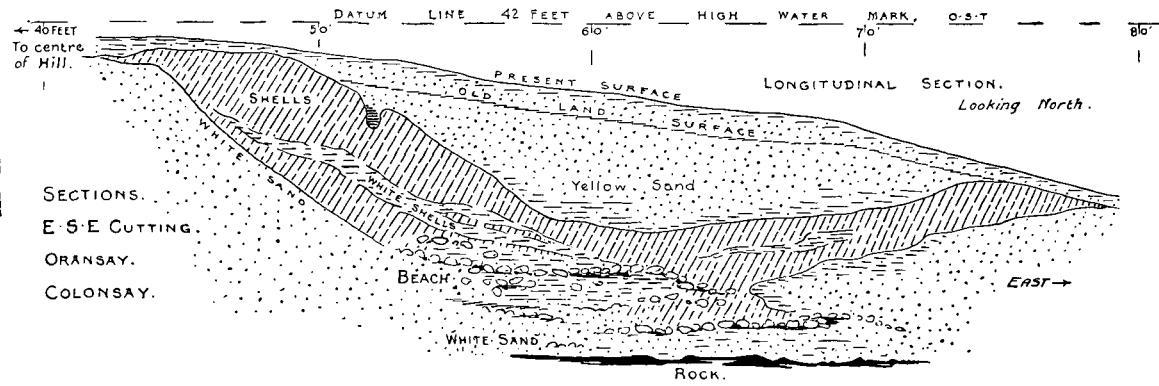
Fig. 8. Plan and Section of Excavation.

picture. The highest point of rock exposed on the N. face—centre of picture—is 16.6 feet below datum line = 37.4 feet O.D. During the lower level of the land mass, the sea, there forming the 25–30 feet beach, would wash the cliff along half its height. The shingle at the foot of this cliff is now covered by 3 feet of sand in 11 different strata. The height over O.D. of the top of this shingle is 22.4 feet, and its thickness at this point is 3 feet.

A better idea of the present shore-line is given in fig. 6, which is a nearer view from the W.N.W., and shows the situation of the sand-dunes at the E. end of the island.

The configuration of the hill on the N. is exposed in fig. 7. Through the deep gully which bounds it on this side the sea at one time gained admission to the low-lying ground W. of the hill. This gully, being the only outlet to a land-locked bay, would be an excellent place to erect a yare or wicker trap for the capture of fish.

The excavations were commenced by making a cut, marked E.S.E. on plan (fig. 8), through sandy material overlying the shell-mound previously referred to as having been noted on a former visit. At a point 42 feet E.S.E. from the centre of the upper hill, the shell-mound lay immediately below the turf (fig. 9). It was 1.5 feet thick and rested on clean unstratified sand. This depth below surface was maintained at 49 feet from centre. The layer increased in depth towards the E.S.E., and the underlying sand sloped in the same direction at an angle of about 45°. At 58.5 feet from centre the top of the shell-mound, viewed in longitudinal section, became almost horizontal, but still dipped slightly at 62 feet from the centre, whereafter it gradually rose. Beyond 72 feet from the centre it ascended much more sharply until it met the bottom of the turf, and then again dipped along a line parallel to the slope of the present hill surface. At 60 feet from the centre a transverse section showed a dip to the S. and a tapering out of the shell-mound in that direction. The thickness of shells under datum string, *i.e.* in centre



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Fig. 9. Plan and Sections of Excavations through Shell-bed.

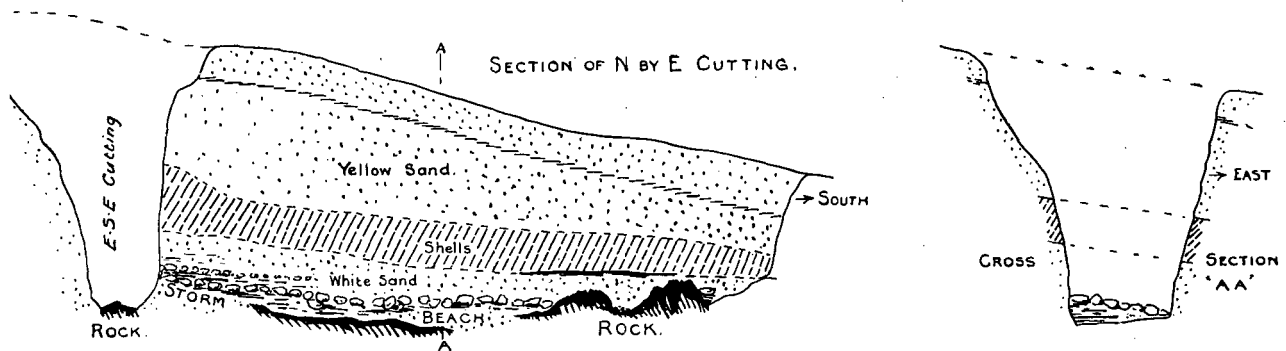


Fig. 10. Section of Trench showing Beach overlying Rock.

of trench, was here nearly 2 feet. The removal of the shell-layer disclosed an underlying bed of pebbles of marine origin, embedded in sand and pounded shells, averaging 2 feet in thickness. These pebbles



Fig. 11. Portion of Beach at North End of Trench viewed from above.

or shingle overlay a 1-foot seam of white sand, which rested on rock, the sand in contact with the rock having a reddish tinge and a clayey consistency. At the point where a transverse section showed a dip to the S.—*i.e.* 60 feet from centre—another trench was cut extending



S. by W. for over 20 feet (fig. 10), and the shingle or beach, as we must recognise it to be, was still found overlying the rock; and while the shell-layer was present at the N. end of this trench, it was replaced towards the seaward end by strata of shells and grey sand. This portion of the beach is seen in fig. 11 (viewed from above). Throughout the entire depth of this beach were found the same implements and remains as were found in the overlying shell-refuse. To particularise, these consisted of round-nosed chisels of stone and bone, a harpoon fragment of deer-horn, broken and fire-injured shells of the dog-whelk and limpet, fragments of bird and mammalian bones, many of them partially burnt, anvil- and hammer-stones, and a few cowrie shells, mostly broken, but showing evidence of the artificial perforation which will be explained when the implements are described. There is no room for doubt as to the cause of the commingling of these relics with the beach shingles. They can have found their way into it only by the latter being washed by the sea against the talus of shells thrown from the huts placed higher up the slope out of reach of the waves. The greatest height above O.D. of this pounded shell and shingle layer was 33.5 feet, and it could be deposited at such an elevation only by violent S.W. gales acting on exceptionally high tides. That such gales were not of frequent occurrence towards the close of the occupation is shown by the fact, noticeable in fig. 11 (left wall of trench), that strata of shell refuse and grey sand were found resting on the shingles, but free from admixture with them; but, on the other hand, the shell refuse may have become turf-covered during a period subsequent to final abandonment and prior to later incursions of the sea. Such a covering of turf would protect the shells from further disturbance. It is worthy of note that the rock underlying the beach in the S. arm of the E.S.E.-W.N.W. cut is 1.5 feet higher at the S. or sea-end than it is at the N. end (see fig. 10, lower half), and therefore shingle thrown against and commingling with the shell talus remained in this hollow, the reflux of the waves being insufficient to carry it all back over the

higher portion of the rock. The aspect of the top of the beach, when cleared of the overlying shell-layer, is seen in the lower half of fig. 12,



Fig. 12. View of Top of Beach when cleared of overlying Shell-layer.

which indicates the E.S.E.-W.N.W. trench viewed from E.S.E. At the further or W.N.W. end of the trench the shell-layer is seen sloping down on to the beach surface.

A small trial pit shown in the foreground of the photograph

(better seen in fig. 13) revealed the shingles resting on the shell-layer. This is the maximum altitude at which the shingle was



Fig. 13. Shingle resting on Shell-layer.

deposited, *i.e.* 33.5 feet O.D.—the reflux at this height having been insufficient to dislodge the shell-layer to its full depth. The dense and compact nature of the sand in which the shells are here embedded is an interesting piece of corroborative evidence of the marine nature

of the deposits. (*Cf.* the section of layer immediately overlying this point in fig. 12 (right bottom corner), where the loose nature of the shell-bed is shown.) This overlying deposit, being of later date



Fig. 14. View of Shingly Top of Beach.

and unaffected by marine disturbance, contains no sea-deposited sand.

The loose nature of the shell-layer is shown even better in fig. 14, right-hand top corner. The centre of the picture shows the shingly

top of the beach, and in the foreground a small pit shows a section of the beach, while the top of it is shown in foreground of fig. 15. There we have to notice the dark sand overlying the shell-layer, which indicates an old land surface—proof that the shell-layer was at one



Fig. 15. View of Section of Beach showing old Land Surface.

time turf-covered. A vertical section of the beach is presented in the upper half of fig. 16—centre and left face of trench—while the lower half—in plan—shows the sand resting on the rock. Several large subangular boulders are also shown, which were contained in the beach. These are *in situ*. This view is taken from the S. end of the S. arm of the E.S.E.-W.N.W trench, while that in fig. 17 is taken

from the N. end of the same arm, the rock having been cleared of the overlying beach and sand.

Of the E.S.E. trench itself a typical transverse section is given



Fig. 16. View of Centre of Trench showing Sand resting on Rock.

in fig. 18, at a point 55 feet from the centre of the hill. The general nature of the E.S.E.-W.N.W. trench is seen in fig. 19, which shows the portion of it lying between points distant from the centre of the hill 48 feet and 82 feet respectively, and with this figure it is

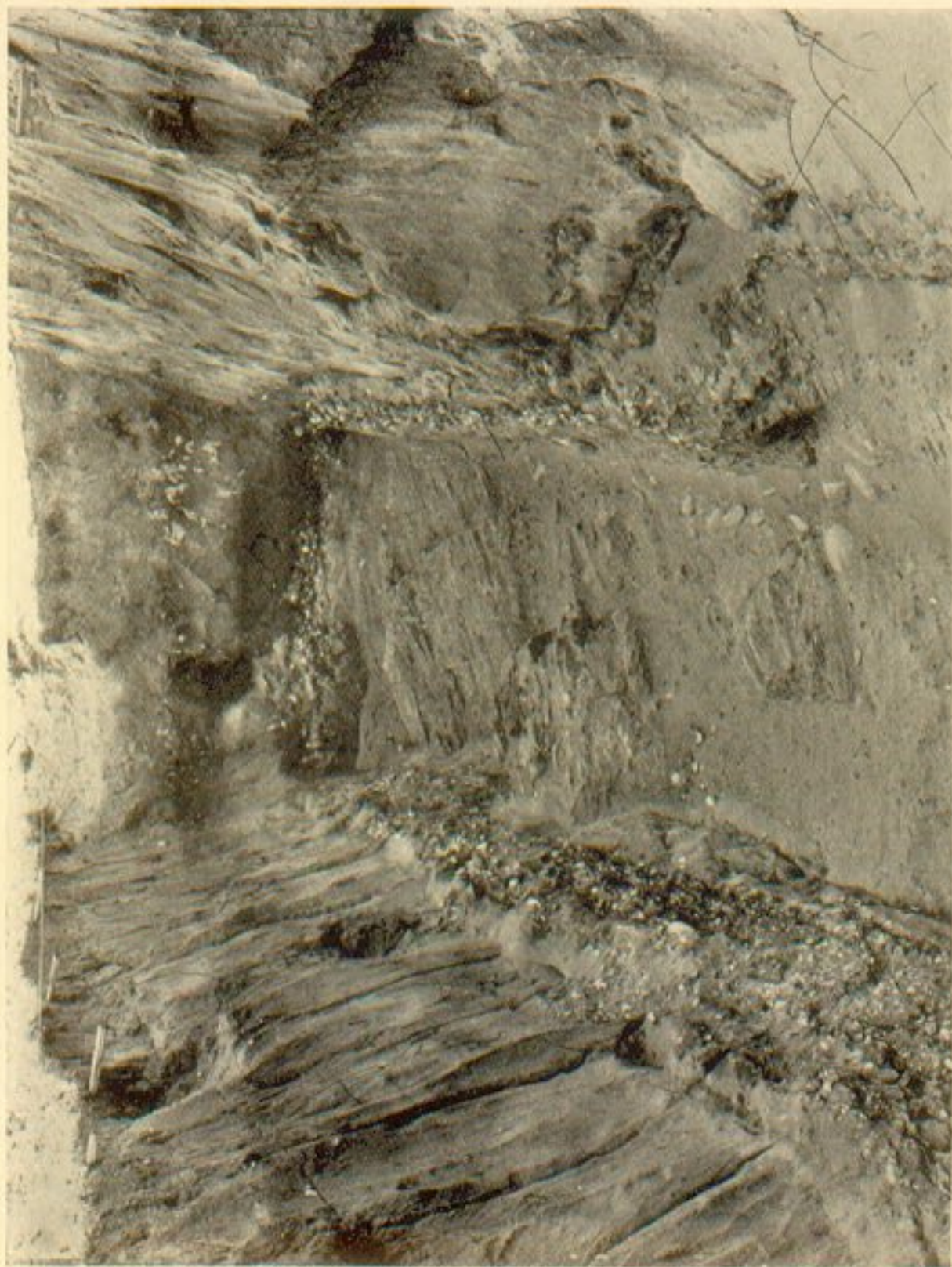


Fig. 17. View of Trench showing Rock in Bottom.

TYPICAL SECTION,  
 Taken at 55 Feet from Centre of Hill  
 along the E-SE. Cutting.

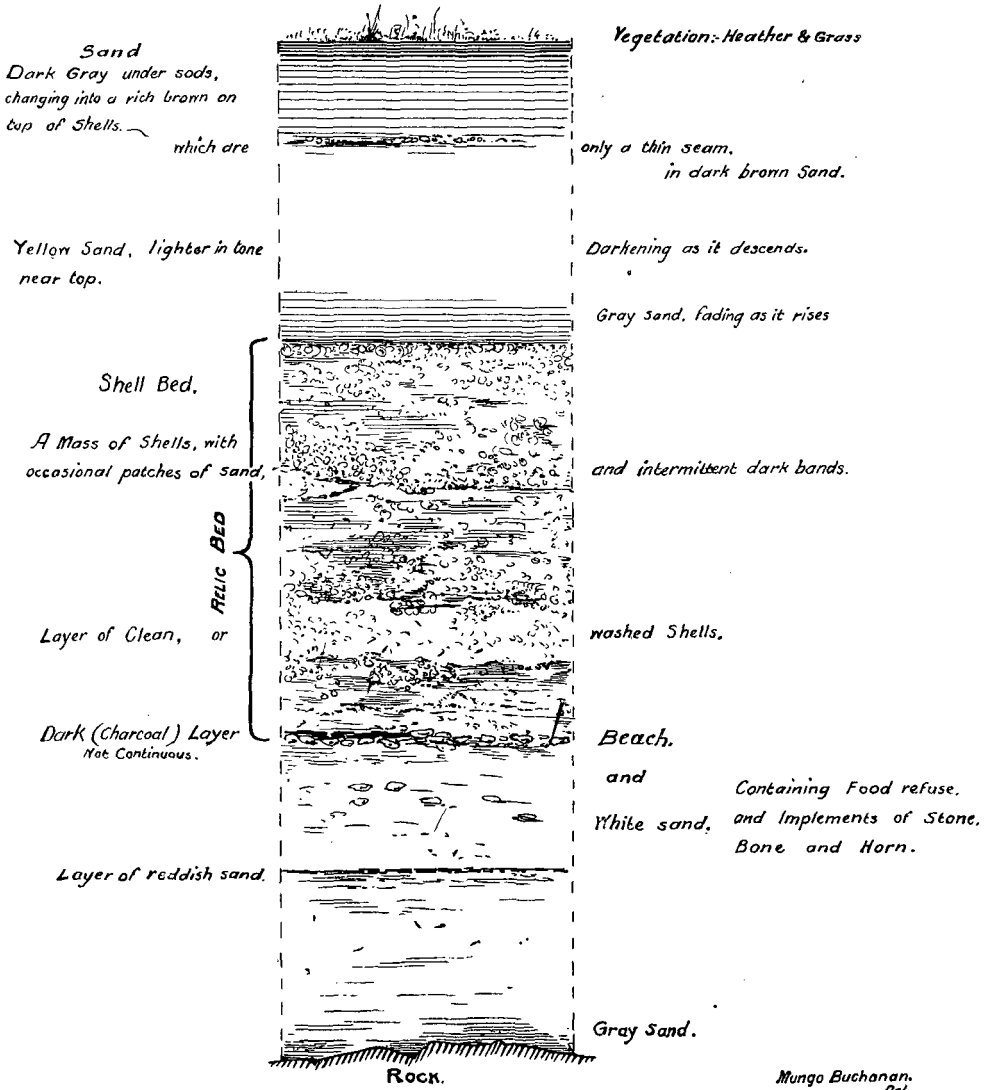


Fig. 18. Typical Section 53 feet from Centre of Hill.



interesting to compare the section in fig. 9. The slope from N. to S. of the shell-mound surface is very noticeable from mid-way



Fig. 19. View of Trench showing Slope of Shell-layer.

along the trench to the further end, as is also the sharp dip to the E.S.E. of the shell-layer in the foreground.<sup>1</sup> The flatter stones

<sup>1</sup> To the N. of this trench the sand underlying the shell-layer dipped sharply to the S., but in the trench itself the angle was less steep..

and flat shells, such as the pecten, oyster, etc., contained in the layer were found to lie on a plane parallel to the surface of the layer, so that we may conclude that they still lie as originally deposited. See also fig. 20, where the angle of rest of the embedded stones is noticeable.



Fig. 20. View showing Embedded Stones.

From this it is an obvious inference that the refuse was deposited from at least two habitations situated respectively about the position from which the view (fig. 19) was taken, and a point to the N. of the left or N. side of the trench. A better conception of the position of the habitations can be got by noting (fig. 21, the same viewed from

the E.S.E.) the converging of the shell refuse, indicating the direction from which it was deposited. A dark seam distinctly noticeable on one side of the trench, about 1 foot below the top, shows the line of an



Fig. 21. View showing converging of Shell Refuse.

old land surface, the dark colour being due to carbon from vegetable matter. This seam contained a few tools, shells, and osseous remains.

No definite chronological position can be assigned to this surface. On the one hand, the remains may have been deposited during the occupation of the higher site—shown in the distance—in which case that site would post-date the lower, or, on the other hand, they may have been scattered over an old surface by the burrowing of rabbits or by wind-denudation of the upper shell-mound. When the E.S.E. trench was excavated between points distant respectively 45 feet and 57 feet from the centre of the hill, it was observed that the strata of refuse differed markedly in composition, clean shells, with a sprinkling of clean sand, being intercalated among dirty shells embedded in dark loamy sand—fig. 9, section, and fig. 22, the latter of which is a cross-section about 53 feet from the centre of the hill. The trench walls show in either margin, and the centre shows sections not quite vertical. Mid-way in this section a patch of the clean shell refuse is seen intercalated between two masses of dark refuse. These heterogeneous layers may be the result of various non-continuous occupations, during which the sandy material contained in the refuse was carried downwards by water-percolation, or they may indicate periods of heavy rains, or again, they may have been washed by sea-spray during periods of violent storms. The marine shingle containing food refuse is also shown in this photograph overlying the sand on which the shell-mound rests, and the stones embedded in the right wall are lying on an inclined plane dipping towards the foreground, *i.e.* from W.N.W. to E.S.E.

During the excavations of the W.N.W.-E.S.E. trench several dark patches of the shape of an inverted cone were observed to extend downwards from the surface of the shells for a distance of 1.5-2 feet. These consisted of dark carbonaceous sandy loam, containing some small fragments of shells, but no entire shells nor any stones. The position of these post-holes, as they were proved to be, is indicated on fig. 8, and one occurs in the section in fig. 9.

A section of the post-hole, No. 2 in plan, fig. 8, is given in fig. 23.

The width is roughly 0.6 foot, and the depth about 2 feet, the surrounding material being the usual shell refuse and dark-coloured sand.



Fig. 22. View of Cross-section 53 feet from Centre of Hill.

This formed the side of a circular hole tapering in towards the bottom. Hard against this wall a bone pin was found. It is noticeable that the hole does not penetrate, to its entire depth, the shell refuse, which is here about 6 feet thick; therefore it must post-date the greater part of

it and point to a later occupation or reconstruction of the dwelling. Such reconstruction may have involved also an enlargement of the structure, the walls being carried forward into the "forced" ground



Fig. 23. View of a Section of Post-hole No. 2 in the Shell Refuse.

formed by earlier deposits of refuse. This also indicates a denudation of the shell-mound, at any rate to the W.N.W. or left of the post-hole, as we may assume that the floor of the dwelling was more or less level.

Post-hole No. 3 on plan (fig. 8) corresponds roughly in size with No. 2, being slightly wider and less conical. This hole (fig. 24) also does not pierce the shell-mass. It forms, with Nos. 2, 4, and 6, an irregular



Fig. 24. View of Section of Post-hole No. 3.

segment of a circle—fig. 9. Nos. 1 and 5 stand outside of this segment. Close to No. 6 (fig. 8) was a thick mass of clay about 2 feet broad, which, from its partially baked appearance, may have been a hearth; if so, the position of No. 6 post-hole is curious.

Post-hole No. 4 (fig. 25) differs from the others in that it penetrates the entire depth of shell refuse, which is here less thick, and is overlain by a thicker mass of old land surface. The view shows a section, and is taken from the N.E. by E., and the slope of the

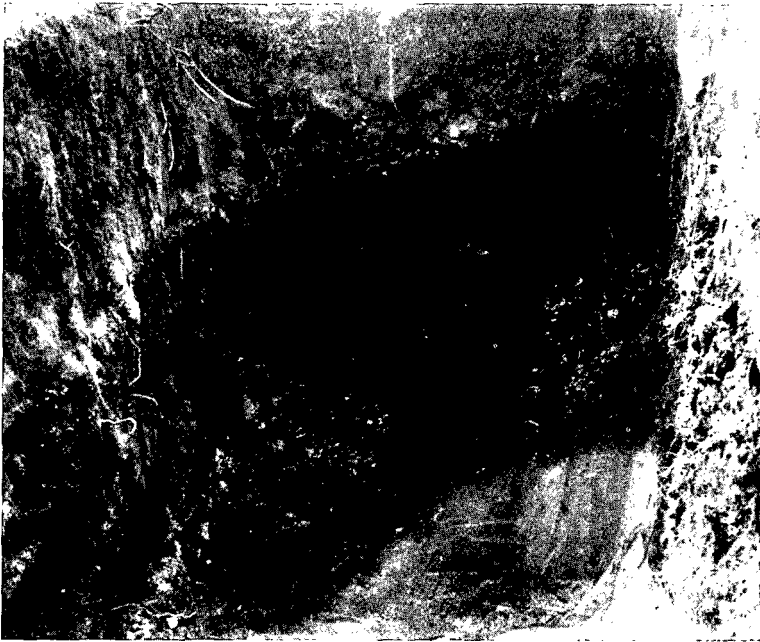
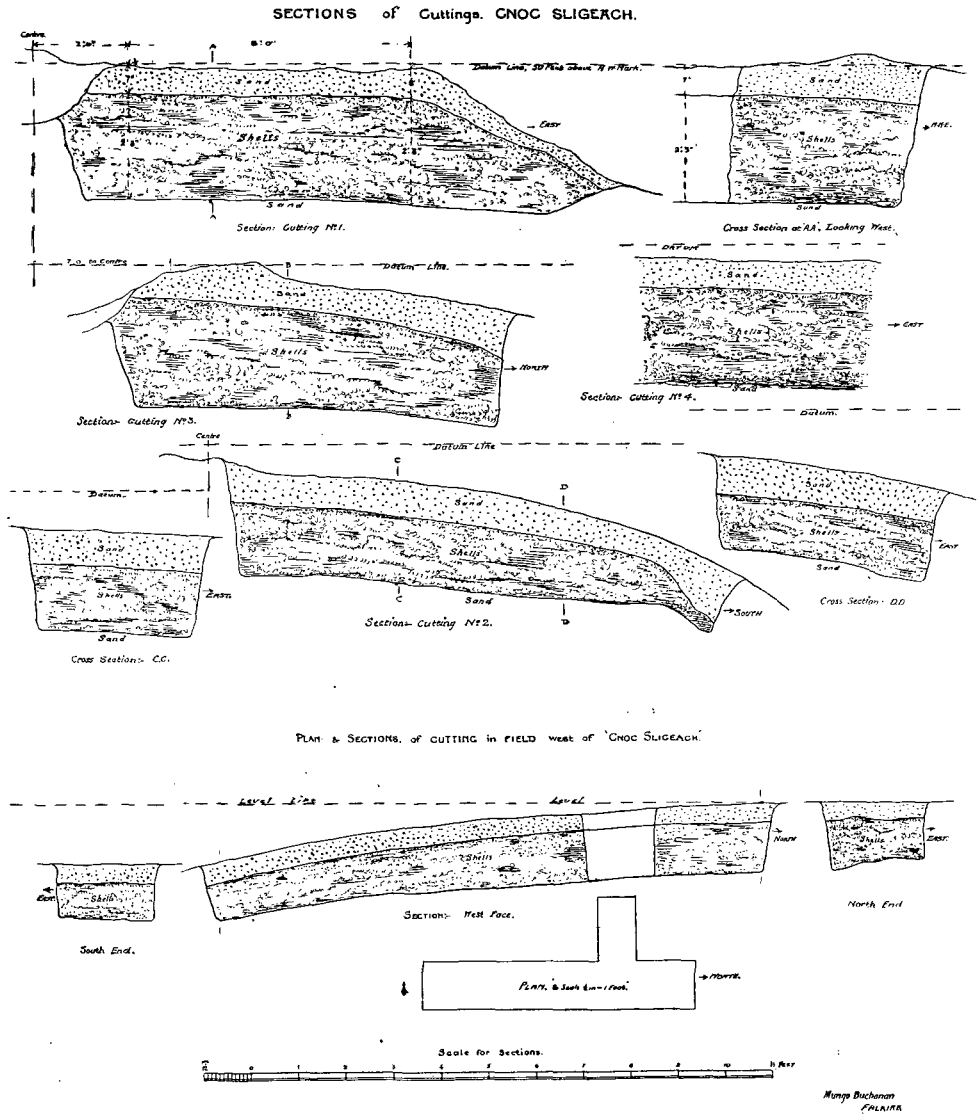


Fig. 25. View of Post-hole No. 4.

underlying sand from W.N.W. to E.S.E. is very marked, commencing on the right of the trench. The surface of the refuse on the W.N.W. side of the post-hole is considerably higher than on the opposite side, as if the end of the post, prior to its final disintegration, had acted as a buttress to the ancient hut-floor. It is not surprising that no





Mungo Buchanan  
Geologist

Fig. 26. Sections of Cuttings.

fragments of wood, even as charcoal carbonised by slow oxidisation, were found, but the contained sandy loam, judging from its colour, was rich in carbon. All fragments of charcoal found in the shell-mound during the excavations were protected from percolating water by limpet-shell roofs, and these shells also protected many delicate objects, such as fish-scales and the spines of the spiny dog-fish. Under the S. edge of the flat top of the hill, the shell refuse did not stop abruptly (fig. 26), as it did elsewhere on its circumference (section), but divided horizontally into two strata, the lower following the angle of the underlying sand, which was about 30°, while the upper part lay roughly parallel to the present surface. These two layers are seen in fig. 27, a view of the S. end of the N. and S. cut. The centre shows a cross-section of the lower layer, while in the centre foreground it is shown in plan, and the upper layer, poorer in shells but richer in sandy loam, is shown on the walls of the trench, which is contracted in the lower half of the picture. In the further end of the trench the section is spoiled by the burrowings of rabbits. These animals never burrowed directly into the shell-layer, but ran their burrows over or under it; in the latter case the shells gradually settled down, and some of them were left in the floor of the burrows. The holes were ultimately filled up by blowing sand, and presenting, as they do, in section two or more strata, give the appearance of separate deposits. I would suggest that this may account for the number of layers found by Mr Symington Grieve on Caisteal-nan-Gillean.<sup>1</sup>

This division of the layers is probably to be accounted for by a temporary abandonment of the upper occupation, followed by a re-settlement at a time when the configuration of the surface on the side of the hill had been somewhat altered by deposits of blown sand; and the *hiatus* need not have been a long one. Further demonstration of such temporary abandonment was found at the

<sup>1</sup> See Mr Symington Grieve's *The Great Auk or Garefowl—Its History, Archaeology and Remains*, 1885.

N. end of this same cut, where a large number of stones, some of which showed signs of use, and large shells were found in a more or less horizontal stratum, intercalated between two strata of shell refuse, containing the usual proportions of such stones and large

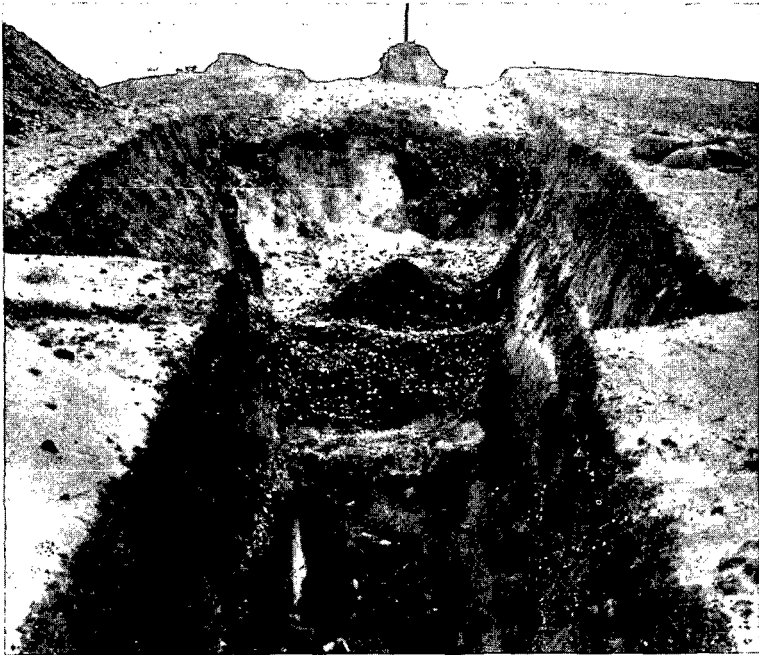


Fig. 27. View of Trench.

shells. This stratum is shown in plan in fig. 28, resting on shell refuse shown in section, and beyond is the overlying shell refuse, also shown in section. A similar layer of stones, etc., occurred on the top of the sand, underlying the shell refuse, and also on its surface, the latter at least pointing to its having been formed under the same

conditions which formed the intercalated layer, while the former may denote the irregular demolition of the sand-dune before occupation and thus afford corroboration of the sand-bunker nature of the site. Temporary abandonments, which may have been



Fig. 28. View of Stones and Shell Refuse.

seasonal, would allow of wind-denudation of the lighter material, and the heavier articles would settle at a common level, being re-covered on reoccupation by further deposits. Such denudation would not take place so long as a structure remained.

Although no very definite traces of post-holes were found in any of the sections of the upper site, we may safely infer from their presence

in the lower site that the depositors of the upper refuse heap were also protected from the weather, and I would suggest that this protection consisted of a kind of artificial cave formed in a sandy hollow, and roofed with timber drifted from the mainland or adjacent islands. These, covered with turf and sand, would provide a shelter resembling



Fig. 29. View of Shell-mound on Top of the Hill.

the caves inhabited by these people on the mainland sites at Oban, to which or to other caves they possibly retired during the inclement months of the year. That the present hill-top was, during the occupation of the site, the bottom of a sandy hollow, is indicated by the abrupt finish (fig. 29) of the shell-mound on all sides except the S. Had the configuration been the same as at present, we would

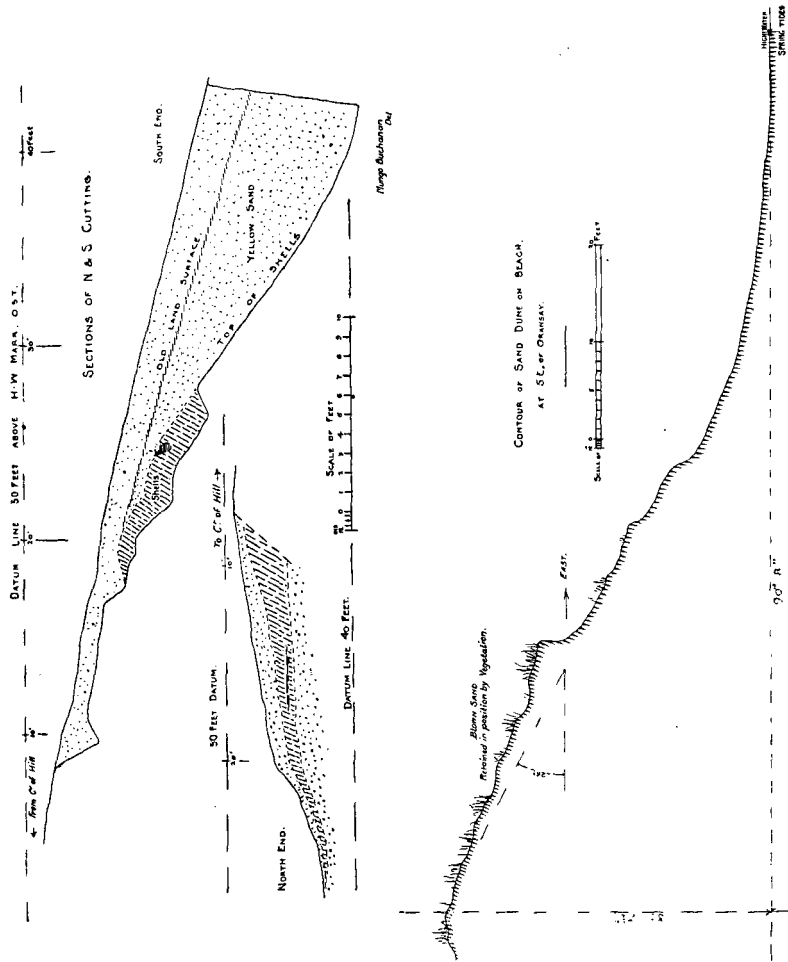


Fig. 30. Sections of Sand-dunes on Beach.

expect to find a talus of shell refuse on all sides; and had the surrounding surface been flat, the shell-layer would have tapered out and died away gradually. Such, however, was not the case, and so the inference seems clear that the ancient shore-line or land margin was covered by sand-dunes similar to those on the present shore-line to the E. of Cnoc Sligeach. Fig. 30 shows a section through these, and the



Fig. 31. View showing the Shore Dunes.

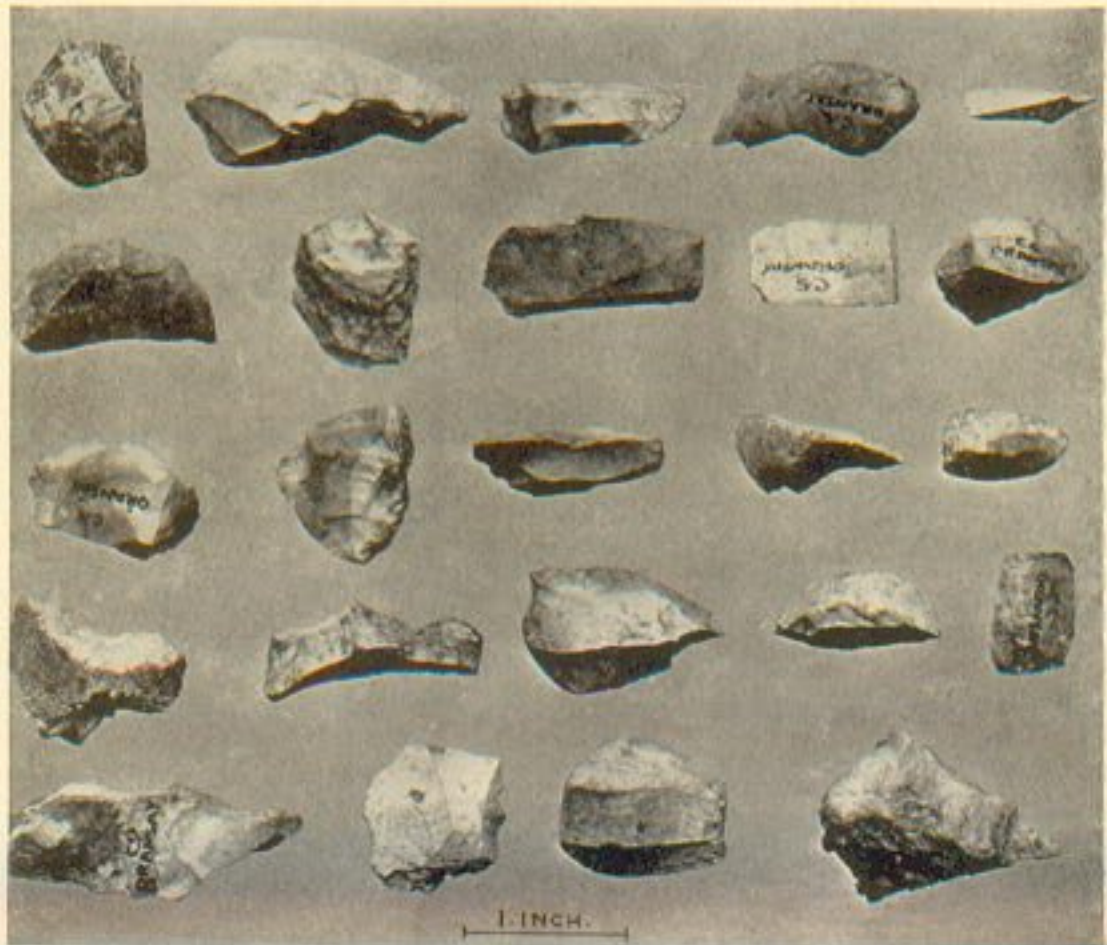
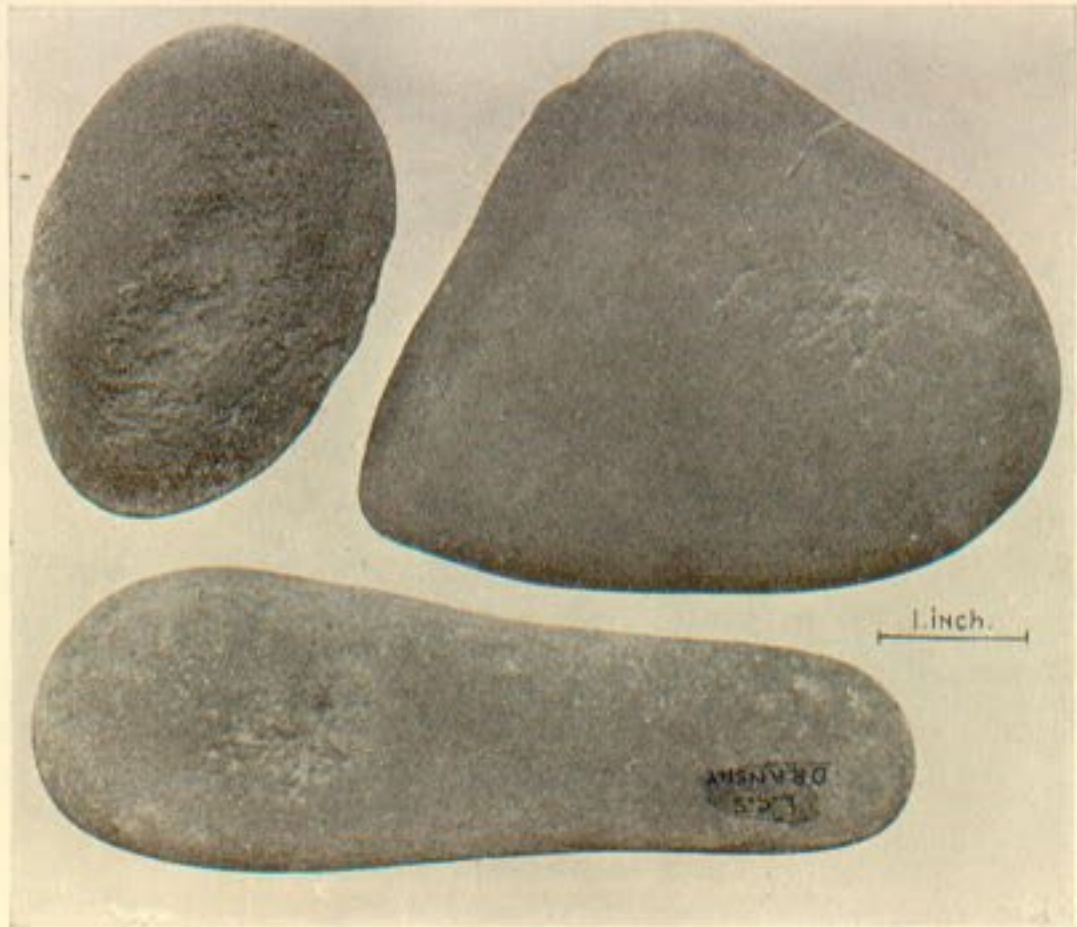
upper half a section through the upper shell-mound. The N. end of this latter shows the position of the stony stratum, while the S. end shows the slope of the shell-refuse surface underlying the drift sand. Time did not permit of the complete excavation of this shell refuse, but trial pits were sunk at various points, and the thickness of the layer was fairly constant. These two sections are shown in the same fig., further to emphasise the similarity between the present and the ancient shore-line. The shore dunes of which fig. 30 is a section are

shown in fig. 31, and a cave-like structure, situated half-way up the slope of these dunes, might be a topographically accurate reproduction of the dwelling-place of this ancient people. It was found by calculation, the data being the width of the base on which the sand could find support and the angle of rest of the present dunes, that the sand to the N. of present hill-top would form a screen 12 feet high, which might be still higher on the other sides, and would efficiently protect the inhabitants on the W., N., and E. sides. (See models in Hunterian Museum, Glasgow.)

#### IMPLEMENTS, ETC.

It is disappointing to have to record that in these Cnoc Sligeach excavations no flints were found with any secondary working. Moreover, after careful examination of the flint chippings in the National Museum of Antiquities in Edinburgh from the other Oransay sites and from the M' Arthur Cave and the Druimvargie Rock-Shelter, I was unable to detect any secondary working on them. We can be quite certain, however, that the flint nodules brought into the site by the ancient inhabitants were purposely fractured, for at least one anvil stone (fig. 32, top left corner) was found with characteristic pittings, and, moreover, the clean primary flaking of many of the chips shows a facility of working which would seem to point to some definite aim. These chips (fig. 33) would be quite suitable for many purposes, such as the shaping of harpoon-heads, but quite inadequate for such a task as the excavation of a dug-out canoe; and although the absence of tools suitable for such a purpose does not exclude the possibility of the use of such canoes, yet the presumption is in favour of such a hypothesis. Anvil stones (fig. 32, top right and bottom) and elongated pebbles pitted near the end indicate by the nature of the pitting that they were used for breaking the shells of the dog-whelk, and these shells were invariably found broken. The club-like stone on the left of fig. 36 is splintered at the broader end and may have formed a





Figs. 32 and 33. Implements and Flint-chips.

kind of chopper, but the fracture may be merely accidental. Stones of this kind are common on the present beach, and their presence on the site probably indicates a definite use. A chopper-like stone is represented in fig. 34 along with a flat crescent-shaped pebble having a

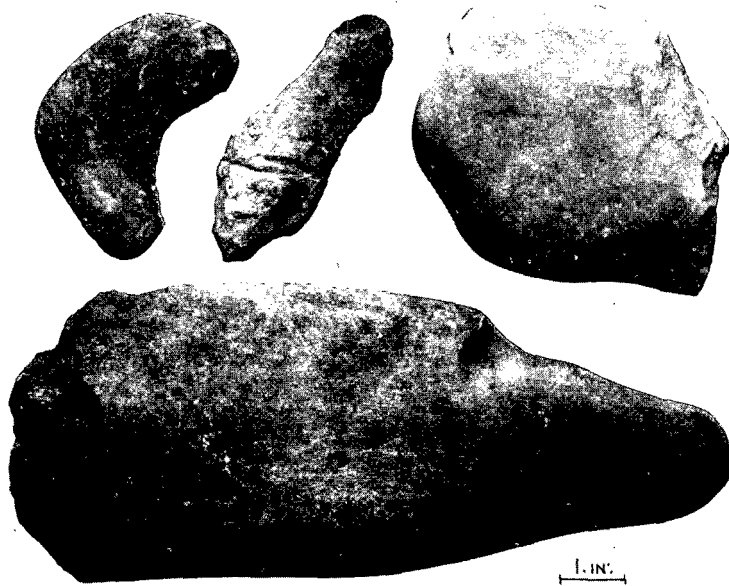
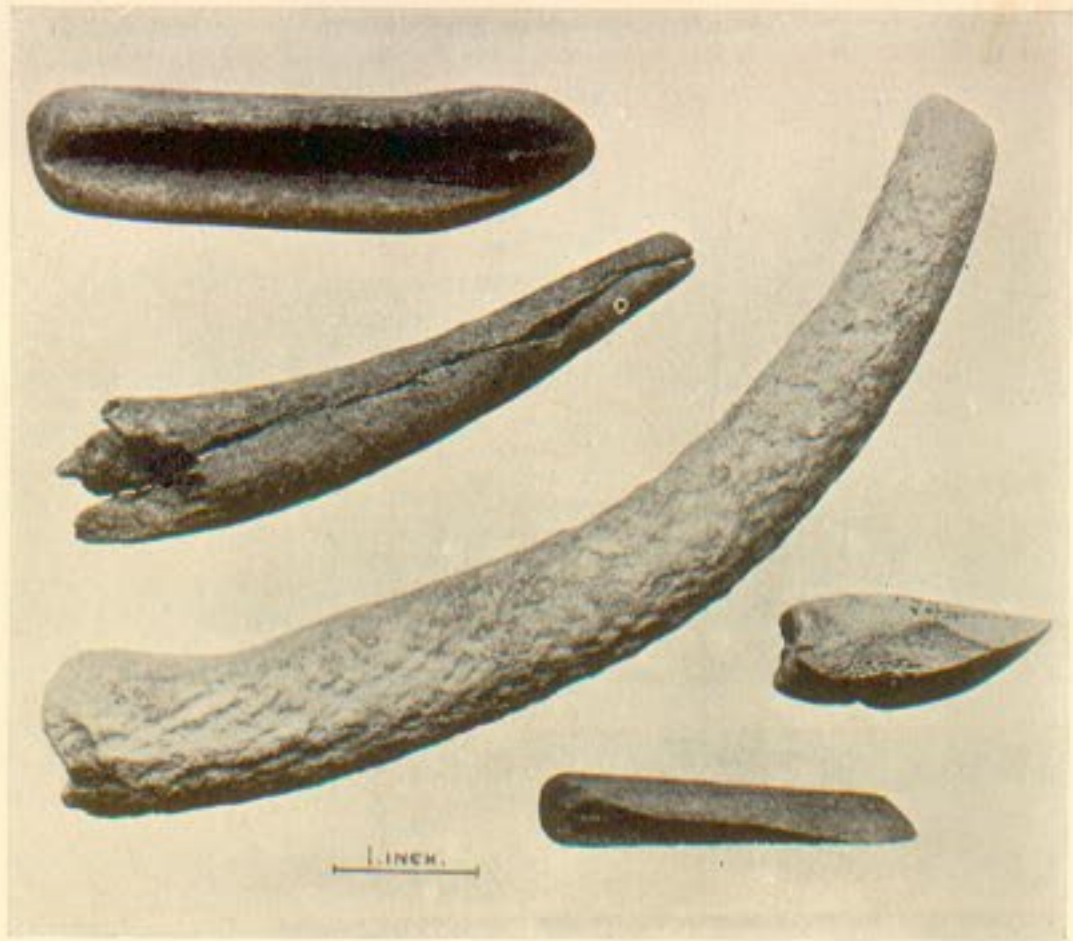


Fig. 34. Implements.

concave cutting edge, an elongated pebble with two gutters on one face, and a nodule of quartzite with a longer diameter of 4 inches, and a thickness of about 2 inches. This stone bears a striking resemblance to a scraper of Aurignacian type, being flaked in half its circumference, and the flaking executed from the under and flatter side.



Figs. 35 and 36. Implements of Deer-horn and Stone.

The gutter-stone in fig. 35 has a groove which is probably natural, but at the same time shows signs of wear—it was possibly used in the manufacture of bone pins and awls or borers. The implements which were most numerous on the site were elongated pebbles (fig. 36), whose ends were ground to a convex facet on both sides. These, along with similarly shaped splinters of bone and horn (fig. 37), have been found abundantly on all the Oransay and Oban sites, and have been fully described by Dr Joseph Anderson in the *Proceedings* of this Society,<sup>1</sup> but no reasonable explanation of their use has so far been forthcoming. Careful examination of several hundred specimens has convinced me that they were used for gouging the mollusc of the limpet from the shell, and that the ground facets were due solely to such attrition. As an experiment a piece of cement (fig. 36, right bottom corner) was used for this purpose, and the result was a tool identical in form with the stones from the site. It has to be noted that the majority of tools as found were discarded specimens. Their history would be something as follows: A stone of suitable size was chosen from the beach, and the ends chipped by a sharp blow to give the rough surface which was desirable for the easy accomplishment of the end in view. Repeated gougings produced the convex facets, and these gradually became smoother, ultimately losing their gripping power, and so the implements were discarded and thrown into the refuse heap. In some cases, if the stone was still otherwise serviceable, it might be re-chipped. This explanation meets all requirements; it accounts for the abundance of the tools—close on 2000 having been found in Oransay alone—and explains their absence from inland sites, for the somewhat similar implements from Mas d'Azil have flat facets and consequently a straight edge, which could not be produced by any such process, and must therefore have served a different purpose.<sup>2</sup>

<sup>1</sup> *Proc. Soc. Antiq. Scot.*, vol. xxxii. p. 298.

<sup>2</sup> Mr T. C. Cantrill, of the Geological Survey, writes: "In 1908 I found several flint chipping-floors in the neighbourhood of Dale, in south-west Pembrokeshire.

The most interesting finds of bone or horn were the harpoon fragments, for the most part of characteristically Azilian type, and similar to those found on other sites (fig. 38). There are two notable

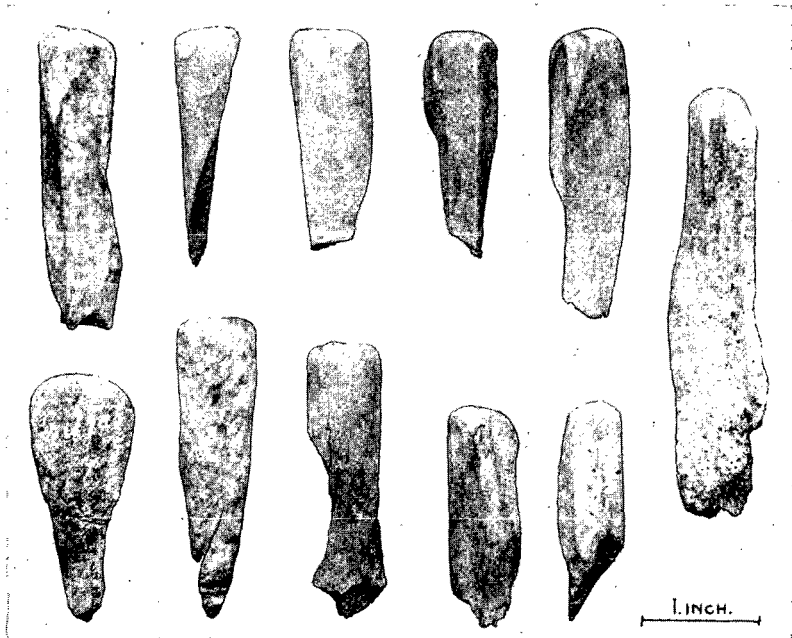


Fig. 37. Implements of Stone- *bone and antler*

The sites are marked by accumulations of flint pebbles, cores, and flakes, lying on the surface of some of the arable fields. Among this flint debris occurred a number of elongated pebbles of sandstone, from 4 to 6 inches in length, the ends of which are in some cases fractured, and in other cases worn to a double facet. If these pebbles are limpet-scoops, their presence may indicate an Azilian station in that district. It should be added, however, that on some of the chipping-floors scrapers, arrow-heads, and polished celts have been collected; but it is quite possible that abandoned Azilian stations may have provided raw material for the implements of Neolithic and later peoples."

exceptions—the beautifully fashioned specimen on the extreme right and that in the centre. The former is conspicuous for the extreme clearness with which the barbs stand out from the trunk, and also for the crescent-shape of the barbs themselves. The specimen in the

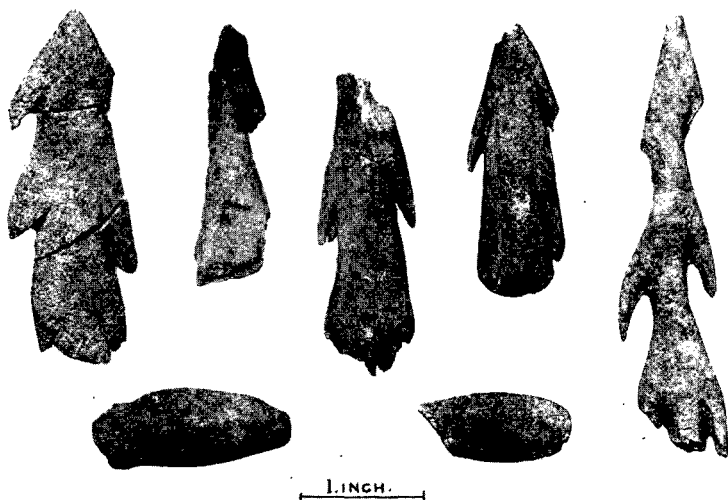


Fig. 38. Harpoons of Bone.

centre is remarkable for an attempt at decoration, consisting of four groups of roughly parallel lines which extend half-way across one face at right angles to the major axis. The trunk fragment (bottom left) has two incisions lying at an angle of about  $45^\circ$  to the major axis. All these harpoons are of bone except that on the extreme left, which is of red-deer antler. The second from the right resembles a specimen

from the M'Arthur Cave, in that its base is ground to a convex facet on one side, suggesting at once its employment for a purpose similar to that indicated for the elongated pebbles and bone and horn splinters described above. Several shoe-horn-like implements (fig. 39), made

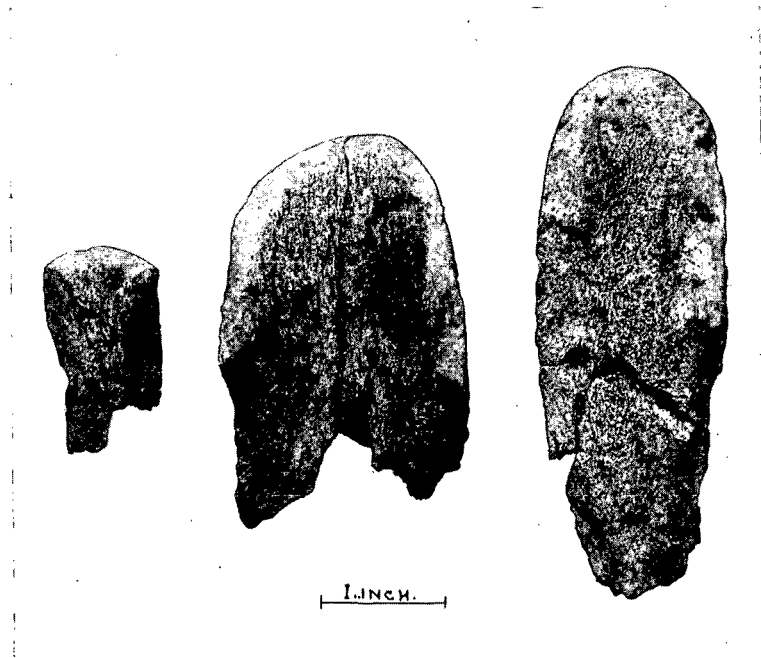


Fig. 39. Implements of Red-deer Antler.

from the antler of the red-deer, have proved an enigma, and we may not be wrong in seeking their explanation in that last resort of the puzzled archæologist—that they were used in some sort of skin-dressing process. They are ground to an edge on the inner side of the horn—a flat stone (not illustrated) having a worn area may have been used in

the process. Pins and borers of bone were met with, and also pieces of pumice-stone on which these were fashioned ; these latter had two or more grooves sunk deep in the flatter faces (fig. 40). Two deer-horn tines, in fig. 35, are worn at the points, and the larger has also a

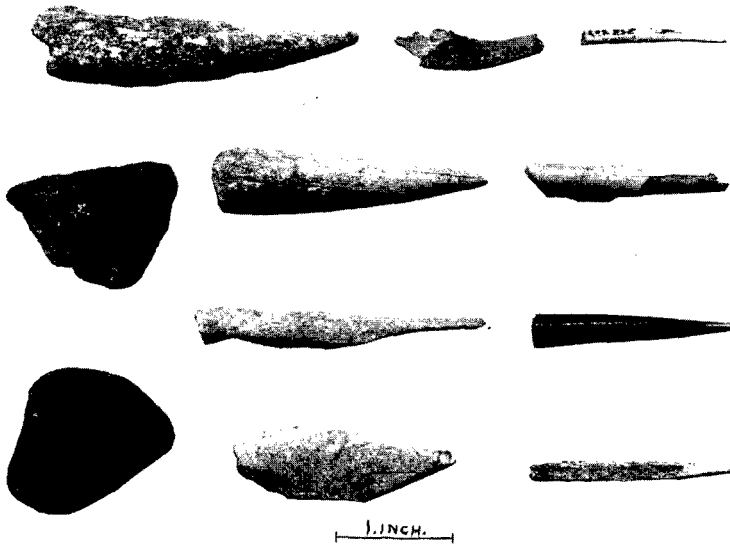


Fig. 40. Pins and Borers of Bone and pieces of Pumice-stone.

ground area on the concave face near the trunk. The other two bone fragments (same figure) are also ground, but their purpose is obscure. Five shells of the pecten, illustrated in fig. 41, are worn on the anterior and posterior margins in a manner characteristic of many of these shells found in the refuse heap, pointing to their use as scoops or ladles. The attrition on the remainder of the shell is probably due to natural



agencies, but the local wear is artificial. The perforated cowrie shells, shown in natural size, fig. 42, were numerous. In the majority of the shells the perforations were more or less circular, always situated in the same part of the shells. Other shells, as of the periwinkle, were per-

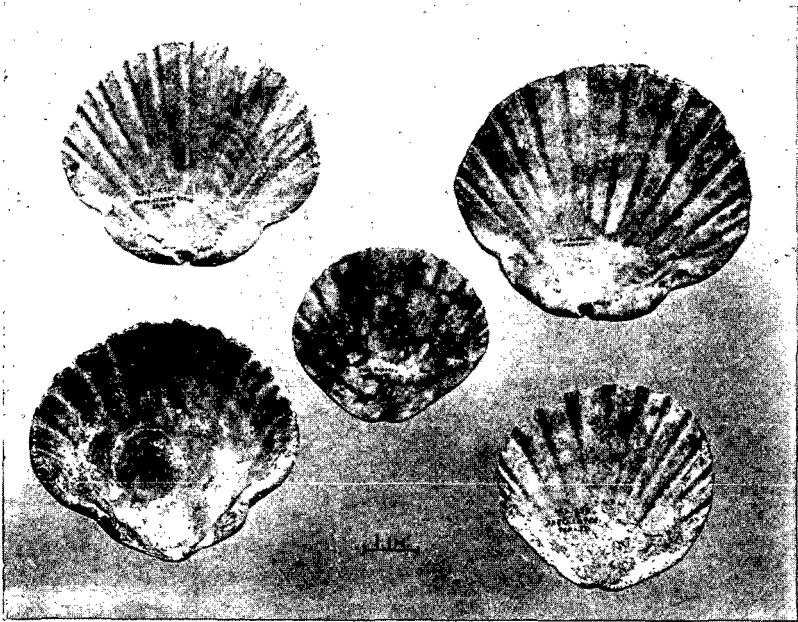


Fig. 41. Shells of the Pecten worn by use.

forated singly, but these were not so numerous. No other ornaments were yielded by the excavations—perforated limpet shells were abundant, but in the case of these the perforation must be regarded as purely accidental, caused by the apex of these shells being driven by pressure through the thin walls of other shells, and the perforation is invariably from the interior outwards. Of quite a different nature

are the perforations in the shells illustrated in fig. 44, but whether these were intended for a definite purpose or merely to facilitate the extraction of the mollusc is a matter of conjecture. Water-worn shell fragments (fig. 43) were fairly numerous, but it cannot be

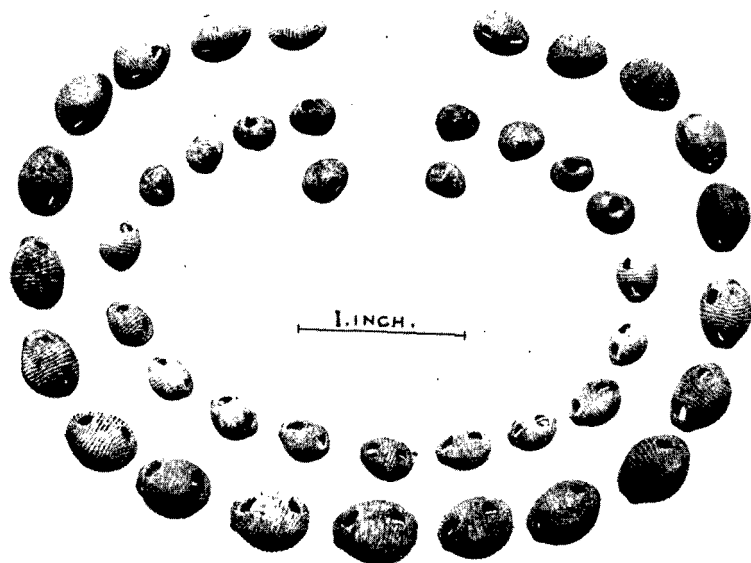
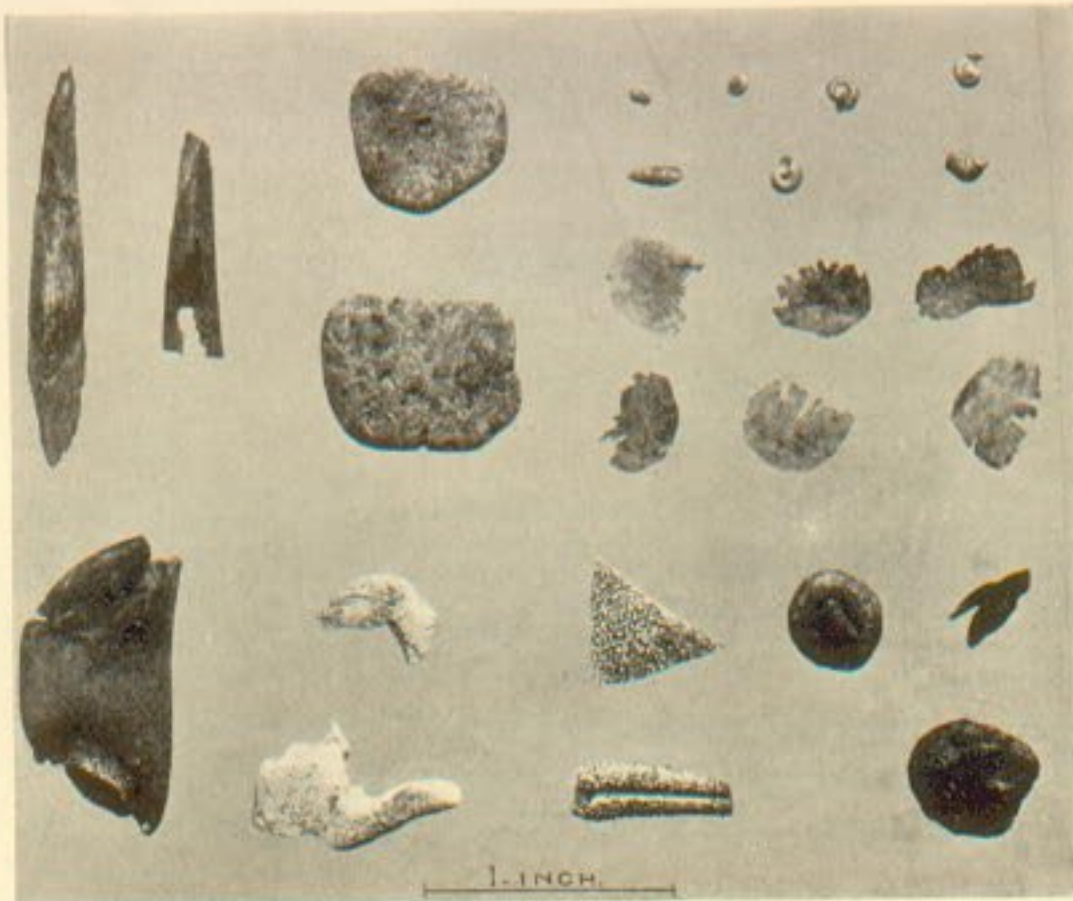


Fig. 42. Cowrie Shells doubly perforated.

determined if they served any end. There are also represented in the illustration spines of the spiny dog-fish (top left), while the six fan-shaped objects are fish-scales.

It was stated at the outset that the object of this paper was "to demonstrate from the shell-mounds of Oransay the existence of human habitation on or about the line of the 25-30 feet beach at a time when

the sea had not permanently retired from that level, and to reveal the Azilian nature of the culture indicated in the occupation." I believe that this object has been attained, and that the photographs and sketches form a guarantee that the work was carried out with scientific accuracy on a scale sufficiently comprehensive to justify the assumption that all evidence, negative and positive, was adequately considered. Moreover, the results yielded by the excavations appear to be so important as to call for the application of a specific designation to the civilisation indicated therein, and while the name Azilian was, from the nature of the culture revealed, serviceable as a tentative description, the site itself may now be allowed to give its name to the period and the name "Oransay" adopted. From a study of the results yielded by the excavations we depict man of the "Oransay" culture as a hunter, a fisher, and a fowler. What his physical characteristics were we are unfortunately unable to determine, for the necessary data, *i.e.* skeletons or definite osseous remains, are wanting. He clothed himself presumably in skins—the bone pins and piercers seem to point to this—while evidence of personal decoration may be seen in the perforated shells and red pigment. What his actual methods of hunting such animals as the deer were, we can only conjecture. His hunting ground would be the larger islands in the neighbourhood and probably the mainland, and to reach these and convey his booty back from them betokens skill in seamanship. His boat must have been a coracle of some sort—skins stretched on a frame of wicker work,—for it is difficult to conceive that he possessed dug-out canoes, inasmuch as the flint chips which have been discovered, though serviceable in other respects, are quite unadapted for working in wood, and no other suitable tools have been found. Perhaps it was in the sea that he found the chief items of his dietary. He possessed well-developed facilities for fishing—the bone harpoons indicate as much—and he would not be likely to neglect the opportunities of placing a yare in the narrow channel already indicated on the north side of the



Figs. 43 and 44. Fish Spines and Scales and Perforated Shells.

hill. It is worthy of note that the remains of crabs found on the site have been identified as belonging only to the deep-water variety, and this presupposes a knowledge of traps or creels. Seals would fall a ready prey to Oransay men; the club-like stones common both in the refuse heap and on the shore would form a deadly weapon in his hands; and though we are driven to conjecture his method of capturing birds, the presence of great quantities of the bones of marine species, including the great auk, leads us to suppose that he employed some such process as is still in vogue in the Outer Hebrides, a sort of snaring by means of a noose on a cord of twisted hair or fibrous grass attached to a long rod. It might be expected that where abundant food supplies would be secured by methods which, while they filled his larder, added the zest of the chase, either by land or sea, the Oransay man would have neither much need nor inclination for seeking sustenance from the soil, even supposing that the rudiments of agriculture were known. Whether he had such knowledge or not, in any case it has to be recorded that there are no traces of mortars, mullers, or of grain, and although the fauna represented is entirely that of the Neolithic period, it is most important to observe that there are two vital omissions—the ox and the dog. The absence of any remains of the latter need not, however, preclude us from assuming that it was used to assist in the chase, for we should not necessarily look for any traces of its bones in the kitchen-midden refuse. We have seen that he ate some of his food raw, *e.g.* some of the shell-fish; but roasting appears to have been the principal method by which it was prepared for consumption, for the fire-fractured stones are not sufficiently numerous to suggest their extensive use as pot-boilers.

I am indebted for assistance during the excavations to Messrs Thomas MacVey, B.A. (Oxon.), Alex. Beckett, James Robson, and to Mr Mungo Buchanan, Corr. Mem. S.A. (Scot.), who prepared the plans from his surveys, which were carried out during the whole time the operations were being conducted.

For the identification of the Fauna I am indebted to :—

C. W. Andrews, D.Sc., F.R.S. (British Museum), who identified the Mammalia.

E. T. Newton, F.R.S., who identified the Aves.

W. T. Calman, D.Sc. (British Museum), who identified the Crustacea.

C. Tate Regan, M.A. (British Museum), who identified the Pisces.

G. C. Robson, B.A. (British Museum), who identified the Mollusca.

- |               |               |                                           |
|---------------|---------------|-------------------------------------------|
| 1. Mammalia,  | identified by | C. W. Andrews, D.Sc., F.R.S. (Brit. Mus.) |
| 2. Aves,      | „ „           | E. T. Newton, F.R.S.                      |
| 3. Crustacea, | „ „           | W. T. Calman, D.Sc. (Brit. Mus.)          |
| 4. Pisces,    | „ „           | C. Tate Regan, M.A. (Brit. Mus.)          |
| 5. Mollusca,  | „ „           | G. C. Robson, B.A. (Brit. Mus.)           |

#### A. MAMMALIA.

- |                         |                             |
|-------------------------|-----------------------------|
| 1. The Grey Seal,       | <i>Halichoerus gryphus.</i> |
| 2. The Common Seal,     | <i>Phoca vitulina.</i>      |
| 3. Otter,               | <i>Lutra vulgaris.</i>      |
| 4. Red-deer,            | <i>Cervus elaphus.</i>      |
| 5. Wild Boar,           | <i>Sus scrofa.</i>          |
| 6. A Species of Dolphin |                             |

#### B. AVES.

- |                            |                             |
|----------------------------|-----------------------------|
| 1. Cormorant,              | <i>Phalacrocorax carbo.</i> |
| 2. Shag,                   | „ <i>graculus.</i>          |
| 3. Goose,                  | <i>Anser sp.</i>            |
| 4. Sheld Duck ?            | <i>Tadorna cornuta ?</i>    |
| 5. Water-rail,             | <i>Rallus aquaticus.</i>    |
| 6. Ringed Plover ?         | <i>Ægialitis hiaticula.</i> |
| 7. Tern,                   | <i>Sterna fluviatilis.</i>  |
| 8. Gull,                   | <i>Larus sp.</i>            |
| 9. Razorbill,              | <i>Alca torda.</i>          |
| 10. Great Auk,             | <i>Alca impennis.</i>       |
| 11. Guillemot,             | <i>Uria troile.</i>         |
| 12. Gannet,                | <i>Sula bassana.</i>        |
| 13. Redbreasted Merganser, | <i>Mergus serrator.</i>     |

## C. FISH.

- |                     |                               |
|---------------------|-------------------------------|
| 1. Conger Eel,      | <i>Conger conger.</i>         |
| 2. Black Sea-bream, | <i>Cantharus lineatus.</i>    |
| 3. Wrasse,          | <i>Labrus maculatus.</i>      |
| 4. Sea-bream,       | <i>Pagellus centrodontus.</i> |
| 5. Angel-fish,      | <i>Squatina squatina.</i>     |
| 6. Tope,            | <i>Galeus canis.</i>          |
| 7. Thornback Ray,   | <i>Raja clavata.</i>          |
| 8. Spiny Dog-fish,  | <i>Squalus acanthias.</i>     |

## D. CRUSTACEA.

- |                  |                        |
|------------------|------------------------|
| 1. Edible Crab,  | <i>Cancer pagurus.</i> |
| 2. Fiddler Crab, | <i>Portunus puber.</i> |

## E. MOLLUSCA.

## Gastropoda—

- Patella vulgata.*  
*Trochus umbilicatus.*  
 „ *cinerarius.*  
*Buccinum undatum.*  
*Purpura lapillus.*  
*Trivia arctica.*  
*Littorina littorea* (young).  
 „ *littoralis.*  
 „ *rudis* (young).  
*Helicella barbara.*  
*Vitrea sp.?* sc. young, an ordinary British sp.  
*Clausilia bidentata.*

## Lamellibranchia—

- Mytilus edulis.*  
*Modiola barbata.*  
*Ostræa edulis* (deep sea).  
*Cardium echinatum.*  
 „ *norvegicum.*  
 „ *tuberculatum.*  
*Pecten maximus*, adult and young.  
*Venus casina.*  
*Pecten sp.* (broken).  
*Tapes decussatus.*  
*Arctica islandica.*  
*Ensis ensis.*

*Helix nemoralis*.

var. *alba*.

*Hyalinia nitidula*.

sp.

*Vallonia pulchella* }

*Cochlicopa lubrica* }

*Vitrea crystallina* }

} from the Cave earth.

Mr Robson adds :—

“I can find no definite indications of any difference between the *Littorina littorea*, *L. obtusata*, and *Purpura lapillus* you committed to me and the modern forms of those species. I looked for two things: (1) Any varietal difference that might be absent in modern forms and present in yours, so as to enable us to assume that during the Azilian period these species were not exactly characterised as they are to-day. But I found no such difference. I could find no character in your forms that I could not match from any set from the coasts of Devonshire or the fjords of Norway. The only noteworthy feature is the absence of any of the larger varieties, both of *Purpura* and *Littorina littorea*; but that is a thing you can find occurring to-day. (2) Any structural characters that associated the Azilian forms with modern cold-water forms, so that we might assume that the Azilian marine mollusca were adapted to a colder climate than the modern. Here again I could distinguish nothing in common between your forms and the Boreal forms of *L. littorea*, etc., which does not also occur among South English forms to-day. Of course I must hasten to say that our series here, though admirable in many respects, are not perfectly adapted for such work, viz. they do not always furnish enough individuals from a particular locality to enable you to conjecture safely what characters, if any, go with that locality. Samples few in number and taken at random are unsafe for biometrical analysis of the kind you propose, and I am afraid that our series are not altogether satisfactory for such work for this reason. But all the same I would be indeed surprised if subsequent research were to contradict these findings.

Of course, in dealing with these negative results you must bear in mind that though Mollusca are pretty sensitive to change, the absence of definitely cold-water forms does not necessarily prove that the climate was like the modern one.”

Mr E. T. Newton also examined samples of material from the post-holes and other definite locations. His report is appended :—

A. POST-HOLE NO. 3, AT 52 FEET PEG.

A quantity of fish-bones, mostly indeterminate, and four otoliths referable to small haddock (*Gadus aeglefinus*).

Also numerous shells, chiefly *Patella vulgaris* (Limpet), with *Purpura lapillus*, *Solen*?, *Saxicava*?

Also land-shells *Vallonia pulchella* (= *Helix*) and *Vitrea*.



## B. LAYER OF CLEAN SHELLS.

A quantity of finely broken shell fragments and pieces of crustaceans, *Patella* and *Purpura*.

Also *Pyramidula rotundata* (= *Helix*).

*Cochlicopa lubrica*.

*Carychium minimum*.

*Jamina muscorum* (= *Pupa*).

## C. FROM BOTTOM OF SHELL-LAYER AND TOP OF BEACH.

*Alca torda* (Razorbill).

Fish fragments (indeterminate).

*Pyramidula rotundata* (= *Helix*).

*Vallonia pulchella* (= *Helix*).

*Vitrea*.

*Pupa*.

*Carychium minimum*.

*Patella*.

*Purpura*.

## D. BLACK SOIL, ETC., FROM LAYER 2 INCHES TO 3 INCHES DEEP, AT PEG 64.

Numerous shells of *Patella vulgaris*, *Purpura lapillus*, *Littorina*, *Murex erinaceus*, *Solen*, and *Cancer* (Crab).

Also *Pyramidula rotundata* (= *Helix*).

*Vitrea*.

Also fish vertebræ, etc.

*Alca torda* (Razorbill).

## E. WITHIN THE STONES AT BOTTOM OF PIT, 6.25 FEET BELOW SURFACE.

Fragments of shells :—

*Patella vulgaris*.

*Helicella caperata* (= *Helix*).

*Purpura lapillus*.

*Vallonia pulchella* (= *Helix*).

*Littorina*.

*Vitrea*.

*Cyprina*?

*Pupa*.

*Mya*.

*Carychium minimum*.

*Cancer* (Crab).

Fish bones (indeterminate).

Perch ? scales.

Fragments of bone—may be human, and perhaps burnt.

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