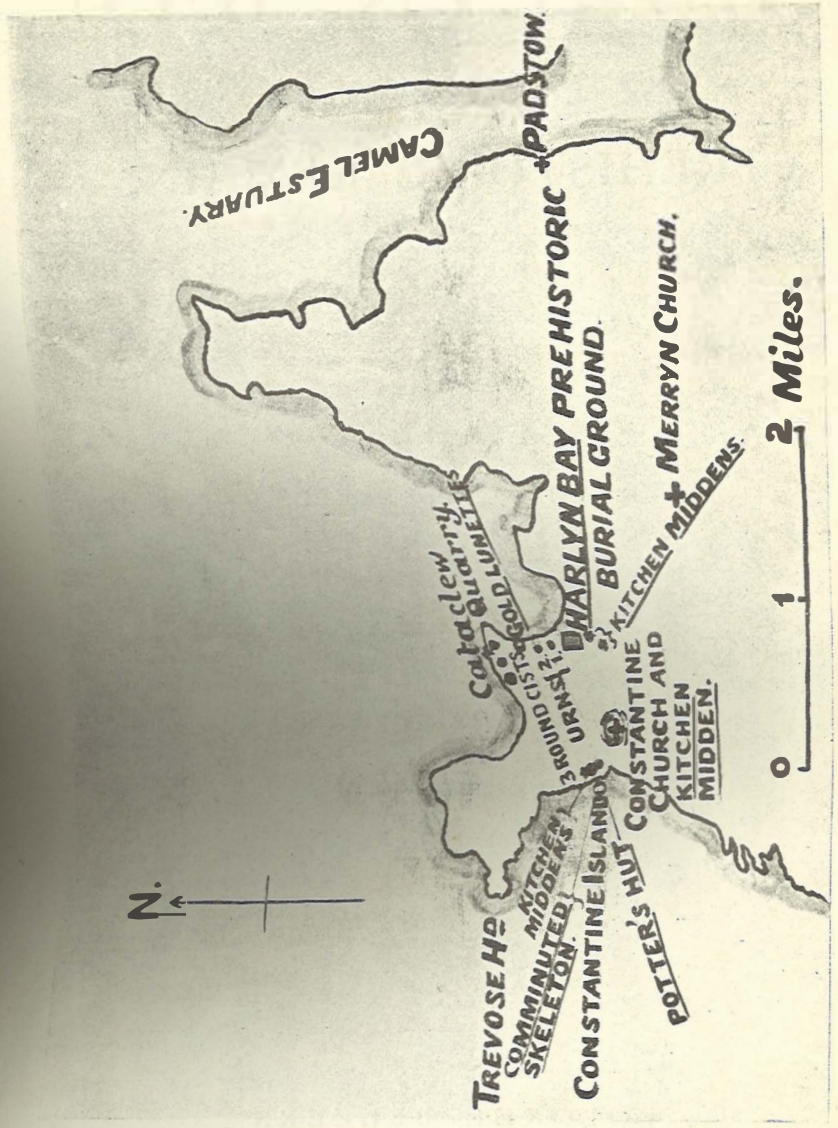

PLATE I.—DIAGRAM MAP OF HARLYN BAY DISTRICT.

HARLYN BAY

AND THE DISCOVERIES OF ITS

PREHISTORIC REMAINS

BY

R. ASHINGTON BULLEN,

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THIRD EDITION, REVISED AND GREATLY ENLARGED; WITH NUMEROUS ADDITIONAL ILLUSTRATIONS, CONTAINING IN ALL TWENTY-FIVE PLATES AND TWENTY-TWO TEXT FIGURES.

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PREFACE TO THIRD EDITION

IT is only necessary to say that the present edition differs somewhat from earlier ones and incorporates, as far as possible, the later discoveries made up to 1905. Since that year very little, if anything, has transpired. My best thanks are due to Mrs. Thelwell (Miss Hughes) for the use of her photograph of the "Interment with broken skull"; to Professor A. C. Haddon, D.Sc., F.R.S., for the use of his photographs of skulls, &c.; to Mr. W. T. Crank, of Clifton, for his photographs of implements; and to Mr. G. Penrose, curator of the Royal Institution of Cornwall, Truro, and others.[1] Most of the photographs by Mr. A. Old and others are the copyright of the author, except those mentioned above which belong respectively to Mrs. Thelwell, Professor Haddon, Mr. Crank and the R. I. of Cornwall. My thanks are especially due to my friend, the late Professor T. Rupert Jones, F.R.S., to another old friend, Mr. W. T. Malleson, B.A., for their criticisms and suggestions; to Mr. Reddie Mallett; to the late Dr. J. Beddoe, F.R.S.; to Mr. E. T. Newton, F.R.S.; to my relative the late Mr. J. J. Muir of Michaelstow; to my friend, Mr. A. Santer Kennard for reading proofs and other kindnesses; to Mr. J. Arthur Pott, M.A.; to Dr. G. J. Hinde, F.R.S.; to Colonel E. V. Bellers and to others whose names are found in these pages.

R. ASHINGTON BULLEN.

Hilden Manor, Tonbridge.

July, 1912.

[1] Figs. 19 and 20 are inserted by the kind permission of the Walter Scott Publishing Co.

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SECTION I

INTRODUCTORY

AT the commencement of 1900 A.D. Harlyn Bay, not far from Padstow, was almost unknown except to those who love the wild rock scenery of the beautiful North Cornish coast. Trevose Head and Cataclew Point jut out to the North, to bear the buffets of Atlantic waves, and to the East is the village of Trevone, with its foreshore of solid slate.

Trevose Head is crowned with round tumuli, and implements of flint are found here and there on the land-surface along the coast.

Harlyn Bay, with its white shell-sand, lies South of Cataclew, and from its shores gently undulating hills of "Devonian" rocks rise up to the Westward, overlain by blown sand which is covered with short grass. Geologically speaking, the underlying rock belongs to the Devonian formation locally known to Geologists as the Ladock Beds, the most recent of the old or Palæozoic rocks of West Cornwall. They are very variable in character, and consist of dark-grey or blue, and sometimes yellowish, slates or schists, together with beds of sandstone, conglomerate and quartzite. No limestones occur in the Ladock Beds.[1]

Attracted by the quiet beauty of the spot, Mr. Reddie Mallett in August, 1900, bought land there, for the erection of a private house. During the work of digging for foundations, and prospecting for water, a slate cist was reached, at a depth of about fifteen feet, and therein was found an interment with characteristic ornaments and implements of an early (though by no means the earliest) stage of civilization in our land.

Mr. Mallett at once communicated with various

[1] H. B. Woodward. *Geology of England and Wales*, 2nd Ed., p. 140.

antiquarian bodies, and, within a short time, a Committee, consisting of Rev. W. Jago, Rev. S. Baring Gould, M.A., Mr. Robert Burnard, P.S.A., Professor O. V. Müller, M.A., and Mr. Buddicom, F.G.S., was appointed to investigate the spot. The Committee personally attended and directed the operations. The first difficulty was the removal of the blown shell-sand which had accumulated to the depth of twelve to fifteen feet and no less than 2000 tons had to be carted away before even the comparatively small part of the burial-place was laid bare. So far about 130 interments have been examined.

SECTION II

SLATE AND SHELL IMPLEMENTS, FLINT IMPLEMENTS

A. The flint implements are of the ordinary Neolithic type, rather small, and for the most part roughly flaked (Plate 4). Their small size is due to the fact that their makers depended on the beach pebbles for their material. They were unable to procure flints locally by mining like the Neolithic men of Cissbury, or Grime's Graves, Norfolk, of Aveyron, France, or Spiennes, Belgium. The source of the flint here is a puzzle, and some geologists think that the chalk-with-flints once covered Cornwall and lands further West, and that it has been removed by denudation. The large deposit of chalk-flints on the summit of Haldon Hill,[1] Devon, confirms this view and suggests that a large area of chalk has disappeared from the West of England, for, according to A. J. Jukes-Browne, F.G.S., the Haldon gravels represent the riddlings of 500 feet of chalk. The gravel which occurs at Haldon Hill is believed to be of Eocene Age, and to have travelled from West to East. He quotes Clement Reid, F.R.S., in support of his view. Dr. G. J. Hinde, F.R.S.,

[1] Haldon Hill is not so called locally. It is always known as Haldon, and there are two, Great and Little Haldon. Strictly speaking it is an elevated tableland, 800 feet O.D., and has not been cultivated, being bad soil owing to the occurrence of the gravel on it.

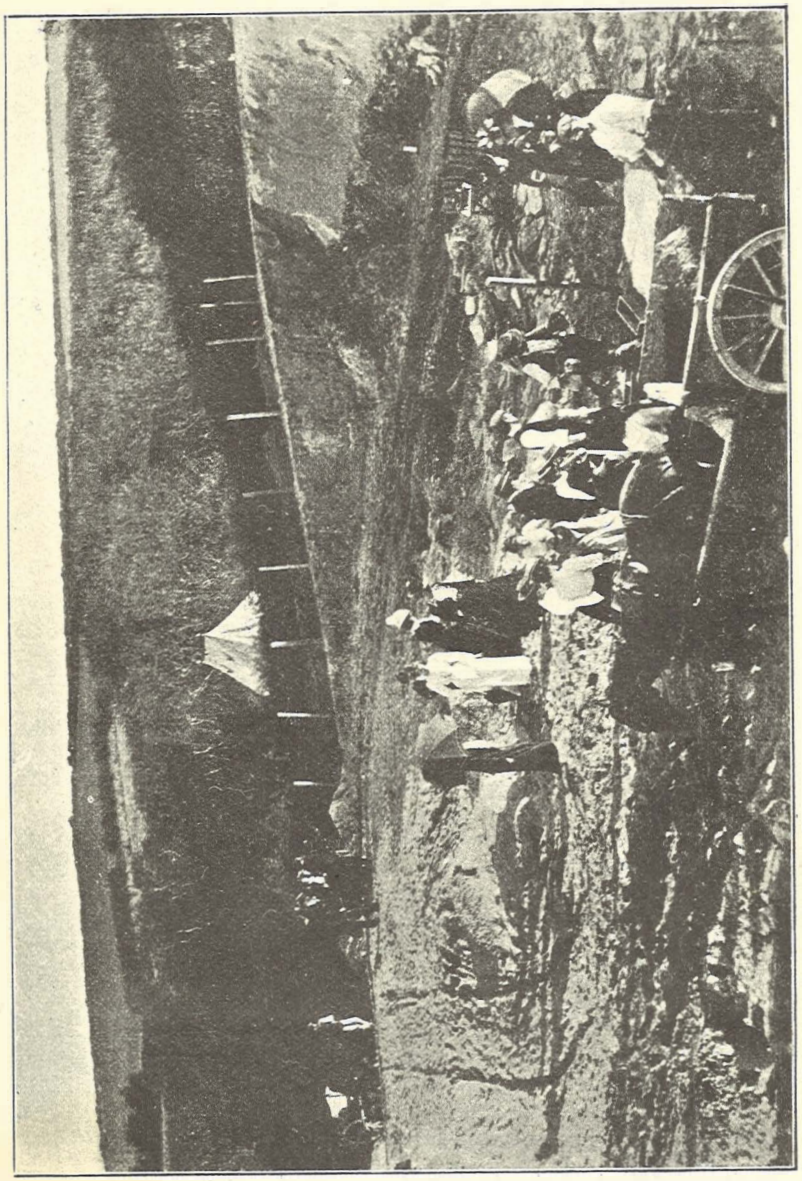


PLATE 2.—VIEW OF HARLYN BAY KELTIC CEMETERY, LOOKING SOUTH.

has kindly examined the Cornish flints from this district, and says "They are evidently from beach pebbles. They are genuine chalk-flints, rather than chert. The organic remains in them are very poorly preserved, but I recognize numerous sponge-spicules, casts of foraminifera (in one instance *globigerina* —a characteristic chalk species), casts of polyzoa, and a piece of a shell like *inoceramus*. If similar chips were found in the neighbourhood of Croydon there would be no hesitation in referring them to chalk-flints, in fact, the pebbles are very similar to those on the Addington Hills, only more weathered."

The late Professor T. Rupert Jones, F.R.S., who was very much interested in the excavations at Harlyn and the occurrence of flint pebbles there and at Constantine, recognized the difficulty of accounting for flint pebbles in this district, but considered that, since there had been patches of chalk about the West of England, *e.g.*, near Sidmouth, there may have been several such sources for beaches in late Tertiary times.[1]

B. Among the most interesting things which have been found are implements made of slate, which make the Harlyn find extremely interesting. Flint flakes, flakes of slate, and some well-made implements of slate occur in the cists; while at the base of the blown sand—where the light and dark sand merge—is a profuse layer of implements, pieces of rubble, animal bones, human teeth, etc. At present a prejudice exists in the minds of some, against the belief in the human workmanship of these slate flakes, it being urged that they are merely pieces of sea-washed rubble. No such specimens are to be found in the beach, however, although, if they were, the fact would be but parallel to the frequent occurrence of abraded Neolithic flakes near Pakefield, not far from Lowestoft, on the foreshore. There the waste of land, year by year and century by century, is of course far greater than in Cornwall. For instance, Shipden, or old Cromer, was traditionally once the seaport, and Cromer the inland village. Shipden, Eccles, and Whimpwell are now covered by the German Ocean.[2] In Cornwall the abrasion of

[1] Letter to author, dated August 23rd, 1902.
[2] Murray's *Eastern Counties*, p. 261.

the coast is not so great ; but at Harlyn Bay the sea has made considerable inroads in the last 2000 years. Consequently there would be nothing strange in worked flakes of slate occurring even on the sea-beach, though the action of a few tides would soon render them dissimilar to those presumably implemental slates which are found about the burial-place at Harlyn.

Plates 2 and 3 give a general view of the prehistoric cemetery at Harlyn Bay during the excavations.

And this leads me to make reference to a peculiar feature of the interments. According to Mr. Mallett's observations, they are all pointing to the *Magnetic North*.[1] This must be an accident, since the Magnetic North was different when the graves were made.

An interment of undoubted Roman date is mentioned by Lysons as found near Hempsted, Gloucestershire (discovered on November 30th, 1859), which was lying North and South. As the body was not cremated, it was most probably not a Roman burial, but there were found with it a lachrymatory (probably an unguentarium) of clear transparent glass of classical shape, broken, but nearly all the pieces were recovered ; also another vase, broken to pieces, and of very thin black earthenware. The pains and expense taken with the burial of the deceased (a youth) showed that he was a person of high rank. He may have been the son of some Roman official who was not of Roman race. There was an inner wooden shell, encased with a leaden outer chest. On the next day another interment in the same direction was found. With this latter there were sixteen Roman coins of the time of Constantius, probably about the year 296 A.D. The chest in this case was of stout elm. There was no lead outer cover.[2]

[1] A burial (solitary so far as is known) at Little Trendeal, about ¾ mile from Bissick, was explored by Mr. S. R. Flint in 1884. Here, as at Harlyn, was a stone chamber lying due North and South, 2 feet below the surface. There was nothing in it except some red powder or dust. It was 18 inches deep, 3 feet 6 inches long, and 2 feet wide.

As at Trevone and Harlyn the cists pointing N. and S. probably indicate people of the same race.

[2] Rev. Samuel Lysons, M.A., F.S.A., "The Romans in Gloucestershire," a lecture before the Literary and Scientific Society and the Gloucester Association for young men, 1860.

Lysons does not say whether the bodies were contracted or not. The interesting point is the *direction* of the long axis of the interments.

The slate used in the making of Harlyn Bay implements is not found near the Bay.[1]

C. I have collated below several references to the use of slate for implemental purposes, commencing in considerable detail ; for a merely vague statement is of little value.

The other extracts from my friend the late Dr. David Boyle's Reports, are of a similar tenor, with the detail omitted.

Neolithic *flint* flakes and scrapers occur in the neighbourhood, in some places in profusion, as well as in the interments. The shell implements are of a curved needle shape. They are made of limpet and mussel-shell. The limpet chosen for the purpose was always a thick translucent shell, and the material used always broken out of the shell in the same manner, nearly of the same size, and the sharpened fragments of shell are bevelled and pointed in a similar manner ; and they occur in the same places (though more rarely) as the worked slate tools. The slate flakes and implements found are of an even texture, free from quartz-veins, and seem specially selected for that reason.

The slate implements are not quite easy to explain ; they were found both in and above the cists. Slate is not a substance that suggests general suitability for the manufacture of tools ; the Harlyn Bay implements, however, cannot have been the production of natural forces. Like the Eoliths, they can be arranged in classes. They are nearly all of the pointed type ; they are neither to be found in the fields with the ordinary slate-rubble, nor on the sea-beach, as some persons, without due examination or appreciation of the evidence, have suggested.

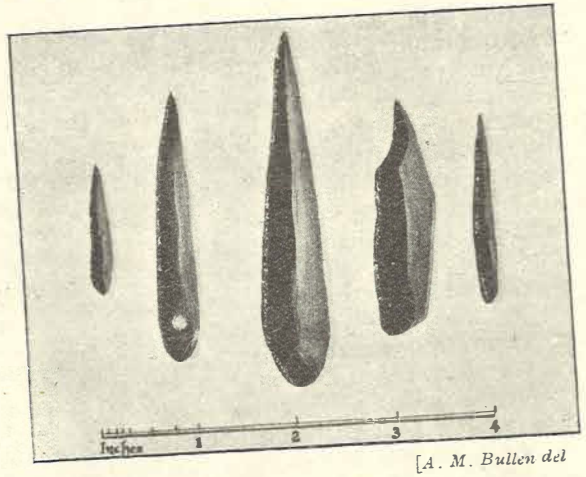
The slate tools from the Harlyn Bay cists are made of a slate that has a fine, even texture, and the local workmen do not recognise the material as being from the immediate neighbourhood. It is quite

[1] In Australia the material for making stone hatchets is carried hundreds of miles by the black fellows ; and in the West Indies axes of the old type are made from material found only on the mainland.

hard enough for the purpose of piercing wood or leather.

Mr. Reddie Mallett deserves to be congratulated on the assiduity with which he has examined every piece of slate and upon the beautifully made bodkins and other piercing instruments he has collected. In June, 1903, he unearthed three slate tools of such beautiful workmanship, one pierced *for suspension*, as to substantiate the fact of their being artefacts (see Fig. 1 and Plate 24).

It is possible that some of these tools were manu-



[*A. M. Bullen del*

FIG. 1.—SLATE TOOLS FROM HARLYN BAY.

factured (like some of the pottery [1] otherwise useless) for "spiritual" purposes—as part of the "grave furniture" to accompany the spirit in the other world.

Some of the more finely pointed boring tools may have been used for the purpose of tattooing [2]; others would serve as awls for sewing skins, in the making of garments and sandals, or the skin-coverings of wicker coracles.

The shell implements are not so easily explained, but Mr. Santer Kennard, who has seen them, con-

[1] T. Rupert Jones, in a review of Greenwell's *British Barrows*.

[2] Mr. J. A. Pott, F.S.A., in suggesting this, quotes Darwin, *Descent of Man*, p. 574, as stating that the ancient Britons tattooed themselves.

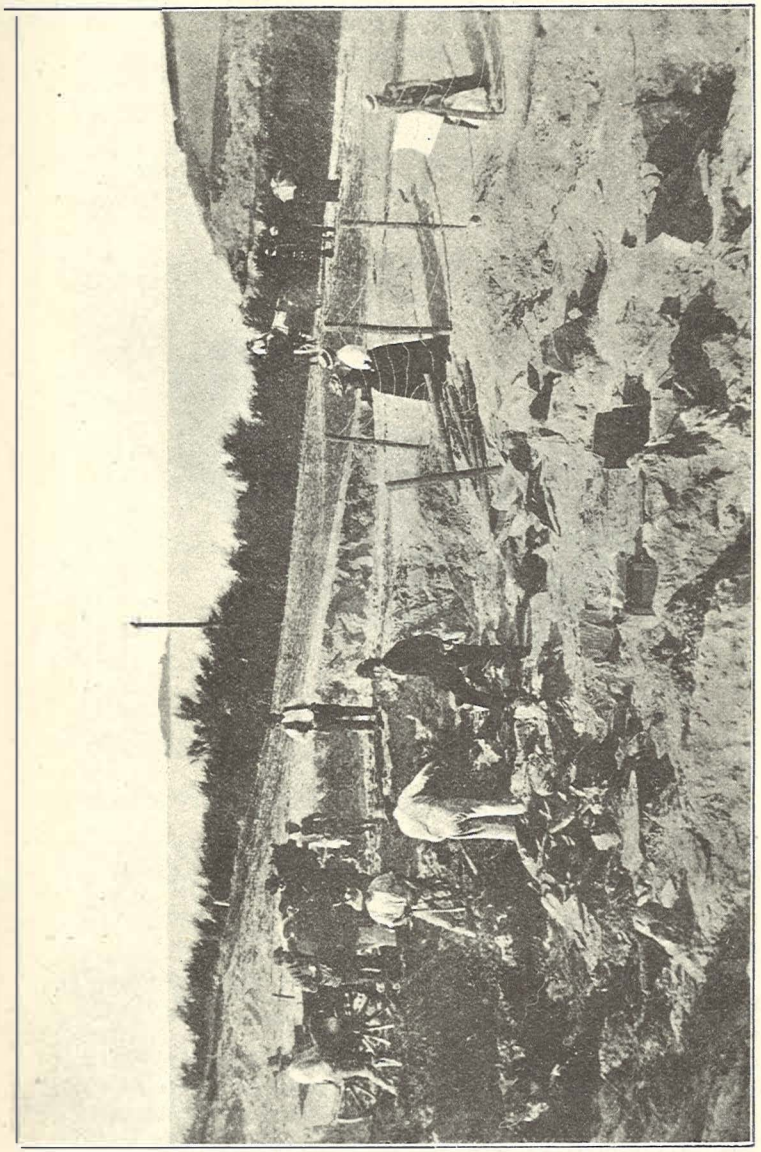


PLATE 3.—VIEW OF HARLYN BAY KELTIC CEMETERY, LOOKING NORTH.

siders that they resemble the flint implements used by the race of fishermen who frequented the caves near Hastings. This purpose was suggested by Mr. Lewis Abbott, in 1895.[1]

In addition to these a slate implement, taken from a cist, and a piece of slate with a bevelled edge from the "Potter's Hut" at Constantine are interesting, both probably potter's tools; the former has its ends *flattened* by rubbing.

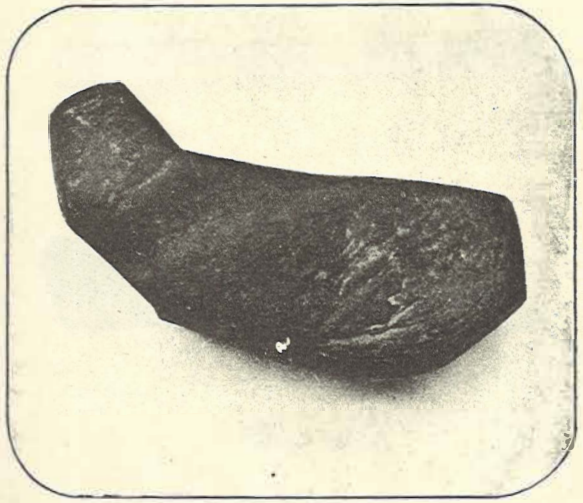


FIG. 2.—TOOL (SLATE), "POTTER'S HUT," CONSTANTINE.

The following are the approximate measurements of the slate "dagger" found in the year 1904:—

Length	162·5 mm.	(about 6½ inches.)		
,, (handle)	61·5	,,	,,	2⅜ ,,
,, (blade)	101	,,	,,	4 1/16 ,,
Greatest breadth (blade)	39	,,	,,	1½ ,,
Least breadth (handle)	19	,,	,,	¾ ,,
General thickness	9	,,	over	⅜ ,,

This dagger-like implement was found by a workman named Bennett to whom Mr. Mallett had given a considerable amount of the dark sand for fertilizing his garden, at the time that he "flemished" it

[1] "Primeval Refuse Heaps at Hastings," *Nat. Sci.*, vol. xi., pl. vi. and p. 94.

down and (to my mind) spoiled the scientific evidence by smoothing away the roughnesses and beautifying the site by tree-planting and other improvements. Surplus sand was in much request for gardening purposes. When spreading the said sand over his garden he found the implement, which had been unnoticed when the sand was carted. Next morning he brought it back to Mr. Mallett with the words, "Sir, here's something that belongs to you." I am quite confident of the bona fides of the

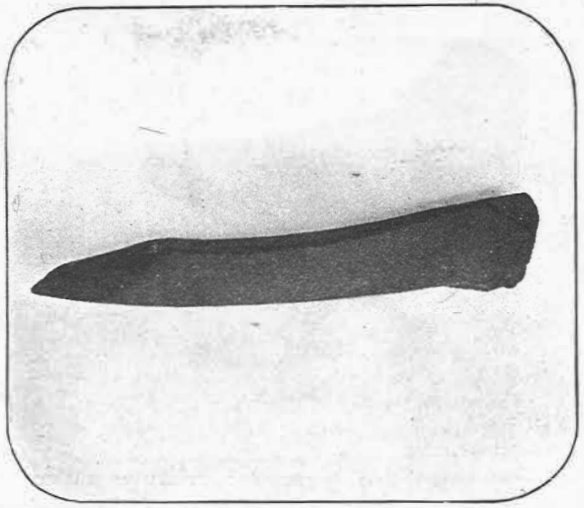


FIG. 3.—SLATE TOOL FROM "POTTER'S HUT."

whole transaction, and so is Colonel Bellers, who has seen and talked to Bennett on the subject. This dagger-like implement has a blade with bevelled edges, it could only be used in thrusting, as its sides are flat (not being sharpened at all); it has a sharp, somewhat twisted point, due to the angle at which the almost parallelly bevelled edges meet. The dagger is made of the dark slate, not found now in the vicinity, according to the universal testimony of the slate-workers of the district.

The slate implement from Fordham was bought by me from a dealer in antiquities, named Whittaker,

at Cambridge, during the meeting of the British Association in 1904. It comes from the collection of a farmer of that place (Fordham). On one side is a stain of a dark ochreous colour, which makes it evident that it was made from a piece of drift slate from the local boulder-clay.

Mr. Davies, of Weston-super-Mare, has another from the same collection and of the same character. His specimen was shown to Professor Montelius, of Sweden, who was a fellow guest of Jesus College

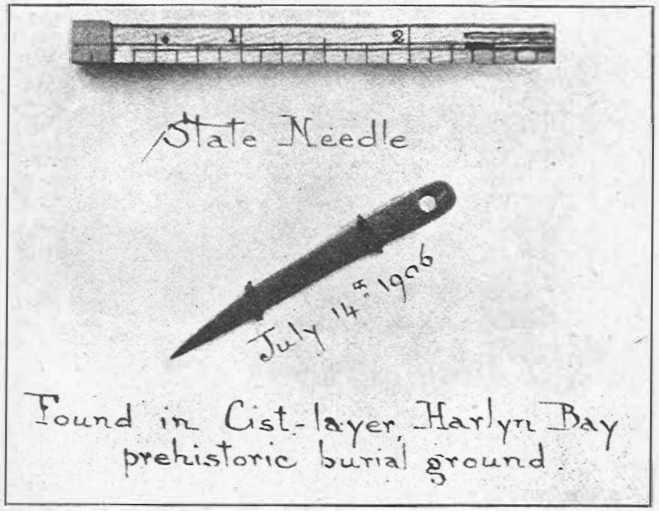


FIG. 4.

with ourselves, and he was quite satisfied with the implement (Mr. Davies'), and put it down as belonging to the Age of Polished Stone weapons. Both weapons are, as I said, similar.

In my implement the slate is unequally hard in its several layers. In consequence, it would seem, of being in contact with the local clay, the under part has decayed and flaked off in places. The ochreous-stained, harder polished part shows no such decay.

Its measurements are:—

Greatest length	. . .	81 mm.	(about $3\frac{1}{16}$ inches.)
,, breadth	. . .	53·5 ,,	,, $2\frac{1}{4}$,,
,, thickness	. . .	8 ,,	,, $\frac{11}{32}$,,

On December 17th, 1907, I exhibited at the Royal Anthropological Institute two specimens about the finding of which there can be no mistake. Colonel Bellers bought the site of the Prehistoric (late Keltic) burial ground from Mr. Mallett in 1906. Colonel Bellers' sister was searching in the bank at the West side on July 14th, 1906, and (though ignorant of the importance of her find) dug out, at a depth of about 15 feet from the top of the section, [close to the site of the slate-built wall where the flattened skeletons (probably a foundation

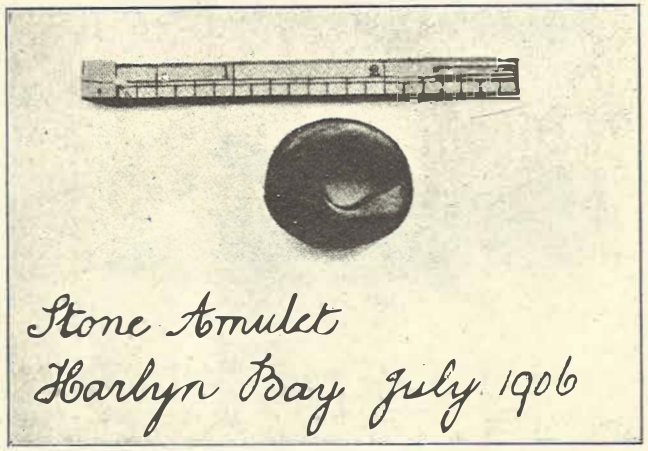


FIG. 5.

sacrifice) were found in 1900], a polished slate needle (Fig. 4), and later a polished amulet, probably of serpentine, which bears a resemblance to the outline of a human eye, bevelled on both sides round the artificial hole (Fig. 5). The slate is of a close and even texture, and of a dark colour, foreign to the Trevose district, so far as workers in local building materials know.

The amulet is the first find of the sort, but the slate needle is the fifth polished stone implement from this district, one being in the Museum of the Victoria University, Owen's College, Manchester, three in the possession of the present writer, and

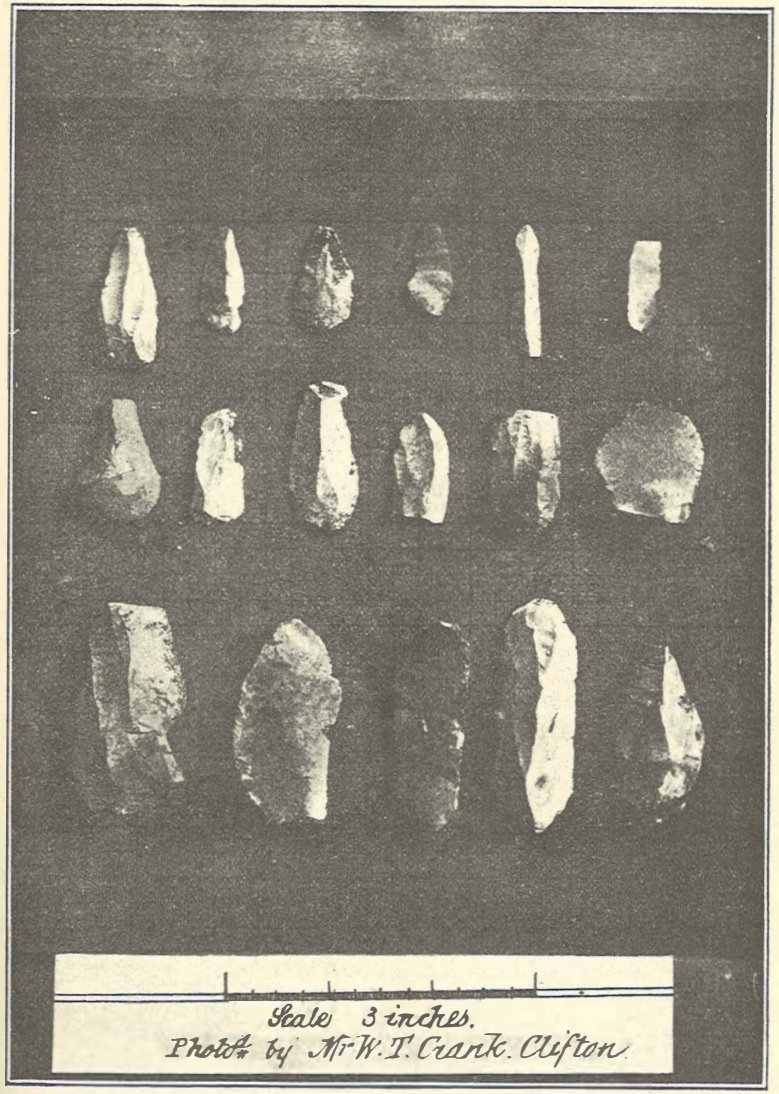


PLATE 4.—FLINT IMPLEMENTS, NEAR HARLYN.

one, now figured, belonging to Colonel Bellers, at Harlyn Bay Museum.

As I stated at the Royal Archæological Institute in July, 1904, "no one would rejoice more than I if the whole district were taken in hand and scientifically explored:" in a year or two it will be built over and the chance lost. One thing is quite certain, the implements mentioned are of human workmanship; those that know the district and the site are convinced of their bona fides, and I will close this brief notice in the words of Dr. Haddon, F.R.S., in a letter, I believe, to the *Royal Cornwall Gazette* in April, 1905:—

"The most important point in connection with this site is the occurrence of objects made of a close-grained black slate. Two perforated awl or bodkin-like objects have been found which were brought to a fine point; another is a pointed object, which appears to have been definitely worked and may have served as a dagger; other pointed objects have been found which could be used for piercing holes in skins. Mr. Mallett . . . has been wise enough to collect both likely and unlikely forms, as at present we are in the stage of amassing evidence; in a short time it will be possible to sift this evidence and to eliminate the artificial from the natural forms. These slate objects constitute a problem that archæologists have not yet seriously tackled. When these finds have been adequately studied, Harlyn Bay will probably become one of the 'classical' spots of British archæology."

SLATE AND SHELL IMPLEMENTS IN THE TORONTO ARCHÆOLOGICAL MUSEUM

From the "Archæological Report," 1896—7, Toronto, by Mr. David Boyle, Curator of the Archæological Museum, Toronto. (The numbers hereunder refer to the pages of that Report.)

2 "Women's" slate knives (p. 13).
1 Half of a semicircular slate knife (p. 13).
1 Slate pebble, partly worked (p. 11).

1 Piece of worked red slate, Bexley Township (p. 11).
1 Unfinished tool of Huronian slate, Bexley Township (p. 11).
2 "Women's" slate knives, Victoria County (p. 12).
1 Pear-shaped slate pendant, Victoria County (p. 12).
3 Worked mussel shells, Victoria County (p. 12).
3 Bored mussel shells, Victoria County (p. 12).
The above were presented by Mr. George E. Laidlaw.

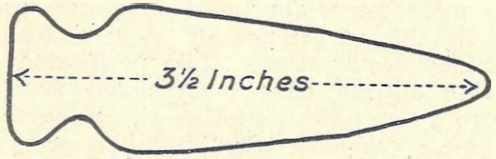


FIG. 6.—WOMAN'S SLATE KNIFE: N. A. INDIAN.

Also (donor not stated),
Half of a slate gorget from a Mound, Hiawatha (p. 5).
1 Shell (Unio) scraper, Beverley Township (p. 5).
1 "Woman's" semicircular slate knife, from Mr. P. Quinn, Otonabee (p. 7).
1 Small slate bead, badly bored, from Mr. W. A. Brodie, Bethesda (p. 9).
1 Slate gorget, Scott Farm, Vespra Township, from Mr. A. F. Hunter, M.A. (p. 9).

Also in the Catalogue of the Ontario Archæological Museum (1897) numerous slate knives, slate slick stones,[1] slate gorgets (Huronian slate), slate scrapers, slate tablets (unfinished), slate tubes, also shells used as spoons and scrapers (Nos. 8653–8661) and others, shell smoothers (for inside of pottery), shell pendants.

All the above are from the United States of North America and many from Ontario [Nottawasaga and elsewhere].

[1] Stone implements applied in connection with weaving and the preparation of leather, for burnishing and smoothing, somewhat in the same manner as is now effected by the flat iron. (Evans, *Stone Implements*, p. 440.)

Additions of the same kind are reported in the Toronto Museum Report for 1898.

Mr. F. Lasham, of Guildford, has several North American tablets of slate in his collection.

Enough has been said above to show the undoubted use of slate in the manufacture of implements and ornaments by peoples of the Neolithic and the Early Bronze stage of culture.

Professor Flinders Petrie has also recorded numerous slate utensils and tools in Prehistoric tombs in Egypt. See "Royal Tombs of the Earliest Dynasties" Part II., 1901, p. 26 (for slate jar); pp. 36, 38 (for slate palettes), p. 43 (for slate vases).

In his work on "Diospolis Parva," p. 20, he says:—

"One of the most usual objects in the graves is a small slab of slate. When in a fresh condition these slates have generally some green paint on one side, and others have a hollow where paint has been ground.

"Bags of the green malachite used for grinding are found near the slate: and a brown pebble from the desert generally lies by the slate, sometimes with green paint also upon it, showing that it was used for crushing and grinding the malachite upon the slate. . . .

"The surface is sometimes engraved with figures of animals; and in later times at the beginning of the dynastic race, the slates were made of the same form but larger, and covered with groups of animals and historical scenes. In all of these, however, the circular hollow for grinding the paint was carefully kept, and was the centre of the decoration. . . . The green paint which is thus seen to be a standard toilet article, was used for surrounding the eye. On the earliest sculptures the face around the eye and below it is green, as on the figures of Sokhar-Khaban and Abu-en-suten.

"The purpose of using malachite was probably medicinal. Livingstone mentions that when in Central Africa he found that obstinate sores were best treated with powdered malachite, which the natives provided for him. A further use of coating the skin round the eye would be to stop out the glare of the desert, as the Eskimo blackens the skin to save

the eye from the glare of snow. . . . The custom of painting must have belonged to the earliest people that we know of in Egypt, as shown by their use of palettes." [1]

Professor Flinders Petrie also records a fragment of a shell bangle and a piece of a shell scraper. ("Royal Tombs," Part II., p. 37.)

Sir John Evans, F.R.S., in his "Ancient Stone Implements of Great Britain," says "Some curved knives of polished slate, about five inches long, notched at the base as if for suspension by a string, have been found in Norway. . . . In the Greenwell Collection is preserved a curved knife of slate, sharpened on the concave side, found in Antrim" (p. 358).

Again, "In Norway, and more rarely in Sweden, stemmed and acutely barbed arrow and lance-heads, made of hard slate, ground on the surface, are occasionally found. Knives of the same material also occur. They much resemble some of those from Greenland, and are probably of comparatively late date. Some spear-head-like implements of slate, ornamented with incised lines, have been found in a circular fort on Dunbuie Hill, near Dumbarton" (p. 404). Again, "Another object in stone, not unfrequently found in graves, and of which the use is now comparatively certain, is a rectangular plate, usually round on one face, and hollow on the other, with perforations at either end. These plates are commonly formed of a closely-grained green chlorite slate, are very neatly finished, and vary considerably in length and proportion" (p. 425). He mentions such slate specimens from the Isle of Skye, Fyrish (Ross-shire), Dalmore, in the same county, Cruden (Aberdeenshire), Tring Grove (Herts), Aldington (Worcestershire), Roundway Hill (Wilts), Aldbourne (Wilts), Calne (Wilts), Lindridge (Worcestershire), Brandon (Suffolk), Sutton (S. Wilts), Mere Down (Wilts), Bulford (Wilts), Sittingbourne (Kent), Lancaster, Sandy (Beds), Isle of Mull, Fyvie and Ballogie, both in Aberdeenshire, Glenluce (Wigtownshire). "There is also a specimen in the Stourhead Collection

[1] In one cist at Harlyn Bay, Mr. Mallett found a mass of blue material, resembling moist blue paint. This was probably cerussite (blue carbonate of copper).

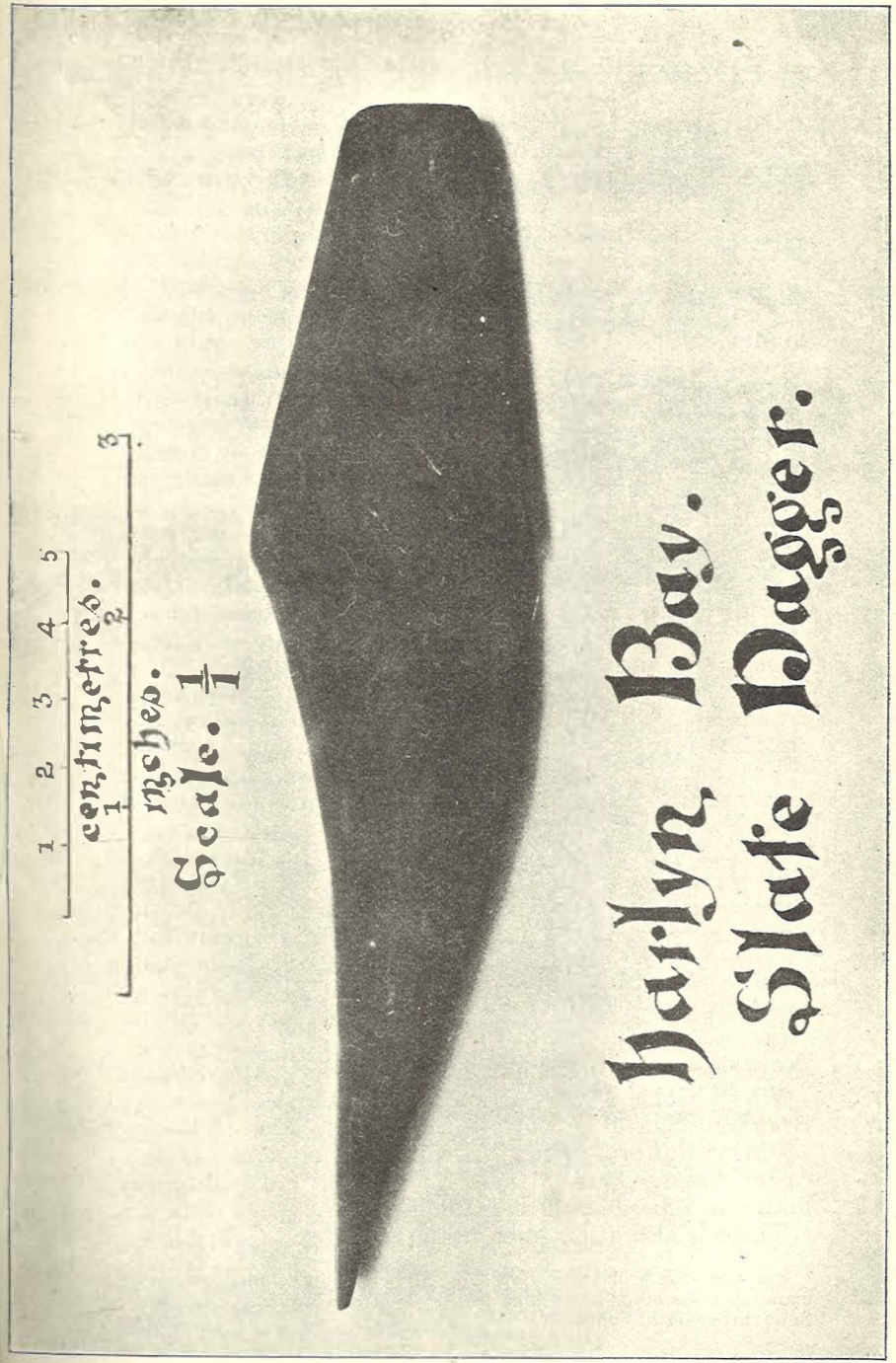


PLATE 5.

in the Devizes Museum, and a few specimens . . . have been found in Ireland. In that country also the same slaty material was used, sometimes green and sometimes red in colour."

Rev. S. Haughton also mentions slate as a material for celts.[1]

Baring-Gould mentions round discs of slate found in Dartmoor prehistoric huts, supposed to be used as covers for vessels.[2]

Other suggestions that have been made are that the round discs may have been used as missiles thrown from "stick-slings," a weapon about three feet long and split at the top so as to make an opening wide enough to receive the stone, which was confined by the reaction of the stick on both sides, but not strong enough to resist the impulse of the slinger. Those who could use it properly cast stones to a considerable distance and with great precision.[3]

Thin stone discs, for the above use, have been found in Mexico and New Caledonia.

The pierced discs may have been net-sinkers, or possibly connected with the fire drill.

Dr. Allen Sturge, writing from Nice in 1903, says, "Slate palettes are probably a mistake. The palettes may have been used for rubbing down paint, but that this was their original purpose there is the greatest doubt. I have a splendid series of them, very large and beautifully made, and without the slightest trace of malachite on any of them. That they can have gone to the trouble of making such fine things for the sake of rubbing down a little paint on one small portion of their surface seems impossible. As Read of the British Museum has suggested, they were probably totems, figures of the sacred animal of the villages to ward off bad spirits. They were very likely passed on from father to son for many generations, and finally, when their meaning had become a good deal forgotten, the greater number made convenient palettes to put their paint down on."[4]

[1] *Catalogue of the Royal Irish Academy*, p. 72.
[2] *Book of Dartmoor*, p. 43.
[3] Note by Mr. J. Arthur Pott. (Strutt, *Sports and Pastimes*, p. 74. Nillson, *Stone Age of Scandinavia*, pp. 49 and 50.)
[4] Evans (*Ancient Stone Implements, etc.*) gives his authorities for his statements in the references at the bottom of p. 404.

SECTION III

BURIAL CUSTOMS, AND THEIR MEANING

A SUPPOSED provision for the future state was the placing of flint, felspar, and charcoal in the grave with the corpse, usually on the abdomen and at the head. The Rev. W. Jago, of Bodmin, has obtained fine sparks from the collision of flint and felspar.[1]

Primitive man may have projected his present needs into the world beyond the grave, as we still see in the ancestor-worship prevalent in China. In that country there is an annual "festival of the homeless ghosts," in which provision is made for those who have died and left no descendants to worship them. The supplying of food and other necessaries of terrestrial existence, publicly in the streets, to "homeless ghosts" in order that they may not become malevolent and injure the living seems to intimate that the "spirit world" is in some sense the parallel of this in its needs and occupations.[2]

But, regarding the cists, the supply of the necessary materials for producing fire may perhaps be explained on the hypothesis that the departed needed fire in the unseen world. However, we need to be cautious in dealing with the ways and thoughts of times so remote, and we must acknowledge after all that this, though probable, is mere guess-work. Canon Atkinson

[1] *Royal Cornwall Gazette*, Nov. 29, 1900. Report of Annual Meeting of the Royal Institution of Cornwall.

[2] In a review of Greenwell's *British Barrows* (1878), Professor T. Rupert Jones, F.R.S., has the following pertinent remarks: "The 'pottery of the barrows' is considered by Canon Greenwell as having been prepared for the sepulchre alone; the domestic vessels, well known on sites of habitations, being of a different manufacture, harder and more useful, and destitute of ornament." As a footnote to this he says: "As these vessels were *spiritual*, and known to be practically useless, it is quite possible that the *flakes*, *potsherds*, and sometimes *pebbles*, so freely united with the earth of mounds, and thrown into graves of much later date, may have been (certainly in earliest times) still more significant of the appliances of every-day life for the deceased. They would directly represent his tools and weapons, his strike-a-light and boiling-stones, and his means for carrying water and hot embers. Poor indeed was the greatest of the heroes, on his dreary death-path, who had not 'a sherd to take fire from the hearth, or to take water withal out of the pit' (Isaiah xxx. 14)." [I am much indebted to Professor Rupert Jones for the above reference. (R. A. B.)]

("Forty Years in a Moorland Parish") commenting on the finding of crocks which contained charcoal, in the churchyard at Danby, considers that they were placed with interments in order to keep the departed spirit from leaving the spot. He quotes a custom in Sweden of sprinkling live coals on the ground between the corpse and the house, as the body is being carried to interment, to prevent the departed spirit from returning, and troubling the living. I found traces of the custom of putting crocks in graves, at Little Stukeley,[1] in Hunts, at a depth of about 4½ feet, but I was not fortunate enough to find charcoal with them. The pottery was mediæval, with a greenish glaze. But this motive, while explaining the presence of charcoal, does not explain the presence of the felspar and flint. Lord Avebury[2] commenting upon Bateman's observations on the tumuli of Derbyshire and other parts, considers that "there seems to have been no intention of depositing with each corpse a complete set of implements. . . . The mound known as 'Cow Low' (Derbyshire) contained only a bone pin. The affectionate relatives who heaped up this tumulus would certainly not have sent their dead sister into the new world with nothing but a bone pin, if they had thought that the things they buried with her could have been of any use. . . . It would be easy to multiply illustrations, and it is, I think, sufficiently evident, that the articles found in the graves cannot seriously be considered as affording any evidence of a definite belief in a future state of existence, or as having been intended for the use of the dead in the new world to which they were going. Moreover, there is a well-marked speciality in each case, which seems to shew that these rude implements, far from being the result of natural belief, are ***simply the touching evidence of individual affection***." [3]

On this latter hypothesis we should conclude that fire[4] being one of the most valuable discoveries of

[1] Pottery in Graves. Similar pottery occurs in the churchyard at Cudham, Kent. I have seen several fragments found there at a depth of about 5 feet. The pottery was similar to that at Little Stukeley, *i.e.*, with green glaze. (A. S. Kennard.)

[2] *Prehistoric Times*, Ed. 1865, pp. 92—98. See also further Canon Greenwell's *British Barrows* (1877).

[3] See Section XXV.

[4] The late J. R. Mortimer mentions two occurrences of iron pyrites

primitive man, the means of producing it were highly valued, and became a fitting offering of affection to the dead.

SECTION IV

SPINDLE-WHORLS

IN other interments at Harlyn, presumably those of women, spindle-whorls were found, the use of which has been well explained by Sir John Evans [1] (Plate 10).

"In spinning with the distaff and spindle the rotatory motion of the latter is maintained by a small fly-wheel or 'spindle-whorl,' [2] very generally formed of stone, but sometimes of other materials, with a perforation in the centre, in which the wooden or bone spindle was fastened, the part below the whorl tapering to a point so as to be readily twirled between the finger and thumb, and the part above being also pointed, but longer, so as to admit of the thread when spun being wound round it, the yarn in the act of being spun being attached to the upper point."

We can reconstruct slightly the life of these Harlyn people. They were intelligent, to judge by their skulls. They practised the arts of the potter and the weaver (as is evidenced by the fragments of pottery and the spindle-whorls found); they were perhaps fishermen; [3] we have no trace of their boats, which would be probably of basket-work covered with skins; they kept domestic animals, including the goose, which, however, if Cæsar is to be trusted, the old Britons did not eat; perhaps they practised agriculture of a sort, Mrs. Mallett having found at Constantine cliffs a hoard of seed, under the ruined

in Barrows (*v.* "Forty Years' Researches"). I expect that, as a rule, grave-diggers have overlooked the iron pyrites. (A. S. K.)

[1] *Ancient Stone Implements of Great Britain*, Ed. 1897, p. 437.

[2] Stone spindle-whorls are called "Fairy Millstones" and "Pixy Wheels." Flint arrow-heads are known as "Elf-darts" in Scotland and Ireland. (*Brand's Popular Antiquities*, II., p. 489.)

In Cornwall they are called "Pixy Grinding Stones." This superstition is mentioned in a letter to Pepys, dated June 19th, 1700. (Pott.)

[3] No fish bones, have, I believe, occurred in the cists or kitchen-middens. But as fishing would be quite feasible from several places on the cliffs, boats may not have been needed.

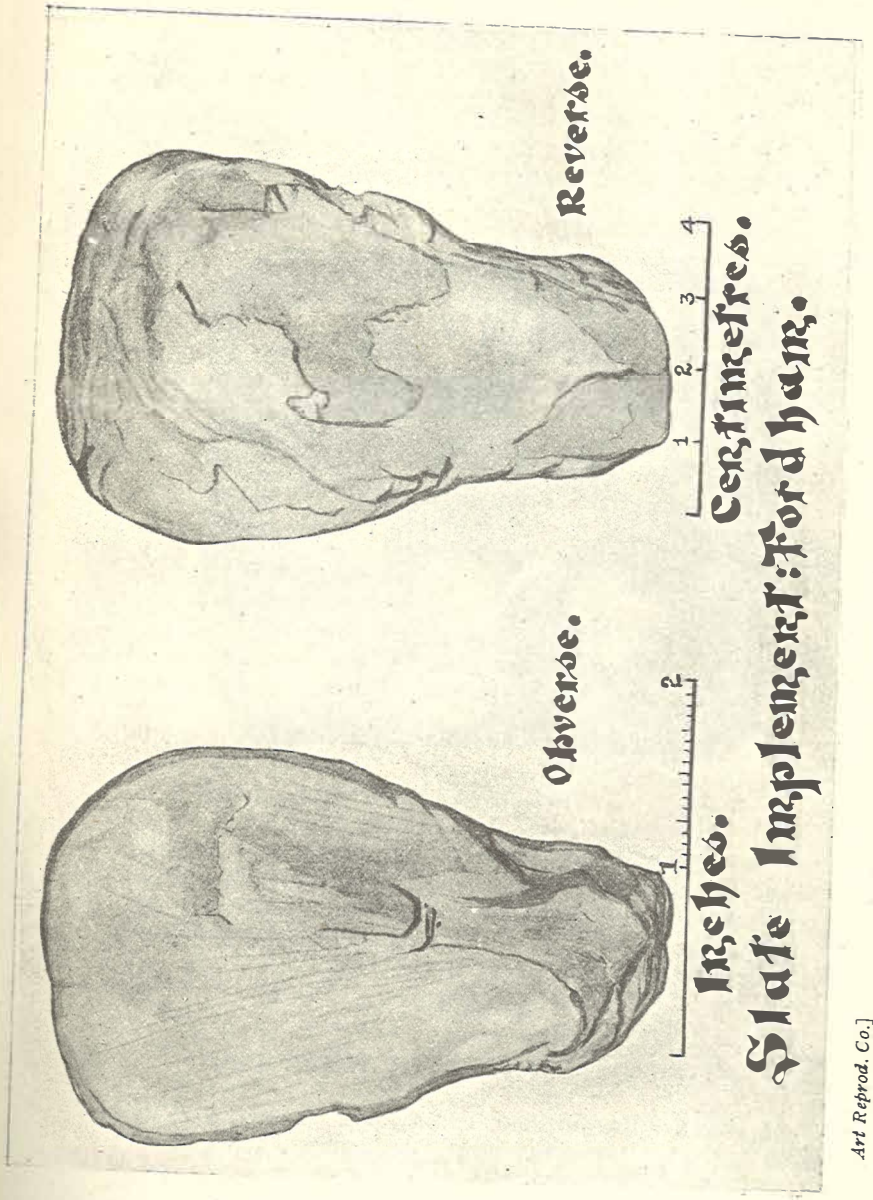


PLATE 6. [*Miss A. Rupert Jones.*

Art Reprod. Co.]

wall of a primitive building ; this seed has been identified by the British Museum authorities as *Lolium perenne*, common Ray Grass. Whether or no the Harlyn Bay race grew and ate such inferior grain there is no evidence on the spot to show.[1] The occurrence of large quantities of broken shells of *Purpura lapillus* in the kitchen-midden, close to the cemetery, together with rounded pebbles of quartz large enough to break them, warrants us in the con-

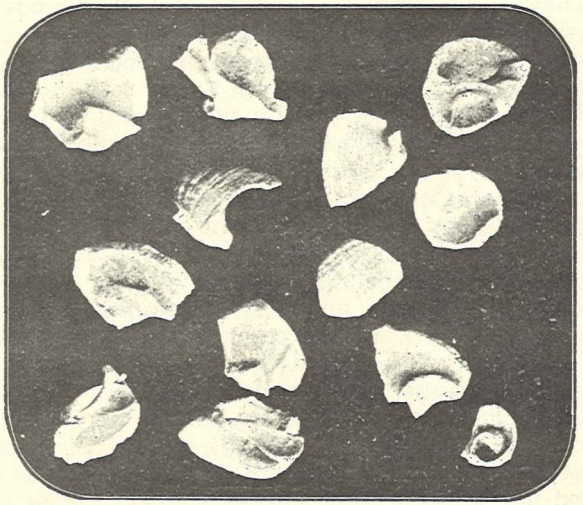


FIG. 7.—BROKEN SHELLS OF PURPURA LAPILLUS.

clusion that the dwellers near Harlyn practised the dyer's art ; a very large quantity of *Purpurae* would be required, since each mollusc would only yield a small drop of dye.

SECTION V

LATE KELTIC AGE OF THE INTERMENTS.

THE graves are placed methodically in regular lines, and in some cases four cists have been put one

[1] It may have been the "hoard" of some small rodent.

above another. Probably through the centuries during which the place was used for interments, the sand encroached, and covered up the lower tiers. One place, almost to be called a prehistoric charnel-house, seems to have been used for the promiscuous reception of human bones taken from other cists previously existing, the cists of those thus dispossessed seemingly being again devoted to the use of fresh tenants. The bones in the "charnel-house" occur pell-mell as though thrown in carelessly.

They occur above a wall 3 feet high, beneath which the flattened skeletons were found [see Section IX.] Three uncisted skeletons have been found by Mr. Mallett.

The pottery found amongst the cists, and in the district of Harlyn Bay settlement, is coarse in texture and of Neolithic type, containing large grains of silica. The interments are also of the Neolothic type—the skeletons found lie on one side—the majority on the left side—in a bent position, with the knees nearly touching the chin (see Plate 9). In some cases there is a large and a small compartment in the same cist. The mother presumably was buried in the larger, and the child in the smaller, compartment. I examined some destroyed tumuli of the Polished-Stone epoch (later Neolithic) on Les Noires Mottes above Escalles, in 1892, and Sir Joseph Prestwich, F.R.S., informed me that there were found mother and child (presumably) in one of these tumuli, and the opinion of some anthropologists was that, when the mother died, the child was probably buried with her, either alive or after having been put to death, the idea being that the mother would want her infant in the spirit world.[1]

[1] When a woman with a young child dies, the latter is always buried with the mother, the Indians thinking it impossible for the infant to do without the mother. (Robertson: *America*, Vol. II., p. 93.)

The practice of putting those, who are ill, to death, is common amongst Indians. The victim places himself contentedly in his grave, and it is by the hands of his children or nearest relatives that he is put to death. (*Ibid.*, p. 191.) (Pott.)

See the frontispiece to Worthington G. Smith's Book, *Man, the Primæval Savage*. It represents the interment of a mother and child, found on Dunstable Downs, near the five round barrows known as the "Five Knolls." This tumulus was rifled and levelled long ago, but in a re-excavation made in 1887, a crouched burial of a boy was found in one, and the mother and child in the other. "The woman was surrounded by fossil echini, broken British pottery and indifferent flint implements. There had been in each case a central interment, with others round the circumference. Both the skeletons came from the circumference." (*Dunstable and Its Surroundings*, p. 43.)

The interments are of what is known as the "contracted" or "crouched" type. In Neolithic times (and afterwards, during the Bronze and Iron Ages, among the descendants of Neolithic man) when a person died the legs were placed, before stiffening, in the attitude they occupied when sitting or sleeping. Probably the legs may have been tied up with ropes or withes, as we know the Peruvians used to do at the time of, and anterior to, the Spanish Conquest, as also the prehistoric race of Egypt, and as the Eskimo of the Lower Yukon still do.[1]

This custom of crouched burial has been well nigh universal, and is not the characteristic of a single period.[2] In addition to those regions just indicated, it is known to have extended over France, Belgium, England, Italy, Germany, Switzerland, Hungary, Austria, Poland, Russia, Algeria, India; also in New Caledonia, and among the Mincopies of the Andaman Islands, the Maories of New Zealand, the Central Africans, the Patagonians, the Araucanians, the Puelches and Charuas of South America, and the Australian natives. Thomas (in 1851) found that the ancient Babylonians practised "crouched" burial. It is mentioned by Diodorus Siculus as occurring among the Troglodytes, a pastoral people of Ethiopia, and by Herodotus (7th century B.C.) among the Nasamones of Libya. The latter people did not allow their sick to die on their backs, but in a sitting posture.[3]

Many are the reasons which have been given for this posture, but most probably the two which are nearest the truth are, first of all the ease with which a body so treated can be carried; and secondly the fact that the posture is that of sitting and of sleep among races of a low stage of culture, and that when the dead was put into his last house, with food and implements (his "funeral furniture") around him,

[1] Schenk, "Les Sépultures de Chamblande," p. 173. *Bulletin Vaudoise, etc.*, 4th Ed., Série, No. 144.

[2] As the skeletons at Harlyn Bay are found lying sometimes on the right, sometimes on the left side, it is possible that they were disposed in the contracted position in the cist in a limp condition after the *rigor mortis* had ceased.

[3] Schenk. *op. cit.*, p. 182.

the posture considered most comfortable when living would be accorded to him when dead. At Harlyn Bay the persons so buried were laid in the crouched position, on the right or left side, in this case the position in a sitting posture being impossible owing to the small height of the cists.

The same type of Neolithic burial is also found in the next age, that of Bronze. In some cave and barrow explorations made by Salt, near Buxton, Derbyshire, in one instance at least a "crouched" burial was accompanied by a bronze dagger: Sir John Lubbock (now Lord Avebury), mentions fifteen "contracted" burials in tombs of the "Bronze" age and two in tombs of the "Iron" age (on the authority of Bateman), and four in tombs of the "Bronze" age in Wilts (on the authority of Sir R. Colt Hoare).

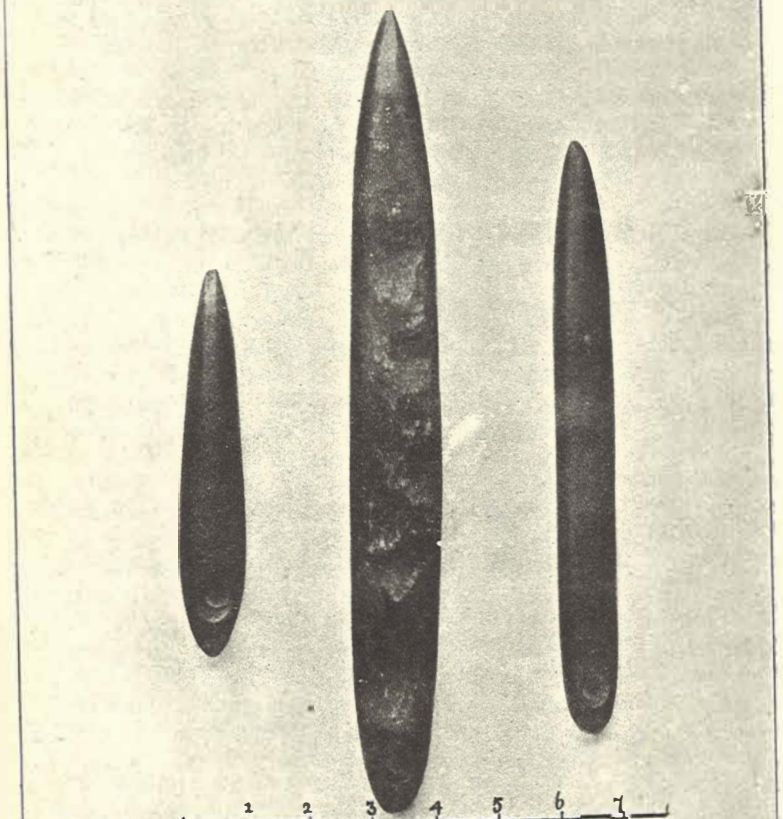
Dr. Schenk, of Switzerland, produces similar evidence from Sion, Verchiez, Derrière la Roche, Chardonne, Belvédère (near Lausanne), from Bardonette, and from the wood of Sembres.

Since objects of bronze and iron have occurred among the Harlyn Bay interments, and cinerary urns of undoubted Bronze age have occurred close by on the Harlyn cliffs, it seems simplest to suppose that here we have *Neolithic customs* continuing into the Bronze and the Early Iron ages.

Rev. D. Gath Whitley[1] contends that the whole cemetery is of Neolithic age, with later intrusions, and he gives some cogent illustrations of Roman and even later relics occurring in cave-earth at Kozarnia (Poland) with the mammoth and rhinoceros; in another cave, with the cave lion and hyæna; he also states that in dolmens Roman coins have often been found, but in all these cases the later objects have of course been intruded into deposits or structures of Palæolithic and Neolithic age.

The type of skull, however, is the strongest point in all such evidence. Neolithic man is generally considered to have possessed a long oval head, finely moulded, and curving from a somewhat narrow brow

[1] "The Harlyn Burials in the Light of Recent Archæological Discoveries in Europe," *Journal of the Royal Institution of Cornwall*, No. xlviii., 1902.



New Zealand Pendants.

PLATE 7.

to a full round occiput. The "cephalic[1] index" in Neolithic skulls is about 70. The cephalic index of Bronze age man, a brachycephalic race, is about 81. If then we find that the cephalic index is between 70 and 81, and especially when it approximates to a mean between these figures, we must assume that there has been an admixture of races. That is just what we find at Harlyn Bay, and led the late Dr. Beddoe, F.R.S., to put the date of the people who inhabited the spot as living about the age just preceding the Roman Invasion.[2] The lowest cephalic index at Harlyn Bay is 70, the highest is 82·22, the mean of 11 skulls being 75·19.

Neolithic man, found as far North as the Orkney Islands and in Ireland (at a later period), is generally considered to have been related to the old inhabitants of Spain (the Iberians or Ivernians). Their descendants are now known as Basques, and they occur in France as well as in Spain. Since the Basques call their country Euskara, the Neolithic men are sometimes referred to as *Euskarians*.

General Pitt-Rivers, in excavating at Cranbourne Chase, in a Romano-British Settlement, found the skeletons measured 5 feet 2½ inches for the men, and 4 feet 4 inches for the women. These measurements correspond fairly well with those of the Basques and the Berbers of Africa.

The men of Harlyn, however, were 5 feet 4½ inches and the women 5 feet 1½ inches in height, and this indicates that some admixture of race had taken place to differentiate the height from the Neolithic type of skeleton.

Dr. Beddoe says (*op. cit.*), "judging by the eye I should say that the Bronze type is even now not uncommon in Cornwall, whereas in Wiltshire it is certainly rare." He compares the Harlyn Bay skulls with those from the Romano-British burials at Rotherley, and remarks on their general agreement.

The next race, after the Euskarian, that entered Cornwall and subdued Neolithic man was the Goidelic or Gadhelic race, a Keltic people from the

[1] *I.e.*, length-breadth index.

[2] See Dr. Beddoe's masterly and laborious analysis of the Harlyn Bay calvaria, &c., in *Journal of the Royal Institution of Cornwall*, No. xlviii.

Continent. They conquered, but did not exterminate, the Neolithic race. Probably the urns found on Harlyn cliffs were the last resting-places of Chiefs of either this race, or the next, the Brythonic wave of Kelts. These men of the "Round Barrow" race are thought to have introduced a higher culture. Among the bones from Harlyn Bay and Constantine are those of a small ox (which Mr. E. T. Newton, F.R.S., thinks may possibly be the long-faced Keltic ox), sheep, perhaps goat, horse, pig, and goose. The horn cores of the ox are too fragmentary to be certain as to the variety to which they belong. The "Round Barrow" men lived by tilling the soil and rearing cattle; they could weave, they manufactured pottery, and made or traded in articles of bronze.

Whether they were really more cultured or only followed the business of war and conquest, enriching themselves by the work and industry of others, their bronze weapons made them more than a match for the men armed only with weapons of stone and wood, and so everywhere this Goidelic[1] invasion pressed the earlier Euskarian population to the westward.

The Goidels or Gaels were followed by a powerful horde of Kelts from N.E. Picardy—these were the Brythons whose name has been generally given to our whole island.

The characteristics of these fair brachycephals (or shortheads), were jaws macrognathous, strong and massive; and prognathous, *i.e.*, with prominent teeth, but with a good chin; cheek bones prominent; bones large; stature about 5 feet 9 inches. These men became everywhere the leaders and chiefs of the conquered population, *i.e.*, of the intermixture of Neolithic Euskarians and Goidelic Kelts. The Keltic Chiefs are described "as men with blonde hair, beetling brows, aquiline nose, and resolute mouth, commanding figures among their swarthier tribesmen."

It is safe to say broadly, though it is not well to dogmatize, that at Harlyn Bay, at the Late Keltic (or Early Iron) epoch, the interments of Keltic race were cremated; those of Neolithic descent, and

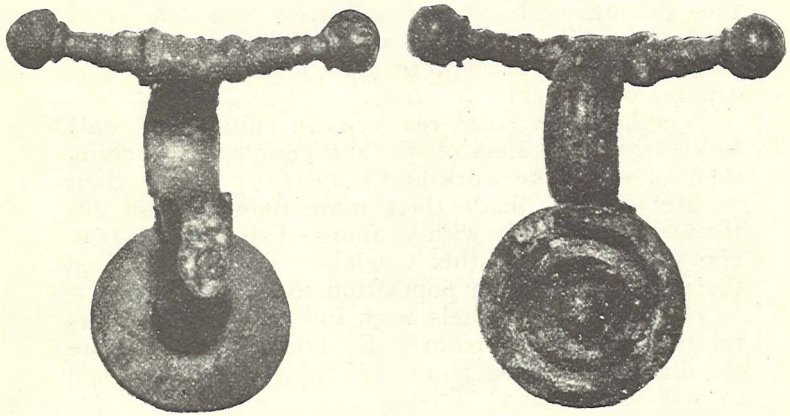
[1] Windle. *Early Man in Britain*, pp. 69 and 70.

those of mixed blood, were buried in the Neolithic manner.

Professor Windle[1] suggests that the Goidels buried, the Brythons cremated, their dead.

Fortunately some of the bronze fibulæ found at Harlyn are (in the opinion of Sir John Evans, Dr. Read of the British Museum, Professor Müller, and others) of the later La Tène form (Fig. 8). Of that type of fibulæ (brooches) the date is fixed as being later than the time of Philip of Macedon.

La Tène is a celebrated lacustrine station at the



[*Photo Mr. G. Penrose.*

FIG. 8.—LATE KELTIC BRONZE BROOCH.

North end of Lake Neuchâtel, which has yielded to Colonel Schwab, MM. Dardel-Thorens and Vouga, from 1858 to 1880 A.D., an immense number of utensils, implements and ornaments in bronze, horn, iron, gold, silver, and glass, in which, however, bronze so predominates that the La Tène period has been called "Le bel âge du Bronze."

The gold coins are rare, only seven in all. One in the Museum of Bienne is described by Keller as a bad imitation of the Macedonian Coin of Philip.[2]

The date of Philip of Macedon, father of Alexander the Great, was from B.C. 359—336.

[1] Windle, *Life in Early Britain*, p. 112.
[2] Munro, *Lake Dwellings of Europe*, Ed. 1890. p. 296.

Moreover, the discovery of Roman remains such as coins, tiles, pottery, bricks (the latter with the mark of the 21st legion "Rapax"), leaves no doubt that La Tène was a military station (as shown by the absence of women's ornaments, and the preponderance of war-like weapons) and its conquerors were the Romans. We know that the earliest conquest achieved by the Romans in Helvetia (Switzerland) were accomplished by C. J. Cæsar, B.C. 58. So that we shall not be far wrong in fixing the age of the later Bronze culture of La Tène somewhere between B.C. 359 and 58.

SECTION VI

GENERAL VIEW OF THE SUPERFICIAL DEPOSITS

THE following is a generalized section of the locality as far as the prehistoric cemetery is concerned.

The upper sand is composed of clean shell-sand

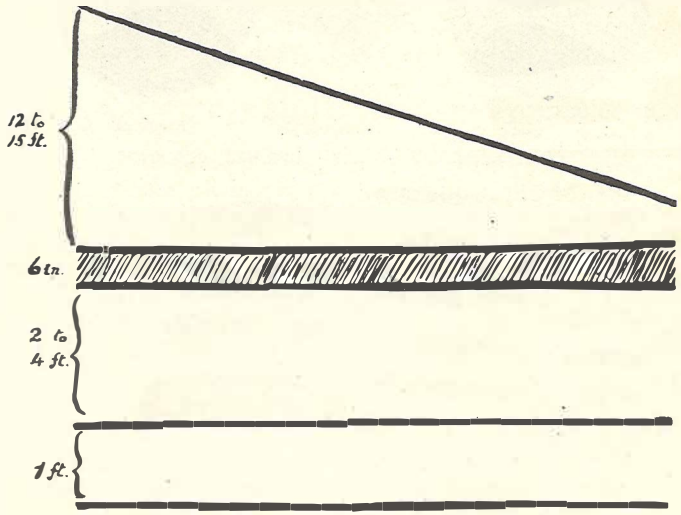


FIG. 9.—GENERALIZED SECTION.

12 to 15 ft. Blown Sand. 6 in. Dark Sand with Slate implements, etc.
2 to 4 ft. Cists with interments. 1 ft. Rubble and Clay.

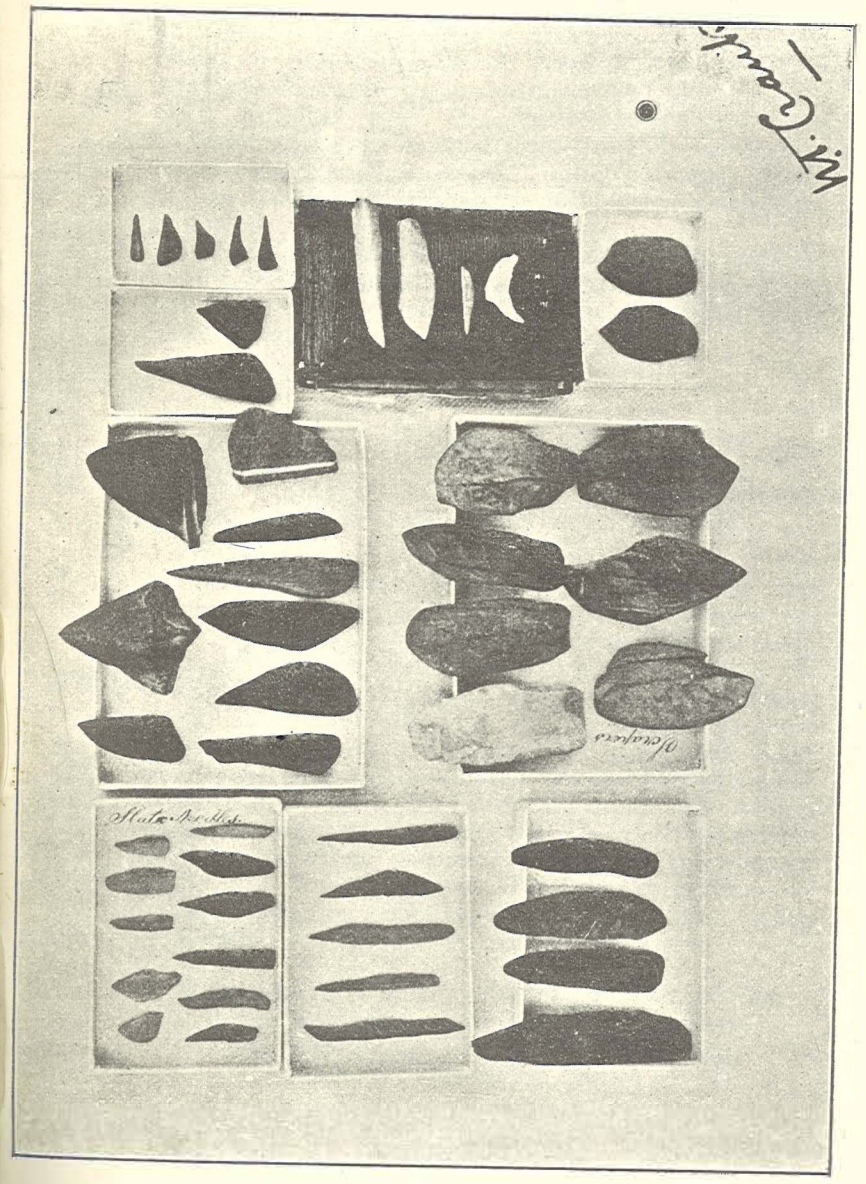


PLATE 8.—SLATE AND SHELL IMPLEMENTS.
(4 of white limpet shell, above them 5 are of black mussel shell. Some of the above are natural forms.)

underlain by slate-flakes, animal bones, human bones and teeth, burnt stones, implements and frequent traces of fire, which occur generally, as in a thin stratum, where the light and dark sand merge.

In the dark sand Mr. Mallett has found bone bodkins, and even worked limpet-shells, and numerous fragments of rock and stone, probably found on the beach and brought to the site as curiosities, or for use.

The bright sand is 12 to 15 feet at its greatest depths, being graduated as shown in the diagram and following the configuration of the underlying slate beds (Ladock Beds).

SECTION VII

MAMMALIAN REMAINS OTHER THAN HUMAN

MR. E. T. NEWTON, F.R.S., F.G.S., of the Geological Survey, in kindly reporting on the bones from the district under discussion (March 21st, 1902), considers that there was nothing calling for special remark. Ox, sheep, pig, horse, goose, rabbit being all common forms; the ox and sheep were represented by many bones. Of the sheep there are horn cores and teeth that are undoubtedly Ovis aries, but many of the bones might perhaps belong to goat. Seeing, however, that we have undoubted evidence of sheep and no proof of the presence of goat, it is best to regard all the bones as those of sheep. The ox (Bos taurus) may be the variety longifrons, but there is no definite evidence.

Report by Mr. E. T. Newton, F.R.S., on the bones and teeth from the neighbourhood of Constantine Church received from Rev. R. Ashington Bullen.

From Constantine Kitchen-midden.

Ox. Bos taurus (small form, ? B. longifrons)
Sheep. Ovis aries.
Goose. Anser cinerius.

Constantine Island, Potter's Hut.

Ox. Bos taurus.
Sheep. Ovis aries.
Pig. Sus scrofa.
Rabbit. Lepus cuniculus.
Horse. Equus caballus.

Harlyn Bay (from the grave level and in the cists).

Ox. Bos taurus.
Sheep. Ovis aries.
Horse. Equus caballus.
Pig. Sus scrofa.
Many parts of skeleton of very young lamb.

Kitchen-Midden, Harlyn Bay (south of Mr. Mallett's House).

Ox. Bos taurus.
Pig. Sus scrofa.
Rabbit. Lepus cuniculus.

Constantine Hut (outside).

Piece of rough pottery.
Ox. Bos taurus.
Sheep. Ovis aries.
Pig. Sus scrofa.
Rabbit. Lepus cuniculus.

Constantine Hut (inside).

Ox. Bos taurus.
Sheep. Ovis aries.
Pig. Sus scrofa.

SECTION VIII

AMULETS AND CHARMS

THE occurrence of quartz in abundance in the graves has been alluded to above (Section III.), and a possible explanation given. Other objects that have occurred in the graves in numbers (taking all the occurrences collectively) are human teeth, which did not belong to the skeletons on or near which they lay.

Mr. Mallett carefully noted the exact place of their occurrence in several instances.

He wrote, February 14th, 1902:

A. "I have observed odd teeth or an odd tooth lying above skeletons, and quite apart from them, on various occasions. Such teeth apparently do not belong to the body interred."

B. "Two more teeth found on the pelvis of a skeleton under the enclosure gate." (February 24th, 1902.)

C. "A bronze ring and an iron bracelet were found amongst teeth and lumbar vertebræ." (February 5th, 1902.)

D. "From the Round Cist (Plate 21) 23 teeth found not belonging to the interments." (March 1st, 1902.)

These teeth were probably amulets or charms.

I am informed that teeth used to be abstracted in the last century from the coffins under the floor of St. Merryn Church, Cornwall, and sold at eighteenpence each as charms against disease.

Is it possible that this 19th century custom has been handed down from the early iron age?

St. Merryn is about two miles from Harlyn Bay.

It seems probable that the masses of white quartz found in the graves, many being of a shield shape, may have had some religious and superstitious significance. Large masses of quartz occur not only in the cists, but sometimes outside, resting against the end slab near where the head lies.

In many of the burials at Harlyn Bay Mr. Mallett has noticed [1] that the covering slate over the skeleton is inclined at an angle of, say 45°, so that the actual chamber is triangular in section. This is not due to subsidence of the side wall. This is exactly the way the Turks bury their dead, placing them naked in the tomb and building a slanting roof over them as I myself have seen in 1865. See also Joly ("Man before Metals," 1883, p. 335).

See also Section II., Miss Bellers' important find of a stone amulet.

[1] On March 17th, 1902, he writes that: "I may safely assert that nearly all the graves have slanting 'lids,' (*i.e.*, covering slabs)."

SECTION IX

THE FLATTENED SKELETONS

THESE skeletons (Plate 12), two in number, an adult and child,[1] occurred on the West side of the burial-ground, where the overburden of blown shell-sand is deepest; and the mode of their interment is most remarkable.

They were found covered by large slabs of slate, on which had been built a low wall rather more than three feet high, composed of slates and boulders of quartzite, built without any mortar.

The wall itself is peculiar, being of a blunt ⌒ shape in section, wider at the top than the bottom. It has been traced a length of 20 feet.

The large slate above the bones was about 4½ feet long, 2 feet wide, and very heavy.

The mode of their burial at once raises questions of great interest, which will now be very briefly considered. There is little doubt in my mind that we are here in the presence of human sacrifice. These skeletons were buried in this way, so as in some manner to procure the stability of the wall built above them, and to protect the burial-ground which the wall fenced off.

Harlyn Bay is not the only locality in England that has afforded presumptive evidence of the practice of foundation sacrifice among the Kelts. Prof. F. Haverfield wrote in the Antiquary, "Quarterly Notes on Roman Britain:" "The excavations of Mr. Martin, Mr. Ashby and their colleagues at Caer Gwent (Venta Silurum) have gone steadily forward and some more traces of apparently normal types discovered. A pit 18 feet deep and at bottom 5 feet by 10 feet in width and breadth yielded some interesting pottery and an earthenware money-box (?). Under one of its walls was found a human skeleton,

[1] Adult and milk teeth were found among the two smashed skulls. A bronze ring was found on the side of the adult skull.

N.B.—An iron bracelet (?) was found among the bones of the adult skeleton.

An iron ornament was also found by Mr. Mallett under the chin of one skeleton (that under the glazed frame in the grounds). One half of the ornament was recovered, and is now in the Museum at Harlyn Bay; the other half is still with the skeleton.

PLATE 9.—CIST AND SKELETON IN SITU.

which has suggested speculations on human sacrifices among the Celts." [1]

Professor A. Haddon, D.Sc.,[2] entitles one chapter of his book "London Bridge: Foundation Sacrifice." This child's game is evidently traditional, and has its origin in the dim mists of prehistoric times. In treating it he has collected evidence from England, Ireland, Greece, Scotland, Germany, India, Borneo, Swabia, France, Italy, and Holland. In the game as played in the British Isles, Mrs. Gomme in her "Traditional Games of England, Scotland, and Ireland," shows that "the special feature of the rhymes is that considerable difficulty occurs in the building of the bridge by *ordinary* means, but without exactly suggesting that extraordinary means are to be adopted."

Professor Haddon then shows that in the game a prisoner appears, and from this he passes on to two old Greek songs from the Peloponnesus and Kappadocia in which the foundations of bridges were set up on human sacrifices, the sacrifice in each case being a woman.

He then instances the foundation of the church at Hy by St. Columba on the sacrifice of Odhran. The story is as follows:

Columkille said then to his people, "It would be well for us that our roots would pass into the earth here." And he said to them, "It is permitted to you that some of you go under the earth of this island to consecrate it." Odhran arose quickly and thus spake: "If you accept me," said he, "I am ready for that." "O Odhran," said Columkille, "you shall receive the reward of this: no request shall be granted to anyone at my tomb unless he first ask of thee." Odhran then went to heaven. He (Columkille) founded the church of Hy then. We see from this incident that Columba, though a Christian, had not entirely divested himself of heathen practices.

Professor Haddon mentions many other instances from the Highlands, Germany, Africa, India, and Siam, of the foundations of bridges, castles and city

[1] F. Haverfield, M.A., F.S.A., Hon. F.S.A., Scotland. *Antiquary*, Vol. xxxviii. (1902), p. 376.

[2] *The Study of Man* (1898), Ch. XII., p. 347.

gates, being built on a human sacrifice, or else of the impression being abroad among the people that a human sacrifice was needed for the purpose of ensuring a foundation.

Hilprecht's account of his discoveries at Nuffar are pertinent to this subject.[1] "In addition," he says, "to their talismanic character many of the objects deposited seem to have carried with them the idea of a sacrifice or an act of devotion on the part of their donors to secure greater stability for this public building, to express gratitude for an unknown successful transaction, or to obtain the favour of the gods for the fulfilment of a certain desire. In the light of such votive offerings I view a collection of antiquities discovered together in the foundation of the latest South-East enclosing wall, comprising a Persian seal, a Babylonian seal cylinder, a pair of silver ear-rings, eleven pieces of corroded silver, about 40 silver beads, and 300 odd stone beads, which apparently represent the gift of a woman; or the goose egg with its undeveloped germ of life to be sacrificed, and above all, a surprising find which was made on the North-Western side of the ziggurat (temple). Imbedded in the mortar of clay and straw that filled a large space between Ashurbanipal's stage-tower and its later additions, Haynes uncovered three human skulls placed on the same level at nearly equal distances from each other. There can be no doubt that we have here an authentic example of the practice of bloody sacrifices offered in connection with the construction of important new buildings—a practice widely existing in the ancient world, and prevailing even to-day in several parts of the Orient."

Here at Harlyn Bay, I think, in these flattened out skeletons, we have the human foundation, on which the wall was built. An instance of the once, probably all but universal, custom of human sacrifice, which as late as 1843 in Germany at Halle, and in 1872 at Calcutta, was popularly deemed a suitable foundation for a bridge, although, of course, the foundation in neither case was so laid.

[1] Hilprecht, *Exploration in Bible Lands*, p. 368. He further says that Babylonian antiquities of the Cassite and even earlier times were repeatedly found inside these bricks.

SECTION X

INTERMENTS WITH BROKEN SKULLS

ONE interment is very peculiar (Plate 11). The skull is broken in several places, and the nasal bone severed by a clean cut across the front. There are three teeth out of position, projecting through the side of the left ramus of the lower jaw, beneath the normal row of teeth.

Also in the round cist[1] (Plate 21) the skulls are broken. In the cist (Fig. 6, Plate 15) a broken skull lies at the South end outside the cist.

The discoveries of Mr. George Bonsor near Carmona, Spain, in 1895, probably throw light upon this broken skeleton.

He says: "The Archæological importance of l'Acébuchal compared to the other stations of the Alcores, determined me, in 1896, to converge upon this spot the whole work of my last diggings.[2]

"I caused some trenches to be opened in the neighbourhood of the barrows already explored, and also at certain spots where there appeared, on the surface, black earth mixed with cinders. This contained débris of native pottery, burnt stones, and numerous burnt bones of animals, among which parts of the skull, vertebræ and hoof-bones of animals of the deer tribe, jaws of pigs or wild boars, and big beef and horse bones occurred. One collected there also flint flakes, bone and copper piercers, and fragments of ceramic ware decorated with a pointed geometrical design. Generally a covering of burnt stones concealed these remains; some of these stones, by the traces of fire which they exhibited, were probably used in the building of hearths."

After describing some burials in pits hollowed out of the rock, Mr. Bonsor proceeds (p. 91) . . . "We had the satisfaction to discover four other burials. . . . These showed either irregular graves

[1] "The skeletons in the round cist not only had slate slabs immediately *on* the skulls and other parts of the body, but also immediately *under* as well." (Mallett, Letter, March 6th. 1902.)

[2] *Les Colonies Agricoles, pré-Romaines*, p. 89, § 99; *Revue Archéologique*, Vol. XXXV., 1899.

hollowed out in the rock, or quadrangular spaces built of stones and slate.

"Let me describe each of these burials in detail.

"*No.* 5. A grave of irregular shape, hollowed in the rock. Five stones had been thrown on the skeleton which it contained. These stones covered severally the skull, the left shoulder, the right arm, the left leg and the feet. The skull was quite flattened on the rock. A girdle-buckle in copper was seen about the middle of the body, near the left leg was found a long ivory bodkin, engraved with several series of parallel and crossed lines.

"*No.* 4. An irregular grave, the lower part only was hollowed in the rock, the upper walls were formed of rough stones. As in No. 5, a stone was found upon the skull, but this had only broken the jaws ; it was the only skull of these 'stoned' skeletons that I was able to keep. A second stone had fallen on the right knee. The lower earth contained no relic.

"*No.* 2. A grave rounded at the ends, larger by the side of the head than towards the feet. The skull was found quite smashed under a large stone. Another stone fell upon the arms, which were raised towards the face ; between this stone and the bones of the right arm was found a long ivory comb ; another like it was picked up near the head. These combs were in a very bad state of preservation, I was able notwithstanding to see that they were engraved. A vertebra of one of the cervidæ was noted in the earth at the bottom of the grave.

"*No.* 8. The last and most interesting of these burials showed us a rectangular hollow well, built of stones and of slate, measuring 2 mètres in length (about 6 feet 8 inches), one mètre (3 feet 4 inches nearly) in width and the same in depth. The skeleton was found at the bottom upon the rock, and had the legs bent, and the hands upon the face. A heavy stone covered the skull, which was completely smashed like the others.

"One had to dig these graves with the greatest care in order to free the skeletons from the mould which covered them, without touching the bones at all, so as to be able to draw them in their correct position. Thanks to this method, I was able to

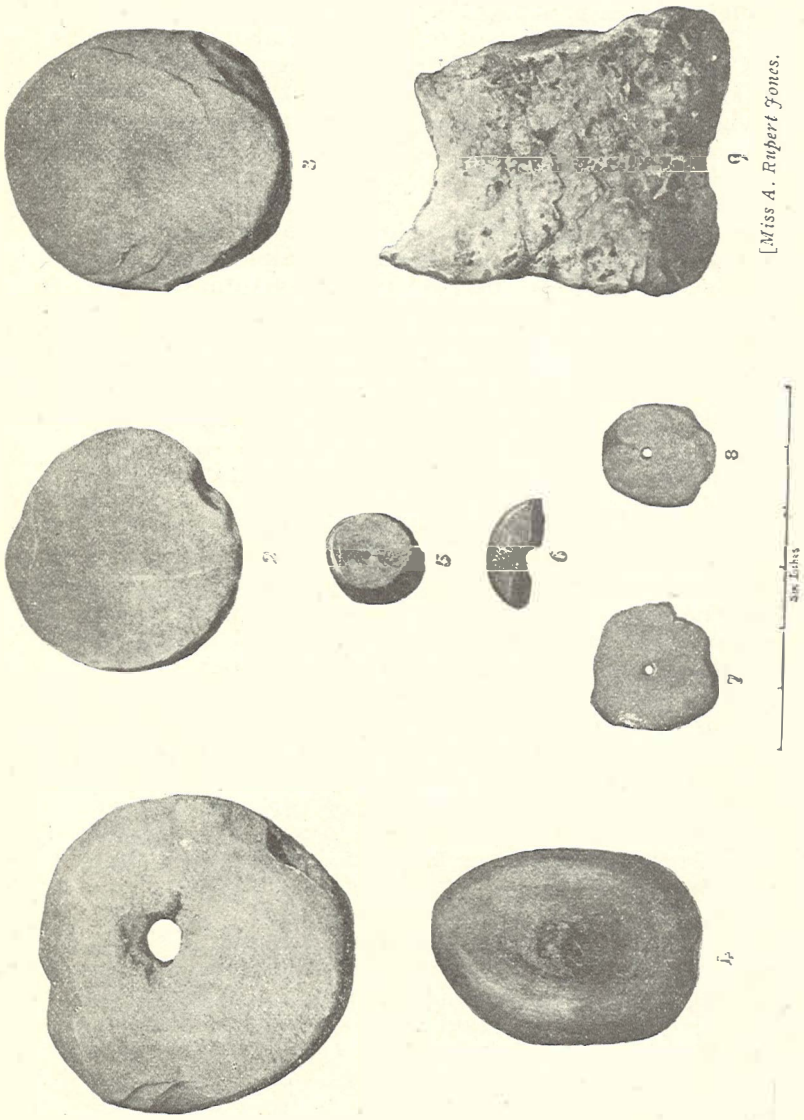


PLATE 10.—SPINDLE WHORLS, QUERN, ETC., KITCHEN MIDDEN SOUTH OF HARLYN BAY CEMETERY.

observe the exact position which the skeletons occupied in the grave, and to exhibit the drawings shown above.

"During two months we continued to dig, by parallel trenches, in the neighbourhood where these burials were seen, in the hope of discovering more, but fruitlessly.

"There was no need to be a great observer in order to conclude from the position of the skeletons that these people had been killed on the very spot. The stones which appear to have been violently thrown into the grave, and the crushed skulls too are facts which tell their own tale.

"A shallow grave of irregular shape, seems to have been hollowed in haste. They hastened to carry the sick person to the spot, perhaps sought to prevent a natural death ; then they must have placed him with all speed in the grave he was to occupy, with the head to the West, before giving the fatal blow.

"It is especially in the identical position of the skeletons with the legs bent and the hands raised towards the head to ward off the blow which was about to fall upon them, that we can recognize the distinctive marks of sudden death.

"Everything seems to show that at the moment of agony they used to hasten to carry the dying person to the summit of the Alcores and then to kill him in a grave or on the naked rock, breaking his head with a stone. They finished the burial afterward, raising the sides of the grave to the needed height with stones and with slate, then filled the hollow with earth and raised a mound over it."

SECTION XI

DISMEMBERMENT OF THE BODY, OR OF THE SKELETON

IN the round cist (Plate 21) a thigh bone of No. 3 skeleton, and one of No. 4, could not have been put in with the rest of the remains, for each was separated from the rest of the skeleton by a layer of slate slabs.

Also the broken skulls in the East compartment were quite separated from their respective skeletons.

Miss Agnes G. Weld,[1] in a lecture on "Egyptian Funeral Customs and Beliefs," refers to the neolithic people, the prehistoric race, as having been, according to Professor Flinders Petrie, "a fair race, akin to the ancient Libyans and Amorites and to the modern Kabyles of Algeria, mingled with the remnants of an earlier stock of Hottentot affinities. . . . They buried their dead unshrouded and uncoffined, in a contracted position, with the knees and arms sharply bent up and the hands joined together before the face in the front of which lay the slate palette, shaped like an animal or bird, on which the deceased used to grind the malachite with which he painted a green ring round each of his eyes. . . .

"The prehistoric race frequently dismembered their dead and appear to have occasionally made ceremonial meals of their flesh and marrow; but they never slew the living to bear the departed company in another world, as we have certain proofs that some at least of the race to whom the Pharaohs belonged did."

It is not of course suggested that the prehistoric Egyptian race and the race at Harlyn Bay were identical, but the evidences of dismemberment at such widely separated localities as Cornwall and Egypt are interesting.

Mr. J. Arthur Pott, F.S.A., has recorded another curious discovery by Dr. Penrose Williams at Constantine, which opens up an interesting and unexpected problem as far as England is concerned. "The site of the discovery is a small promontory united to the mainland by low rocks, which is known as Constantine Island. Upon this little peninsula several interesting discoveries have been made by Mr. Mallett and others, . . . but Dr. Williams' find is perhaps the most significant of all. The island, whose upper surface is about 18 feet above the present high water mark, is covered with sand overgrown by turf, and the low cliffs fall almost perpendicularly into the water. Toward the seaward end of the island, the writer observed traces of a

[1] *Berks, Bucks, and Oxon. Archæological Journal*, New Series, Vol. VII., pp. 18, 19.

wall, which may have formed part of a hut, but he was not able to make a thorough examination. Dr. Williams, however, was more fortunate, and close to the wall, and in a raised beach which underlies the turf and sand, he found "the remains of a skeleton arranged in a neat little heap between two small slabs of slate, all the bones being chopped up into small pieces. The bones must have been bare of flesh when buried to be contained in so small a compass." I here quote Dr. Williams' description written at the time of the discovery, but have since examined the remains, and noticed that the bones had been split longitudinally, and bore clear marks of some cutting instrument. No fragment exceeded five inches in length, and the whole might have been contained in a basin eight inches in diameter. . . . This find affords the clearest proof of the mutilation of the dead, and were it not for the fact that high authorities have declared that there is no evidence of cannibalism amongst the early inhabitants of this country I should have no hesitation in saying that the condition of the bones points to the existence of that custom; and even against the weight of authority I am disposed so to regard them, especially as one piece of positive evidence is worth any quantity of negative. . . . Space forbids any detailed discussion of the object of such mutilations (as the removal of flesh from bones, etc.). . . . Whatever may have been the idea underlying these horrible rites, it is clear that human sacrifices, the mutilation of the dead, and probably cannibalism also, prevailed in the district of Harlyn.[1]

SECTION XII.

REPORT ON THE HUMAN SKULLS AND BONES

BY THE LATE JOHN BEDDOE, M.D., F.R.S.

§ 1. Cranial index and general cranial characteristics.

The number of fairly measurable adult skulls,

[1] Pott (J. P. Arthur), "Neolithic and other remains found near Harlyn Bay, Cornwall," *Antiquary*, Vol. XL., pp. 135–6.

when I visited Harlyn Bay in the autumn of 1900, was only 11, of which 7 had belonged to males, 2 to females, and of 2 the sex was doubtful. They were mostly of fair size and development.

The cranial index in the males taken individually was 70·0, 72·54, 72·69, 76·18, 77·28, 78·61 and 82·22: in the females it was 73·41 and 76·70, and in the doubtful cases 75·28 and 77·22: the average of the 11 being 75·19 or in the 10, omitting the one brachykephal 74·49. There were 5 dolichokephals, 5 mesokephals, and 1 brachykephal, the last differing considerably in general form as well as in cranial index from the others; it is trapezoid in vertical aspect, and might be taken for a Swiss skull of Disenti's type. Of the rest, some remind me of the common neolithic types; others have a leaning towards later forms, even towards Pitt-Rivers's Saxons; but we have not enough, especially of facial, bones to say much on this subject. The coffin-shape, common among Romano-Britons, and generally indicative of a small admixture of the brachykephals, does certainly occur. The brachykephal may have been of the Gaulish stock whom Cæsar found in Britain.

§ 2. Stature.

The average stature seems to have been rather low. This is estimated from the length of what are called "the long bones," such as the femur, tibia, humerus, radius, ulna: often one has only the femur whereby to form a judgment, which is the largest and most solid, and in any case the most valuable bone for the purpose.

For various reasons (quas nunc perscribere longum sit) this kind of estimation is difficult: there are several methods in use, those of Pearson, Topinard, Manoeuvrier, and Beddoe (my own): the first is the latest and probably the best; but we need further investigation to decide this question.

We should probably not be far wrong in putting the average stature of our men at about 5 feet $4\frac{1}{2}$ inches, or 1635 millimeters, and that of our women at 5 feet $1\frac{1}{2}$ inches or 1560 millimeters.

In one or two of the men, probably old subjects, the stature must have been diminished by the bowing and consequent shortening of the femur, which is

Mrs. Thelwel

PLATE II.—CIST.

very apparent ; by allowing for this the mean stature of the men might be a little increased.

In a later communication from Dr. Beddoe, dated August 17th, 1902, he says, "I went down to Harlyn Bay a week or two ago, and spent a day with Mr. Mallett. But he had very few bones to show me that I had not seen before.

One very perfect skull found outside a cist, small, perhaps feminine: length 174, breadth 132. Indices 75·8, altitude 74·7.

Another cracked, large, ill-formed, indices 73·4 and 64·9.

Two or three long bones from different bodies, yielded rather larger dimensions than my previous averages. One femur would indicate a stature of 174 centimetres by my rule, but Pearson and Manoeuvrier would put it down a good deal.

SECTION XIII

NOTES ON FIVE SKULLS AT HARLYN BAY

BY PROFESSOR A. C. HADDON, D.SC., F.R.S., F.Z.S., F.R.A.I.

At the urgent request of the Rev. R. Ashington Bullen—from whom I have received much kindness—I visited Harlyn Bay in April, 1905, in order to examine the very interesting prehistoric cemetery which was discovered there in 1900 by Mr. Reddie Mallett on his property. I would like to take this opportunity to thank Mr. Mallett for reserving a cist to be uncovered during my visit, and for affording me every facility in an examination of the ground, the cists and their contents.

Mr. Mallett also permitted me to measure the five skulls in his museum, and the following notes on them may serve the use of students until they have been subjected to a critical study by a more competent anthropologist. I employed the methods advocated by Broca, Flower and Turner. The several indices are sub-divided as follows: *Cephalic*, Dolichocephalic—75, Mesaticephalic 75-80, Brachycephalic 80 + ; *Altitudinal* (length-height), Tapeinocephalic—72, Metriocephalic 72-77, Akrocephalic 77 + ; *Total Facial*, Chamæprosopic—90, Leptoprosopic 90+ ; *Upper Facial*, Chamæprosopic—50,

Leptoprosopic 50+; *Gnathic*, orthognathous—98, Mesognathous 98-103, Prognathous 103+ *Nasal*, Leptorhine—48, Mesorhine 48-53, Platyrhine 53+; *Naso-malar*, Platyopic—107·5, Mesopic 107·5—110, Prosopic 110+ *Orbital*, Microseme—84, Mesoseme 84-89, Megaseme 89+; *Palatal*, Dolichuranic—110, Mesuranic 110-115, Brachyuranic 115+.

MEASUREMENTS

——	1	2	3	4	5
Glabello-occipital length	188	186	176	164	170
Ophrys-occipital length	188	184	175	166	169
Maximum breadth	137	137	135	135	138
Maximum frontal breadth	117?	116	115	115	116
Minimum frontal breadth	95	97	96	98	91
Basio-bregmatic height	124?	122	130	126	123
Frontal longitudinal arc	121	128	114	107	125
Parietal longitudinal arc	132	115	132	104?	112
Occipital longitudinal arc	116	115	113	130?	107
Nasio-opisthial arc	369	358	359	341?	344
Foramen magnum length	37	39	34	32?	34
Basio-nasal length	102	104	95	134*	92
Total sagittal circumference	508	501	488	507?	470
Auriculo-bregmatic arc	...	290	288	290	284
Bi-auricular breadth	...	126	117	115	120
Transverse circumference	...	...	405	405	404
Horizontal circumference	...	...	497	489	489
Nasio-mental length	...	112	109	...	104
Nasio-alveolar length	...	72	65	675	62
Bi-zyomatic breadth	...	...	127	...	125
Bi-maxillary breadth	...	89	96	93	88
Bi-dacryc breadth	...	24	17	22	20
Basio-alveolar length	...	101	94	129*	85
Bi-malar breadth	...	101	96	98	94
Naso-malar line	...	110	105	105	104
Nasal length	...	54	47	47	46
Nasal breadth	...	26 5	19 5	23	22
Orbital breadth (dacryon)	...	r. 41	r. 39	r. 39	r. 39
	...	l. 40	l. 38	l. 33	l. 40
Orbital height	...	r. 34	r. 30	r. 38	r. 35
	...	l. 33	l. 30	l. 33	l. 36
Palato-maxillary length	...	59	53	50	50
Palato-maxillary breadth	...	62	61	62	59
Molar and pre-molar length	...	40	40	41	41
Symphysial height	...	...	31	...	26·5
Coronoid height	...	...	58	...	56
Condyloid height	...	...	57	...	45
Gonio-symphysial length	...	...	75?	...	77?
Bi-gonial width	...	...	88	...	87
Bi-condyloid width	...	...	114	...	120
Breadth of ramus	...	...	35?	...	29

* Measured from the opisthis, as the basion was absent.

INDICES

——	1	2	3	4	5
Length—breadth	72·9	73·7	76·7	80·4	81·2
Length—height	66 ?	65·6	73·9	75	72·4
Breadth—height	90·5?	89·1	96·3	93·3	89·1
Total facial (bi-zygomatic)	...	...	85·8	...	83 2
,, ,, (bi-maxillary)	...	125 8	113·5	...	118·2
Upper facial (bi-zygomatic)	...	...	51·2	...	49 6
,, ,, (bi-maxillary)	...	80·9	67·7	72·5	70·5
Alveolar	...	97·1	98·9	96 ?	92·4
Nasal	...	49	41	48·9	47·8
Naso-malar	...	108·9	109·4	110·2	110·6
Orbital right	...	82·9	76·9	97·4	89·7
,, left	...	82·5	79	100	90
Palatal	...	...	115·1	124	118

No. 1 is from a low-level cist grave (cist Z, 70 feet N. of "Tamariska" hedge). It is a fully adult skull and may be that of a male.

The coronal and sagittal sutures are complex, the lambdoidal moderately so; the sutures are partially obliterated. The right pterion is in H, 5 mm. wide. There are no wormian bones nor mutilations.

It is an ill-filled ovoides, dolichocephalic and tapeinocephalic.

No. 2 is from Constantine. It is that of an adult female.

The nasal aperture has a forma infantilis.

It is an ovoides, dolichocephalic, tapeinocephalic, orthognathous, slightly mesorhine, mesopic, microseme, and probably dolichuranic.

No. 3 was found outside a cist. It is not fully adult, as the basilar suture is open, and is presumably that of a male.

The coronal and sagittal sutures are moderately complex, the lambdoidal more so; all are quite open. The pterion is in H, the right being 11 mm. and the left 14 mm. There are two moderately-sized wormian bones in the lambdoidal suture on the right side.

The nasal aperture has a forma infantilis.

It is an ill-filled ovoides, mesaticephalic, metriocephalic, chamæprosopic (—90) by the total facial index but leptoprosopic (90 +) by the upper facial index, slightly mesognathous, leptorhine, mesopic, microseme, and on the border of mesurany and brachyurany.

Although this skull slightly exceeds the upper limit usually fixed for dolichocephaly (—75) it may be taken as a fair example of the dolicocephalic series.

No. 4 is from Constantine Church midden. It is that of a young adult, probably female.

The metopic suture is widely open, the coronal and sagittal sutures are moderately complex, the lambdoidal suture is a broad band, 25 mm. wide, of intricate wormian bones; there are two large wormian bones in the coronoid suture near the bregma.

The nasal aperture has a forma infantilis.

It is an ovoides, but ill-filled in the frontal region, barely brachycephalic, metriocephalic, probably orthognathous, barely mesorhine, barely prosopic, megaseme, and brachyuranic.

No. 5 is from Constantine Church midden. It is that of an adult female.

The nasal aperture has a forma anthropina.

It is a pentagonides, slightly brachycephalic, barely metriocephalic, chamæprosopic, orthognathous, leptorhine, barely prosopic, slightly megaseme, and brachyuranic.

The five skulls fall into a dolichocephalic (Nos. 1, 2, 3) and a brachycephalic (Nos. 4, 5) group. It is true that one of the former (No. 3) slightly exceeds the usual limit assigned to dolichocephaly, but its length appreciably exceeds that of either of the brachycephals, and it is one of the two narrowest skulls; strangely enough the other is a brachycephal, but in this case the skull is a very short one, being the shortest of the series. There is very little difference in breadth between the other skulls. In other words, the brachycephaly in these skulls is mainly a matter of reduction in their length. The two most dolichocephalic skulls are the lowest in height, both being marked by tapeinocephalic, the others being

PLATE 12.—FLATTENED SKELETON: THE COVERING SLATE SLAB REMOVED.

metriocephalic. Two of the dolichocephals are at the upper margin of mesopy, the brachycephals being at the lower margin of prosopy. The dolichocephals are microseme and the brachycephals megaseme.

On the whole the evidence is in favour of there being two cranial varieties in this short series, but most of them are probably of mixed origin. It would probably be safe to relegate the dolichocephals to the Mediterranean race, but the brachycephals with their very low cranial indices are by no means representative of the Alpine race.

SECTION XIV

LAND LOSSES IN CORNWALL

AN interesting article in the *Strand Magazine* for October, 1901, by Mr. Beckles Willson, on the "Lost Land of England," endeavours to show that the Scilly Islands not very many hundred years ago were connected with Cornwall by the now lost land of Lyonnesse.[1]

(See diagram Fig. 10, copied by permission.)

The article in question (pages 398—408) and "the various diagrams were carefully prepared with the assistance of several eminent geologists and officers of H.M. Ordnance Survey."

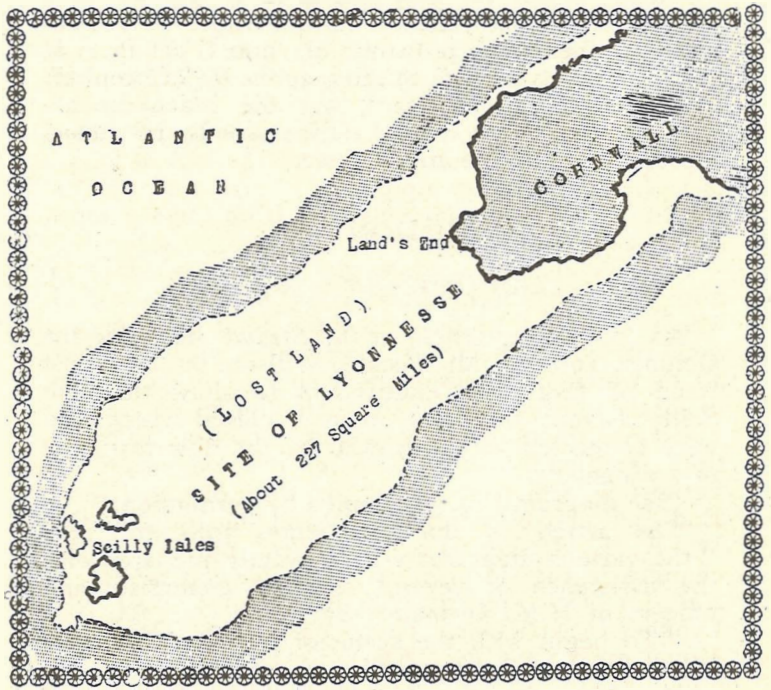
"To begin with the scene of Neptune's greatest victory, the reader's attention is directed to Cornwall. According to a survey made in the reign of Edward I., the Duchy contained 1,500,000 acres. In 1760 a Parliamentary report gave it as 960,000 acres. By the Ordnance Survey some years ago it was given as 829,500 acres. But statistics are proverbially unreliable. To the Westward of Land's End, between there and Scilly, lies the lost land of Lyonnesse.[2] Better than figures, better even than

[1] A large and clear chart, with much detail, is given in Mr. Ussher's "Historical Geology of Cornwall," *Geological Magazine*, 1893, plate 3.

[2] In which Tennyson paints the scene of the battle when the paynim overcame King Arthur:

"All day long the noise of battle roll'd
Among the mountains by the winter sea;
Until King Arthur's Table, man by man,
Had fallen in Lyonnesse about their Lord."

history and tradition, is the evidence offered by the Cornish coasts themselves at low tide. Beneath the sand of Mount's Bay, Penzance, is a deposit of black mould, in which may be discovered to-day the remnants of leaves, nuts, branches, and trunks of trees ;



LYONNESSE.

FIG. 10.—BY PERMISSION FROM "STRAND MAGAZINE," OCT. 1901.

(In the above diagram the thick black line represents the modern coast-line. The dotted line indicates approximately the ancient coasts).

and the remains of red deer may be traced seaward as far as the ebb allows.

"Leland states that the district between Land's End and Scilly was formerly continuous, and contained 140 parish churches and presumably as many villages. According to a modern Cornish authority, a flood occurred in Cornwall at the end of the fourteenth century, and carried away 190 square miles of land. Mount's Bay itself is of recent origin, the

tradition being that the ocean, breaking in violently, drowned that part of the country which is now the Bay. Even in the last century Land's End was much farther to the Westward (some authorities give the distance as half a mile) than it is at present."

The writer of the article in the *Strand Magazine* considers that between 1867 and 1900 Great Britain has lost permanently 182,207 acres by erosion of the coasts.

A well-known geologist, H. B. Woodward,[1] does not take quite so gloomy a view of the loss of land ; there being a certain amount of "give" as well as "take" ; and the land reclaimed from the sea must be put as an asset against the loss.

He says also that, while the loss in Yorkshire in 200 years has been about 16 square miles (3 of which was poor sandy land), the total gain in the same period has been 60 square miles on that coast, all of which is exceptionally rich.[2] This may help to soothe our fears about the extinction of our island.

He also refers to Scilly having, according to tradition, originally formed part of Lyonnesse or Lethostow, which stretched far west of the Land's End, as above mentioned ; and he quotes Mr. W. A. E. Ussher's well-digested notes on the changes in the Cornish coast, the *Geological Magazine* for 1879, pp. 27—36, and pp. 74—81, the Lyonnesse particularly on p. 94, and St. Michael's Mount on p. 74. (See Appendix F.)

SECTION XV

PREHISTORIC MAN IN CORNWALL.

It would be a fine picture for the imagination to conjure up the numerous settlements of men using stone and slate tools in the early iron age throughout the long stretch of Cornish coast. At Harlyn Bay (about two and a half miles from Padstow) we certainly have the overlapping of the early iron

[1] *Geology of England and Wales*, 2nd Ed., p. 594, 1887.
[2] *Ibid.*

age by the bronze age, before men had quite abandoned the use of stone and slate implements. Schliemann [1] points out that stone implements, although met with in the same stratum with articles made of different metals and with splendid earthenware, do not argue a primæval and prehistoric age. Small saws and knives of silex are, for instance, found in numbers in the Acropolis of Athens, and they appear to have been used up to a very late period. A rude prehistoric people could by no means have made the beautiful terra-cottas which are found at Troy immediately below the ruins of the Greek Colony, and still less could they have manufactured the splendid pottery which shows a high degree of artistic taste, and occurred moreover at a great depth.

Professor Sergi, "The Mediterranean Race," p. 234, designates this overlapping of stone and bronze tools as the æneolithic period (following Orsi as his authority). The use of stone tools was extended into (1) the copper and (2) the bronze ages, being only gradually quite supplanted by the use of metal.

Mr. J. Arthur Pott has called my attention to Sir Charles Lyell's idea that some metals were probably looked upon and treated like stone, being worked cold. So that unless an implement shows that it is made of metal extracted by fire, it is no proof of a metal age, *e.g.*, copper is often found quite pure and may be worked in the state in which it is found.

The overlapping of the Stone and Bronze Ages is well illustrated in Stevens' "Flint Chips." [2]

The same type of kitchen-midden occurs at Harlyn Bay, Constantine, and Scilly. At all these places hearths with plentiful traces of charcoal are found, with cut and burnt bones lying near them, blackened with the charcoal which is present in abundance. At Harlyn the charcoal occurs at the level of the graves; but at Constantine, in an extensive kitchen-midden [3] stretching along the sea-

[1] *Troy and its Remains*, p. 274, Ed. 1875.
[2] P. 482.
[3] There are several kitchen-middens, some inland. Some are covered with blown sand, and can only be identified by the shells and bones turned out by rabbits in making their burrows.

PLATE 13.—INTERMENT WITH BROKEN SKULL.

cliff, charcoal, burnt bones, and shells occur at nearly every level explored at various points by us on the side of the midden down to a depth of 8 feet from the surface. The working party consisted of Mr. George Bonsor, Dr. Thelwell, Mr. R. Mallett, and the author. A list of the animals found is given above. (Section VII.)

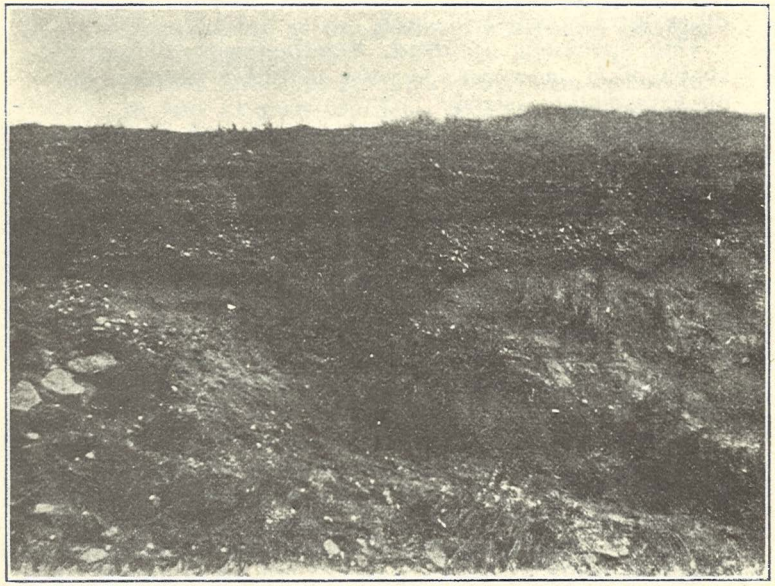


FIG. 11.—PART OF KITCHEN-MIDDEN, CONSTANTINE CLIFF.

The shells found (some showing the action of fire) were:

1. Patella vulgata (limpet).
2. Cardium edule (cockle).
3. Mytilus edulis (edible mussel).

The above are marine shells.

Of non-marine mollusca the following occurred:

4. Helicella barbara.
5. Pomatias elegans.
6. Helix aspersa.
7. Helix nemoralis.

Helix nemoralis is often found associated with neolithic man; it is also a pleistocene shell of the quaternary pre-neolithic age.

Helix aspersa has not been found frequently associated with neolithic man; but Mr. Mallett, by trenching in a tumulus, found a large quantity at Harlyn Bay on the level of the graves, but in the next field, at about 11 feet of depth, associated with other kitchen-midden shells.

One specimen occurred, together with numerous shells of *H. nemoralis*, at the neolithic potter's hut on Constantine Island.

Helicella barbara (=*acuta*) was found in abundance in and about the Harlyn Bay graves. One in Mr. Mallett's museum occurred alongside a smashed skull.

Cardium edule occurs rather abundantly at the kitchen-midden near Constantine Church. The nearest locality from which it is now procurable is Padstow Harbour, three miles distant. It is not plentiful at the midden on the cliff at Constantine.

Helix nemoralis occurs at the Harlyn Bay graves and at the potter's hut on Constantine Island.

Pomatias elegans. This mollusc with the preceding (*H. nemoralis*) was found to the amount of about a bushel outside an urn, in a burial of the bronze age on Harlyn Bay cliffs. (Mr. T. Hellyar's find.)

Further remarks on this discovery occur elsewhere. (Section XVII.)

Since the opercula occurred with the shells the living animals were evidently buried as food for the deceased man after cremation. Mr. Mallett frequently found the shells of Helix nemoralis and Pomatias elegans close to the jaws of the interred skeletons as though purposely placed there.

I examined traces of a kitchen-midden south of the cist-graves, under Mr. Mallett's guidance; and at a considerable depth, some ten feet or so, in the sand there were broken shells of Purpura lapillus (dog whelk), Mytilus edulis (edible mussel), and Patella vulgata (common limpet). The most recent excavations, however, trace this midden to a distance of more than fifty feet from the spot where it was discovered.

Mr. Mallett has since excavated the long mound

to the south of this midden; and at a depth of 11 feet found similar marine shells, and also a large quantity of Helix aspersa (the common garden snail) which is noticed in the Section on Mollusca. (XXII.)

The work which Mr. George Bonsor (of which no authoritative account is yet published) carried on in 1901 in Scilly shows that the people who once inhabited that part of Cornwall belonged to the same stage of civilization as those that dwelt round Harlyn Bay and Constantine.

The marine shells mentioned above also occur in Scilly, in the kitchen-middens there; and as Mr. Bonsor pointed out, while we were excavating, that the men who ate the molluscs, both at Constantine and Scilly, had a fancy for the younger, and therefore more tender specimens.

Hut at Constantine.

At Constantine Island, on a raised beach consisting of boulders and coarse quartz sand, neolithic man built a hut of slate and rubble and roofed in with slabs of slate.

Its ground plan was an elongated ellipse (Plate 14); the lower course consisted of large slabs of slate; there was a straight entrance, about 4 feet long, made of a single slab of slate on each side; the elliptical walls rose to a height of about $2\frac{1}{2}$ feet at each end, and with a ramp on each side wall, rising to $3\frac{1}{2}$ feet in the middle; the roof was composed of slabs of slate, stretching across the top from wall to wall.

From the entrance to the end the length of the whole was 13 feet, being about four feet for the "porch" or entrance, and nine feet for the main building.

Inside this building were found the bones of the animals, which Mr. E. T. Newton, F.R.S., has kindly identified. (Section VII.)

Associated with these bones were:

1. Limpet shells: Helix nemoralis; one Helix aspersa (as already stated), and one Pupa muscorum.[1]

[1] This latter, with some of the *Patellæ* in the condition of those of the Portland-Bill Raised-beach, probably belong to the Raised Beach and Head in which neolithic man excavated for the foundations of his building here.

2. A hand hammer, made from a raised-beach pebble of hard Cataclew stone (vogesite), grooved to fit the fingers of the hand.
3. Several *lumps* of clay (presumably for making pottery, the coarse silica being provided by the raised beach on the spot).
4. A broken beach-pebble; presumably a muller for mixing the clay and sand.
5. A hearth with traces of fire.

Unfortunately some person had destroyed what remained of the building between my visit in October 1901 and January 1902; I only saw the lower wall at the former date. But Mr. Harold Hellyar and his brothers, who discovered the hut and explored it with Mr. Mallett, were able to give me a number of measurements and particulars, which enabled me to represent the building somewhat as it must have appeared when first found. (Plate 17.) The bones and shells I had carefully noticed and labelled on my visit in January 1902.

When found the hut was quite filled with sand, which had covered up and preserved the contents.

If the inside was the winter retreat of the inhabitants, they also seem to have summered outside; for another hearth was found on the northern side, with bones and marine shells noted in the following lists and traces of charcoal: there were also lumps of clay similar to those within the hut. About eighty yards distant on the sea-coast occurs the long kitchen-midden mentioned above, containing fragments of coarse hand-made pottery at its lower levels and wheel-turned pottery in the upper part.

Many of the bones have been broken for their marrow, and some are cut and pointed as though used as scoops.

The strategical situation of the hut is exceedingly good. The site for it must have been dug in the raised beach; and, since its entrance faced the land, and it had the mass of Constantine Island between it and the sea, it would be a good "look-out"; while at the same time secure from observation by sea-rovers.

On the surface of Constantine Island, especially on its sea-face, numerous waste flakes, made from

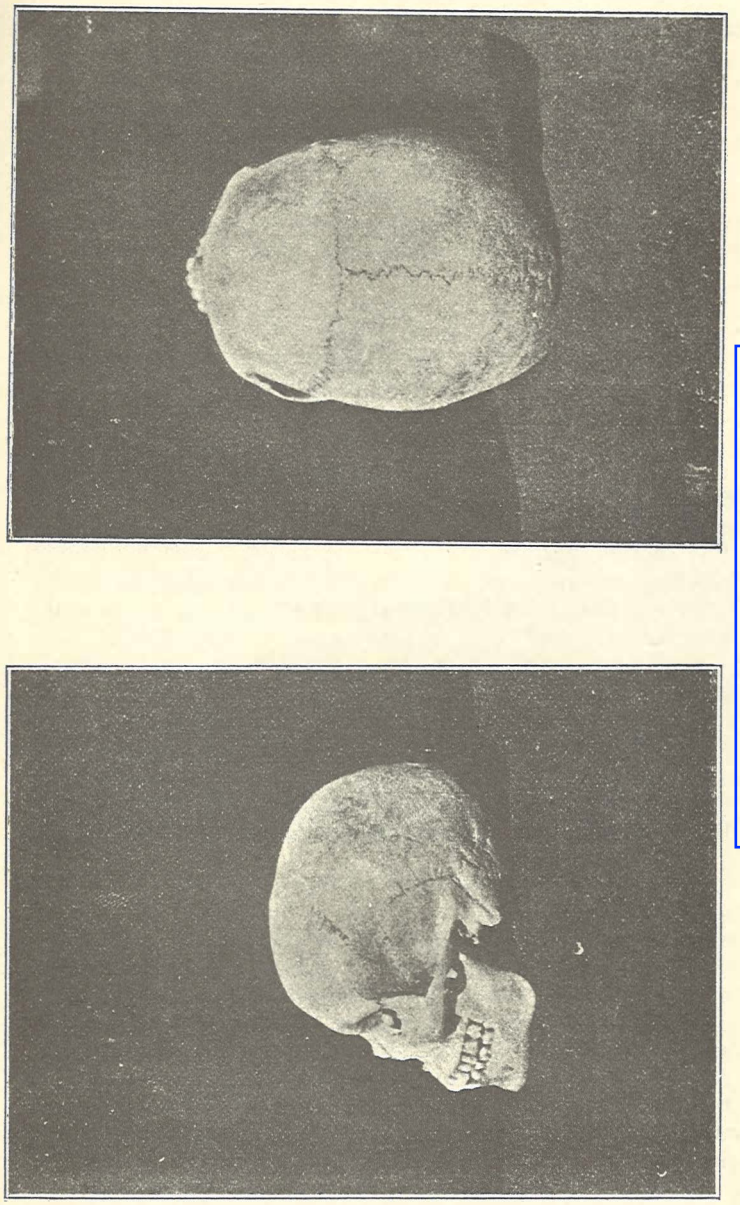


PLATE 14.—SKULL FROM OUTSIDE A CIST. 2.
(No. 3 of Professor Haddon's analysis.)

flint shore-pebbles, occur, or rather did, for I am afraid there are not many left for future explorers.

Neolithic flakes also occur at Cataclew (near the barrows) at Trevose Head, and Harlyn Bay; and at Treyarnon a spindle-whorl has been found in a cave.

Sand must be but a poor preservative, however, for wooden objects, for, up to the present, if any wooden weapon-hafts or other tools were left, none have been found; presumably they have rotted away.

FIG. 12.—CONSTANTINE BAY AND ISLAND.

For analogues to the Constantine hut the nearest locality with which I am acquainted is the Isle of Portland. The larger granite huts of Dartmoor seem not to be quite of so early a date. At Kingbarrow in Portland several underground structures of bee-hive form were discovered between 1880 and 1884, and others since [1] by Mr. Wallis; Mr. E. Cunnington of Weymouth has been well acquainted with them. They were discovered in the course of quarrying operations and have been unavoidably destroyed, as

[1] Damon, *Geology of Weymouth*, 2nd Ed., 1884, pp. 164—166.

all the upper surface of the ground had to be removed in quarrying the Portland stone.

They are somewhat different from our Constantine hut, being of beehive shape, in height about 8 feet, with a diameter at the base of 10 to 12 feet.

"They were completely walled in with flat stones overlapping inwards until they leave at the crown an opening of 16 inches diameter, generally covered with a slab; over all lay the soil, about a foot in thickness. One, and one only, was 12 feet deep from the top, penetrating into the hard rock beneath. But the most remarkable is one of a twin structure, a singular feature of which is a passage at the base between the two, 2 feet in height by 2 feet 6 inches in width."

When we come to the consideration of the contents they are not unlike those of our Constantine hut; the following objects have been found in them.[1]

1. Skulls and bones of domestic animals. Numerous.
2. Limpet shells (Patella vulgata). Some in sets of graduated sizes.
3. "Corn-crushers," rounded hard grey stones, used probably for bruising corn. Numerous.
4. One celt and small flint flakes.
5. Flint pebbles.
6. Pieces of Kimmeridge Shale.
7. Pieces of hard grey stone (not Portlandian), from which the "Corn-crushers" appear to have been made.
8. Blackened wheat. In one hut . . . a wheelbarrowful.

"The Portland huts may be said to resemble in many particulars the underground dwellings in the North of Scotland, known as "weems," and others as "beehive houses," which are supposed to have existed as far back as the "stone age," though they are also known to have been inhabited down to the year 1823."[2]

The Isle of Portland is thickly strewn with chert implements and flakes of the neolithic age.[3]

[1] Damon, *op. cit*, Ed. 1884. p. 166.

[2] Wilson, *Prehistoric Annals of Scotland*, Vol. I., p. 104, quoted by Damon. *loc. cit.*

[3] Mr. E. Cunnington has collected here for years, and I have a large number also in my possession.

Possibly the "new-stone" age overlapped the bronze age into the early iron age, as at Harlyn, for stone, bronze, and iron, all three, occur as the materials of which the tools or ornaments were fabricated; as in the Harlyn district, silica (either as chert or flint) predominates.

There is a further similarity; the beehive huts of Portland and the hut at Constantine are built of dry rubble without mortar; and, allowing that the inhabitants of the former were agricultural and of the latter piscatorial in their pursuits, we have, if not identity, at least evidence of a contemporaneous period of civilization.

The large slabs of local slate procurable at Constantine from the cliffs or the fore-shore made it easier to build and roof the hut. Though simply built it has proved strong, the upright sides and roof of slabs having stood till last year, being then wantonly destroyed. The Portland huts being built underground, the entrance was necessarily from above, and the beehive form was the simplest to attempt. At Constantine the entrance was from the East side; and the elongated elliptical plan, with "ramped" walls and a flat roof rising to an arch at the highest part, met the requirements of the builders.

In both cases concealment from enemies seems to have been the object; and perhaps the hearth at the Constantine hut, with the general similarity of contents, may emphasize the idea that the Portland huts were for shelter and residence as well as storage.

Baring Gould[1] states that the custom of building beehive huts by the Caussenards exists in the present day. "No doubt the people (the neolithic dolmen-builders) lived in caves where there were any suitable, but not exclusively. Granite and gneissic and schistose formations are devoid of caves, and there doubtless the neolithic men built huts that were circular. The thousands of hut circles strewn over Dartmoor, Cornwall, the Welsh hills, and Irish moors belonged to these people. Similar huts are found in connection with the similar megalithic remains in Palestine. On the Causses it is not possible to

[1] *Deserts of Southern France*, Vol. I., p. 198.

identify them, as the custom of building beehive huts subsists to the present day. Every shepherd throws up one for his night's lodging. In every vineyard is one in which the boy may watch when the grapes are ripe."

PLATE 10.—ILLUSTRATING SECTION XV.

The specimens are from the kitchen midden described in the above section, to the south of the Harlyn Bay Cemetery.

Top row, left specimen: probably a digging stick weight, as used by the Kaffirs in South Africa, and probably once an almost universal tool for light soils. Or it may have been a net sinker.

Top row, middle and right: round slate disks. Probably sling stones.

The late Mr. H. Stopes, in 1900, showed me at Swanscombe that artificially rounded sling stones of flint were abundant at about slinging distance from the camp on Swanscombe Hill. He collected a large number there, some while we were walking together.

In Dr. Chil's Museum at Las Palmas, Grand Canary, a considerable number of rounded beach pebbles are shown from ancient Canario Caves, carried many hundred feet up and sometimes many miles away from the beach, for use as hammers, rubbers, pounders, slingstones, etc.

Bottom row, centre: spindle whorls, some of baked earth.

Bottom row, left corner: hand hammer.

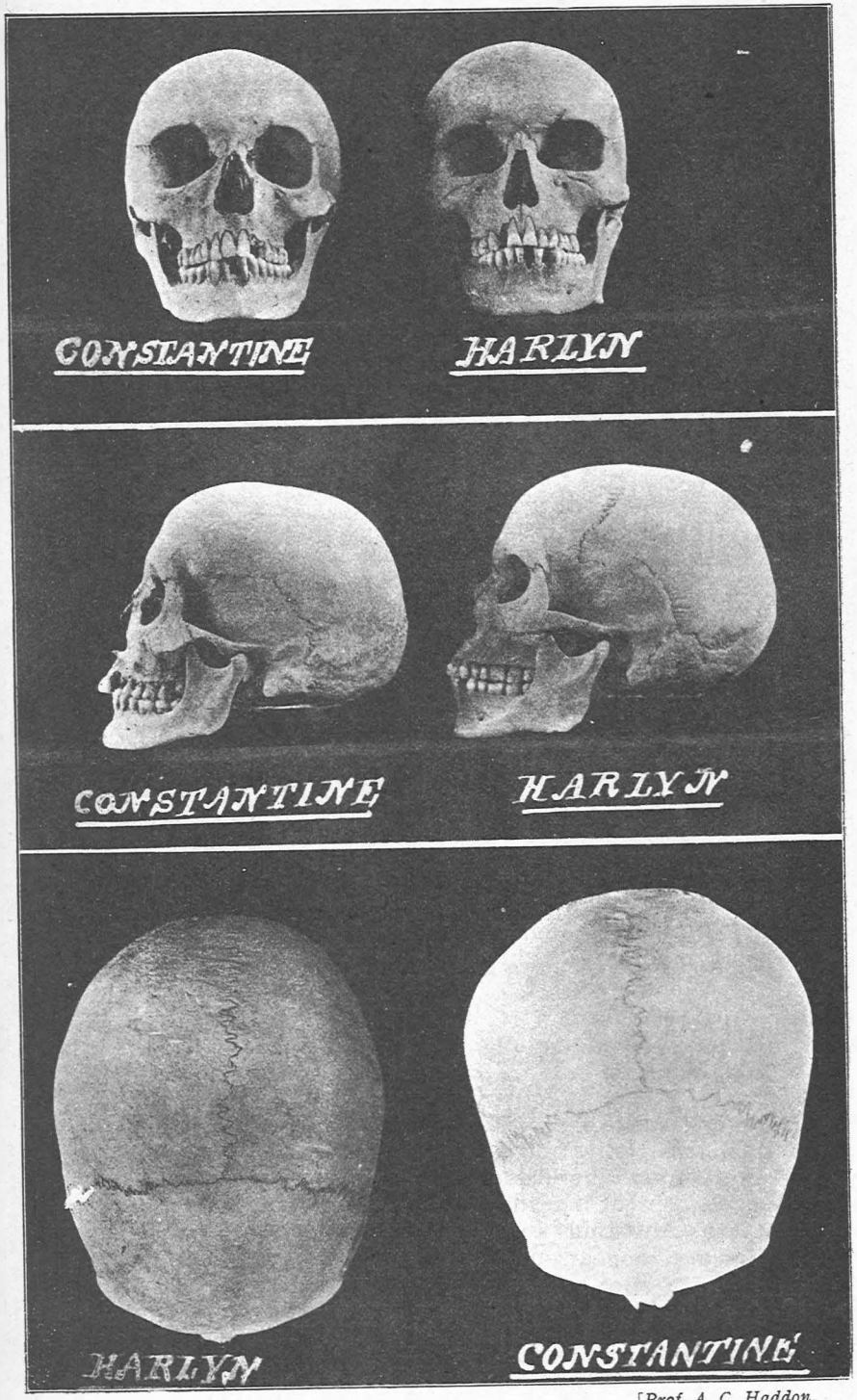
Bottom row, right: part of upper stone of a quern or hand-mill.

SECTION XVI

ROMAN COIN

OF two coins of copper (the property of Mr. Thomas Hellyar of Harlyn House on whose land they were found), one is:

A coin of Faustina junior, daughter of the Emperor Antoninus Pius, wife of Marcus Aurelius. Her likeness appears on the obverse, with the hair done up in a knot behind; and on the reverse, there is a female figure standing; the inscription is illegible.



[Prof. A. C. Haddon.

PLATE 15.—SKULLS (PROF. HADDON'S NOS. 3 AND 5).

Dr. Barclay Head, of the British Museum, in a letter to me described the reverse of a good specimen as reading AUGUSTI PII FIL[IA].

One of the great centres from which Roman coins seem to have been issued in the West of England was Exeter [Isca Dunmoniorum], the great stronghold and trading centre of the West. Large hoards, however, have been found in other parts of Devon, *e.g.*, 40 silver coins at Poughill, near Tiverton, 1836; 2000 small copper coins at Kingskerswell March 1839; others at Bovey Tracy in 1837, and in British Barrows at Haldon, silver and brass.

Large numbers of small copper coins have occurred in Exeter. One of Constantine the Great, with two legionary soldiers and ensigns on the reverse, minted at Constantinople having the mint-mark S. Cons., that is signata (stamped) Constantinopoli. Such as these appear to have been distributed to the soldiers as part of their pay.

"During the summer of 1835 Roman coins increased in number to such a prodigious degree as to be nearly a drug at Exeter, which no one troubled his noddle about at last; and this city seemed as fertile of Roman pence, when dug into, as the teeming soil of modern Italy or Pompeii itself."[1]

Large quantities of Roman coins have been found near Redruth, Treryn, Helford Haven, Mopas, etc. in Cornwall, in some cases as much as 24 gallons being dug up at a time, and more will continue to be found as long as the plough passes over the land.[2]

In connection with the ancient Cornish mines we have Borlase's testimony of great stores of Roman money being found at Mopas, Karn Bre, in the parish of Illogan, St. Agnes Bâl, etc.

The copper coins being bulky would be buried in time of panic, or danger; the more valuable gold and silver coins not being so cumbersome, would be less likely to be so hidden, by the Roman military Quæstors or paymasters. "The copper coins being found in such numbers, not scattered, but in great heaps, were committed to the custody of Dame Tellus, our mother earth or, if you please, the Bank,

[1] Shortt, *Sylva Antiqua Iscana*, p. 32.
[2] Shortt, *Collectanea Curiosa Antiqua Dunmonia*, p. 10.

for that was the only one till they should come and dig it up again, which warlike expeditions engagements, death, or carelessness very often prevented." [1]

The reason why so many hoards of copper coins have been found near Cornish mines is that the Roman authorities worked the tin and copper themselves, being jealous of any other nation participating in the British tin trade, and having likewise such excellent harbours as Falmouth, the Hamoaze, Helford Haven, and Fowey. We know that they worked the lead mines in Derbyshire, pigs of lead having been found with the names of Emperors and private persons on them.

Two such pigs of lead also occur in the Bristol Museum, one of 182 lbs. avoirdupois, with the stamp of the Emperor Vespasian, from the Mendips; and another of 89 lbs. from the River Frome, Wade St., Bristol, stamped with the name of Antoninus Pius.

These metallic riches were the rewards of victory.

The Roman coinage was in the hands of Imperial Officers, the *Triumviri monetales*, Directors of the Mint, A.A.A.F.F.F. aeris, argenti, auri, flando, feriundo, faciundo, *i.e.*, for melting, stamping and making bronze, silver, and gold coins; under them there were a host of minting officers:

flatuarii or *flatores*, who blew the *folles* or bellows of the melting furnaces;

malleatores monetæ, who prepared the rough masses of gold and silver by hammering;

optiones fabricæ, or advisers;

exactores, foremen or superintendents;

signatores, who with the hammer stamped the coin;

suppostores, who placed the metal in its die for striking, and withdrew it when struck;

æquatores, who judged the weight, and

nummularii, who decided whether the coins were genuine, of the proper fineness, quality, and standard.

Consult Ramsay, "Roman Antiquities," 1896, Ch XIII, for values etc. of Roman Coins. Much interesting information on Cornish Tin Mines may be found in Canon Hammond's "Cornish Parish," 1897, Ch. IV.

[1] Shortt, *Collectanea Curiosa Antiqua Dunmonia*, p. 10.

SPANISH COIN

The small copper coin, also ploughed up at Harlyn, Dr. Head says was issued for circulation in the Spanish South American colonies. It is marked "VIII"

DESCRIPTION OF PLATE 18

Fig. 1. Urn No. 2, diagram: Harlyn Cliff.
Fig. 2. Urn No. 1, discovered by Mr. Hellyar and restored by Rev. W. Jago.
Fig. 3. Urn No. 2, unearthed Jan. 1st, 1902, Harlyn Cliff.
Fig. 4. Bronze ring from cist (Fig. 6, same plate).
Fig. 5. Iron armlet from same cist.
Fig. 6. Cist, full length 5 feet 1½ inch. Largest upright slab 16 inches high. Viewed from the East side (diagrammatic).
A. Smashed skull protruding beyond cist and without the other parts of the skeleton.
B. Incomplete skeleton, flattened by slabs overlying.
C. Two skeletons (mother and child ?). Adult's and child's bones, teeth, pieces of skulls apparently incomplete; bronze ring and iron-bracelet found among teeth and lumbar vertebræ.
D. Pieces of skull and odd bones above covering slab.
E. Pieces of slate to keep S. end of cist in position.

SECTION XVII

THE CINERARY URNS

THE urns found on Harlyn Cliffs, on Mr. Thomas Hellyar's property, are two in number. They are both preserved at Harlyn House; the second, though entire when found, fell to pieces in removing it.

1. The first was discovered several years ago

(the exact date is uncertain). Mr. Hellyar has Rev. W. Jago's drawings and restoration of the same.

The urn (Fig. 2, Plate 18) contained:

A bronze dagger, blade with two rivet holes.
An incense cup (so-called).
A spindle-whorl.
A hone of slate.

There were two long handles to the urn, each perforated with a small hole. The urn was 20 inches high with a diameter of 15 inches in the bulging part; and consisted of a thick coarse type of pottery, half an inch thick.

The "incense cup" had a diameter of about 2·625 inches, and a height of about 1·4375 inches.

The pattern upon it (only *indicated* in the diagram) was of the kind that can be produced by pressing plaited grass upon moist clay.

In this connection the remarks of Dr. Daniel Wilson (quoted by Tylor) are instructive: "early British urns may have been strengthened by being surrounded with a platting of cords or rushes . . . It is certain that very many of the indented patterns on British pottery have been produced by the impress of twisted cords on wet clay,—the intentional imitation, it may be, of undesigned indentations originally made by the platted net-work on ruder urns." [1]

Cinerary urns decorated in a similar manner, but with a different pattern, are to be seen in Exeter Museum.

2. The second urn, now in fragments, was observed by Mr. Hellyar's sons late in December 1901, through a fall of sand on the edge of the cliff at Harlyn (Fig. 3, Plate 18). It was unearthed by Mr. Hellyar and his sons and Mr. R. Mallett on January 1st, 1902.

It consists of the same kind of coarse pottery with large grains of silica, as that of the urn first mentioned, and the pattern is also of the plaited-grass type.

Underneath it were some fine rounded pebbles (probably a fragment of a raised beach); the urn

[1] Tylor. *Early History of Mankind*, 3rd Ed., revised, p. 273.

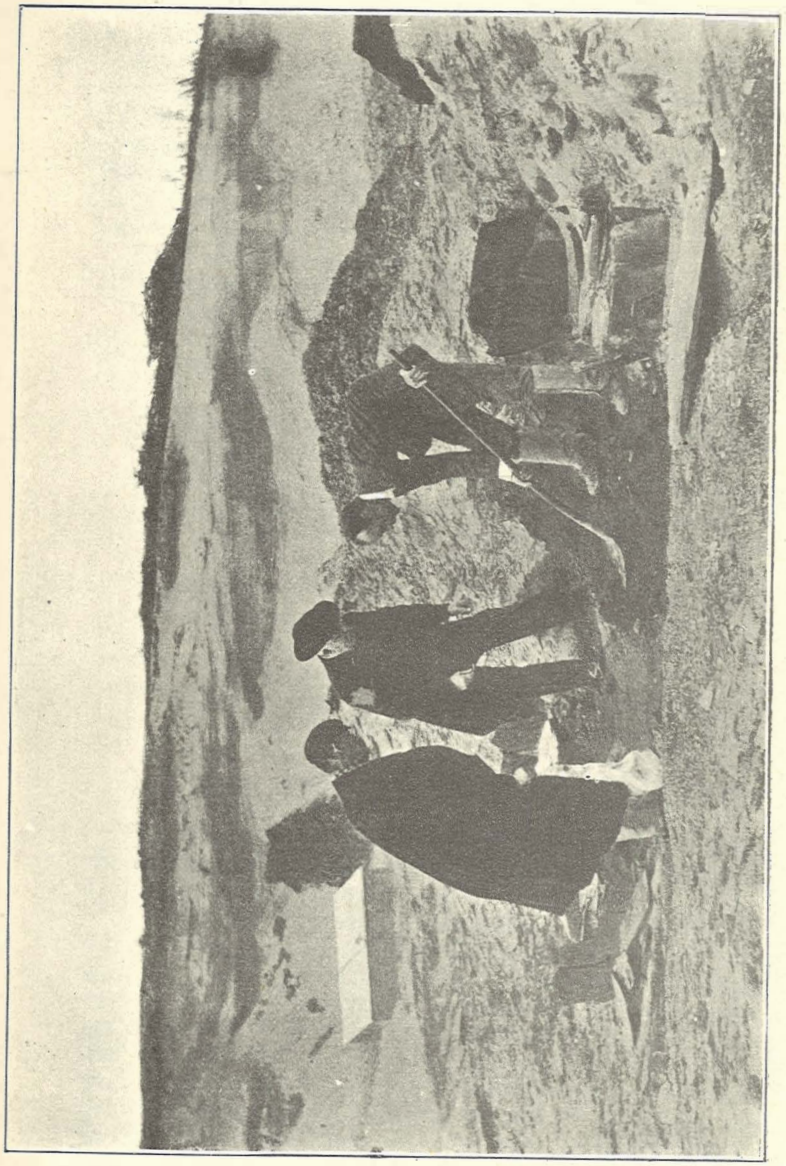


PLATE 16.—HARLYN BURIAL GROUND, SHOWING DEPTH OF BLOWN SAND, LOOKING NORTH-WEST.

H.B.

was *inverted* upon these with the incinerated remains inside it.

Around the urn were placed two full cart-loads of white quartz blocks and "Cataclew" stone boulders. These must have weighed over two tons. I saw the whole of this valuable building material partly at Harlyn House and partly at Mr. Mallett's. "Spar," as the quartz is locally called, is now difficult to procure in quantity at Harlyn.

The whole interment (Fig. 1, Plate 18) was arranged as follows:

1. Commencing at the top, blown sand with turf above, covering a layer of charcoal.
2. A slab of slate as covering stone, resting on the blocks of quartz and Cataclew rock.
3. Between the slab and the urn bright blown shell-sand.
4. The urn, *inverted*, underneath which were the cremated remains, with a bronze pin 1·5 inches long, and two fragments of other pins, also two white bone[1](?) beads, slightly broken. The urn was of black pottery, but the clay of which it was composed was mixed with large grains of quartz sand.
5. Close to the urn and within the slates placed round, to keep the fine rounded pebbles on which the urn rested from spreading, was about a bushel of land shells, Helix nemoralis and Pomatias elegans.

The dimensions of the urn were—maximum diameter 16 inches, minimum diameter 14 inches, depth 9 inches. Thickness of material ·5 inches.

I owe the following information to Dr. H. P. Blackmore, F.G.S., of Salisbury. "As to the inquiry respecting the cinerary urns at Fordingbridge in 1865 by the navvies in making the railway, eight or nine were found at fairly regular intervals apart and all inverted, *i.e.*, mouth downward. They were only from nine inches to a foot below the surface of the soil. There was no mound or large stones over them, but the subsoil was dark in colour and contained a quantity of charcoal. The only

[1] The material was much decayed, and this rendered the identification of the substance uncertain.

published account was in the local papers at the time." (October 8th, 1902).

An urn of similar *material* with plaited-grass ornamentation, a wavy *horizontal* pattern, instead of a vertical (as the Harlyn Urn No. 2), is in Exeter Museum. It was also found inverted over human bones, in a tumulus at Nymet Tracy in 1868. It is somewhat elaborately decorated on the upper half as follows:

3 Horizontal straight rows plaited-grass pattern.
8 Horizontal wavy rows plaited-grass pattern.
3 Horizontal straight rows plaited-grass pattern.

In another cremated interment from Broad Down Farway, near Honiton, the pottery being of the same general character as the urns mentioned above, were found—

1. A cup made of shale (probably Kimmeridge shale).
2. Bone beads (similar to those from Harlyn).
3. The fragments of a large urn and cremated interment.
4. An "incense cup" containing the burnt bones of a child.
5. Part of a child's skull (? a second "cremation") near the incense cup.[1]

A propos of the objects enumerated above, the remarks of a writer well known to the last generation are pertinent.

"Bead necklaces occur alongside the stone war-hatchet and flint lance-head as the property of the warrior and one of his most prized possessions. Possibly indeed they may have constituted symbols of rank and the special badge of office, as considerable variety marks their forms.

"An Orkney cist for example contained about two dozen of the common oyster shell, each perforated, and in all probability, designed to be strung together as a collar, abundantly noticeable for size, if not for beauty. In such cases the shell of the common limpet (P. vulgata) and the cockle (Cardium commune) are taken advantage of to form a novel shell-ornament. They are rubbed down until

[1] The thought suggests itself that we have here a hint of child-sacrifice analogous to the heaps of burnt bones of children burnt to honour Baal, which were found by Major di Cesnola in Cyprus.

they are reduced to rings, which were either strung together, or attached, as ornaments to the dress. Underneath a large cromlech, accidentally discovered in the Phoenix Park, Dublin, in 1838, in the process of levelling a mound, which thus proved to be an ancient tumulus, two male skeletons were found, and beside them each still lay a quantity of the common littoral shells (neritina littoralis). On examination it is noted in the report of the Royal Irish Academy that the shells were found to have been rubbed down . . . with a stone to make a hole for the purpose, as it appeared evident, of their being strung to form necklaces; and a vegetable fibre serving the purpose was also discovered, a portion of which was through the shell. Alongside of this also lay a knife or arrow-head of flint, and a small fibula of bone, but no traces of metallurgic arts." [1]

SECTION XVIII

THE GOLD LUNETTES, OR LUNULAE

MR C. G. Prideaux-Brune, in 1866, called the attention of the members of the Royal Institution of Cornwall to the discovery, in a barrow at Harlyn Bay, of these valuable specimens of early art.

"We owe it to Mr. C. G. Prideaux-Brune that the attention of members of this Society was first called to this discovery, and that steps were taken to secure so valuable an object of archæological interest for the permanent gratification of public curiosity." [2]

"It is very probable that golden relics of this type have before been found in Cornwall, but at a time when Prideaux-Brunes were scarce in the county and the melting-pot supplied the deficiency." [3]

They were claimed by the Duke of Cornwall (the late King Edward VII.) as treasure trove. He

[1] Dr. Daniel Wilson on "Some Ethnographic Phases of Conchology," *Edinburgh New Philosophical Journal*, 1859, p. 68.

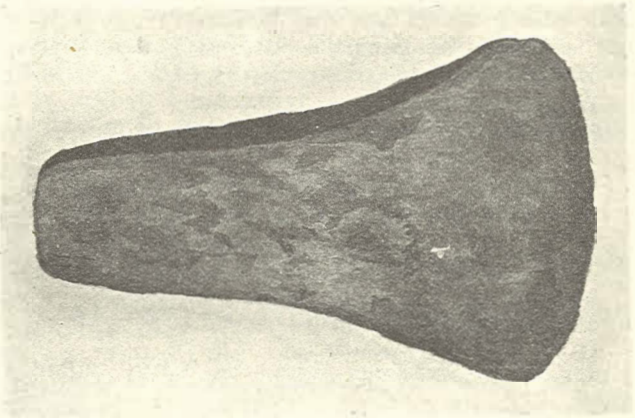
[2] "Observations on the Gold Gorgets or Lunettes found near Padstow and now in the Museum of Truro," Smirke, *Journal Royal Institution of Cornwall*, Vol. II., p. 134.

[3] *Ibid.*, p. 139.

directed that they should be deposited in the Museum of the Royal Institution of Cornwall at Truro. (Plate 22.)

With them was also found a bronze celt. (Fig. 13.)

Gold ornaments of this shape used to be called lunettes (*i.e.*, ornaments made somewhat like a crescent moon), a useful word of a rather indefinite nature referring to the shape only and suggesting nothing as to their purpose, for it is uncertain whether they were worn round the throat (as gorgets), or on the head (as tiaras), or round the neck



[*Drawn by A. M. Bullen.*

FIG. 13.—BRONZE CELT FOUND AT HARLYN WITH THE GOLD LUNULAE.

(as collars), or as bracelets or armlets, or as pendants, like those on the martingale of cart-horses, the same as the Italian charm against the "Evil Eye."

Smirke [1] gives their weight as respectively 4 oz. 9 dwts., and 2 oz. 2 dwts.

They are ornamented with incised lines, the smaller one very elaborately. The plainer one is the heavier.

A peasant [2] near Quentin in Brittany, in 1832, "in search of buried treasure, disinterred no fewer than 12 such articles, weighing in all 21 lbs." They

[1] *Journal Royal Institution of Cornwall.* Vol. II., p. 136.
[2] *Ibid.*, p. 137.

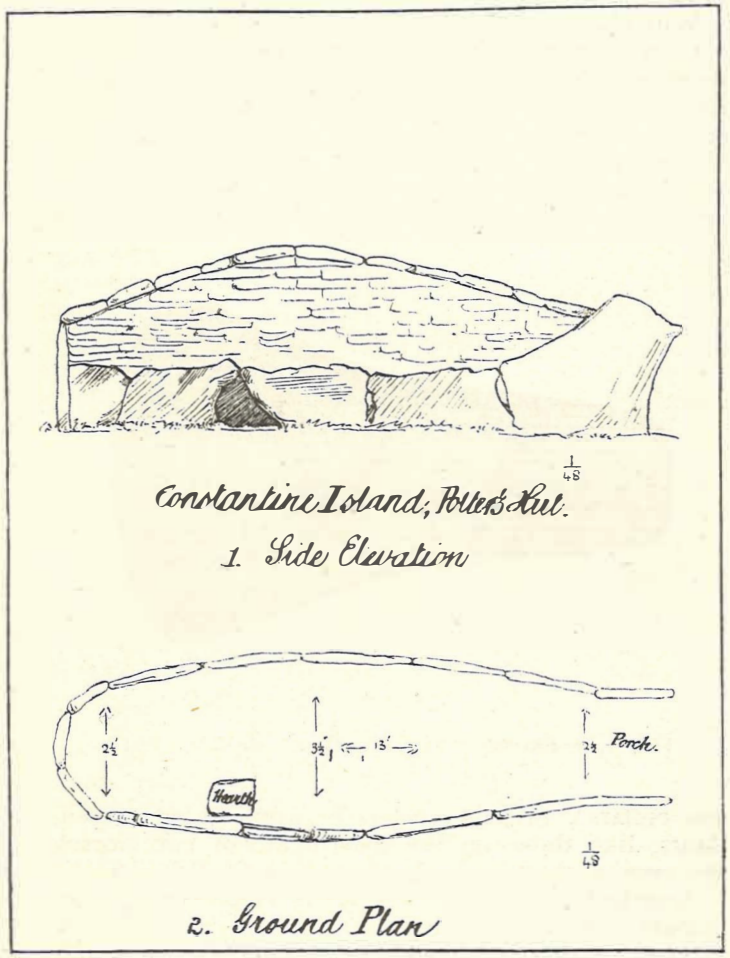


PLATE 17.—PLANS OF POTTER'S HUT, CONSTANTINE ISLAND.

Drawn by Miss A. Rupert Jones after measurements and sketches by Messrs. Mallett and H. Hellyar.

were all more solid and less flexible than the Harlyn find.

Smirke mentions gold ornaments resembling the Harlyn Lunettes from St. Ayr in Normandy.[1] He also considers that those in the Museum of Antiquities at Copenhagen (probably diadems) have rarely the zig-zag line ornament so predominant in the Irish and Cornish types of lunette.

He says:[2] "We shall not be warranted in bestowing on these golden relics the praise of any great skill or of any distinguished æsthetic genius. The graved lines and simple forms are of a class likely to be adopted by rather rude, unimaginative artificers, and such as were in fact adopted almost universally in early pottery, before the more elegant forms and beautiful creations of ancient Greek art prevailed. A zig-zag moulding, broken and angular straight lines, and lozenge-shaped gravings and impressions, seem to be among the earliest and easiest efforts of ornamentation or enrichment. They require the smallest resort to the powers of invention or execution. I believe the prevalence of this simple style of ornament must be known to all who have had occasion to inspect any collection of so-called Celtic pottery in almost any part of Europe. . . .

"I must therefore avow my present impression to be that these golden spoils from Padstow, Penwith, and St. Juliot are the work of early British or Irish art. I can see nothing in them to put in requisition the higher artistic skill or genius of either classic or Semitic art."[3]

Mr. George Coffey, in a valuable paper read at the Dublin Meeting of the British Association, Section H, 1908, shows that these gold lunulae belong to the Early Bronze Age, dating before 1000 B.C. The ornamentation on them is the well-recognized Bronze Age ornament (bands of lines, cross hatchings, chevrons, lozenges, and triangles). The same ornament occurs on many flat bronze celts of an early period. His paper is accompanied with a map of distribution of lunulae, a list of places where they are known to have been found, 4 plates (three of

[1] *Journal Royal Institution of Cornwall*, Vol. II., p. 13.
[2] *Ibid.*, p. 141.
[3] *Ibid.*, p. 142.

lunulae and one of early celts) and 5 figures in the text.[1]

SECTION XIX

CONSTANTINE CHURCH, SACRED STONE, AND KITCHEN-MIDDEN.

THE ruins of Constantine Church stand near a kitchen-midden. It was built in a hollow in the sand. Underneath the ruined tower at the west end of the church is a large rounded boulder of Cataclew stone (Plate 20), weighing apparently nearly a quarter of a ton. The nearest locality for this rock is Cataclew (Fig. 14), about a mile and a half distant in a straight line. This stone seems to have been a sacred object around which the church tower was built, perhaps 1600 years or more ago. We have a similar instance at Maplescombe Church, near Farningham, Kent, in which is a large mass of tertiary conglomerate at the N. E. corner. And Prof. T. Rupert Jones, F.R.S., considers the so-called Chair of Bede at Jarrow Church to have been a sacred stone of early date, but known to have been chiselled by modern masons into its present rectangular shape.

Mr. A. S. Kennard, F.G.S., considers that there is more than one stone in the ruined church at Maplescombe, and that there may have been a stone circle (cromlech) there, round which the Christian church was built.[2]

If the whole surrounding mound at Constantine Church is a continuous kitchen-midden, as seems likely, consisting of successive accumulations, the great boulder marked probably the meeting-point

[1] C. Coffey, "The Distribution of Gold Lunulae in Ireland and N. W. Europe," *Proceedings of the Royal Irish Academy*, Vol. XXVII., Section C., No. 10.

One from Newtown, Crossdoney, co. Cavan, was found in a rough wooden case.

All the evidence seems to point to Ireland as the place of their manufacture.

[2] Maplescombe Church has a rounded apsidal chancel of early Norman work, circa 1080 A.D. The stones mentioned are arranged inside the chancel. (A. S. K.)

for whatever religious or ceremonial rites were practised. The Christian missionaries who built Constantine Church made that spot the centre for the new religion, including the stone within their edifice in a position of honour.

Mr. Spence Bate, F.R.S., described a human skull, animal bones, and pottery (the last of three qualities), from this Kjökkenmödding, in 1864 to the

FIG. 14.—CATACLEW QUARRY.

British Association.[1] He spoke of the midden as being near the ruins of Constantine Church. The human skull was not in the shell-bed, but in the sand near it. Bones of sheep, lamb, deer, and roebuck were found.

The pottery found by our party in October, 1901, Mr. G. Bonsor considered to be of three kinds,—Mediæval, Roman, and Neolithic. The black neolithic pottery was found in situ.

[1] *Report British Association*, 1864, p. 88.

The principal marine shells were:
Purpura lapillus, abundant.
Cardium edule, fairly numerous.
Mytilus edulis, abundant.
Patella vulgata, abundant.

Cardium edule was much less abundant than the others mentioned, but more numerous than in the midden on the cliff at Constantine.

The burials at Constantine in the midden are probably of the Christian Era.

SECTION XX

THE ROUND CIST

NOT having seen this cist I append Mr. R. Mallett's description.

March 1st, 1902. "To-day's is a wonderful cist. It is rounded and measures 5 feet in diameter. It is at the very lowest level and on the rubble. It is divided into two compartments, the Western compartment containing skeletons of two adults and one very young child, and the Eastern compartment one adult skeleton. The skull in the Eastern compartment is lying on the left side, smashed, and under it a good sized piece of quartz.

"Now as to possible dismemberment: a thigh bone of No. 3 and one of No. 4 could not have been put in with the body, for each was separated from the rest of the skeleton by a layer of slate slabs, just as if all that could be gathered of the corpse at the time of interment had been buried, and after the interment another limb had been discovered and put on top; another bone of No. 3 was apart from the skeleton. One iron ornament was found amongst the bones of the child (No. 3) and 2 pieces of cuttlefish also occurred in the Western compartment. Two slate knives occurred on the top of the cist."

March 14th, 1902. "The two skulls in the Western compartment turned out to be quite separated from their respective trunks. I proved

PLATE 18.—CINERARY URNS, HARLYN BAY.
Drawn by Miss A. Rupert Jones after sketches by the Rev. W. Jago, Mrs. Mallett and Messrs. Mallett and Hellyar.

this by most careful working. No. 2 skull was far above the vertebræ of the trunk, and No. 1 skull was placed exactly above No. 2. The greater portion of the upper jaw of No. 2 skull was found under the lower jaw.

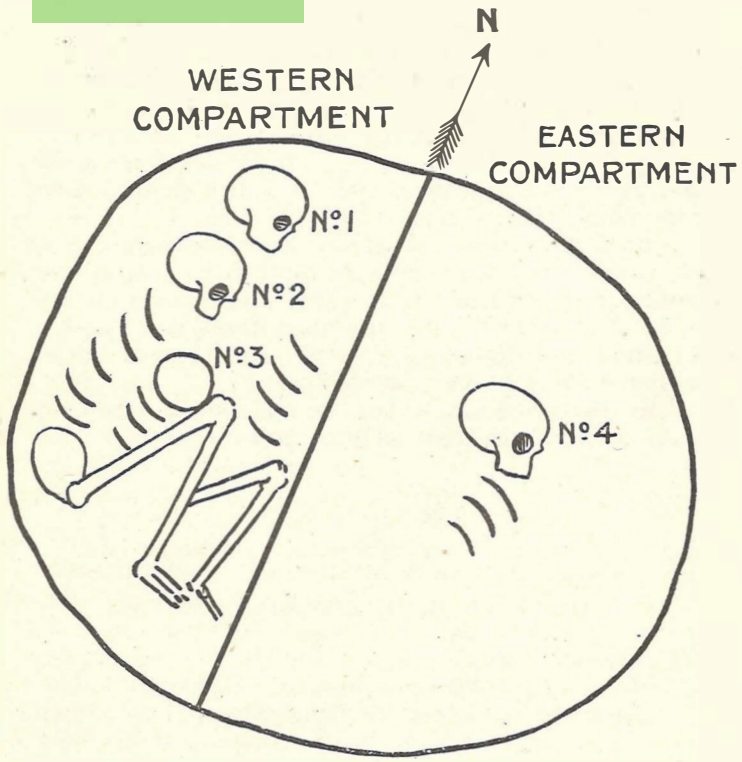


FIG. 15.—ROUND CIST.

"I have found two more large pieces of quartz near this cist, both of heart-shape,[1] about 15 inches long and very heavy. I firmly believe them to have been worked and that the shape had a meaning."

Mr. J. Arthur Pott, M.A., F.S.A., with regard to the iron ornament mentioned from the round cist, has made the following observations. Avebury

[1] Or, rather, "shield-shape." (R. A. B.)

says, "Bronze brooches are very rarely found in the Bronze Age, but are common in that of iron."

Many early superstitions are connected with iron, *e.g.*, an object of this material, if placed upon a child's cradle, prevents spirits from stealing the occupant. Such superstitions suggest a reason for burying iron and other objects of metal with the dead.

Cæsar, Gallic War, v. 12, "There is very little iron in Britain, but the natives use disks or rings of iron made to a certain weight for money. Copper, which is imported, is also used. Lead (more probably tin) is found in the interior and iron on the coast (probably in Sussex). The Britons keep fowls and geese, but do not eat them. The Britons have communal wives" (*id.* v. 14).

The Druids reserved to themselves the monopoly of working in metal, and the occupation of an iron worker was therefore claimed by the primitive priesthood (Dr. G. Fleming, quoting Rossignol, Thierry, Eckstein and others). Possibly metals were buried with members of the priestly caste.

Joly and Avebury record that coffins of unhewn slabs are characteristic of the bronze and iron ages.

SECTION XXI

LOCALITIES WHERE ANTIQUITIES OF VARIOUS AGES HAVE BEEN FOUND IN CORNWALL

Of uncertain date.

Hill castles. Bartiné, Bosence, Caerbran, Castleandinas, Castle-anowthan, Chûn, Lescudjack, Lezingey, Trecrobben, Tregonning, Trevadoe.

Of uncertain date.

Cliff castles. St. Anthony, Boscajell, Bosigran, Carnidjack, Gurnard's Head, Maen Castle, Tolpedn-Penwith, Treryn.

Of uncertain date (perhaps made by neolithic "dolmen-builders").

Holed stones. Bolleit, Cairn Kenidjack, Men-antol, Rosmodreny, Tolven, St. Just Vicarage Grounds.

Palæolithic.

Prah Sands.

Neolithic.

Dolmens. Bosporthenis, Caerwynen, Chûn, Lanyon, Mulfra, Zennor.

Neolithic implements.

See Evans's "Ancient Stone Implements of Great Britain."

Bochym Cury, four greenstone celts.

Boscregan, pivot stone, button, leaf-shaped arrowhead; beads.

Brane Common, two whetstones (in barrow).

Carn Bre, (1) scraper from hut-circle, (2) flint knife, (3) flint lance-head, (4) flint arrowheads.

Falmouth, polished celt of diorite.

Kerris Vaen, part of granite mortar with channelled lip. (Doubtful.)

Pelynt, (1) perforated polished greenstone hammer (this may be of "bronze age"), (2) chipped celt.

St. Agnes, Truro, flint arrowheads.

St. Just, rough greenstone celts.

Tregaseal, whetstone (in a barrow) (this and the specimen from Brane Common may be of the bronze age).

Trevelgue, perforated polished axe of greenstone.

Truro, polished serpentine axe (made from a pebble).

Probably bronze or early iron age.

Circular enclosures and supposed British Huts. Bodennar Crellas, Bosporthenis (Beehive hut), Bosullow, Botrea Hill, Castallock Rounago, Chrysauster (British village), Kerris Roudago.

Stone circles. Boscawen-ûn, Boskednan, Borah, Botallack, Carn Yorth, Rosemoddress (Dawns Myin), Tregaseal, Tredennack, Zennor, Trereen, Liskeard, Carn Menelez.

(Perhaps anterior to Stonehenge, the date of which is now generally accepted as about 1600 B.C.)

Barrows (probably mostly bronze age). Boskednan, Boskenwyn, Bosphrennis, Carn Kenidjack, Chykarn, Kynance, Lady Downs, Portherras Cove, Trannock Downs, Tredinek, Cataclew, Harlyn (gold lunettes).

Monumental Pillars (probably of the date of the stone circles, and of the same epoch as Avebury, anterior to Stonehenge). (Pipers) Bolleit, Boswens Croft, Boshava, Boscawen-ûn, Ninemaids near St. Columb, Boslow "Longstone," Bosworthan, Brew, Chyanhall, Drift, Kerrow Hill, Pridden, Tregiffian, Treleu, Tresvannack, Trenuggo, Trevear, Trewren.

Bronze age.

See Evans's "Bronze Implements of Great Britain," p. 499. Angrowse Mullion, dagger with 3 rivets.

Camelford, stone mould for buckles.

Falmouth, ingot of tin like the letter H, weight 158 lbs.

Fowey River, bronze pin.

Harlyn, celt, dagger, pins, fibulæ.

Karn Bre, socketed celts, several; celts, expanding edge; long celts.

Kenidjack Cliff, palstaves and lumps of metal, and socketed celts.

Lanant, lumps of fine copper, broken socketed celts.

Launceston, socketed celt with parallel ribs.

Mawgan, hoard of celts with fine rapier; bronze saw.

Penvores, palstave with double loop.

Penzance, palstaves.

Redmore, fibula.

St. Austell, looped palstave.

St. Hilary, copper swords in fragments; lumps of copper; spearheads; celts.

St. Michael's Mount, spearheads, axes, and swords.

Early iron (late Keltic but pre-Roman) Period, after 200 B.C.

Harlyn graves (uppermost tier) and perhaps Trelan Bahow (mirror, fibulæ, glass beads).

Roman remains. (Whitley, "Roman Occupation of Cornwall," Journal Roy. Instit. Cornwall, Vol. V. 1895.)

Roads, stations uncertain.

Coins, Hayle (27 and others) Carnon, Pennance Farm, Falmouth (more than 1000), Carhayes (30); Carnbrea, Dalberry, Cadbury, Worlebury Castles; Long Bridge (9), Golvad-

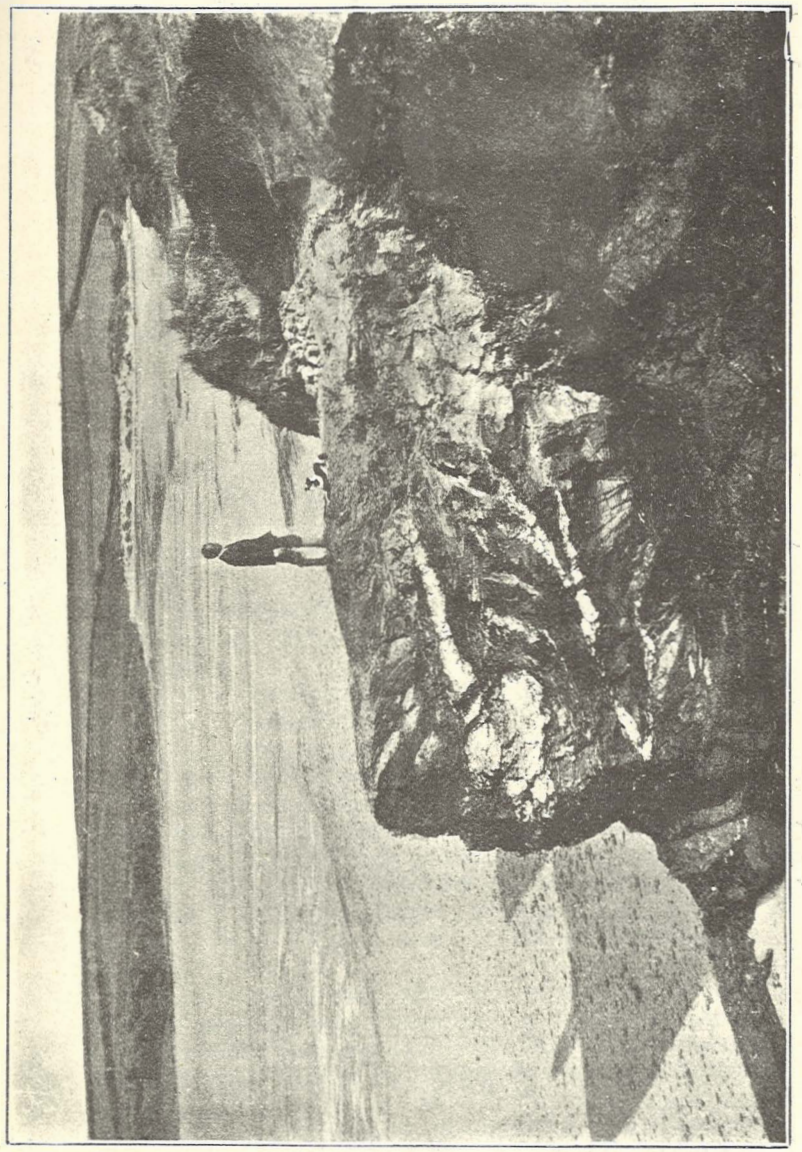


PLATE 19.—SITE OF THE DISCOVERY OF URN NO. 2.

nek, Bocadzhil (103), Treryn (brass pot full), Penrose (2 of silver), Condora S. entrance to Helford River (24 gallons of the reign of Constantine and his family); Constantine Creek, Helford (40); Malpas Ferry (20 lbs. weight of coins dated from A.D. 259—284); Buryan, St. Minver Sands (with personal ornaments and Samian ware).

Roman fibulæ, Trelay.
Roman armlet, near Bodmin (in a peat bog).
Roman urn, near Newquay.
Roman pottery, Carminow near Helston.

SECTION XXII

OCCURRENCE OF HELIX ASPERSA

Pre-Roman localities at which Helix aspersa has occurred.

Mr. A. Santer Kennard, F.G.S., has kindly given the following references to his own observations on this species.

1. Exedown, near Wrotham, Kent.
2. Greenhithe, Kent.
3. Newbury, Berks.
4. St. Catherine's Down, Isle of Wight.
5. Lea Valley, Essex.

He says that all but No. 4 are perhaps of the bronze age, but certainly pre-Roman; and that those from St. Catherine's Down are of the neolithic age.

Kennard ["Proceedings of the Malacological Society," Vol. II., p. 106; "On a Rainwash at Darenth"] says:—

"*Helix aspersa* has been recorded from several deposits and has been considered to have been introduced at that [Roman] time; but Mr. J. W. Flower, F.G.S., noted that it is constantly found in British Barrows in Wilts. . . . Mr. B. B. Woodward has also called my attention to the fact that it is recorded from deposits resembling 'kitchen-middens' on the shores of the Mersey, one mile from the present seashore, so that its pre-Roman existence in this country must be admitted."

Mr. W. J. Lewis Abbott, F.G.S., published an account of its occurrence in a neolithic kitchen-midden at Hastings, in "Natural Science," Vol. XI., p. 98, 1897.

It also occurs in a neolithic layer from the Holocene [and Pleistocene] deposits at Buckland, Dover (Bullen; Proc. Malacological Society, Vol. III., p. 163, Fig. II.).

Harlyn Bay and Constantine Hut may now be added to the above localities.

Since the second edition of this work was published the following additional information has to be added to the information about *Helix aspersa*, (Müller).

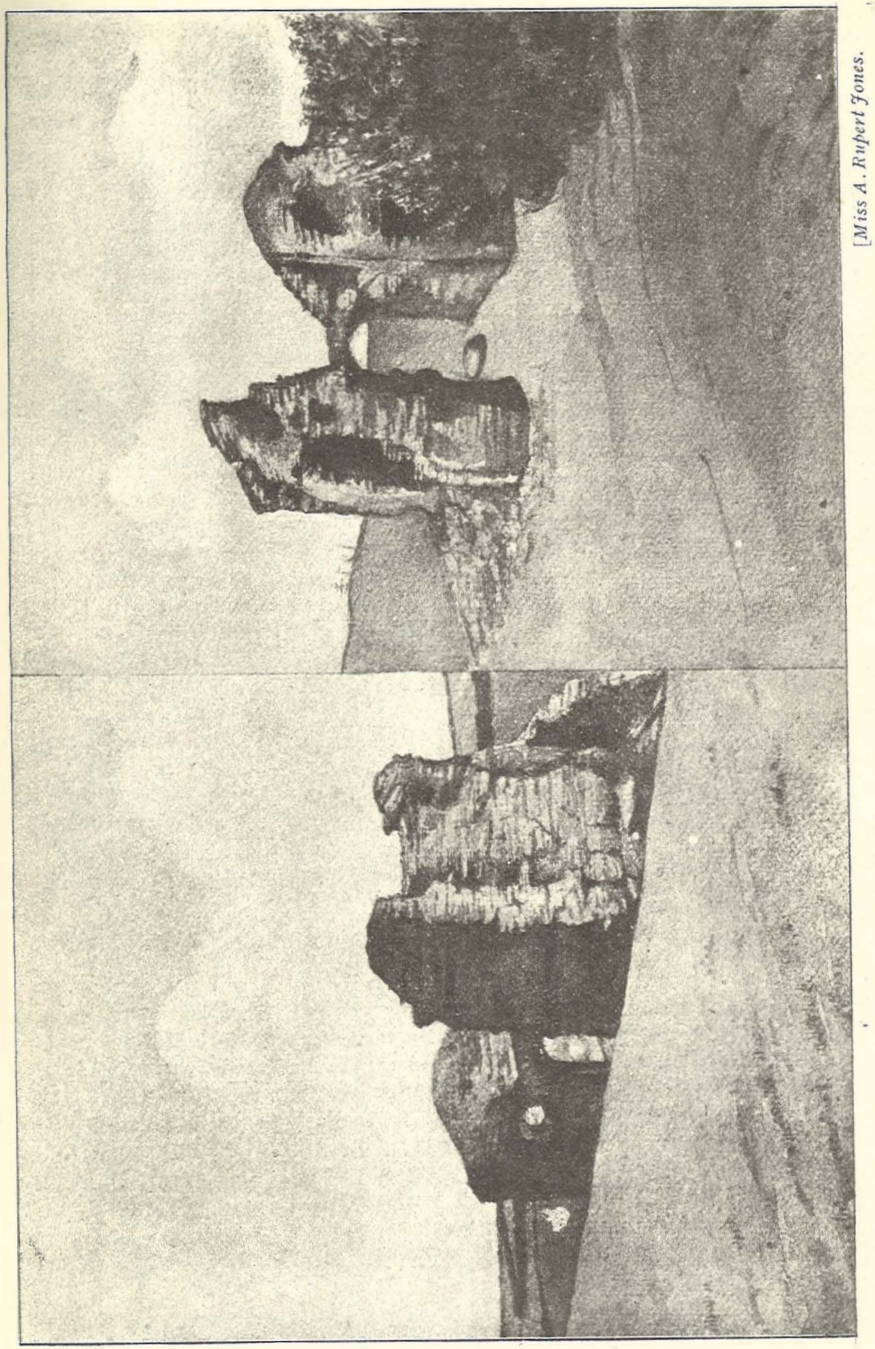
Mr. Santer Kennard has found it in an important deposit at Chudleigh, South Devon. From the associated fauna this deposit is Pleistocene. This is the first record of *Helix aspersa* in deposits of this date in the British Isles. It also occurs in the Pleistocene of Ballinamintrae Cave, Ireland.

Mr. Kennard considers it as common in all deposits of Roman Age in London. It is also recorded by him from the pre-Roman layer at Tooley Street, S.E.

SECTION XXIII

MINUTE MARINE SHELLS FORM THE PRESENT SEA-BEACH AT HARLYN BAY, CORNWALL

THE following marine shells, all young, were collected by Dr. Thelwell during visits to Cornwall in 1900 and 1901. He obtained them by floating off the dry sand from the small pools as the tide came in, and then sorted out his captures, a most fascinating amusement, which has resulted in the addition of the three species of *Pleurotoma* to the British list. They are not named in the list of Mr. Step, ed. 1901, but were exhibited by me at the Malacological Society on January 10th, 1902. They were identified for Dr. Thelwell by his friend, the late Dr. G. W. Chaster, of Southport.



[*Miss A. Rupert Jones.*

PLATE 20.—CONSTANTINE CHURCH, SHOWING SACRED STONE.

Tectura virginea (Müller). (1)
Helcion pellucidum (Linnaeus)
Fissurella graeca (Linn.)
Emarginula fissura (Linn.)
Cyclostrema serpuloides (Montagu)
Trochus tumidus (Mont.)
Phasianella pullus (Linn.)
Scalaria communis (Lamarck)
,, clathratula (Adams)
Natica alderi (Forbes)
Lamellaria perspicua (Linn).
Capulus ungaricus (Linn.)
Littorina rudis (Maton)
,, neritoides (Linn.)
,, obtusata (Linn.)
Lacuna puteolus (Turton)
,, divaricata (Fabricius)
,, pallidula (Da Costa)
Pleurotoma costata (Donovan)
,, brachystoma (Philippi)
,, nebula (Montero-sato)
Rissoa cancellata (Da Costa)
,, cingillus (Da Costa)
,, costata (Adams)
,, parva, variety interrupta (Da Costa)
,, punctura (Montagu)
,, reticulata (Mont.)
,, semistriata (Mont.)
,, soluta
Barleeia rubra (Mont.)
Adeorbis subcarinatus (Mont.)
Cerithium tuberculare (Mont.)
Bittium reticulatum (Da Costa)
Triforis perversum (Linn.)
Eulima polita (Linn.)
,, bilineata (Alder)
,, distorta (auctt). (2)
Odostomia rissoides (Jeffreys)
,, lactea (Linn.)
,, inconspicua
,, insculpta (Montagu)
,, scalaris, rare (Philippi)
,, pusilla (Phil.) (3)
,, spiralis (Mont.)
,, turrita (Hanley)
,, unidentata (Mont.)
,, Warreni (Thompson)
Defrancia linearis (Mont.) (4)
Lachesis minima (Mont.) (5)
Utriculus truncatulus (Bruguière) (6)
Philine catena (Mont.)
,, punctata (Clark)
Melampus bidentatus (Mont.) (7)
Otina otis (Turton)
Anomia ephippium (Linn)
Arca tetragona (Poli.)
,, lactea (Linn.)
Crenella rhombea (Berkeley)
Mytilus phaseolinus (Philippi)
Modiolaria marmorata (Forbes)
,, costulata (Risso)
,, discors (Linn.)
Lima subauriculata (Mont.)
Astarte triangularis (Mont.)
Lucina borealis (Linn.)
Montacuta ferruginosa (Mont.)
,, bidentata (Mont.)
Lasaea rubra (Mont.)
Tellina pusilla (Philippi)
Tapes virgineus (Linn.)
Venerupis irus (Linn.)
Cardium exiguum (Gmelin)
Psammobia tellinella (Lamarck)
Mya Binghami, rare (Turton)
Saxicava rugosa (Linnaeus)
Thracia distorta (Mont.)
,, papyracea (Poli)

(The following alterations depend on the principle of precedence adopted by the British Association in 1898, at Liverpool. As a result of Malacological studies the genera of molluscous animals, as of other organisms, is liable to change when good cause is adduced for the alteration.)

(1) Acmaea virginea
(2) Eulima incurva (Renieri). Sykes, "Notes on some British Eulimidae," *Proc. Malac. Soc.*, Vol. V., p. 350.
(3) Turbonilla pusilla
(4) Clathurella linearis
(5) Donovania minima
(6) Tornatina truncatula
(7) Leuconia bidentata

SECTION XXIV

BULLEN, "ON EOLITHIC IMPLEMENTS."

[From "*Transactions of the Victoria Institute*," Vol. XXIII. (1901), pp. 216, 217.]

Geological Period.			Geographical Conditions and Climate.	Fauna.
Holocene.	Modern.		Present day.	Present.
	Neolithic Age.		(3) Present day with addition of submarine forests round coast.	*Bos longifrons*, Owen.
Pleistocene.	Post-Glacial.	Palæolithic.	1. Wet epoch. 2. Cold and dry with glaciers. 3. Warm and moist.	*Bos primigenius*, Cuvier. *Cervus tarandus*, Linn. (5) *Elephas primigenius*. Blum. *Rhinoceros tichorhinus*, Cuvier. (6) *Elephas antiquus*. Falconer. *Rhinoceros megarhinus*, Christol.
	Glacial.		1. Increasing cold. 2. Submergence. 3. Marine boulder clay.	Arctic.
Newer Pliocene (1) (Lyell) Early (Older) (2) Pleistocene (Prestwich).		Eolithic.	Gradually growing colder. Mild at first (4).	(7) *Elephas meridionalis*, Nesti. *Rhinoceros leptorhinus*, Cuvier

NOTE.—*Elephas meridionalis* overlaps *Elephas antiquus*, as *E. antiquus* overlaps *Elephas primigenius*, but *E. meridionalis* and *E. primigenius* did not co-exist.

(1) Judd's *Student's Lyell*, pp. 182, 3.
(2) Prestwich, *Geology*, Vol. II., p. 442.
(3) Boyd Dawkins, *Early Man in Britain*, p. 254. Map.
(4) Judd's *Student's Lyell*, p. 170.
(5) Probably an immigrant from India. Scharff, *History of the European Fauna*, p. 253.
(6) Probably identical with *Elephas Armeniacus*. Scharff, *op. cit.*, p. 252.
(7) Agrees in all essential characters with *Elephashysudricus*. Scharff, *op. cit.*, p. 253.

Flora.	Synchronism with other regions.	
Present. Wheat, barley, &c.	1. Iron Age. 2. Bronze Age. 3. Polished Stone Epoch. 4. Chipped Stone Epoch.	North-American Stone Age South- " " " Melanesian " " Australian " " Egyptian (partly) " "
Partly Arctic.	Raised beaches and head. Low- and high-level gravels. Brixham Cave. Kent's Hole Cave. Cresswell Caves. Hoxne Gravel. Selsey Bill Drift.	(8) Loess of the Continent. (9) Belgian Caves. French Caves. German Caves, &c.
Arctic.	Moel-Tryfaen Clyde Drift.	(10) Scandinavia. North Germany. France. Italy. Spain Switzerland. North America. Nicaragua. North Africa.
Much as at the present day. (12) Gradually changing with increase of cold.	Plateau gravels. Dewlish. Cromer Forest-Bed.	(11) Pliocene of the Val d'Arno. Italy, and St. Prest., France.

(8) Prestwich, *Geology*, Vol. II., p. 483, and p 6. Table of Sedimentary Strata.
(9) *Ibid.*, pp. 498 and 504. "Cave Chronology."
(10) *Ibid.*, Chap XXIX.
(11) Prestwich, *Quarterly Journal of the Geological Society*, XLVI., 1890; "Westleton Shingle Paper," Part II., p. 174.
(12) Clement Reid, *Geology of the Country Round Cromer*, 1882. p 54. Oak, beech, elm, pine, fir, and yew occur.

Note.—The date of primitive man's appearance on this planet will always have a fascination for the human mind, but the sensational statements in the daily press are very, very wide of the mark. A

writer in a daily [1] paper recently put the appearance of Neolithic man at between 200,000 and 300,000 years ago. And drift man is put back from 700,000 to 1,000,000 years ago. And Pliocene man, if he existed, is put still further back. The calculations of Sir Joseph Prestwich, F.R.S., are well summed up in his remarks to the Victoria Institute the year before his death (1895). Combating the idea that the last days of the Glacial Epoch were 80,000 years ago, he says that, "in his opinion 10,000 to 12,000 is a more probable estimate. The American geolo-

FIG. 16.—SCRATCHED CELT OF DIORITE FROM MALTON, YORKS.

gists, upon quite different and independent data, have arrived at a similar conclusion. Among the reasons assigned by Mr. Warren Upham, one is the rate of erosion of some of the great waterfalls on that continent. Exception might be taken at this as the rate is known to vary considerably. This estimate would show that the Ice Age came to an end not more than 7,000 or 8,000 years ago. This may serve to give a minimum measure, but it serves to render more secure the other estimates which are somewhat in excess of this, and which would extend the time to 10,000 years." [2]

[1] The *Daily Chronicle*, October 17th, 1911

[2] *Journal of Transactions*, Victoria Institute. London. Vol. XXIX., p. 22.

The bulk of geologists are inclined to put the Glacial Age at about 16,000 or 17,000 years ago.[1]

I give an illustration of a polished celt of diorite found at Malton, Yorks, about 1894 or 1895, which is quite distinctly marked on both faces with what would be described by a good many persons as glacial striæ. (Fig. 16.) But it is inconceivable that this is a correct description of them. I showed the photograph to the late Sir John Evans, then President of the British Association, as we were coming to Liverpool on the Cunarder "Etruria" in October, 1897. He considered the striæ to be due to the scratchings of a harrow as the celt lay on or near the surface. Since the implement in question is stained with bilberry juice it would seem to have been lying on an uncultivated moor, when found. This at first made me hesitate to think that the striæ were so caused. But there is no reason why the present wild moorland may not have at one period been cultivated and the scratches caused as Sir John thought. At Shoreham, in Kent, the steep hillsides (now given over to pasture on which the common orchis has reappeared after being seemingly quite exterminated) were ploughed up to their summits when it paid to grow wheat, but have now reverted to their wild state. The plough terraces (lynchets) in Dorset, too, are in many instances uncultivated, and it is quite within the bounds of reason that the moors of Yorkshire were at one time more cultivated at spots which now show no evidence of cultivation.[2] We have to face the fact that other things than ice have been responsible for striating the surfaces of flints and other stones at other periods than the Glacial Age. Again and again have I brought flints from the Kent Plateau to Professor Prestwich, but he always refused to recognize them as ice-scratched. They came in useful, however, for filling up the holes in the garden paths.

[1] *Geological Magazine*, 1911, Decade V., Vol. VIII., p. 524. Review of "Draysoniana."

[2] The downs in Wiltshire and Dorset, which are now waste, must have been under cultivation during Romano-British times to support the population of the numerous villages which existed there, as shown by the excavations of the late General Pitt-Rivers. (A. S. K.)

SECTION XXV

SITE OF THE VILLAGE OR DWELLING PLACES, PROBABLY NOT ON THE SAME SPOT AS THE HARLYN BURIALS

WE have seen so far that Harlyn Bay was the burial-place of a tribe of pre-Roman Britons; the question is, did they live on the spot? Careful observations by Mr. R. Mallett tend, in his opinion, to show that they did. But so far, no traces of their dwellings have been found on the spot—although he has lately (1902) explored an unquestionable hut in the neighbourhood. However, as these would probably have been either of the nature of skin tents, or of wattle-and-daub, and therefore of a perishable nature, this is not surprising. Even if their buildings were of stone they would serve as a quarry for men of a later age and so be destroyed as so many on Dartmoor have been. For even in the interments, the garments in which the dead were buried have disappeared; the human bones being stained with the verdigris of the bronze fibulæ that fastened such coverings, where they rested against them.

It may be, however, that the men who made these graves lived in the neighbourhood seaward, and that the place of their habitation has been destroyed by the sea, and that the patches of implements discovered above the cists were left there for memorial and decorative reasons, just as the civilized inhabitants of Tasmania at the present day cover their graves with abundance of the brightest and most beautiful shells they can procure. On the whole, I am inclined to think that the actual settlement where the men lived has not yet been discovered.

Among most primitive tribes, notably among the North American Indians, who may be considered at the neolithic stage of culture, generally speaking, the dead are put out of sight, away from the village, and so anxious are they to be rid of the departed, that instances are on record of their being bent

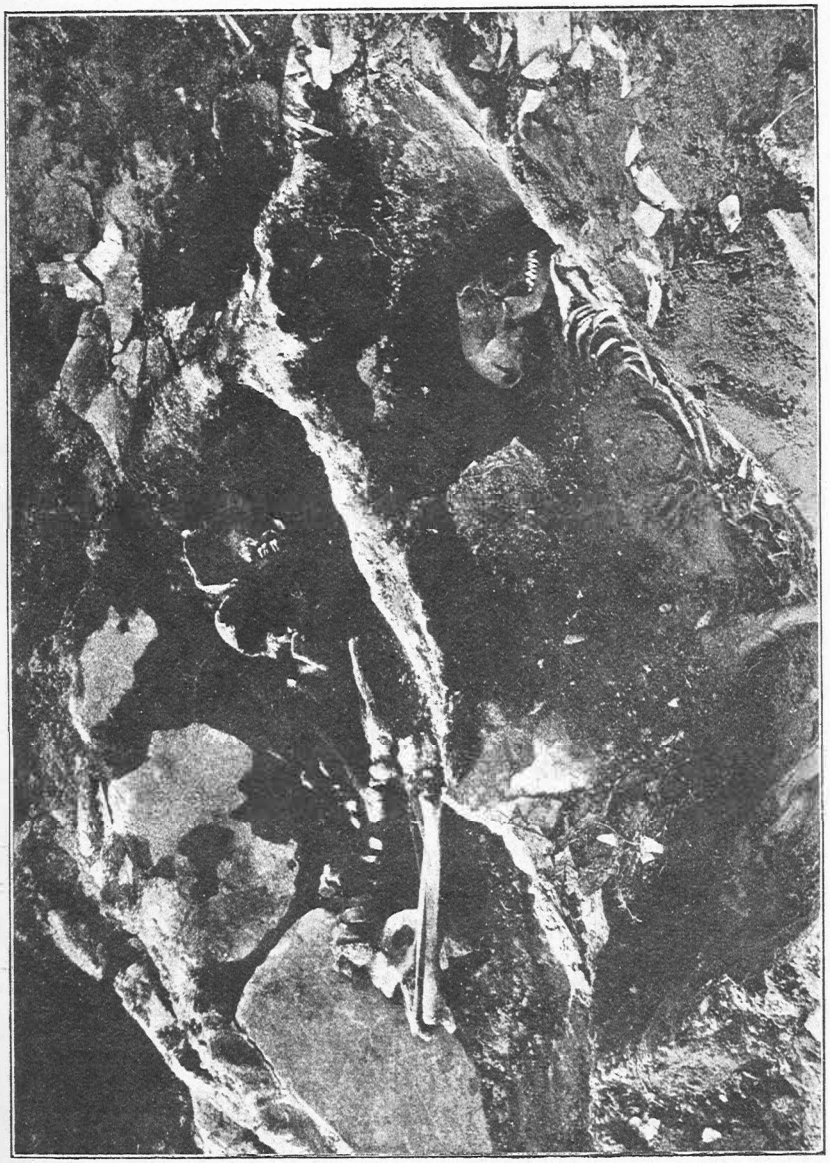


PLATE 21.—ROUND CIST.

into boxes, and carried into the forest before actual death.[1]

The Fuegians, when a person dies, carry the body *far into the woods,* "place upon it some broken boughs or pieces of solid wood, and then pile a great quantity of branches over the corpse.'[2]

Among the Patagonians,[3] about a year after decease the bones are "packed together in a hide and placed upon one of the deceased's favourite horses, kept alive for that purpose (the others having been slain at his decease), and in this manner the natives bear the relics sometimes *to a very great distance* until they arrive at the proper burial-place where the ancestors of the dead man are lying."

Without entering into a long and tedious discussion, we may say that the general desire of the living was to avoid the dead, and to locate them in some known place apart from human dwellings so that the living might not chance upon them unawares, which would be an ill-omened circumstance.

The following extract is interesting in this connection:

"In the savage[4] there is no tender clinging to the remembrance of the loved one who is deceased. The dead is at once transformed into a bugbear, who must be evaded and avoided, or cajoled by every available means.

"The dead is carried to his grave by roundabout roads, the way is swept or sprinkled with water to obliterate the traces by which the funeral convoy has gone. The door of the hut by which the dead passed is blocked up. To the present day in parts of Scotland the dead man's chair is turned upside down lest he should return and claim it.[5]

"The Czechs on returning home after a funeral, turn about at every few paces and throw stones, mud, even hot coals in the direction of the grave to deter the spirit from following them. . . .

[1] Brown, *Peoples of the World*, 1882, Vol. I., pp. 93—99.
[2] Admiral Fitzroy, *Voyages of the Adventure and Beagle*, Vol. II., p. 181, (quoted by Lubbock, *Prehistoric Times*).
[3] Fitzroy, *op. cit.* 158 (quoted by Lubbock).
[4] Baring Gould, *Deserts of Southern France*, Vol. I., p. 209. (This statement is rather sweeping!)
[5] In Hampshire (England) the opposite idea prevails. the chair is set and the door left open for the spirit to return to its usual haunts.

"The Californian Indians were wont to break the spine of a corpse so as to paralyse the lower limbs and make 'walking' impossible. Spirit and body to the unreasoning mind are intimately associated together. . . .

"The daubing with paint[1] and disguising of the person after a funeral, to the savage is simply a means of deceiving the returning ghost. The Coreans when in mourning assume extinguisher hats that completely conceal their features, for precisely the same reason.

"In New Guinea, for the same object, mourners envelope themselves in wicker-work frames in which they can hardly walk about."

All which emphasizes the idea expressed above that the Harlyn "settlement" and the "burial-place" were separate from one another.

SECTION XXVI

HYGROMIA MONTIVAGA, WESTERLUND, AND PROBLEMS CONNECTED THEREWITH

ALL my time and labour spent at Harlyn Bay has been amply repaid by the discovery of *Hygromia montivaga*, Westerlund.[2] (Fig. 17 and Plate 23.) This is a Lusitanian shell, and an entirely new record for England.[3] Our connection with Portugal dates to a time far anterior to the reign of Charles II.! The origin of the fauna and flora of England will always be a fascinating subject, and the new shell is a fresh link in the chain of evidence. Mr. J. P. Johnson has recently[4] discovered, near St. Michael's Mount, that curious underground "snail-slug," *Testacella maugei*—another Lusitanian species. This, however, is not the first time of its recorded

[1] So among the Patagonians, when preparing the deceased for burial by stripping the bones, the Indians, *their faces blackened with soot*, walk round the tent singing in a mournful tone of voice and striking the ground to frighten away the Valichus or evil beings (Lubbock, *op. cit.*, p. 431.)

[2] Scharff, *European Animals, their Geological History and Geographical Distribution*, 1907, p. 79.

[3] I have expressed my thanks elsewhere to Edgar A. Smith, F.Z.S., and B. B. Woodward, F.L.S., etc., and Dr. Böttger, for their kindness in identifying this shell. *Proc. Malac. Soc.*, Vol. V., p. 188.

[4] *Geological Magazine*, January, 1903, p. 28.

appearance in Britain, but is an extension of its ***habitat*** to the south-west of England. In the south-west of Ireland, near Kenmare, occurs a beautiful slug — *Geomalacus maculosus*, also a Lusitanian species. Edward Forbes explained "the origin of the plants and animals of the British Isles on the hypothesis that they were all diffused from a common centre, and that consequently they must have been disseminated when these islands were continuous with those countries where the identical species were

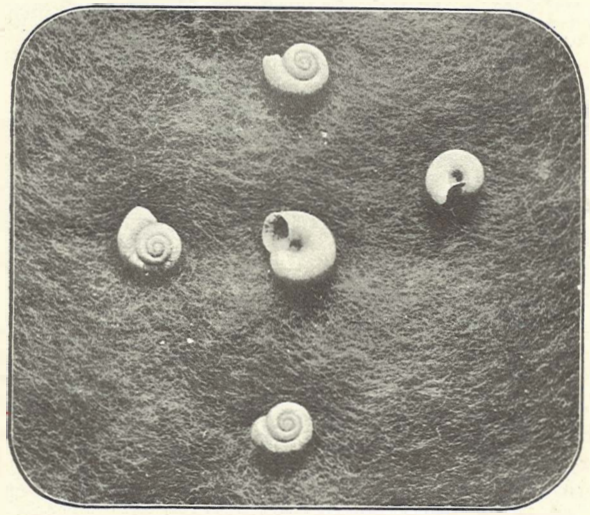


FIG. 17.—HYGROMIA MONTIVAGA, WESTERLUND.

found. He brought forth geological evidence to support his assertions, and even went so far as to point out the fact that at one time, and that recently, dry ground existed between the S.W. portions of the British Isles and America."[1]

According to Dr. Scharff, Edward Forbes held "that the Lusitanian[2] element of the British flora

[1] E. Forbes, Memoirs Geol. Survey Gt. Britain, &c., Vol. I., 1846, pp. 336, *et seq.*, and Scharff, "History of the European Fauna, 1899, *passim* (in the *Contemporary Science Series*, Walter Scott Publishing Co.).

[2] The term "Lusitanian" indicates south-west Europe and north-west Africa. From this centre, and probably from now sunken land to the west of it, issued a fauna and flora of which we have abundant evidence in our own islands, especially in Ireland. *Scharff, op. cit.* p. 308.

was of Miocene age, and that it survived the glacial period in this country." Among mollusca common to Britain and south-west Europe, he instances *Pyramidula rotundata* as occurring in Miocene fresh-water deposits near Bordeaux. This hardy little snail has since flourished throughout Britain and Europe and it also occurs in the Azores.

One indication of the antiquity of a species is its "discontinuous distribution." Applying this principle to several of our British terrestrial mollusca Dr. Scharff has reduced Forbes' ten molluscan provinces to two:—

1. England and Wales (except south-west).
2. South-west England and Wales, and the whole of Scotland and Ireland.

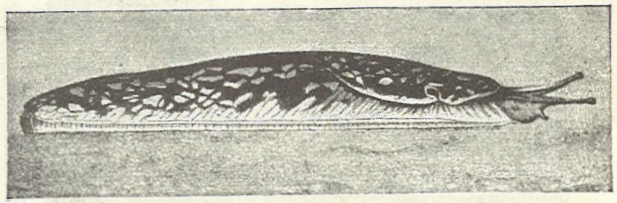
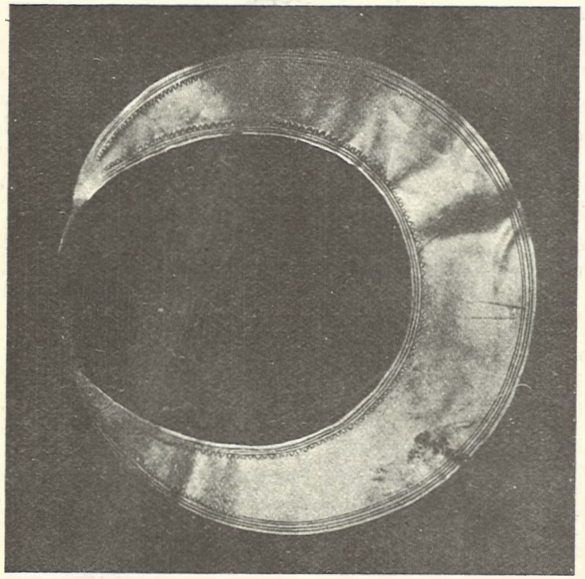


FIG. 18.—THE KERRY SLUG.

In this second division six species occur which are wholly absent from the first. These six are all members of the "Lusitanian" fauna in the broad sense of the word.

They are:—*Geomalacus maculosus*, Allman, *Testacella maugei*, Férussac, *Helix pisana*, Müller, *Hygromia revelata*, Michaud, *Helicella barbara*, (Linn.), and *Lauria anglica*, Fér. (=*Pupa ringens*, Jeff.). The importance of the discovery of a new locality of a known Lusitanian species nearly allied to *Hygromia revelata* is at once apparent. Moreover, it occurs in the lowest stratum at Harlyn Bay, namely, the clay and rubble close to the underlying Devonian slate rock, and from its occurrence in that position it is probably to be reckoned as of Pleistocene age. The following table [1] gives the extension in space

[1] The table is compiled from the Distribution List of the Conchological Society contained in Lionel Adams' *British Land and Fresh Water Shells*, 1896; Lovell Reeve's *British Land and Fresh Water Mollusks*, 1863; and Mr. B. B. Woodward's authority, the last for *Helicella barbara* only.



[*G. Penrose.*

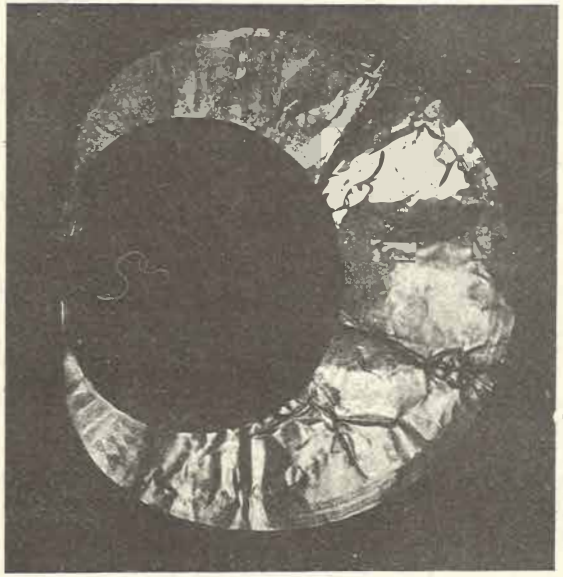


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PLATE 22.—GOLD LUNULÆ, HARLYN CLIFFS.

of the above six recent species as far as I have been able to ascertain it.

Species.	Locality in British Isles.	Locality in Lusitanian Province.
Geomalacus maculosus, Allman.	Valentia (Cork), Lough Carrough (the place of discovery in 1842), Cloonee, Darynane, Berehaven, Glengariff.	Portugal.
Testacella maugei[1] Férussac.	Clifton (near Bristol), St. Michael's Mt., S. Ireland, Jersey, Dorset, Middlesex, Berks, West Gloucestershire, Glamorgan, Pembroke, Waterford.	Portugal, Spain, Canary Islands.
Helix pisana, Müller.	St. Ives and Whitsand Bay (Cornwall), Tenby and Manorbeer (S. Wales), Louth, Meath and Dublin Bay, Jersey.	Portugal, Spain, S. France, Italy. N. Africa, the Azores, the Canaries.
Hygromia revelata. Michaud.	Torquay, Plymouth (Devon), Mevagissey, Pendennis, Land's End, Scilly Isles (Cornwall), Channel Isles.	France.
Helicella barbara, Linn.	Portland, Cornwall, Iona (Scotland), Isle of Wight, Eastbourne, Abergele (N. Wales), Tenby (S. Wales), Cork and Portmarnock (Ireland).	South and West Europe.
Lauria anglica, Férussac.	North and West Scotland. North England, Ireland, Anglesea, Channel Islands.	Cintra and Oporto, Portugal and Algeria.

In discussing the subject of faunal emigration, Dr. Scharff considers that wood-lice, spiders, land snails, and slugs require a land-bridge to convey themselves to an outlying island. He quotes Darwin's experiments and those of Baron Aucapitaine as showing this necessity.[2]

[1] *Testacella maugei* was found fossil in the Holocene of Porlock Weir, Somerset, by Mr. Loydell. I should think that it was introduced into Middlesex and Berks (see Taylor's monograph). *Helicella barbara* is common over nearly the whole of Ireland. *Lauria anglica* occurs in France (Ile de Ré), and is common in Ireland. It has a wide distribution in England. (A. S. K.)

[2] Scharff, *op. cit.*, pp. 14—17. The introduction especially treats of the migration of animals from mainlands to islands.

Darwin immersed *Helix pomatia* in sea water for 7 days, and again put it in for 20 days, and each time it perfectly recovered. During that time it might have been carried with an average ocean current, say on timber, 660 geographical miles, about 700 English miles. Darwin then removed

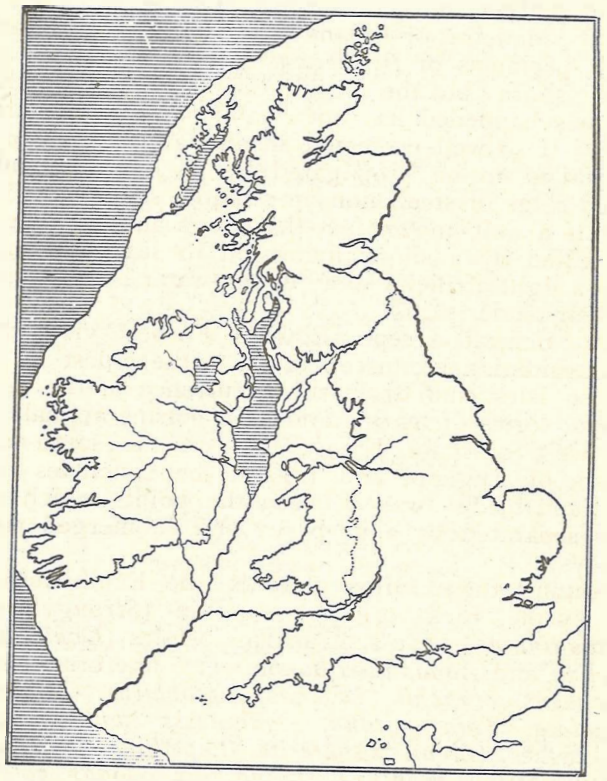


FIG. 19.—MAP OF BRITISH ISLANDS WHEN THE EARLIER MEMBERS OF THE SOUTHERN MIGRATION REACHED ENGLAND.

the calcareous hibernaculum and, when it had formed a membranous one, immersed it another 14 days, and it again recovered and crawled away.

Aucapitaine's experiments were with 100 shells of 10 species, placed in a box pierced with holes, and immersed in sea water for 14 days: 27 recovered. Among these out of 12 *Pomatias elegans*,

11 revived. *Pomatias elegans* was better protected than the other varieties, because that species possesses an operculum.

Here, then, there is positive evidence that *H. pomatia* and *P. elegans* might be transported to an island from the mainland.

Yet neither of these species inhabits the Canary Islands, Madeira, or Ireland. On all sides of Ireland dead specimens of *P. elegans* have been picked up on the shore ; but the species during all the centuries this has happened has not established itself in Ireland. If so well protected an animal as *P. elegans* has failed to be propagated by sea, what chance would slugs or small non-operculated shells have?

It is a well-known fact that slugs and their eggs are killed by a short immersion in sea-water, and even a light artificial spray of sea-water is too trying to their tender skins.

Dr. Scharff accepts Edward Forbes' view that the Lusitanian molluscan fauna is the oldest in the British Isles, and, from the occurrence of the same littoral forms of marine and semi-marine animals on the west coast of France and on the south-west coasts of England and Ireland, he concludes that the land-bridge was between the points which are now separated by a deep sea and submerged river valleys.

Among these forms there is one Echinoderm—the purple, rock-boring, sea-urchin (*Strongylocentrotus lividus*) ; two semi-marine beetles (*Ochthebius lejolisii* and *Aepophilus bonnairei*) ; five crustaceans (*Achaeus cranchii, Inachus leptochirus, Gonoplax angulata, Thia assidua, Callianassa subterranea*) ; two fishes (*Blennius galerita, Lepadogaster decandollii*) ; three molluscs (*Otina otis, Donax politus, Amphidesma castaneum*).

Scharff's reasons for believing this land-bridge to have existed seems unassailable: —

1. Common shore forms migrate along the coast just as land animals do.
2. Their eggs are carefully attached to fixed objects.
3. The young remain and grow old in some particular rock-pool, rarely venturing but a few yards from the spot where they first saw the light of day.

The case is strengthened by the fact that a millipede (*Polydesmus gallicus*) exists in Ireland, France,

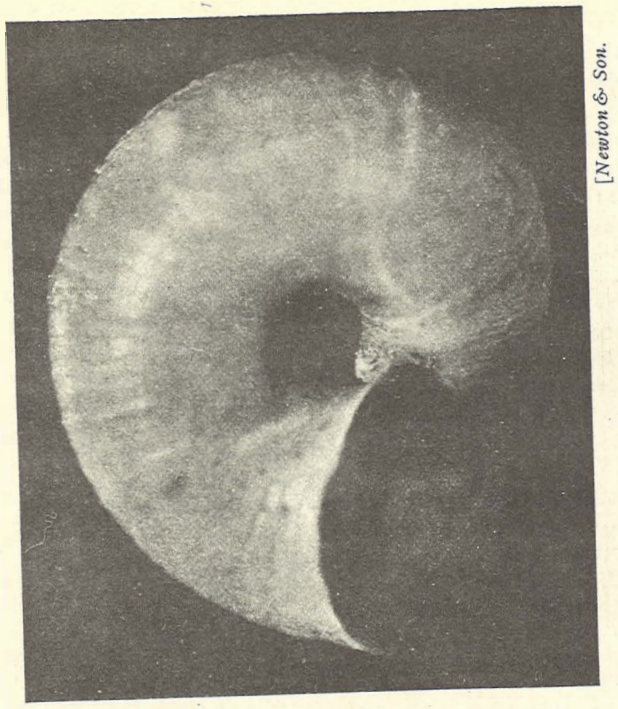
and the Azores ; two earthworms (*Allolobophora veneta* and *A. georgii*) occur in Ireland, Spain, and the Mediterranean region ; a weevil (*Otiorrhynchus auropunctatus*) in Ireland and France, south of the

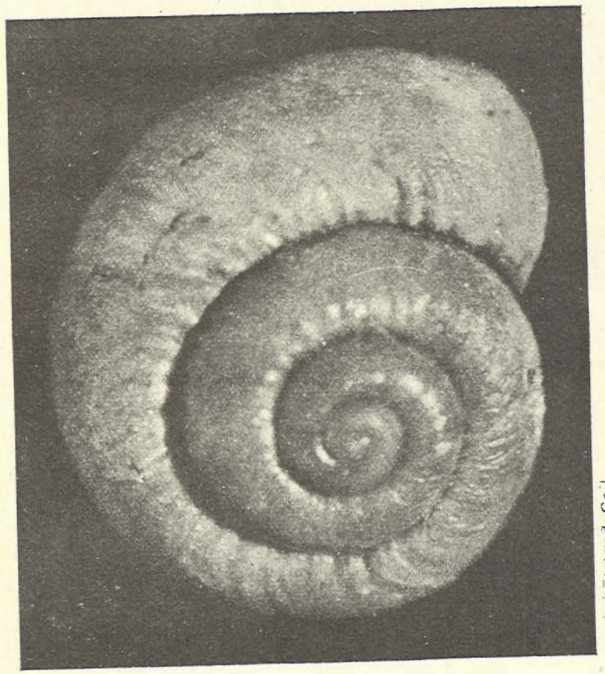
FIG. 20.—MAP OF BRITISH ISLANDS WHEN THE SEA HAD PROBABLY INVADED THE COUNTRY FROM THE EAST IN OR BEFORE THE PLEISTOCENE PERIOD.

Auvergne Mountains (see also Chapter VII. of Scharff, *op. cit.*).

Reasons for believing that a land-bridge stretched across the Atlantic come from a somewhat unexpected quarter.[1] Dr. Alcock instances one of the weevers, known as *Bembrops caudimacula*, Stdnr.,[2]

[1] Alcock, *A Naturalist in Indian Seas*, 1902, p. 120.
[2] Steindachner.





[*Newton & Son.*

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PLATE 23.—HYGROMIA MONTIVAGA, WESTERLUND. × 12 DIAMETERS.

as occurring in Japanese waters, from which locality it was named by Steindachner in 1877 ; it was discovered in 1880 in the Gulf of Mexico, not recognized and renamed by Goode, *Hypsicometes gobioides*. Some years after it was discovered off the Madras coast and again received a name. "Seeing that it is a ground fish its occurrence in three regions so utterly remote . . . requires a special explanation. My own opinion," he says,[1] "is that the curious range of this fish, which is by no means an isolated instance, can only be explained by the assumption of a continuous sea and shore connecting those points at some former geological period."

If a ground-fish require a continuous coast line at a former geological period to account for its present habitats, the case is much stronger for littoral invertebrata, and stronger still for terrestrial mollusca.

The map, Fig. 19, explains how the Lusitanian species immigrated into our islands, and the map, Fig. 20, helps to account for their present "discontinuous distribution."

[1] *Ibidem. loc. cit.*

APPENDIX A

I SUBMITTED the specimen of Cataclew Rock to Mr. F. W. Rudler, I.S.O., F.G.S., in 1904, and after examining it and also consulting Dr. Flett, F.R.S., then petrologist to the Geological Survey, he pronounced it to be Vogesite, one of the Lamprophyres. He says that these occur as intrusive rocks, either dykes or sills. The Cornish dykes have often been included under the name of "greenstone," and many have been called "mica-traps."

Vogesite = kersantite with hornblende or augite.

Lamprophyres = rocks intermediate between diorites and andesites (diorite-porphyries).

Note.—The green and dark kinds of eruptive rocks have hornblende or augite predominant, while the reddish ones owe their colour to the abundance of felspar on their composition. Gustav Rose found that, in fusing a mass of hornblende, it uniformly became augite on cooling.

Kersantite: a *biotite* porphyritically developed in a greenish grey matrix, consisting mainly of oligoclase and occasionally occurring as well-developed little crystals.

Hornblende: one of the most abundant simple minerals of which rocks are composed, the others are felspar, quartz, mica and calcic carbonate.

Augite: Rammelsberg analyses it as containing 51 parts of silica, 3 of alumina, 6 of iron, 13 of magnesium, 3 of manganese, and 24 of calcium. The name comes from auge, brilliance; augites, a precious stone, turquoise. But the scientific term augite now means the rock composed as analysed above.

Andesite: its colour varies from white to grey, yellowish, flesh-red. Its lustre is sub-vitreous to pearly. Silica, alumina, sesquioxide of iron enter into its composition.

Diorite: dioros, a divider. A granite-like rock consisting of hornblende and albite. Greyish-white

or nearly black in colour, it is unmistakable, or clearly defined, as distinguished from dolerite.

Dolerite: doleros, deceptive. It consists of labradorite plus pyroxene with generally some magnetite. It is a light red, crystalline, granitoid, dark-coloured, massive porphyrite, sometimes a crypto-crystalline and cellular lava.

Porphyry: porphura, purple. Originally applied to a rock with a purple-coloured base, with enclosed individual crystals of felspar; the term is now used as a generic name for all rocks consisting of a felsitic base, with felspar crystals.

Biotite: named after Biot, a French naturalist. A hexagonal and an optically unaxial mineral, formerly called Magnesia Mica, Hexagonal Mica, and Uniaxial Mica. It exists in tabular prisms, in disseminated scales, or in massive aggregations of cleavable scales. Its components are silica, alumina, sesquioxide of iron, manganic oxide, potassa, water, iron and titanic acid.

The above statements are from Lloyd's (formerly Cassell's) "Encyclopædic Dictionary," compiled by Dr. R. Hunter, LL.D., F.G.S., and other scholars from the works of the most eminent scientific men of the day.

APPENDIX B

THE NEWLY DISCOVERED PREHISTORIC "BURIAL FIELD" NEAR WORMS

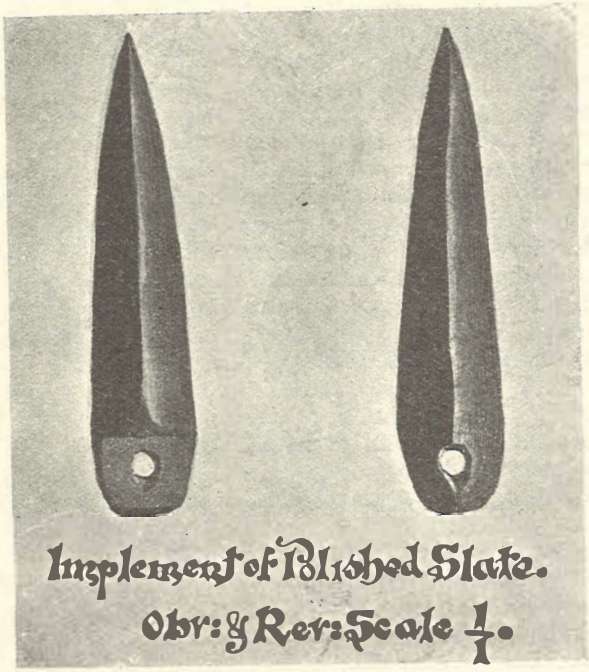
(From the German Illustrated Newspaper "Ueber Land und Meer," No. 4, January, 1901; published at Stuttgart.)

WORMS, famed in our hero-sagas as the glorious old city on the left bank of the Rhine, has been strangely blessed by fate in the evidence still afforded to her of her famous past. The well-known Paul Museum offers a collection, unique of its kind, of Roman and early German antiquities; but now the very earth of the old "wonnegaus" (sweet meadow) has even in the immediate vicinity of the town afforded a "find" which carries us far back beyond

historic times, and which proves that Worms was chosen as a popular place of settlement from the earliest ages.

In 1896 on the North side of the town, only about 200 yards West of the Rhine, a "burial-field" of the Stone Age was disclosed; and now only a few weeks ago on the so-called "Adlerberge," south of the town, on the road that leads towards "Frankenthal," but a very few steps from the Bavarian frontier, a circle of ancient graves has been laid bare, which, if appearances are not very deceptive, date from the end of the Stone Age, or the beginning of the Iron Age, and are in point of time in all probability the direct successors of the Stone Age tombs.

These tombs are particularly interesting as examples of so-called "crouched" burials; that is to say, all the skeletons are found in a crouching attitude, and were unquestionably buried in that position. This place "Adlerberge" is of moderate elevation, and of diluvial formation, and was already known to have been the site of prehistoric settlement; traces of a large number of cave-dwellings have been found there, although with but meagre contents, such as earthenware vessels, or rather "pot-sherds," remains of stone and bone implements, and scattered fragments of household stuff. Still, everything points to the conclusion that these dykes, a few yards in width, and not very deep, once carried huts built of stakes and faggots, which on one side, as is clearly shown by the traces that may yet be seen, were provided with a coating of clay as a better protection from wind and weather. This colony must have been inhabited during long periods of time, from the end of the Stone Age, and beginning of the Iron Age, right down to the later Bronze Age. It can hardly be doubted that the tombs now discovered in the "Adlerberge" are connected with this settlement, and all indications lead us to believe that they both date from the same period. Amongst the smaller objects found in the "crouched" tombs are—vessels of pottery, pierced pendants, bone beads and needles, flint knives, axe-handles of staghorn, and especially a three-cornered weapon, known as the triangular dagger. Although the chemical



[A. M. Bullen.

PLATE 24.

metallurgy of this article has not yet been definitely pronounced upon, still there can be no doubt that it is one of those objects in metal, so rarely found hitherto, either of copper, or of bronze with a very slight admixture of tin, which is a clear proof that it belongs to a transition time between the stone and metal ages, to which period the remaining items of the discovery also point.

As concerning the "crouched" position of the skeleton, it seems clear that the limbs were folded together in this position soon after death, and were kept so by being bound with cords. The reason of so strange a proceeding need not be considered; it may have been a race habit, or even a religious custom; evidently it was not done to economise space, as, in the older burial-fields of Worms, we find corpses stretched full length, whereas, on the other hand, "crouched burial" seems to have continued almost down to the Christian epoch. The race to which these corpses, of which 23 have been exposed at Worms, belonged proves to have been of a very strong and powerful build, the men being from 1·75 M. to 1·90 M. in height—(*i.e.*, from about 5 feet 9 inches to about 6 feet 3 inches). Their chief pursuits seem to have been hunting and fighting, as may be judged from the contents of the men's graves; well-wrought flint arrow-heads, an axe of staghorn as well as the iron dagger. One "find," near the top of the grave where there were no weapons, was most remarkable; it was a highly-polished reddish stone, which on closer examination proved to be a lump of oxide of iron.[1] Can it be that the dwellers on the "Adlerberge," near Worms, had practised the same custom as the "Nadovessier," to whom Schiller attributes in their death-lament these words:

> "Colour, too, to paint the body,
> Lay ye in his hand,
> That with red he be resplendent
> In the spirit land."

It almost seems to be so, and the analogy is striking, too, between these "crouched" skeletons and

[1] A lump of ruddle was found at the second urn or burial at Harlyn Cliff, and lumps of similar material in three cists at Harlyn burial-ground.

the ancient Peruvian mummies, embalmed and rolled up into a ball, with their artificial heads and cowering fully-dressed bodies. Traces of interment in wooden coffins or coffin-like shells are at least indicated amongst the "crouched" tombs, in that of a woman in whose tomb five small saw- or knife-like implements were found.

Apparently the "crouched-burial" belonged to a tribe who took possession of a colony remaining over from the Stone Age; it may be that they took it by force. In any case they carried on the arrangements already existing, and their burial-ground was laid out in the immediate vicinity of that belonging to the Stone Age.

The Stone Age colony on the "Adlerberge," as has now been demonstrated in the clearest manner by its graves and what was found in them, belongs to a later period than that discovered to the north of the town in 1896; so that it forms a link between the first well-authenticated settlement in the vicinity of Worms and that of the "crouched-burial" people who entered into their heritage.

APPENDIX C

IN the course of the work of laying out new golf links at Sunningdale an interesting discovery has been made by Messrs. J. D. Craig and Son, of Camberley, to whom the work was entrusted. The links in question are situated on what was formerly known as the Ridge Mount Estate, about half a mile from the Sunningdale Railway Station. On the site was a mound about 10 feet in height from the ground and about 40 feet across, and on coming to this Mr. Wallace Craig formed the opinion that it was an artificial hill which had originally been made by carting material there. This mound it was decided to level for the purpose of making a teeing-off ground for the ladies' links. Mr. J. D. Craig was superintending the work, and on the mound being touched it was found to contain very ancient burial urns. Realising the nature of the find Mr. Craig at once communicated with the authorities of the Reading Museum, and subsequently Mr. O. A

Shrubsole, F.G.S., the curator of the Geological and Anthropological Department of that institution, with Mr. Colyer, the assistant curator, proceeded to Sunningdale, where they found that three urns had been disinterred by Mr. Craig. It was decided to proceed with a careful examination of the mound, and since then 17 further urns have been unearthed and removed, all of them containing calcined human bones. In addition to these the excavators found indications of two interments of ashes not deposited in any urn, but which are supposed to have been enclosed in a cloth which had since decayed.

EXPERT OPINION

In a report on the matter the Reading Museum authorities, who have taken a keen interest in the discovery, say: "All the vessels contained small fragments of bone with carbonaceous matter and soil, indicating in each case that the body had been cremated, and a portion of the ashes had been placed in the urn and covered up by earth. In eight cases the urns were found in an inverted position; as such positions would be unnatural and troublesome, it may legitimately be held to indicate a fear lest the spirit of the dead person should escape from the urn. Such indications are not unusual in ancient burials. Among imperfectly civilised races there is frequently a strong disposition to fear or to propitiate the spirits of the dead. The mound itself is distinctly artificial and circular in form, the diameter is 75 feet, but probably this has been increased by the washing down of the soft sandy soil of which the mound is composed. The present height is 6 feet, but it was doubtless originally higher. The urns were generally about a foot from the present surface, and appear to have been deposited in a systematical manner about 3 feet apart, near the centre of the mound, but inclining to the Western side.

"From the imperfect condition of several of them it is likely that the mound may have been disturbed in ancient times. Accidents might have even occurred at the time of the burial of some of the urns. In one case an urn was found slightly overlapping one which had been previously deposited. The crust

of the urns in almost every case is of clay baked red, and strengthened by fine flint grit.

AN ANCIENT CREMATORIUM

"They are all rudely hand made, and only a few bore any ornamentation. It is obvious, therefore, that we have here a cemetery—the remains of an ancient crematorium (?) The size of the urns might be thought to indicate the importance of the deceased person, yet one interment was apparently thought of sufficient importance to have a funeral mound to itself. We have, therefore, evidence of a settled community living near the spot. It is of interest in connection with this that there is an ancient earthwork about a furlong south-east of the mound.

"It being important to ascertain whether the tumulus contained any earlier interment a further two days' investigation was made by Mr. Shrubsole. For this purpose a trench was cut from north to south through the centre of the mound, but nothing whatever was met with. The soil was composed of the sand of the Bagshot beds with occasional traces of carbonaceous matter, and a few split pebbles. Cross cuts were also made from east to west, and the centre was dug for a depth of two feet below the original surface of the ground. The result is therefore taken to show that the mound was raised simply as a receptacle for the urns deposited in it."

OF ANCIENT BRITISH MAKE

Mr. Shrubsole, in his report, says: "The urns are all of rude British make, and may, therefore, safely be ascribed to time before Britain came under the Roman influence. In the absence of any vestige of a weapon or ornaments the exact age of the burials cannot be determined with certainty, but from the shape of the mound, the care evidently exhibited in the disposal of the dead, and the evidence of a village community, we should not be far wrong in saying that they belong to the age of Bronze, and probably to a late rather than an early date in that age in this country. Here, in fact, were deposited the remains of 'the rude forefathers of the hamlet.' Some of the urns are 1 foot 4 inches in diameter. Other ashes were not thought worth any urn at all.

[A. M. Bullen.

[A. M. Bullen.

PLATE 25.

A few ashes were deposited with some rough pieces of sandstone, and in one case a slab of conglomerate from the gravel marks the site. Another such slab was noticed in the surface soil of the mound. The split pebbles may have been symbolical.

"It should be stated that in addition to what disturbance the site may have suffered in ancient times, the top of the mound was levelled about seven years ago. This will account for the imperfect condition of the urns—the inverted ones having lost their bottoms and the others having the upper part injured. In connection with this matter it is of interest to note that the modern crematorium at Woking is only a few miles distant, which shows that some of our ideas have been anticipated in early times."

The spot has, of course, been visited by many archæologists from various parts of the country, and they estimate the burials as having taken place any time between 2,000 and 6,000 years ago, while all go so far as to suggest that the site was that of a battle in pre-Roman days. One authority has expressed the opinion that by digging and trenching further the remains of the actual fire by which the cremation was effected will be found.

WHERE THE URNS ARE TO BE SEEN

In all, therefore, twenty urns have been unearthed, and of these some have been sent to the British Museum, the Reading Museum, Oxford, and the Louvre (Paris). One has been kept and put under a glass case at the Sunningdale Golf Clubhouse, whilst Mr. Wallace Craig has two very fine ones at his residence, High Street, Camberley.

APPENDIX D

BIBLIOGRAPHICAL REFERENCES TO CORNISH ANTIQUITIES

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Summary.

No Roman stations in Cornwall; no Roman roads; yet the Romans not only visited Cornwall, but there was some amount of occupation by them, probably in the form of trading ports.

Evidence for the presence of the Romans in Cornwall is simply—that Roman coins have been found at twenty localities, in some half-dozen cases only taking the dimensions of hoards;—that there are earthworks which may be Roman;—that on the estuary of the Camel the occurrence of pottery of Roman date with other relics seems noteworthy; that there were similar occurrences at Bosence and St. Hilary; that there are two so-called miliary stones in the county, namely, one at St. Hilary, and one at Tintagel. (The so-called Romano-British relics from Trelan are pre-Roman. So also are the so-called Roman celts.)

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APPENDIX E

PLUNDERING OF GRAVES

FROM "Popular Studies and Mythology and Folk Lore."

No. 3. Ossian, by Alfred Nutt, p. 20. "The Agallamh na Senorach, or Colloquy of the Elders." (Post 12th century Irish Literature.)

"The book is a chaos of local legends connected only by the fact that all are put in the mouth of Caoilte, the last survivor of the Fenian Band, and are related by him either to Patrick or to various chieftains with whom he takes up his quarters."

P. 57, note. "A common 'motif' in the colloquy is the opening of a warrior's grave and the rifling of its treasures. Eight such instances occur in the Book of Lismore version. I cannot help connecting this fact with the well-known grave-rifling practices of the Norse invaders."

APPENDIX F

LYONNESSE: GEOLOGICAL CONSIDERATIONS

AS against the view of the article from the "Strand Magazine" quoted in Section XII of this little work, it should be stated that the evidence given there is mainly traditional; and, as Ussher says,[1] "traditions of a more extensive coast-line, of lands now swept away, have been handed down, magnifying the extent of the ancient land, as the account passed through succeeding generations."

The large number of raised beaches in Cornwall[2] taken together with the submerged forests at Looe, Fowey, Mounts Bay, Falmouth, and other places[3] shows, of course, that there have been extensive changes of level; but these, so far as the evidence

[1] Ussher, *Geological Magazine*, 1879, p. 28.
[2] *Ibid.*, p. 203 and following pages.
[3] *Ibid.*, p. 251.

is determinable accurately, are of late pleistocene date and anterior to the advent of neolithic man.

Mr. Ussher's chart of the sea between the Land's End and beyond Scilly shows the contour of the sea-bottom from the 5 fathom line to the 50 fathom. The only continuous one which *connects* Scilly with Cornwall is the 40 fathom line. This covers a large area of the sea-bottom, much larger indeed than the 227 square miles mentioned in the article from the "Strand Magazine."

But when we consider that the oscillation of the land surface as measured by the vertical height of the raised beaches above the mean sea-level, and the submerged forests below the same, is less than 100 feet, the 240 foot submergence demanded by the traditions of Lyonnesse, an event supposed to have taken place only a few hundred years ago, *i.e.*, within the recent and historic period, is a somewhat large demand upon our scientific imagination.

Ussher's article is worthy of attentive study, as it is quite impartial in marshalling the evidence, pro and con.

APPENDIX G

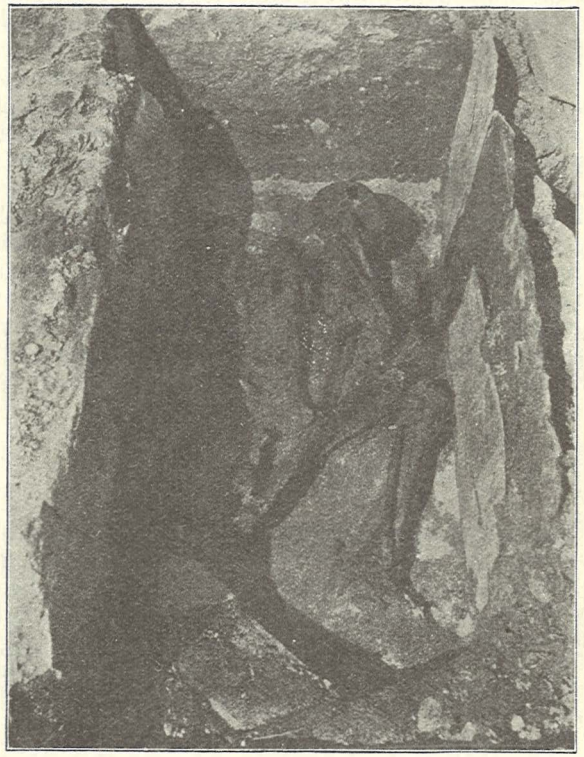
THE following important letter is the one alluded to on page 27, and was the result of the work done by Professor Haddon in 1905, at a time when he was very busy just before the meeting of the British Association in South Africa in that year. It gives the opinion of one of our greatest anthropological authorities and therefore carries the greater weight:

PREHISTORIC CEMETERY AT HARLYN BAY

"Digging operations have been resumed at this highly interesting spot, and a considerable portion of the sand 'overburden,' as it is locally termed, has been removed, laying bare an expanse of the old surface soil on which these ancient Cornishmen roamed. Numerous slabs of slate and pieces of spar were found, at one spot forming an almost continuous pavement, but so far no human remains have been discovered, although it seemed as if several graves

should be there. At all events, it is certain that the slates and stones had been placed there by man.

"Our readers will remember that three years ago Mr. Reddie Mallett, the enthusiastic and energetic discoverer of this site, to whom we owe the preservation of the relics, excavated a rounded cist,

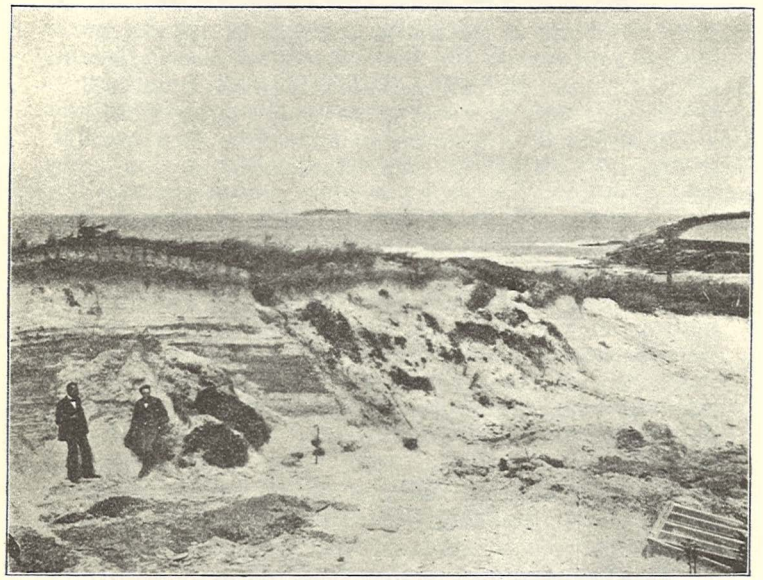


[*Photographed by Prof. Haddon.*

FIG. 21.—CIST OPENED BY PROF. HADDON (1905).

with a diagonal slate partition. This cist contained several skeletons. One of these is still in situ, and is lying on its left side, in the doubled-up position which was characteristic of burials of the later Stone Age. A new cist has been discovered a few yards from the one just referred to, which is oblong in form, being 4 feet 6 inches in length, and 2 feet

4 inches in breadth, inside measurement. The long axis of the cist has a N.N.E.-S.S.W. direction, the head end being N.N.E. When partially exposed the skull was visible, but the rest of the skeleton was covered by a large slate slab, over 3 feet in length, which nearly filled up the rest of the cist. When the slab was taken off, and the sand beneath it removed, a complete skeleton of a powerfully-built, full-grown man was discovered, lying on his



[*Photographed by Prof. Haddon.*

FIG. 22.—SITE OF CIST (FIG. 21) LOOKING NORTH.

left side, with his knees doubled up as far as they would go The right arm was also strongly flexed, the hand being turned towards the head. The man was lying on his left upper-arm, the left fore-arm being bent back round the upper part of the chest, and the hand pointed towards the head. The face looked to the S.S.E. No ornaments nor implements of any description have so far been found in the cist ; but one point of great interest was the finding of the bones of a frog immediately in front of the

man's mouth. These could not have come there accidentally ; but it is by no means easy to understand why the frog was placed there. A small piece of slate was stuck vertically in front of the mouth, and a piece of spar and some pieces of slate were laid on the neck.

"Some distance off another burial has been found. The skull is quite dissevered from the body, and rests on its under surface and jaw. A mussel shell is stuck to the skull immediately over the right ear ; the face looks due E. The skull appears to be that of an adult male ; it is long and narrow, as are the great majority of the skulls that have been found in this cemetery. Close by the skull is a small, imperfectly-made cist, which contains some decayed bones, but at present it is not possible to say how they are disposed. So far as Mr. Mallett remembers, this is the only example of a skull placed in such a position.

"There is still much more work to be done on this important site before all the problems connected with it can be solved. At present the evidence seems to point to the conclusion that the people buried there belong in the main to the Iberian branch of the Mediterranean Race. It is well known that in the Neolithic, or later Stone Age, the Iberians spread all over France and the British Islands, where their descendants are still to be found. The burial of their dead in cists, with the body lying in a contracted position on the left side, is characteristic of these people ; but granting that the bulk of these folk may have been Iberians, it does not follow that any of the graves belong to the Neolithic age. No stone implements have been found in the graves, but a few bronze and even iron ornaments have been found. These point to the so-called Late Celtic period, or, as it is better termed, the La Tène period. Thus, assuming all the cists to have belonged approximately to one age, we may presume that the then inhabitants of this district belonged to the aboriginal stock, and retained their traditional method of burial, although they had passed out of the Stone Age, and were living at the beginning of the Iron Age.

"The most important point in connection with this site is the occurrence of objects made of a close-grained black slate. Two perforated awl- or bodkin-

like objects have been found, which were brought to a fine point ; another is a pointed object, which appears to have been definitely worked, and may have served as a dagger ; other pointed objects have been found which could be used for piercing holes in skins. Mr. Mallett has collected a considerable number of objects made of black and ordinary grey slate. Time will show how many of these have been worked by man, and how many are natural forms. He has been wise enough to collect both likely and unlikely forms, as at present we are in the stage of amassing evidence ; in a short time it will be possible to sift this evidence, and to eliminate the artificial from the natural forms. These slate objects constitute a problem that archæologists have not yet seriously tackled. When these finds have been adequately studied, Harlyn Bay will probably become one of the 'classical' spots of British Archæology.

"A. C. HADDON."

APPENDIX H

[*From the* "PROCEEDINGS OF THE MALACOLOGICAL SOCIETY," Vol. V., Part 3, October, 1902.]

NOTES ON HOLOCENE MOLLUSCA FROM NORTH CORNWALL.

By the Rev. R. ASHINGTON BULLEN, B.A., F.L.S., etc.

Read 11th April, 1902.

HARLYN BAY is situated about two and a half miles to the north-west of Padstow, and the mollusca mentioned in this communication are partly from the prehistoric burial-ground discovered there in August, 1900, and partly from neighbouring localities near Constantine Bay. The graves at Harlyn Bay were covered with bright blown shell-sand of ancient date, there being a well-developed top-soil from a foot to a foot and a half in depth, covered with a strong growth of grass. Since only

surface-finds (within plough depth) of Roman coins have been made in this and other Cornish localities, the blown sand is of pre-Roman date. This blown sand was from 3 to 15 feet in depth over the graves, the lower measurement representing the foot of the old grass slope.

The mollusca occurred under and in the graves and in kitchen-middens to the south of the interments, according to the following lists: —

I. HARLYN BAY (pre-Roman) BURIAL-GROUND.

A. Under the Grave-level (in *clayey* sand).

MARINE: —*Patella vulgata*, Linn.

NON-MARINE: —*Hygromia granulata* (Ald.), **H. montivaga** (West.), *Vallonia pulchella* (Müll.), *Helix nemoralis* (Linn.), *Cochlicopa lubrica* (Müll.), *Pomatias elegans* (Müll.).

B. Grave-level (under upper rubble-layer).

MARINE: — *Purpura lapillus* (Linn.), *Littorina obtusata* (Linn.), *Monodonta crassa* (Mont.), *Patella vulgata*, (Linn.), *Helcion pellucidum* (Linn.), *Mytilus edulis*, (Linn.).

Tools fashioned from *Patella* and *Mytilus*. Also sepiostaire from *Sepia officinalis*, (Linn.), in some graves.

NON-MARINE: —*Agriolimax agrestis*, (Linn.), *Vitrea nitidula* (Drap.), *Pyramidula rotundata* (Müll.), *Helicella barbara* (Linn.), *H. caperata* (Mont.), *H. itala* (Linn.), *Hygromia granulata* (Ald.), **H. montivaga** (West.), *Helix nemoralis*, (Linn.), *H. hortensis* (Müller), *Pomatias elegans* (Müll.).

C. From the bright sand.

NON-MARINE: —*Helicella virgata* (Da Costa), *H. caperata* (Mont.), *H. barbara* (Linn.).

D. Kitchen-Midden South and East of Harlyn Burial-ground, but within its outer fence.

MARINE: —*Purpura lapillus* (Linn.), mostly broken shells,[1] *Patella vulgata* (Linn.), *Mytilus edulis* (Linn.).

[1] Mr. A. Santer Kennard compares these with shells from Ireland, broken, most probably, to extract the purple dye.

NON-MARINE: —*Helix aspersa* (Müll.), *H. nemoralis* (Linn.), large specimens.

E. Kitchen-Midden in next field South of Harlyn Burial-ground, under a tumulus from 11 to 13 feet in depth.

MARINE: —*Patella vulgata* (Linn.), *Cardium edule*, (Linn.), *Ostrea edulis* (Linn.).

[A fragment of patella resembles pieces found abundantly in the burial-ground that are of a pure translucent white texture and evidently useful for the manufacture of small shell-implements. Vide supra I., B.

NON-MARINE: —*Vitrea nitidula* (Drap.), *Helicella barbara* (Linn.), *Vallonia pulchella* (Müll.), *Helix aspersa* (Müll.), abundant, *Cochlicopa lubrica* (Müll.).

II. HARLYN CLIFF.—From an early bronze age, cremated interment, in an *inverted* urn of very coarse pottery, $\frac{1}{2}$ inch thick.

NON-MARINE: —*Helix nemoralis* (Linn.), *Pomatias elegans* (Müll.).

These shells were placed round the urn, about a bushel in all. Mr. Harold Hellyar and his brothers discovered this and excavated the spot, January 1st, 1902.

III.—Constantine Church is about a mile and a half to the westward of Harlyn Bay. The scanty remains are very ancient, anterior to the departure of the Romans in 410 A.D.

The thick walls were built of fragments of slate without mortar. The tower is built round a large rounded boulder of Cataclew stone, derived from an intrusive dyke, which occurs in the slate between Trevose Head and Cataclew Point. South of the church there is a kitchen-midden in which coarse pottery occurs.

The marine shells there are: —*Purpura lapillus* (Linn.), *Patella vulgata* (Linn.), *Cardium edule* (Linn.), *Mytilus edulis* (Linn.).

The nearest place now for the last-mentioned mollusc is said (by Mr. Hellyar, sen., of Harlyn

House) to be Padstow Harbour, about four miles distant.

IV.—About half a mile to the westward occurs the kitchen-midden on the low sea-cliff at Constantine Bay, described by Mr. Spence Bate in 1864.[1] Here, again, the three prevailing species occur, *Patella vulgata*, *Purpura lapillus*, and *Mytilus edulis*. Underlying the shell-mound there is a raised beach. This kitchen-midden having been previously described, I will only say that the description Spence Bate gives, though in the main correct, is not quite consonant with the facts as now observable. Mr. George Bonsor, an expert anthropologist, was with me in October, and we found hearths at several levels down to a depth of 8 feet, with burnt bones and burnt *Mytilus* shells. Mr. Harold Hellyar has also, in digging into the mound, found evidence of long occupation, the pottery from the lower levels being coarse and hand-made, that from the higher part having been turned on the wheel.

V. CONSTANTINE ISLAND. — About fifty yards from the mainland is a detached mass of slate covered with sand and overgrown with grass yielding numerous flint-flakes on the surface. Neolithic man had built here a hut of unusual form, ellipsoid in shape, with a low entrance about 4 feet long. Inside the hut occurred a hearthstone with evidence of fire upon and round it. In the month of January, 1902, I visited the hut with Mr. R. Mallett, and we found the following shells: —

(*a*) From their condition the three following belong to the Raised Beach and Head, the former well and the latter poorly developed.

MARINE: —*Purpura lapillus* (Linn.), *Patella vulgata* (Linn.).

NON-MARINE: —*Jaminia muscorum* (Linn.).

(*b*) From the Neolithic floor.

MARINE: —*Littorina littorea* (Linn.), *Patella vulgata* (Linn.), *Cardium edule* (Linn.), *Mytilus edulis* (Linn.).

[1] *On a Cornish Kjökkenmödding*, Trans. Devonshire Assoc., Vol. I. (1882—6), p. 139.

The last two also occurred *outside* the hut, where, too, were a hearth and bones of animals of the same species as those from within.[1]

NON-MARINE: —*Helicella itala* (Linn.), *Helix aspersa*[2] (Müll.), one specimen, *H. nemoralis* (Linn.), abundant, *H. hortensis* (Müll.).

NORTH CORNWALL: TABLE OF OCCURRENCE OF MARINE AND TERRESTRIAL MOLLUSCA OF PRE-ROMAN DATE.

	Harlyn. I, A.	Harlyn. I, B.	Harlyn. I, C.	Harlyn. I, D.	Harlyn. I, E.	Constantine Church.	Constantine Cliff.	Constantine Island.	Harlyn. II.
MARINE.									
Sepia officinalis (Linn.)	...	*							
Purpura lapillus (Linn.)	...	*		*	...	*	*	*	
Littorina littorea (Linn.)	...	...		...	...	...	...	*	
,, *obtusata* (Linn.)	...	*							
Monodonta crassa (Mont.)	...	*							
Patella vulgata (Linn.)	*	...		*	*	*	*	*	
Helcion pellucidum (Linn.)	...	*							
Cardium edule (Linn.)	...	...		...	*	*			
Ostrea edulis (Linn.)	...	...		...	*				
Mytilus edulis (Linn.)	...			*	...	*	*		
NON-MARINE.									
Agriolimax agrestis (Linn.)	...	*		...					
Vitrea nitidula (Drap.)	...	*		...	*				
Pyramidula rotundata, Müll.	...	*							
a. *Helicella virgata* (Da C.)	...	...	*	...	...	...	...	...	...
,, *itala* (Linn.)	...	*		...	...	...	...	*	
,, *caperata* (Mont.)	...	*	*	...	...		...	...	...
a. ,, *barbara* (Linn.)	...	*	*	...	*	...	...	...	...
a. *Hygromia granulata* (Ald.)	*	*							
,, **montivaga** (West.)	*	*							
a. *Helix aspersa* (Müll.)	...	...		*	...	...	...	*	
a. ,, *nemoralis* (Linn.)	*	*		*	...	...	...	*	*
a. ,, *hortensis*[3] (Müll.)	...	*		...	...	...	...	*	
a. *Vallonia pulchella* (Müll.)	*	...		...	*				
a. *Cochlicopa lubrica* (Müll.)	*	...		...	*				
a. *Jaminia muscorum* (Linn.)	...	...		...	...	...	...	*	
a. *Pomatias elegans* (Müll.)	*	*		...	...	...	...	...	*

[1] For list of these, identified for me by Mr. E. T. Newton, F.R.S., &c., vide "Harlyn Bay," anteà.

[2] I found none living on the island itself, otherwise the nearest point of the present occurrence of *H. aspersa* seems to be about a furlong inland.

[3] Probably brought from further inland. I have seen no recent specimens near the places named, but, of course, this is only negative evidence. Of the non-marine mollusca those marked "a." are abundant.

My sincere thanks are due to Mr. B. B. Woodward and Mr. E. A. Smith for the trouble they have taken over the *Hygromia montivaga*, West., and especially to Dr. Böttger for identifying the shell, which is a new record for England ; also to Mr. B. B. Woodward and Mr. A. Santer Kennard for the identification of critical species.

INDEX

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