I.

ON THE CAIRNS OF ARRAN — A RECORD OF EXPLORATIONS — WITH AN ANATOMICAL DESCRIPTION OF THE HUMAN REMAINS DISCOVERED. By THOMAS H. BRYCE, M.A., M.D.

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The work of which this paper is a record was begun on the initiative of Dr Ebenezer Duncan of Glasgow. When on a visit to Arran in 1896 Dr Duncan opened one of the compartments of a "chambered structure" near Lag, and he included a brief notice of certain human remains found therein, in his presidential address to the Philosophical Society of Glasgow in the following year. In the summer of 1900 he invited me to make a further investigation of this structure, and of another in the same neighbourhood. My interest as an anatomist was primarily to obtain information as to the physical characters of the early inhabitants of the island; but the explorations revealed some archæological facts, both novel and interesting, which it was necessary to follow up by extended inquiry and comparative investigation, before an opinion could be hazarded as to the precise era of culture to which the race belonged whose remains were discovered.

Accordingly I explored a group of cairns in Arran, which includes representatives of all the types which, so far as I know, exist in the island, and are still available for study.

The record of these explorations, taken along with that of the earlier investigations of the stone circles by Dr James Bryce, gives a fairly complete picture of the prehistoric sepulchral monuments of Arran.

The researches of Dr James Bryce were made in 1860, and included the great group of circles on Mauchrie Moor, as well as circles in Glen Shant, and that on the summit of the Lamlash road.

The cairns have never had more than casual treatment, and any excavations that have been done have either been left unrecorded, or have been unintentionally effected in the reclaiming of land or the building of houses. There is a record of two such chance finds at Glenkill and Knockankelly—from which the relics have been preserved, but no systematic or comparative investigations have been carried out.

The cairns now to be found are probably only a fraction of those at one time existing in the island, for a number are mentioned in the older books on Arran, which I cannot now identify.

Before proceeding to the descriptive part of my paper, I must express

my obligation to J. Auldjo Jamieson, Esq., the Commissioner of the Arran estate, for permission to excavate the cairns and cists, and to the resident factor, Mr Patrick Murray, for courteous help in the carrying out of the work.

The sepulchral structures which I have explored fall into two great classes:—

I. Megalithic structures in the form of a segmented chamber without an approach passage, or of large cists serially arranged, either enclosed in cairns, or denuded of their covering.

II. Carefully constructed short cists, enclosed either in cairns, or within the area of circles of standing stones.

Part I.

CAIRNS ENCLOSING A SEGMENTED MEGALITHIC STRUCTURE.

The earliest recognition and description of these remarkable cairns is to be found in the Journal of Pennant's Tour in Scotland, 1772. He refers to a cairn of which there is now no trace. "In the course of my ride," he writes, "on the other side of the hill of Dunfion facing the bay of Lamlash, I saw on the roadside a cairn of a different kind from what I had seen before; it was large, of an oblong form, and composed like the others of round stones; but along the top was a series of cells, some entire, but many fallen in; each was covered with a huge flat stone of great size resting on others upright, that served as supports; but I could not count them by reason of the lapse of the lesser stones."

Of cairns of this class in Arran I have examined eight that now remain; but in four of these only is the cairn even partially intact. The enclosed structures in the other four stand denuded.

Five form a uniform group, and will be treated of in this paper, along with certain structures in Kintyre and Islay, a description of which I have added by way of amplification and comparison. The remaining three are in such inaccessible situations, and would have taken so much labour to excavate, that I was obliged from lack of time and means to

pass them over, in the hope of returning at some future date to complete the work. I am the more anxious to carry this out, as owing to their remote situation their features are preserved better than in some I have actually explored.

1. *The Dippen Cairn* (fig. 1).—This structure is so ruinous that I have contented myself with a mere description of it. It stands on the

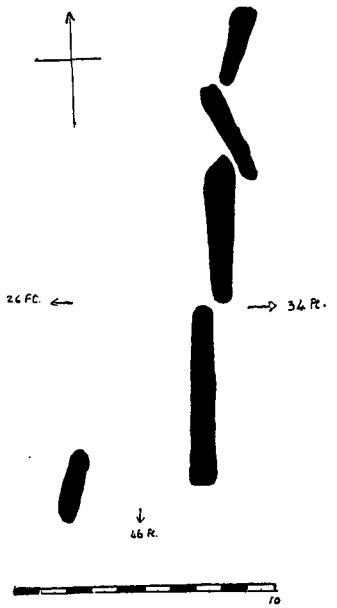

Fig. 1. Plan of Ruined Megalithic Cists at Dippen.

hill above Dippen, a short distance from the coast road. The megalithic structure is represented only by a series of large blocks or slabs of greenstone arranged in a row, running due magnetic N. and S. These are placed on their side, and all stand at one level (approximately 3 feet) above the ground. Each stone overlaps the one preceding it, from north to south. The whole measures 20 feet, and the individual slabs vary much in size. Beginning at the north end, the first is 2 feet

11 inches by 11 to 17 inches; the second, 4 feet by 6 to 8 inches; the third, 5 feet 8 inches by 12 to 17 inches; the fourth, 6 feet 9 inches by 9 to 11 inches.

These represent the east stones of a series of large cists of which the west stones, partition slabs, and probably covering blocks are all now absent. Only one stone stands somewhat displaced on the west side, at the south end. A number of large slabs stand in a neighbouring wall, which probably was built of the stones from the cists and cairn. The latter has been greatly curtailed by reclamation of the land around it, but there is still a large heap of stones. Many of these stones have, no doubt, been picked off the fields and thrown on the site of the old cairn, but its base can be clearly seen. It extends 46 feet to the south, 34 feet to the east, and 26 feet to the west of the megalithic structure, but the plough has been carried to within four feet of its north end.

On account of the degree of previous disturbance, I judged it not worth while to dig out the site of these cists.

2. *Torlin Cairn* (fig. 2).—This cairn, or mound, is situated at the mouth of the Kilmorie Water below Lag, in a field adjoining the shore on the east bank of the stream. In its present state it is elevated about five feet above the general level of the field, but shows only a fraction of its former extent. It ends on the north in a steepish bank of irregular contour, which is evidently the limit of a former excavation. Local tradition saddles a tenant of the farm of Torlin with the responsibility for this destruction; a sacrilege for which he is said to have paid with his life. The work had evidently been brought to a close, by the laying bare of a large chamber, or cist, which now, in a ruined state, stands out free of the excavated mound. From the line of quarrying the mound stretches 70 feet to the south, 30 feet to the east, and 40 feet to the west. To what distance on the north the mound extended, it is impossible now to say; but from the appearance of the ground it may possibly have reached even so far as 60 feet. In any event, it was probably oval in shape, its length considerably exceeding its breadth. A second cist, separated from the first by a transverse slab, also stands

denuded on its western side, owing to the excavation having proceeded further into the mound on that side. Like the first, it has been rifled, and the side stone is now absent.

We commenced operations by running a trench right through the mound from north to south, revealing the whole of the megalithic structure (fig. 3). Its entire length is 22 feet. It is built of large, rough, unhewn slabs of soft sandstone, such as may be obtained from the rocks on the shore. It is divided into four compartments by three transverse slabs, and the lateral blocks correspond to the number of the

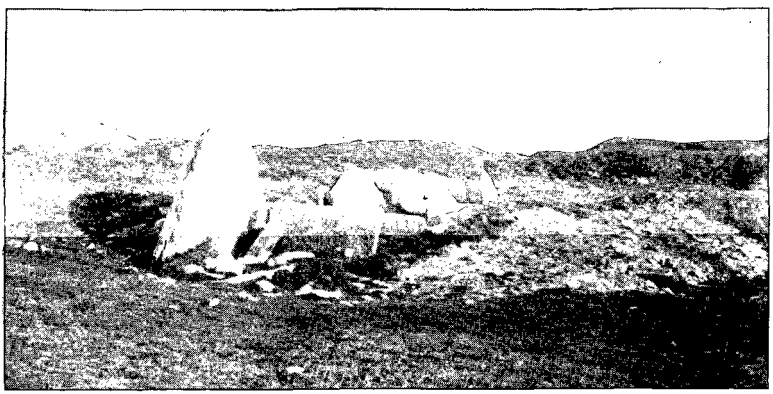

Fig. 2. Torlin Cairn from the N.W., showing the bank left by an old excavation. The stones projecting above the surface within this bank were covered until the recent excavation.

compartments. Each compartment is approximately 5 feet square, and the side slabs, with one exception, exceed the transverse slabs in height by 1 to 2 feet, as can be seen in figures 2 or 4.

The long axis of the structure lies due N. and S. (magnetic). Beginning at the north end, compartment No. 1 has now no end stone, and its western slab lies on its face in the bottom of the cist. Its eastern stone stands 5 feet 2 inches above the ground, is 6 feet 1 inch in length and 8 inches thick. Between this compartment and the second is a transverse slab 4 feet 10 inches broad and 3 feet above the ground.

This slab supports the eastern block of the second compartment, which is 5 feet 10 inches long, with its upper edge on a level with the transverse stone. It is overlapped by the side stone of the first cist, and, in turn, overlaps that of the third. The western stone, as previously stated, is now absent.

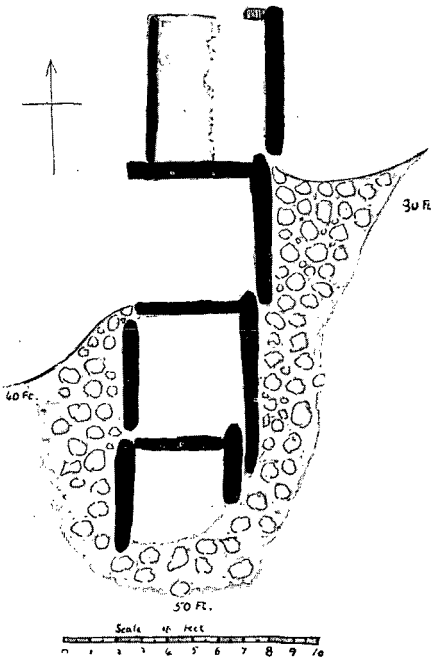

Fig. 3. Plan of Megalithic Cists in Torlin Cairn.

The third compartment measures 4 feet 11 inches by 4 feet 7 inches. The east stone is the largest of the series, being 8 feet 4 inches long, and overlapping, by a tapering end, the side stone of the succeeding compartment by 3 feet. The west stone lies obliquely, and at both ends falls short of the transverse slabs. It is broader at the base, however, and is partly supported by the adjoining stones. Both lateral stones

rise about a foot above the transverse slabs. The southern compartment is open to the south, having no end stone, and is smaller than the others, being only 3 feet 6 inches broad. The side blocks are 4 feet 10 inches

Fig. 4. Torlin Cists from the South after excavation.

and 3 feet 3 inches respectively, and they are supported by the third transverse stone, which rests between their ends.

From this description it will be gathered that the megalithic structure may be considered either as a single chamber, sub-divided into compart-

ments, or as a series of chambers.[1] The ground plan (fig. 3) will make it clear that each chamber is formed of three stones—two side blocks with a transverse slab between their north ends. The transverse stone of the succeeding chamber completes the walls of the preceding one, converting it into a cist, while the terminal or southern chamber stands open (fig. 4).

No roofing slabs are now present.

Two previous accounts exist of the structure. In Dr James Bryce's *Arran* (1872) it is described as consisting "of a great number of stone chambers formed of five large slabs, said to be filled with human bones. Only one has been opened, and from it certainly bones and a skull were removed. The lid of the stone cist, or chamber, still lies near; an upright stone probably marks the head." Again, in M'Arthur's *Antiquities of Arran* we read: "At Torlin on a green bank by the shore there is an interesting example of the 'elongated' chambered cairn. It is intersected from east to west by a row of vaults, consisting each of six unhewn slabs, from 5 to 8 feet square." After describing the tragedy of the farmer above alluded to, he adds: "We proceeded to remove the stones and earth, which filled the rifled cells of this ghost-haunted cairn, but a few marine shells, mixed with small delicate bones of birds, were all we could discover to repay our labour." From these loose statements, it is impossible to add further information, but it may perhaps be gathered that forty years ago there were slabs and blocks of stone now gone; and possibly that the four chambers now remaining may be survivors of a larger series.

The trench was carried right through the mound, but no trace of any other built structure was discovered. There was no "passage," such as is seen in a true "chambered cairn," and the structural feature of these cairns is also wanting, for a transverse trench, cut east and west, showed nothing but the rounded stones of the cairn. Further, the amount of earth relative to the stones was a striking feature.

[1] By *chamber* I mean a space or vault open at one side; by *cist* a space closed on all four sides.

It is not a cairn of loose stones, but is a mound of stones and earth.

The two northern cists had long ago been rifled. The third was cleared out by Dr Duncan four years ago, so that the interest centred in the terminal cist, which had not been disturbed.

The earth was removed down to the level of the transverse slab, and then the space between the stones very carefully cleared out. About 3 feet 6 inches below the top of the cross-slab a gravel bed was bared, and this was considered the floor of the cist. The lower edge of the stones was easily cleared, showing that they were imbedded only a few inches in the subsoil. They stand, therefore, by mutual support, rather than from deep imbedding. The first two feet of soil were removed without uncovering anything, but among the earth, large numbers of the bones of small rodents were observed. Two feet from the top of the cist, we came on a skull and some bones lying in the N.W. corner. The long bones lay chiefly along the walls of the cist in great confusion. The skull was placed face down, and tilted somewhat on its right side, with the occiput towards the corner. An ulna lay on one side, a humerus on the other, a rib beneath it, and towards the centre of the cist was the fragment of an os innominatum. The soil in which the bones were imbedded was a blackish mould, compressed into almost stony hardness.

In the N.E. corner fragments of another skull and some long bones were uncovered, and from this level to the floor of the cist, bones in every degree of disorder were found. Two skulls were found lying close together in the N.W. corner; a thigh bone lay on the same level nearer the centre, and a lower jaw rested upon it.

The remains recovered were those of at least six adults; and there were bones also of one child and one young infant. Besides the human bones there were some animal bones. The special feature about these was the large proportion in all stages of immaturity. The few adult bones were a portion of the femur of a pig, a vertebra of the same animal, the femur of a fox, and a portion of the tibia of probably the dog. The immature bones were all ungulate, and probably those of the

young pig, and the lamb or kid. There were also some leg and wing bones of small birds, and the humeri of a large bird.

Among the bones of animals recovered by Dr Duncan there was a vertebra of an ox, the skull of an otter, and some fish bones.

On the floor of the cist a flint implement (fig. 5) was found. It is an elongated scraper of flint with knife-like edges, measuring $3\frac{3}{8}$ inches long by $1\frac{9}{16}$ broad. It is carefully worked all round except at the narrow end, which shows the bulb of percussion. There was also picked

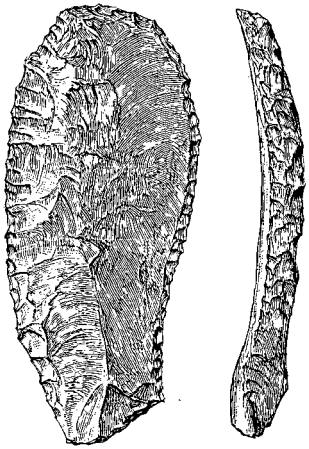

Fig. 5. Flint Scraper with knife-like edges from S. chamber, Torlin Cairn. ($\frac{2}{3}$.)

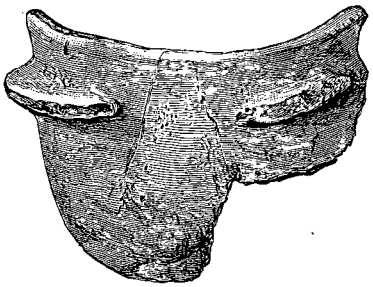

Fig. 6. Portion of Urn from S. chamber, Torlin. ($\frac{1}{3}$.)

up a fragment of pottery of dark coloured paste, coarse and rough in make. It has belonged to a round-bottomed vessel and is without decoration by any impressed pattern, but has two projections or ears placed on the neck (fig. 6). Among the earth, a very small amount of wood charcoal was recovered, but there was no sign of fire anywhere.

Fig. 2 shows the condition in which I left the structure.

3. *Clachaig: Limekiln Cairn.*—This mound stands on the edge of the old sea beach terrace, about half a mile west of the Kilmorie Water,

on the farm of Clachaig. To distinguish it from another mound on the same farm, I shall call it the Limekiln Cairn, after a disused limekiln close at hand, to the building of which very probably the cairn contributed. The cairn (fig. 7) is from 8 feet to 10 feet high, and of oval shape. Its long axis lies N.N.W. and S.S.E. The top of the mound is approximately flat, but it is highest at the south corner. Locally it has been regarded as the burial-place of a crew of shipwrecked sailors. Our attention was directed to it by two parallel slab-like stones, which just appeared above the turf at the north end. The

Fig. 7. Clachaig (Limekiln) Cairn from the South.

south end has evidently been quarried, as it ends in a steepish bank of crescentic contour (figs. 7 and 8). From the north end to the excavated edge the measurement is 39 feet, and if the tape be carried down the steep bank and the gently sloping base, the length over all extends to approximately 60 feet. The breadth of the broad top is 26 feet; the western slope measures 23 feet to the base, the eastern 11 feet and is very much steeper. This side has probably been excavated to make room for a cart track.

Taking as a guide the slabs appearing above the surface at the north end, a trench was cut from north to south. The space between the two

stones was dug out, but only at a depth of 4 feet did we come on the transverse stones. No covering stones were seen, but the trench between the side stones was filled with large blocks and slabs of sandstone, and these were met with even close to the bottom of the cists presently to be described. There was nothing in their arrangement to show whether they had formed a roofing structure or not.

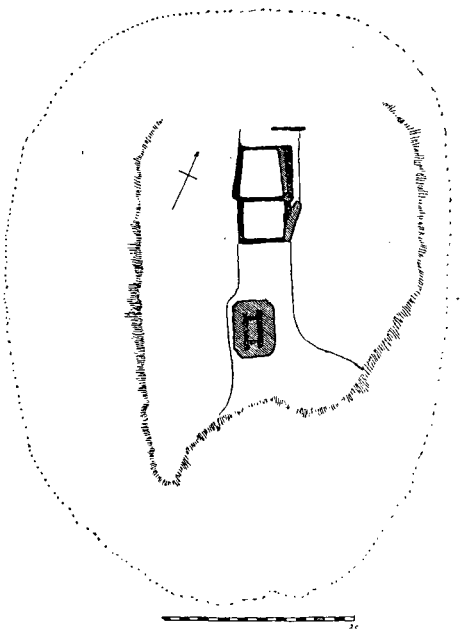

Fig. 8. Plan of Clachaig (Limekiln) Cairn.

When fully dug out, the megalithic structure was found to have been built as follows (figs. 8 and 9) :—

On the west side were two huge blocks of sandstone, standing 8 feet above the gravelly subsoil in which they were imbedded. The first was fully 6 feet broad, and overlapped the second on its outer side; this was a similar block, 5 feet broad, but not quite so high as the first. On the

east the wall of the trench was formed of two pairs of stones each 4 feet deep, placed opposite the two west slabs.

The top stone of each pair was somewhat displaced, the first inwards, the second outwards; but the two lower slabs were vertical, and were placed on a level with the transverse slabs. Of these there were three, dividing the deeper part of the trench into two cists. The northern cist measured 5 feet by 4 feet 6 inches; the southern, 4 feet 4 inches by 4 feet 6 inches, and both were 4 feet deep from the top of the middle transverse slab to its lower edge, set in the gravelly subsoil.

South of these cists the trench was carried down 4 feet into the cairn till a large flagstone was bared. Between this and the transverse slab of the second cist were a number of large blocks of sandstone, some

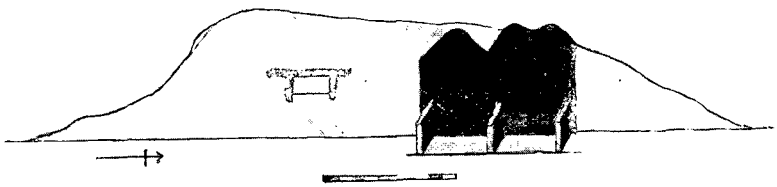

Fig. 9. Section—Clachaig (Limekiln) Cairn.

placed vertically, some obliquely, some horizontally, but all irregular in position, and showing no structural arrangement. When the large pavement slab was raised, it was found to cover a short cist. The sandstone slab was 6 feet long by 4 feet broad and 7 inches thick. The cist (see plan and section) was neatly built of four slabs of sandstone, all exactly on the same level, and of uniform thickness. The lateral stones, 5 feet long, were not exactly opposite one another, but exactly parallel, and between them were placed the end stones, 1 foot 8 inches in length, and distant from one another 3 feet 4 inches, enclosing thus a space 3 feet 4 inches by 1 foot 8 inches, and when dug out, 2 feet deep.

Deposit.—The megalithic chambers, as said above, were filled with large blocks of sandstone and smaller stones imbedded in the soil, but once the actual cists were reached, the character of the soil changed

into a dry black mould very firmly compressed. Nothing was discovered above the level of the transverse stones. Our experience at Torlin led me to pay special attention to the corners. Having instructed the workmen to clear the centre of the space, I then took the work into my own hands, and with a small trowel dug carefully in the corners and along the sides till a uniform level was reached, and then the process was repeated. Often a block of sandstone stood leaning against the side, jamming the bones, and making it impossible to get them out whole. But in several instances such stones had been a protection, and saved the skulls in the corners, and these were picked out of the hard mould as if out of plaster-of-Paris. Exactly as at Torlin, the skulls lay invariably in the corners, and the long bones along the walls of the cists, but beyond this no arrangement could be made out. In one instance a skull was found with the remains of a pelvis on each side of it, and some ribs round and under it. From this heap the long bones extended along the end and side walls, but in no instance could all the bones of the skeleton be accounted for. In the north cist, two skulls in fragments were found in each corner at different levels, along with other bones of the skeleton; in the south cist, two interments were found placed in the same way in two of the corners, and a single one in each of the other corners. Thus altogether there were the remains of fourteen individuals interred in the two chambers, and all the bones were unburnt. Some of the skeletons were those of men, others of women; two were those of young children. The animal bones included, as at Torlin, many specimens from young animals. The adult bones were the lower ends of the humerus and tibia of an ox, broken apparently for the marrow; the astragali of the same animal, and the metatarsals of a pig. Of immature bones there were the sacrum, a lumbar vertebra, and the upper end of an ulna of a large ungulate, probably a calf, the lower jaw of a young pig, teeth of the same, the skull of a lamb or kid—and various very young long bones of the smaller ungulata, probably pig, lamb or kid.

In the north chamber were found the fragments of a rough black clay

vessel (fig. 10) without decoration, and with a projection or ear on the neck. The lip is irregular and slightly everted.

In the east corner the polished stone axe represented in fig. 11 was found. It is made of greenstone, and is rather roughly polished—the grain running in several directions. It measures $8\frac{1}{8}$ inches in length by $2\frac{13}{16}$ inches in breadth at its cutting edge, which is semicircular in

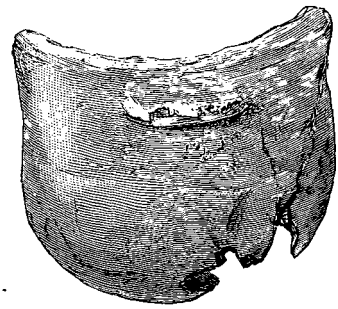

Fig. 10. Urn from N. compartment, Clachaig (Limekiln) Cairn. ($\frac{1}{3}$.)

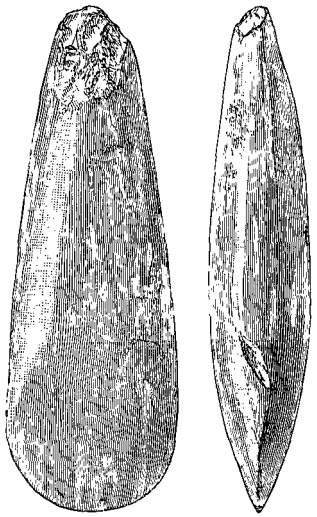

Fig. 11. Stone Axe from N. compartment, Clachaig (Limekiln) Cairn.

shape. The butt end is rather sharply tapered, and a chip has been broken off here. The body of the weapon is also chipped in several places.

A few pieces of wood charcoal were picked up among the soil.

In the south cist, close to the north-east corner, lay the vessel of pottery figured in fig. 12. It was placed mouth downwards, and filled with the dry black mould in which it was embedded. By good fortune no stone had fallen here, so I was able to recover it entire. The skull

represented in fig. 55 lay slightly deeper, but within a few inches of the urn. It is a globular vessel, made of dark-coloured paste with a slightly reddish tinge, thin walled and delicately wrought. It stands $3\frac{1}{2}$ inches high, is $3\frac{7}{8}$ inches in diameter across the mouth, which is bounded by a shallow vertical rim. The upper surface slopes gently to join, at a sharp angle, the rounded under aspect. The sloping upper surface is ornamented by groups of vertical and horizontal lines, alternating with one another, impressed in the soft clay, by a fine-toothed instrument, while a double row of dots runs round the shoulder. The inner side of the lip is also marked by a single row of dots. The upper part of the rounded bottom is decorated by three rows of dashes, horizontally

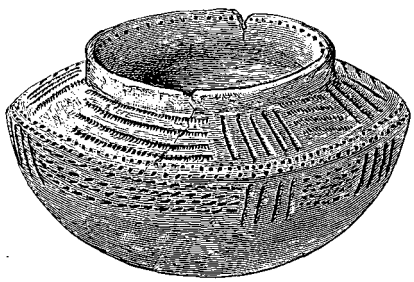

Fig. 12. Urn from S. compartment, Clachaig (Limekiln) Cairn. ($\frac{1}{4}$.)

arranged and interrupted by groups of short vertical lines, like those on the upper aspect.

Deposit in the Short Cist.—This was filled with fine mould. In the centre, near the bottom, lay the fragments of an urn of darkish paste (fig. 13) ornamented with mouldings, and a pattern of chevron markings. As reconstructed, this urn is $5\frac{1}{16}$ inches in height; the mouth measures 6 inches in diameter. In the soil below the neck a mass of soft clay was found, which hardened when placed in the sun, and I think this may have represented the clay of the absent parts of the urn softened by the wet which had soaked into the cist.

Some fragments of unburnt human bones, and the upper jaw of a young pig, were found beside the urn.

The flint implement represented in fig. 14 lay on the floor at the north end. It measures $2\frac{1}{8}$ inches by $1\frac{1}{8}$ inch. It is worked on one face only.

Careful sifting of the soil failed to reveal any object of bronze. The interment in this regular, neatly constructed short cist is evidently a secondary one, and affords, with its single burial, and large richly decorated urn, a striking contrast to the great roughly-made cists of the megalithic

Fig. 13. Urn from Short Cist in Clachaig (Limekiln) Cairn.

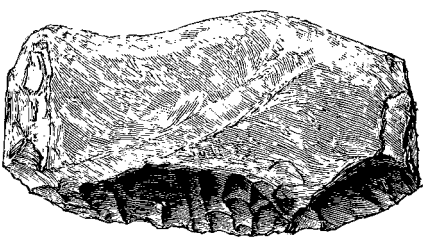

Fig. 14. Flint-knife or Side-scraper from Short Cist, Clachaig (Limekiln) Cairn.

structure, with its multiple interments, and its small round-bottomed vessel ornamented merely with groups of straight lines and dots.

4. *Sliddery Water Cists.* — This structure, popularly known as "Oscar's grave," stands on the right bank of the Sliddery Water, $\frac{3}{4}$ of a mile above the bridge carrying the coast road over the stream. It is placed high up on the steep ground, which slopes to the bed of the river. There is no cairn covering the cists, but at the south end is a heap of stones 16 feet across, which may be the remains of a cairn. Before excavation, all that could be seen were three pairs of irregular slabs of a

hard sandstone, bounding a trench or chamber 19 feet over all, and running due magnetic N. and S. A large block at the north end stood 3 feet 3 inches above the ground, 4 feet broad and 13 inches thick. Eight feet to the east was another stone on end, 3 feet broad and 3 feet above ground. When fully cleared of stones and earth, the chamber was found, as at

Fig. 15. Sliddery Cists from the south end.

Torlin and Clachaig, to be divided by transverse slabs into three compartments (figs. 15 and 16).

The north division is bounded by two lateral blocks 5 feet 10 inches and 5 feet 8 inches in length, with a short transverse slab 2 feet 6 inches broad, and 2 feet 6 inches below the tops of the side stones. The stones incline towards one another at the north, diverge at the south, overlapping the side stones of the second compartment, which lie roughly

parallel. They are 6 feet and 7 feet respectively, and are separated at the north end by a transverse slab 3 feet 6 inches broad, and 2 feet 4 inches below their upper surfaces. The south compartment is built of two side stones, 6 feet, and 6 feet 3 inches in length, which lean strongly inwards, and diverge to the south. The third septal slab is 2 feet 7 inches broad, and 2 feet 4 inches below their top sides. There is no boundary slab at the south end, and the space between the ends of the

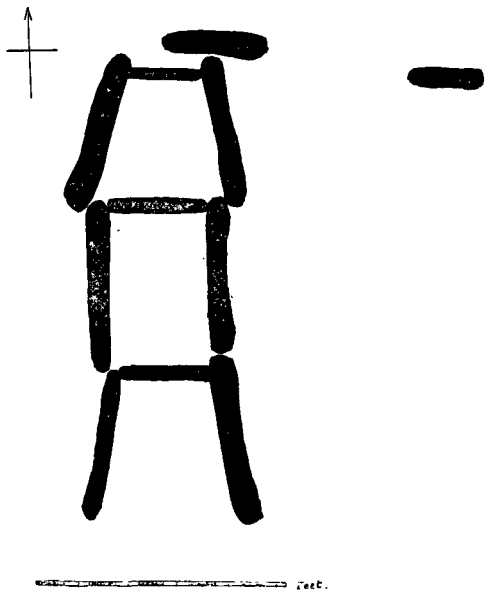

Fig. 16. Plan of Sliddery Cists.

stones is 5 feet 3 inches. The large irregular block at the north end, seen in fig. 15 standing above the others, was found to be placed on its side, and supported slightly on the end stone of the compartment. Its character and position suggest the probability that it may have once been the covering stone of this compartment.

The compartments were filled with stones and black earth, and were 2 feet 6 inches to 3 feet deep to the level of the red clay bottom.

The earth was very damp, and only a fragment of an unburnt thigh bone was found about half-way down in the north chamber. Near the bottom of all the compartments there was a layer of black matter mixed with a considerable amount of charcoal. One small piece of slag was recovered, but no stones which had certainly been exposed to fire. Nor did the clay bottom appear baked. A stone was preserved with the black matter adhering to it. When dried and examined under the microscope, this proved to be a mixture of earthy particles and minute fragments of charcoal, most, if not all, of them being wood-charcoal. I shall return to this in describing an exactly similar layer in the cists at Shiskin.

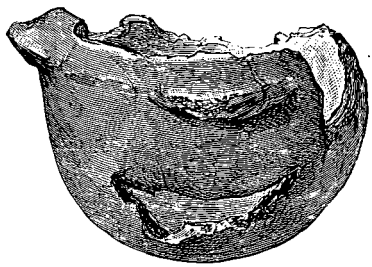

Fig. 17. Urn from N. compartment, Sliddery Cists. (⅓.)

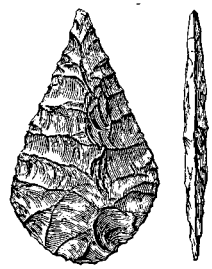

Fig. 18. Arrow point from N. compartment, Sliddery. (½.)

In the north chamber, near the centre, a very rude, thick-walled, undecorated urn of black paste was found. The soil round it was damp and adherent, and unfortunately the neck was broken by the spade; but the rounded bottom and a section of the neck were saved. When the fragments were put together (fig. 17) the urn was found to stand 4 inches in height; the mouth is 5 inches in diameter. Round the upper part of the vessel there is a slight shoulder, which is raised at intervals into wide projections or handles. The neck above the shoulder falls inwards a little to the brim. The lower part of the vessel contained the same black mould as filled the cist, and though entire when taken out it fell to pieces when dried. In the soil, close to the urn, a small leaf-shaped

arrow-head $1\frac{1}{4}$ inch in length by $\frac{3}{4}$ inch in breadth was picked up (fig. 18). Nothing was found in the middle compartment, but in the south division the knife-like implement of flint shown in fig. 19 was found in the black layer at the bottom of the cist. It measures $3\frac{3}{8}$ inches long by $1\frac{5}{8}$ inch broad, is flat on one side, convex on the other. It is worked only on the convex side, to a curved edge which is fairly sharp and slightly serrated. Not a fragment of burnt bone could be found, and no animal bones, not even those of the small rodents so abundant at Torlin and Clachaig.

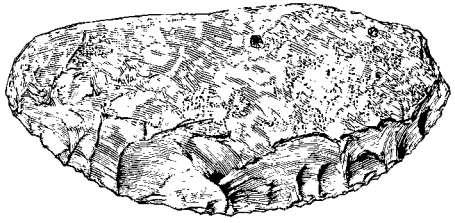

Fig. 19. Knife or Side-scraper of flint from S. compartment, Sliddery. ($\frac{2}{3}$.)

5. *Tormore Cists.*—This megalithic structure stands at the south end of Mauchrie Moor on the farm of Tormore, close to a wire fence separating that farm from Torbeg. It rises, a prominent object, out of the heather of the moor, close to the road leading to the peat moss, and some hundreds of yards below the road from Shiskin to Mauchrie.

There is no trace whatever of any mound or cairn. The structure stands denuded (figs. 20, 21).

The long axis of the chamber bears N.E. and S.W., and is subdivided by three transverse slabs into three compartments, the south being open as at Torlin and Sliddery. The side walls are formed of three blocks on each side, of very varying proportions, being massive slabs of a hard freestone (fig. 21).

The northern compartment is bounded on its west side by a pointed stone, to the left in fig. 21, 4 feet 9 inches broad and 2 feet thick, standing

5 feet 6 inches above the ground, but allowing 3 feet for the depth of the cist, it rises 8 feet 6 inches from its bed in the subsoil. The east stone is a foot lower,—5 feet 4 inches broad and 1 foot 4 inches thick. The cist is closed on the north by a slab 3 feet 9 inches by 1 foot thick, with its upper surface 5 feet 6 inches below the top of the west

Fig. 20. Tormore Cists from the North.

stone. In fig. 20 it appears as a white bar on the ground level. The middle compartment has, on the west side, a stone 5 feet 10 inches broad and 1 foot thick, nearly 3 feet lower than its neighbour of the north compartment, and 2 feet lower than the opposing stone, which is 4 feet 10 inches broad, 1 foot 9 inches thick, and rises nearly 8 feet above its bed. Between these blocks, which are overlapped on the outer side by those

of the preceding compartment, is a transverse slab 3 feet 8 inches by 6 inches, placed 1 foot higher than the north transverse stone, and 3 feet lower than the top of the east stone. In fig. 20 this slab is seen standing about a foot above the soil and turf, which filled the cist before excavation. The south compartment is bounded by two similar stones; the west stone, 4 feet 10 inches long, is placed obliquely, and is tilted inwards; the east, 4 feet 4 inches long, is in a straight line with the other east stones. The compartment is open to the south, but on the

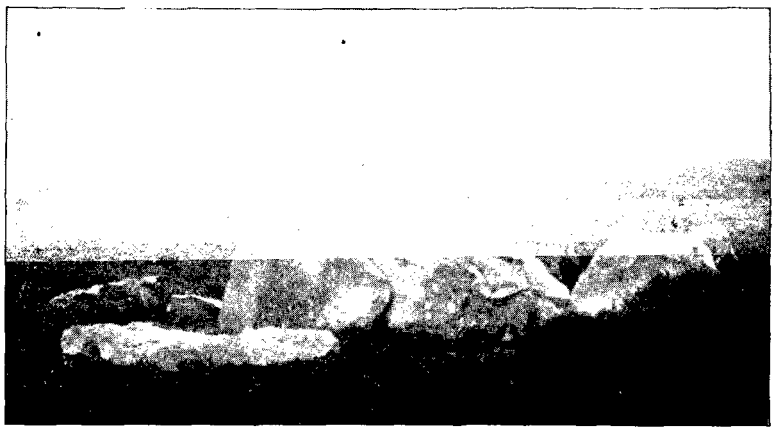

Fig. 21. Tormore Cists from the West.

north a transverse stone is wedged between the lateral ones, as in the other cists; it is only 2 feet 6 inches across, is on the same level as the second transverse slab, and only 6 inches lower than the top of the east stone, and 1 foot 10 inches lower than the west. The middle compartment is the largest, being 5 feet by 3 feet 8 inches; the north is 3 feet 7 inches by 4 feet 2 inches; the south 4 feet 8 inches by 3 feet 8 inches to 2 feet 6 inches.

Adjoining the chamber there lie prone on the ground three large flat slabs of the same stone: one, apart on the west side, measures 7 feet 3 inches by 3 feet 9 inches. Its upper surface is flat, but its under aspect is

bevelled away into a broad ridge, on which the slab rests. Two blocks lie together close to the north end of the chamber. They seem to represent a single slab 7 feet 4 inches long by 4 feet 4 inches broad and 14 to 16 inches thick, which has been broken across.

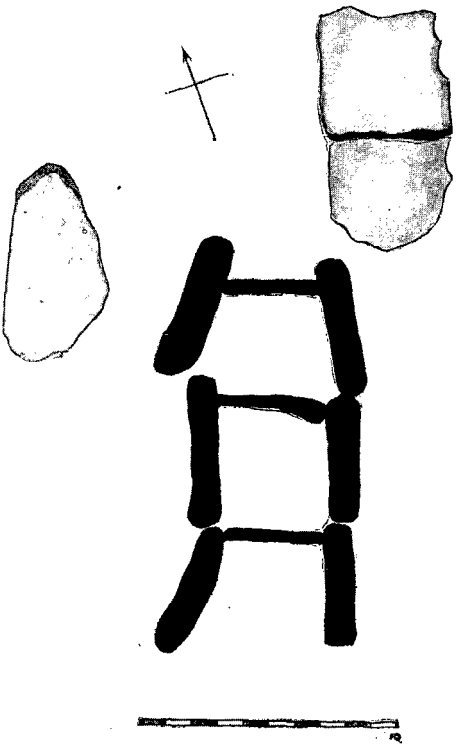

Fig. 22. Plan, Tormore Cists.

These may have been the covering stones of the chamber, but the side stones are so irregular in height that it is difficult to see how they could have been poised on the top of them. On the other hand, they

are too large to have been placed between these stones, so as to rest on the transverse slabs.

The cists or compartments, when cleared out, measured in depth about 3 feet, down to the subsoil in which the stones were imbedded. They were filled with dark-coloured earth, containing many stones, some of considerable size. On riddling the soil, a few minute fragments of bone were recovered, which I believe had not been burnt; but no other bone, burnt or unburnt, was found, and there were no animal remains whatever.

Near the bottom there was in each cist, as at Sliddery, a layer of black soil, in which many pieces of wood charcoal were picked up. A sample of this earth, thrown into water, proved that the black colour was due to minute particles of charcoal, which floated on the surface, while the earthy particles were deposited. The deposit, when dried, lost its black colour; and when examined under the microscope was found to consist of earthy particles and minute crystals of various sorts. Much of the charcoal was undoubtedly wood-charcoal, for many particles showed the woody structure under the microscope; but again many were too small for any structure to be made out. To test the matter further, the charcoal was thrown on water, several times in succession, and the lighter particles separated from the heavier. On the suggestion of my colleague Dr Thomas Gray, the ammonium molybdate test for phosphates was applied to the earth, and to the various samples of charcoal. A small quantity of each sample from both Sliddery Water and Tormore cists was boiled in nitric acid, and after filtering, the fluid tested with excess of a solution of ammonium molybdate in nitric acid, brought to near the boiling point. As a test experiment, a piece of bone ash was treated in the same way, and gave a copious precipitate. The larger particles of ash, not certainly wood-charcoal, gave no reaction, nor did the smaller particles, separated by washing. On the other hand, the soil gave a marked reaction, though the deposit fell far short in amount of that from the bone ash. The minute particles of black colour, separated as the final deposit from the charcoal, also gave a precipitate, sometimes a little less, sometimes a little more

than the soil itself. The test is thus indeterminate. All one can with certainty say is, that bone ash, if present at all, was only in the form of very minute particles, and in very minute quantity. No stones which had certainly been exposed to fire were met with.

Relics.—A polished and perforated stone hammer of hornblendic gabbro[1] (*fig.* 23) was found in the north compartment.

It measures $3\frac{3}{8}$ inches long by $2\frac{1}{4}$ inches at its broad end, and is $1\frac{3}{8}$ inch thick. The perforation is $\frac{13}{16}$ inch in diameter, and is some-

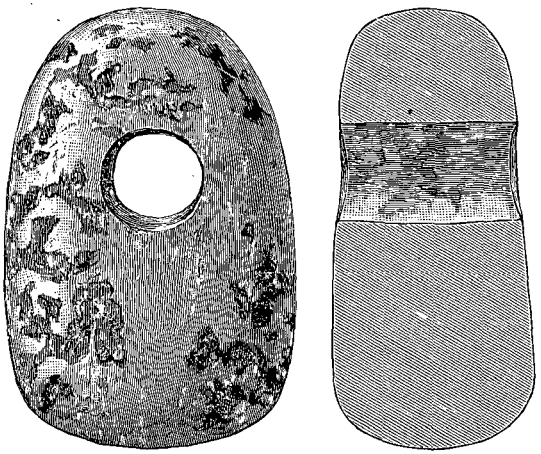

Fig. 23. Stone Hammer from N. compartment, Tormore. ($\frac{2}{3}$.)

what uneven, as if the hole had been drilled from both sides, and it differs from the usual type of perforation, in being of nearly the same diameter throughout—indeed, it widens rather than narrows to the centre. In the same compartment three flint implements were recovered. The first (fig. 24) is an elongated knife-like implement of brown flint, measuring $2\frac{5}{8}$ inches by $\frac{15}{16}$ inch. Its edge is worked on both sides, and the convex surface is chipped all over. The second (fig. 25) is also

[1] This rock is to be found on the Ayrshire coast, opposite Arran.

an elongated knife-like tool, worked all round to a good edge, and tapering to a sharp point. It differs from the last in being worked on the flat surface as well as the convex. It is $2\frac{3}{16}$ inches long and $\frac{9}{16}$ inch broad. The third is a flake, triangular in shape and quite flat. Its base is unworked; and of its two edges one is nearly straight, the other convex and chipped to the level of a projection, which stands out from one side of the base and is not worked. Besides the three

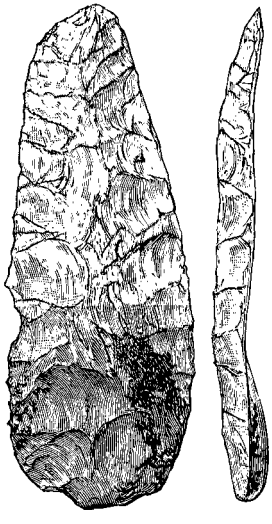

Fig. 24. Knife of brown Flint from N. compartment, Tormore. ($\frac{1}{1}$.)

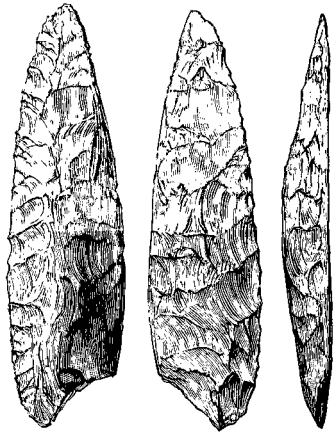

Fig. 25. Knife-like Implement of blackish Flint from N. compartment, Tormore. Front, back, and edge views. ($\frac{1}{1}$.)

implements, six flakes or portions of implements showing some working of the edges were recovered in the sieve, and two flakes of pitchstone, such as is found at Corriegills.

In the south compartment the only relic found was a knife of grey opaque cherty flint, with both edges chipped, but with no working on the surfaces (fig. 26).

Fragments of pottery were recovered from the north compartment.

They were of the same dark-coloured ware as the other urns. On one fragment only was there any ornament, in the form of some straight lines and dots scratched on the clay.

This completes the description of the cairns of this type in Arran which have been explored, but I am able to give an account of three others, one in Kintyre and two in Islay, which throw some further light on the Arran structures.

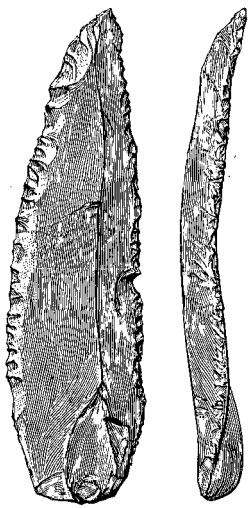

Fig. 26. Knife of grey cherty Flint from S. compartment, Tormore. (½.)

I am indebted to Mr Alexander Gray, formerly of Campbeltown, now Curator at the Marine Biological Station at Millport, for directing my attention to the existence of the example in Kintyre.

6. *Beacharra Cists.*—In June 1892, the Kintyre Scientific Association, conducted by Mr Gray, explored a row of cists on the farm of Beacharra, on the west shore of Kintyre, and 17 miles from Campbeltown. The only description extant of the investigation is a short paragraph in the local newspaper. The objects found are now in Campbeltown Museum, and have not before been described. I visited

the site of the cists, which is the top of an eminence overlooking the shore, and found that the general characters of the structure were exactly similar to those of the cists I was familiar with in Arran. The following account is drawn up, partly from my own observations, partly from the detail in the local paper, and partly from information obtained from Mr Gray, to whom I am also indebted for the sketch plan (fig. 27)

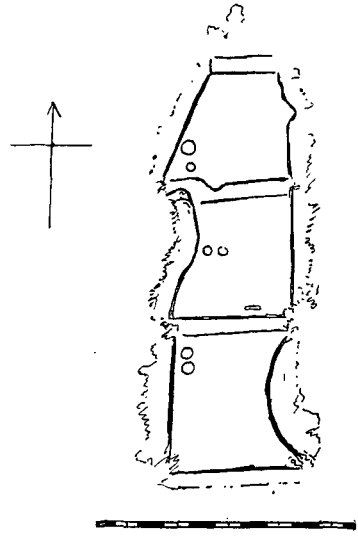

Fig. 27. Plan of Beacharra Cists.

drawn on the spot at the time of the excavation. The measurements were carefully taken by Mr Gray.

The cists stand on the crest of a hill, and are surrounded by a low mound now only a foot or two above the general level of the field, out of which the tops of the stones appear. The whole structure measures 19 feet, the long axis bearing N. and S., and has three irregular slabs of mica schist on each side. Most of the slabs are inclined somewhat inwards, leaving between the upper borders a space of 3 feet 4 inches to 3 feet 6 inches. When the space between the side blocks was cleaned

out, transverse slabs, placed 2 feet below the tops of the side stones, were bared, which subdivided the chamber into three compartments. The north division measured 4 feet 4 inches by about 3 feet 4 inches, increasing to 5 feet; the middle, 4 feet 4 inches by 3 feet 4 inches at the top, to 4 feet 6 inches at the bottom of the cist; the southern, 5 feet 6 inches by 3 feet 6 inches. The depth is not noted on the plan, but is stated to have been about 2 feet 6 inches. The floor of the cists was of hard boulder clay; but the so in the cists was of quite another character, being a

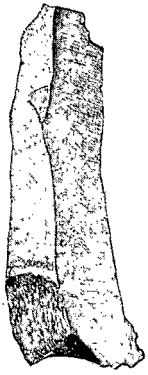

Fig. 28. Flint Implement from Beacharra. (T. H. B., del.) ($\frac{2}{3}$.)

Fig. 29. Buckle of Jet from Beacharra. (T. H. B., del.) ($\frac{2}{3}$.)

"black loamy" earth. Numerous large flat slabs of schist lay in the upper layers of the cists. None were large enough to cover the mouth. The explorers surmised that they might have formed a roofing structure. No charcoal was seen, and no trace of bones, human or animal, was found. The deposit consisted of—(1) a flint implement; (2) a jet object; (3) six clay vessels. The implement (fig. 28) was found on the floor of the south compartment. It measures $2\frac{3}{4}$ inches, and is triangular in section. It is an unworked flake ending in a truncated point.

The edges are not chipped, but are the thin sharp edges of the flake as struck from the core. The concave edge is not smooth, but finely, though irregularly serrated. The jet object (fig. 29) was found in the middle compartment. It was not at the bottom of the cist, but comparatively near the surface, though below the level of the transverse slab. It is of shuttle shape, measures $3\frac{5}{16}$ inches by $\frac{13}{16}$ inch broad, and is divided into two equal bars by a lens-shaped aperture $2\frac{1}{16}$ inches long.

The clay vessels were grouped in pairs—a pair in each cist at the points indicated in the plan. They were surrounded by thin, slate-like slabs of mica schist, about the size of an octavo volume; but no distinct

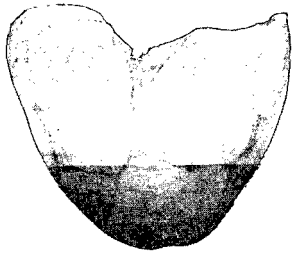

Fig. 30. Urn from S. compartment, Beacharra, $3\frac{1}{2}$ inches high. (T. H. B., del.)

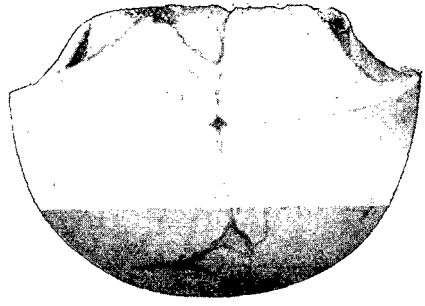

Fig. 31. Urn from S. compartment, Beacharra, $4\frac{1}{4}$ inches high. (T. H. B., del.)

structural arrangement could be made out. The explorers surmised that small cists had been formed enclosing the vessels, but it is quite clear that no such arrangement was actually observed. It may be noted in this connection that the structure of this type explored by Canon Greenwell near Crinan had a partial pavement of small slabs of schist. The vessels lay in all positions; one, mouth upwards; another, mouth downwards; the others on their sides. They were filled with the same black mould as filled the cists. They were a good deal broken, but were pieced together by Mr Gray, and form a group in Campbeltown Museum, of great interest; and I must express my obligation to the authorities o the museum for permission to draw and describe them.

No. 1 (fig. 30), found in the southern cist, is a round-bottomed vessel of blackish ware rudely constructed, and ornamented round the neck by obliquely-placed shallow flutings. It stands $3\frac{1}{2}$ inches high, and measures 5 inches across the mouth.

No. 2 (fig. 31) was in the same cist. It is also a round-bottomed circular vessel of dark ware, but much thinner, and more delicately fashioned. It is $4\frac{1}{4}$ inches high. Its mouth is $4\frac{3}{8}$ inches across. From the lip it slopes outwards to a shoulder of $6\frac{3}{8}$ inches diameter. Below the shoulder, the sides are at first nearly vertical, then gradually come in to the round bottom. The walls are $\frac{3}{8}$ inch thick at the bottom,

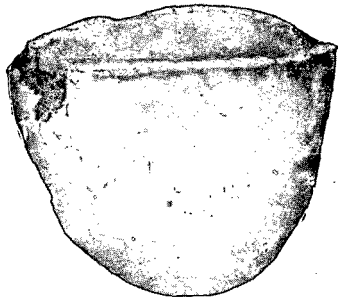

Fig. 32. Urn from middle compartment, Beacharra, $4\frac{1}{4}$ inches high. (T. H. B., del.)

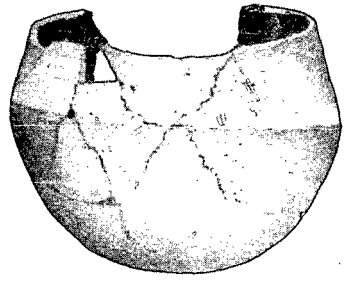

Fig. 33. Urn from middle compartment, Beacharra, $3\frac{1}{2}$ inches high. (T. H. B., del.)

diminishing to $\frac{5}{16}$ at the lip. The ornamentation is very unusual. On the sides, below the shoulder, there is a row of very shallow vertical flutings extending all round the vessel. The flutings are of different depths, and are not regular or parallel. The deepest and broadest part of the impression is at the upper end, as if the implement had been placed there first, and then drawn downwards over the bowl-shaped surface. The upper part or neck is also ornamented by the same markings, which are here and there very shallow, and worn flat. There are three groups of vertical lines, one consisting of four, the second of three, while the third has only one line remaining, the rest of the neck

being broken away. Alternating with these are three groups of arched markings. Two of these consist of three semi-ellipses, one within the other, with the open side at the shoulder. The third group is double, the two sub-groups having each only two curved lines, the open side of the arch being downwards in one, and upwards in the other.

No. 3 (fig. 32), found in the middle cist, is a rudely made thick-walled black ware vessel, with round bottom, plain, slightly everted lip,

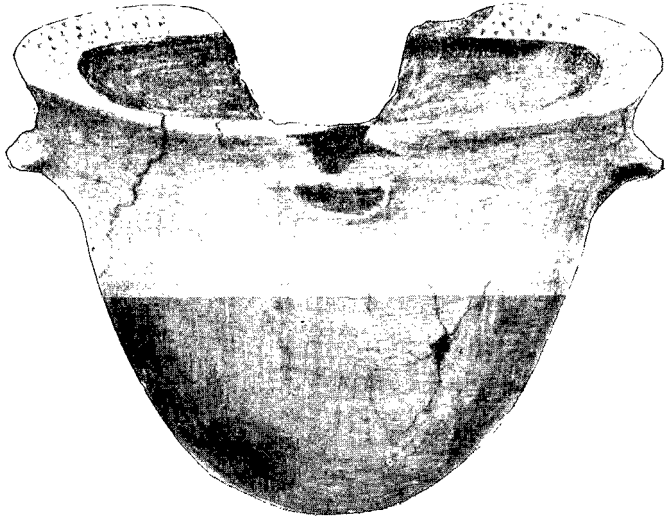

Fig. 34. Urn from N. compartment, Beacharra, 7 inches high. (T. H. B., del.)

and no ornamentation. It is $4\frac{1}{4}$ inches high, $5\frac{5}{8}$ inches across the mouth, and $\frac{3}{8}$ inch thick at the lip.

No. 4 (fig. 33), the neighbour of the last, is also unornamented, of dark ware, but slightly reddish on the surface. It has an unevenly moulded shoulder from which the rounded bottom springs; while above is an inwardly inclined neck ending in a thin regular lip. It is $3\frac{1}{2}$ inches high, $4\frac{1}{4}$ across the mouth, and $5\frac{1}{2}$ inches in diameter at the shoulder.

No. 5 (fig. 34), found in the northern cist, is the largest of the series.

It stands 7 inches high, and tapers gradually to a rather conical bottom. It measures 10 inches across the mouth, and has a broad, slightly convex lip $1\frac{1}{3}$ inch broad, which overhangs on the outer side; but within is flush with the inner side of the vessel. The lip is the only ornamented portion of the urn. One-half of its circumference (fig. 35) has lines across it, impressed by a comb-like implement of thirteen teeth, placed

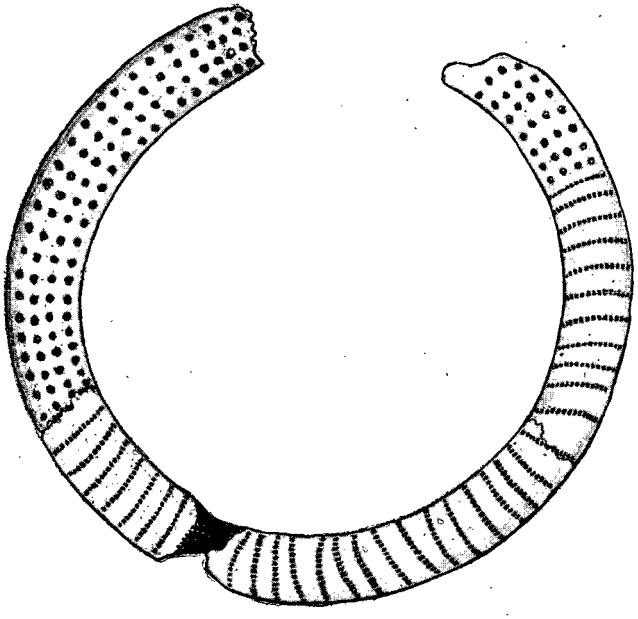

Fig. 35. Scheme of Decoration on rim of Urn figured in fig. 34. (T. H. B., del.)

close together but not quite regular, many being more oblique than the others. The other half of the circumference has been similarly impressed by an implement of four larger teeth, forming rows of dots. The dots are fairly regular, and therefore unlikely to have been done free-hand by a single pointed implement. On the neck have been four shelf-like projections or handles, placed at equal distances round the circumference.

Three of them are present, but the part which bore the fourth has been broken away. Each is $2\frac{1}{2}$ inches broad, and projects one inch from the side of the vessel.

No. 6 (fig. 36), found beside No. 5, is the exact counterpart of the Clachaig cup (fig. 12), both in shape and character of ornamentation. It is made of dark ware, is $4\frac{1}{2}$ inches high, $3\frac{3}{4}$ across the mouth, and $6\frac{1}{4}$ inches in diameter at the shoulder. The short vertical lip joins, at a sharp angle, a slightly inclined upper surface, which ends in a shoulder from which, at an acute angle, the rounded bottom springs. The lip is ornamented by

Fig. 36. Urn from N. compartment, Beacharra, $4\frac{1}{2}$ inches high. (T. H. B., del.)

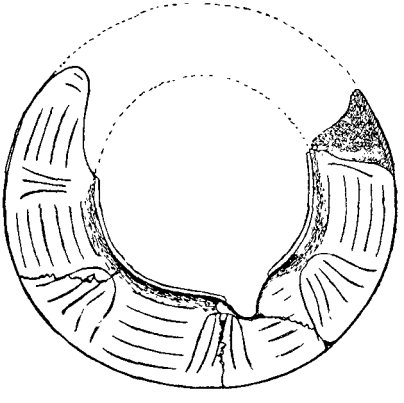

Fig. 37. Scheme of Ornament on upper surface of Urn represented in fig. 36.

vertical lines (fig. 37) impressed, or rather scratched in the clay by a pointed instrument. The upper surface is marked by these scratched lines arranged in alternate horizontal and vertical groups. The outermost of the series of lines, in two of the vertical groups, have been joined over the intervening lines so as to enclose them in a semi-ellipse. Below the shoulder is a row of vertical scratchings, while round the bowl there are several rows of interrupted horizontal lines.

When on a visit to Islay in August last I came across two structures with large cists serially arranged, very similar to those in Arran, and I

shall here add an account of the excavation of them, though their disturbed condition gave less satisfactory results than were obtained in Arran and Kintyre. For permission to examine the structures I am indebted to Ian Ramsay, Esq., of Kildalton, and to Mrs Ramsay.

Island of Islay.—7. *Cragabus Cists.*—Cragabus is a crofter hamlet on the Mull of Oa. On an elevation above it there is a row of denuded cists, and a standing stone.

Fig. 38. Plan of Cists at Cragabus, Islay.

The standing stone stands 9 feet 6 inches to the N.E. of the cist. It is 11 feet 6 inches in height over all; 9 feet above, and 2 feet 6 inches below ground. It is 3 feet 6 inches broad, 1 foot 1 inch thick, its edges pointing north and south. Between it and the cists, under the surface, is a layer of rather large boulder stones, embedded in the sub-soil. This, if it really be such, is the only remains of any cairn structure. The cists are somewhat disturbed. The whole structure is 18 feet over all, and lies E.N.E. and W.S.W. (fig. 38). There are three pairs of irregular slab-like blocks separated by a space of from 3 feet 3 inches to 3 feet 6 inches. It has probably been divided into three chambers by three transverse slabs, but the middle slab is absent, and the eastern displaced.

Further, unlike the megalithic cists hitherto described, the upper edges of the transverse stones are on the same level as those of the side blocks.

Beginning at the western end: The north wall is formed of a block

5 feet 6 inches long, 1 foot thick, and 3 feet 8 inches high on its inner side. It is unsupported by the transverse slab at the east end, and there is no slab at the west end. It fell in on being excavated, and was with difficulty replaced; so that it is possible that it was supported by a transverse stone now removed. The south stone is 5 feet 10 inches by 11 inches thick, and 3 feet 4 inches high. The middle compartment is separated from the first by a transverse stone 3 feet 7 inches by 3 feet 4 inches deep, which supports a south block, 6 feet 6 inches by 1 foot 3 inches thick and 2 feet 8 inches deep on its inner side, but with its upper surface on a level with the transverse stone. The north block, 4 feet 6 inches long and 10 inches to 12 inches thick, lies inclined inwards, and oblique, as if displaced. The eastern cist, which is continuous with the middle, owing to the absence of a transverse slab, has on the north a stone 5 feet 8 inches long, and 12 to 13 inches thick obliquely placed, and overlapping on its outer side the corresponding stone of the middle compartment. It is the highest of the series by 18 inches. The south block is shorter, being only 4 feet broad and 10 inches thick. The cist is closed on the east by a short stone, 2 feet 10 inches in length, and possibly displaced, as it is outside, and not between, the side stones. The cists thus defined were 3 feet to 3 feet 4 inches deep, and filled with stones and dark coloured mould. A considerable number of fragments of unburnt human long bones were found, but in much disorder, though mostly grouped in the corners, and by the sides of the cists. Only a few teeth and some small pieces of the skulls were recovered. Some fragments of charred bone were also found, but it is impossible to say whether human or animal. Near the bottom of the middle cist, the alveolar edge of the jaw of an ox with the teeth, as well as fragments of some long bones of either pig or sheep, were picked up.

Morsels of pottery were got in the same compartment. They were of two kinds: some of a hard dark ware, without ornament, others reddish with an ornament of single horizontal lines. A large number of unworked flint flakes and a core were also gathered from these cists—and one nearly spherical pebble, $1\frac{3}{4}$ inch in diameter.

8. *Ballynaughton Cists* (fig. 39).—This structure stands below an elevated ridge, near the deserted farm-steading of Ballynaughton, about ½ to ¾ of a mile above the road to Lagavulin from Port Ellen. It is an inconspicuous object, not marked on the Ordnance Map, consisting only of a few stones projecting from the turf. There is no trace of mound or cairn structure, and the cists are much dilapidated. Indeed, only one cist is now entire. At one time there had been three large cists

Fig. 39. Plan of Ballynaughton Cists, Islay.

arranged in series, formed of large flat slabs, with transverse slabs which, as at Cragabus, are practically on the same level as the side stones. The whole structure measures 18 feet long; its long axis bearing, as at Cragabus, E.N.E. and W.S.W.

Beginning at the western end: The first cist measures 4 feet 6 inches by 3 feet to 4 feet wide. The north slab is 7 feet long, 9½ inches at its broadest part, tapering at both ends, and 3 feet 2 inches high on its inner face above the floor. The south slab lies obliquely, measuring 6 feet 4 inches long, and from 8 inches to 13 inches thick, and 3 feet 8

inches deep on its inner side. The west transverse stone is 2 feet 7 inches broad and 2 feet 6 inches to 3 feet high, some inches lower than the side stones. The east stone is wedged between the side stones, and measures from 6 inches to 11 inches thick and 3 feet 5 inches in depth on its inner side. The middle cist is 5 feet 2 inches long, but has lost its south wall. The north block is 7 feet 10 inches long, 8½ inches to 14 inches thick, and overlaps the corresponding stone of the western cist. It stands higher than the other stones, being 4 feet 8 inches deep. The end stone is 3 feet 2 inches broad and 4 feet 6 inches deep. The east compartment has only one stone left, 6 feet 2 inches long and 4 feet 8 inches deep, which overlaps the corresponding stone of the middle cist.

At the east end, 9 inches from this stone, on the north side, is a stone on end, 2 feet 8 inches broad by 1 foot 8 inches thick and 3 feet high. Also 26 feet west of the cists there is yet another stone of somewhat pillar-shape, but lying on its face. It is 6 feet 4 inches from base to apex, and 2 feet 9 inches broad at its base. The cists were filled with stones and soil which, in the ruined cists, was ordinary clayey soil. In the complete cist the soil was darker, but there was none of the black mould met with elsewhere. Only one minute shred of bone, unburnt, was found; and no implements or pottery of any kind. One chipped flake of cherty flint was the only relic of the builders. The place had obviously been disturbed. Evidence of this came upon us in an unexpected manner. Close to the bottom of the western cist, in its obscurest corner (marked with a cross in the plan) we struck upon rouleaux of coins sticking together. The bag or vessel containing them had disappeared entirely, and the pieces were thickly coated with the soil in which they lay. There were in all 74 coins, which Mr George Macdonald has kindly identified for me as follows:—

2 Groats of Elizabeth (an early coinage before 1561).
2 Groats of Mary.
26 Irish groats of Henry VIII. (mostly second issue before 1541).
12 English groats of Henry VIII. (London and York), (one first issue before 1526, remainder second issue, 1526 to 1543).

7 Groats (London) Henry VII. (second issue).
1 Groat „ Richard III.
15 Groats „ Edward IV. (mostly heavy issue, *i.e.*, before 1464).
2 Groats „ Henry VI. (before 1461).
3 Groats (Calais) Henry VI. (before 1461).
1 Groat (Edinburgh) James IV. Scotland.
1 Groat (Perth) Robert II. Scotland.
2 half-groats Henry VII. (York, second issue, before 1489? and Canterbury).

The latest coins being those of Elizabeth issued before 1561, fix the date of the deposit in the early part of her reign.

The place selected for its safe keeping by the owner of this humble hoard is interesting. There can be no doubt he chose the cist as his bank, knowing the superstitious dread of the islanders regarding interference with these places of ancient sepulture. The feeling is strong to this day, and must have been still stronger in the wilder days of the 16th century, when in some hour of danger or alarm this unknown individual placed his savings with the dead. The incident throws light on the conditions of the cists 350 years ago. The structure must have been much as it is now; at any rate there could not have been a covering cairn at that time, nor heavy covering slabs, for the cist must have been readily accessible to be a suitable place for the safe and probably hurried hiding of treasure.

The only examples of cairns with megalithic chambers, or cists of this class, within the Scottish area available for comparison with those above described are to be found near Crinan in Argyleshire. Canon Greenwell explored one at Largie farm, and Rev. J. R. Mapleton another at Kilchoan in 1864. These structures have been grouped hitherto with the "chambered cairns"; and as my researches seem to throw some fresh light on their affinities, while they are important as supplying some interesting points of comparison with the cairns I have

described, I may be permitted to re-embody part of the record in the *ipsissima verba*:—

Canon Greenwell[1] writes: "The cairn has originally been a very large one, having a diameter of 134 feet, but the greatest part had been removed many years ago." After describing two short cists, evidently secondary interments, he continues: "The central cist, of very large proportions and much interesting structure, had been rifled in part when the removal of the cairn had laid it bare; so much, however, of its contents had been left undisturbed as to make it one of the most instructive places of sepulture I have ever seen. The cist is a long chamber lying nearly due N. and S. It has a length of 19 feet, a breadth of about $3\frac{3}{4}$ feet, and is about $9\frac{1}{2}$ feet in height, the sides being made of very large slabs of chlorite schist, with portions of walling of smaller stones. It is covered by long slabs of the same stone. The south end is filled up by one slab of schist; whilst the north, which has been the entrance, is open, with two large upright stones placed transversely to the walls of the chamber, and forming a rude kind of portal. There are five large slabs, besides walling, upon the east side; four, besides walling, upon the west side; one at the south end; and two transverse ones at the entrance. The roof is formed of six slabs. It is divided into four compartments by these flat slabs placed across the chamber, each being 2 feet 7 inches high, and there was an oblong stone resting upon two upright stones, one at each end, which crossed the chamber 2 feet 7 inches from the bottom. At a distance of 11 feet 6 inches from the north end and 6 feet above the bottom, a long slab, 3 feet broad, crossed the chamber. I regard all these cross slabs as a provision made to prevent the collapsing of the sides when the large mass of stones, which formed the cairn, pressed against them. . . . At the same time these transverse stones practically divide the chamber into four compartments, and in my description of the contents I will treat it in this way." The compartments measured from south to north, first, 6 feet 8 inches by 3 feet 9 inches; second, 4 feet by 3 feet 9 inches;

[1] *Proc. Soc. Ant. Scot.*, vol. vi. p. 341.

third, 4 feet 6 inches by 3 feet 9 inches; fourth, 4 feet by 3 feet 8 inches. In the absence of a ground plan, and any statement as to the relation of the transverse stones to the component slabs of the walls, it is impossible to say whether or not each was placed, as in the examples I have explored, between the ends of each pair of lateral slabs.

Mr Mapleton[1] describes the Kilchoan structure thus, after noticing the remains of a cairn of stones:—"The cist (megalithic) is placed E.N.E. by W.S.W., and consists of a chamber 14 feet 8 inches in length, 8 feet 3 inches in height at its highest part, and varying from 4 feet 8 inches to 2 feet 8 inches in width. It is formed of six heavy massive slabs of chlorite schist—three on each side—one of which is 7 feet long, 3 feet 2 inches deep, and about 5 inches thick; another is 6 feet long and 13 inches thick. The first pair (*i.e.* at the east end) are not parallel, but converge towards the east; so that the western edges are 4 feet 8 inches and the eastern only 3 feet apart. *The next, or middle pair, are placed just inside the others, so that their outer surface just touches the inner surface of the others, like the slides of a telescope.* The third or western pair are placed in the same manner as the eastern; so that the western end is narrower than the middle. These form the *cist* proper, and are sunk into the ground, so that the interments were below the surface. The roof was formed by large heavy slabs of chlorite schist supported on pillars—of which four are still standing, and two of the cover slabs still rest upon them, though displaced."

After describing the series of pillars or struts, evidently an accessory though important feature, he goes on: "The chamber was evidently higher at the east or entrance end than at the other; and the remarkable convergence, both of side slabs and also of the pillars, at the east end, seems intended for an entrance. The chamber is divided into three compartments by two thick strong slabs placed across the cist *just where the three pairs of side slabs join.* They are not so high as the side slabs by several inches, and were evidently intended for *strength* as well as for divisions. They are about 2 feet 2 inches deep." The compart-

[1] *Proc. Soc. Ant. Scot.*, vol. vi. p. 351.

ments measured: first (the eastern), 3 feet 4 inches by 3 feet to 4 feet 8 inches at the west end; second, 5 feet 2 inches by 3 feet 5 inches; third, 4 feet 8 inches by 2 feet 8 inches. The third or end compartment had an end stone 6 feet high.

Neither at Largie nor Kilchoan was any object of metal discovered. At the first place the record was complicated by the presence of a secondary short cist interment in one of these chambers, and certain unburnt bones were referred to the scattered contents of this cist. In the other compartments burnt bones found on the floor with flint implements, and the bones and teeth of ox and cow, and an urn, were referred to the primary interments. At Kilchoan burnt bones were found in the corners and at the sides of the compartments, and flint flakes and implements were recovered. Among the earth thrown out, some *unburnt* bones and the fragments of an urn were discovered.

Part II.

A. CAIRNS ENCLOSING SHORT CISTS.

I have already described in detail a secondary interment of an unburnt body in a short cist in the Clachaig limekiln cairn. I shall now give particulars of certain explorations, which are of interest as affording a local contrast to the cairns of the first group.

1. *Cairn at Blackwaterfoot.* — In Pennant's "Diary of his Tour,"[1] made in 1772, there is the following reference to this cairn :—"Leave the hills and see at Feorline another stupendous cairn, a hundred and fourteen feet over, and of vast height; and from two opposite sides are two vast ridges; the whole formed of rounded stones or pebbles brought from the shore."

In Headrick's *Arran*,[2] published in 1807, the condition of the cairn at that date is described thus :—"The first and most remarkable [of the antiquities of the vale of Shiskin] is an immense circular heap of stones or cairn situated on an elevated plain above the sea at the mouth of

[1] Pennant's *Tour*, p. 208.

[2] Headrick's *Arran*, p. 153.

the valley. Whether this has been a place of interment or not, I cannot pretend to decide; but the general largeness of the stones seems rather to indicate that this has been a Danish fort, or encampment, of considerable extent. However, the top is flat and filled throughout with large stones, and having no appearance of a mound around it."

In the *New Statistical Account* (1845) it is thus described:—"The largest (cairn) in Scotland is said to be that at Blackwaterfoot. It is now much diminished in size owing to the large quantity of stones that has been carried away from it for dikes, drains, houses, etc., but when entire it was said to have measured across upwards of 200 feet."

MacArthur (1883), on what authority I do not know, states that when the stones were being removed to build the houses of the hamlet, many stone coffins were found, which contained bones, but no implements of stone or metal. The cairn is now represented by a mass of stones, 1 foot to 2 feet above the general ground level. On the west it has been excavated for the building of an outhouse, the floor of which stands about 4 feet below the top of the mound. From the wall of the house to the edge of the mound is roughly 30 feet; and, measuring from the south end, where there is a distinct bank, the mass of stones extends 50 feet. In October 1900, Mr Wallace carried away the stones from the north end of this area, to make the foundation of a horse-mill; so that when I first saw the site of the cairn, except the base, only some 20 feet at the south end remained. In the course of the work, about three feet from the surface, the workers came upon a large flat slab of sandstone, which they selected for the socket of the wheel. On removing the slab, they exposed a "stone coffin." It was empty, and on the dry gravel bottom lay a bronze blade and two bands of gold. These I saw when working at Shiskin, and on my representation Mr Wallace agreed to present the objects to the Museum. I opened up the site of the cist in July 1901, removing the remainder of the cairn to its level. But I came on nothing further, except a piece of wood-charcoal 4 feet from the surface. The cairn was composed of stones of all sizes from large

boulders to small pebbles; and except a thin surface layer, there was no earth at all.

The covering stone (fig. 40) of the cist was a large slab of sandstone of which the measurements, I was informed, were about 7 feet by 5 feet. The cist lay with its long axis N.W. and S.E., and measured 4 feet 3 inches in length, 2 feet 4 inches in breath, and 2 feet 6 inches in depth. The side stones were massive slabs of porphyritic stone from the Leac-a-

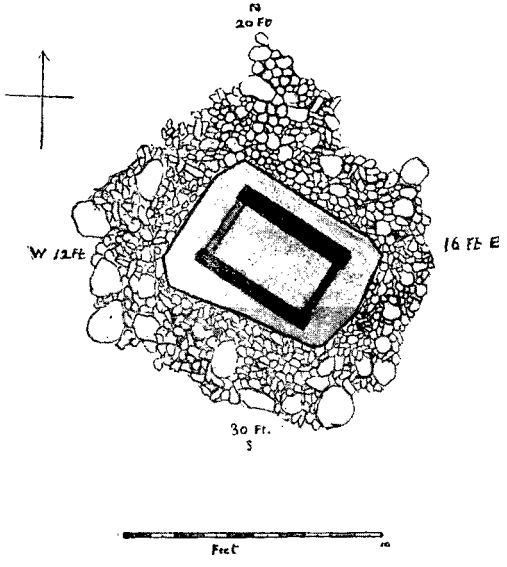

Fig. 40. Plan of Cist at Blackwaterfoot.

Bhreac, so regular as to suggest that they had been hewn; and set exactly vertical and parallel to one another. The end stones were also regular slabs, placed accurately at right angles to the sides, within the side-stones, but exactly opposite their ends, one of porphyritic stone, the other of claystone. After the original opening up, the cist was filled with stones, which I caused to be removed. I was disappointed to find no trace of an urn, and no bones, burnt or unburnt.

The dagger blade (fig. 41) measures 9¼ inches in length and 3 inches in breadth at the base. Unfortunately it has been broken across in two places, but otherwise it is perfect. Two rivets which affixed it to the handle are still present, and the blade is ornamented by three mouldings—a central midrib and two lateral converging on it at the point. Beside the blade were found two portions of a fillet of thin gold (fig. 41A) ornamented with parallel flutings. This is identical with a gold fillet found with a bronze blade in the cairn at Collessie and described by Dr Joseph Anderson, which was worked into an oblong mount evidently for the butt end of the handle of the dagger, and there is no doubt that the fillet had the same purpose in this case.

Fig. 41. Bronze Blade from Cist at Blackwaterfoot. (½.)

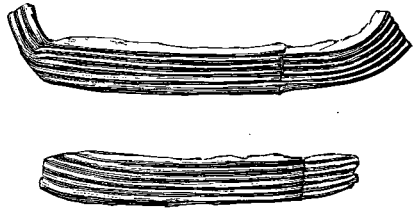

Fig. 41A. Portions of Gold Band, probably part of the mounting of the dagger.

2. *Circular Cairn with Cist at Brown Head.*—The cairn stands by the roadside between Blackwaterfoot and Corriecrievie. Part of it had been removed in making the bank of the road (fig. 42), and the falling away of this bank exposed to view the end of a cist. The structure is only slightly

raised above the ground, and is overgrown with the heather of the moor. When this was burnt off, it was found we had to deal with what was in reality only the original base of the cairn, the stones of which, in all probability, had been used to make the road. The outer limit of the cairn is marked by a series of irregular stones placed close together, defining a perfect circle 26 feet in diameter. Within this outer tier there is a second course of rounded stones, and within this again, a mass of stones and earth forms the core of the cairn. A little

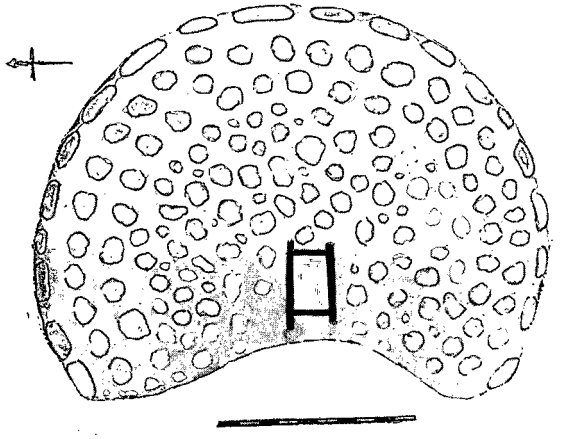

Fig. 42. Plan of Remains of Circular Cairn at Brown Head.

to the south of the centre, convered only by a few inches of soil, there is a cist, lying with its long axis E. and W. The cover and end stone were removed shortly before I was taken to see the cairn. The cist measures 1 foot 8 inches broad by 3 feet 2 inches long; and the end stones are set within the side slabs, which are 4 feet and 4 feet 4 inches long. It was filled with fine dark mould without stones. Near the bottom, about 20 inches from the surface, we came upon the fragments of a small red clay urn, but no bones, burnt or unburnt, were seen. On riddling the earth I recovered a flint flake and fourteen perforated discs

of lignite (fig. 43), but not a trace of any metallic object. The urn (fig. 44) is a flat-bottomed vessel of reddish paste, $5\frac{5}{16}$ inches in height. Its mouth is 5 inches in diameter, bounded by a slightly everted lip $\frac{3}{8}$ inch thick. Round the circumference of the vessel are two mouldings which

Fig. 43. Beads of Lignite from Cist in Brown Head Cairn. ($\frac{1}{1}$.)

are decorated by a series of angular impressions arranged with their points alternately in opposite directions so as to form a sort of zigzag ornament. The remainder of the surface is covered with a somewhat irregular chevron pattern; and the lip, which is inclined downwards within, is ornamented with short parallel lines.

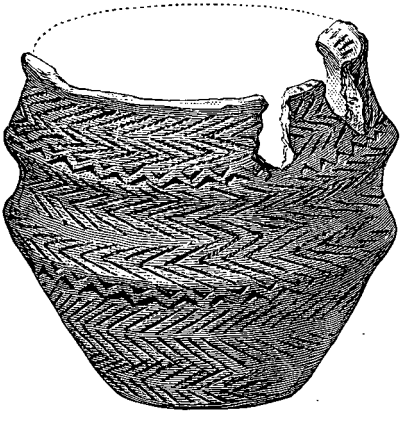

Fig. 44. Urn from Cist in Cairn at Brown Head, $5\frac{1}{16}$ inches high. ($\frac{1}{3}$.)

Fig. 44A. Bottom of Urn from Cist at Brown Head. ($\frac{1}{2}$.)

The under aspect of the urn (fig. 44A) has the unusual feature of an ornament in the shape of three arms of a cross composed of angular impressions arranged with their apices pointing away from the central point of the disc-shaped bottom.

3. *Clachaig Flagstaff Mound* (fig. 45).—This mound is situated close to the farmhouse of Clachaig, and goes by the name of Ossian's mound. It is placed on a natural elevation, in a very commanding situation, the

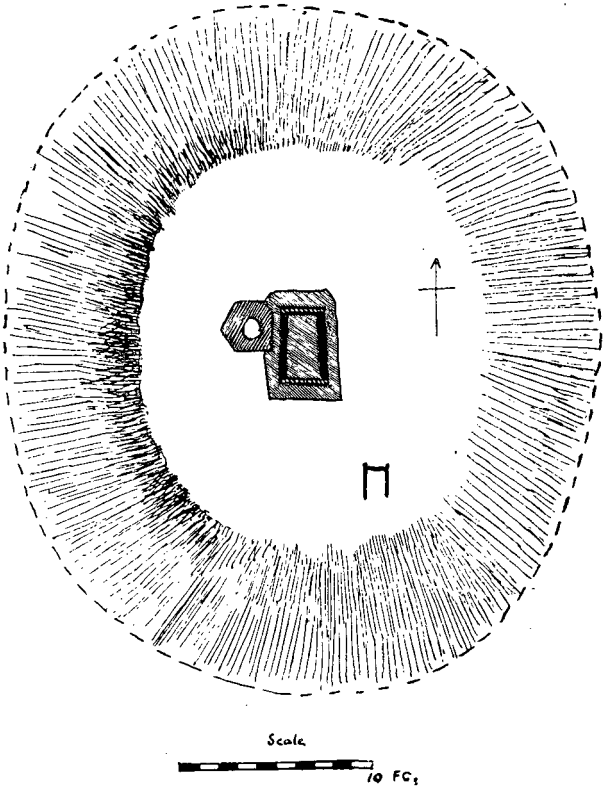

Fig. 45. Plan of Ossian's Mound and Cists, Clachaig.

whole having the appearance of an artificial terraced mound of considerable height. The actual tumulus measures 35 feet by 29 feet, with its longer axis directed N. and S. The top is flat, and measures 29 feet by 16 feet, the east edge being bevelled away.

Many years ago, the mound was opened by the Rev. Dr Waddell and Mr Spiers. They laid bare a cist, but discovered in it neither bones nor urn. I determined therefore to re-examine the site, and cut a trench from the south end to the centre. The material was almost entirely earth, there being relatively few stones. Close to the edge of the mound, and 12 feet from its centre, we came on a broken cist, with only three stones in place. It measured 2 feet 7 inches by 1 foot 7 inches, but was devoid of relics.

When the centre of the mound was reached, a sandstone flag, 2 feet from the surface, was exposed. It measured 5 feet 4 inches long, 3 feet 2 inches broad, and 7 inches thick, and covered a cist built of sandstone slabs. The long axis of the cist lay N. and S., and the sides were not parallel, the north end being 4 inches narrower than the south. Over all it measured 4 feet 2 inches by 2 feet 9 inches, and it differed from all the other cists explored, in having its end stones outside the lateral ones. The space enclosed was 3 feet 9 inches by 2 feet 1 inch, diminishing to 1 foot 7 inches. The depth was 2 feet, and the stones were set in clay of the natural mound. The cist was filled with dark-coloured mould in which no bones, burnt or unburnt, were discovered. Amongst the earth were the fragments of an urn and a flint flake. The earth was carefully sifted, but no beads nor bronze object of any kind was found. The fragments of pottery were of a reddish paste. It was not found possible to reconstruct the vessel. The fragments show a pattern of chevrons and lines composed of rows of fine points placed very close together.

4. *Cist at Glenkill, Shiskin.*—In 1887 Mr James Tod presented to the Museum an urn of the "food-vessel" type found in a cist with an unburnt interment at Glenkill. There is no mention of a cairn or mound, and presumably this was an example of an interment in a short cist under the ground without any distinguishing mark to indicate the site.

There is no record of any relics found with the urn. It is a flat-bottomed vessel (fig. 46) 6 inches in height and $6\frac{1}{2}$ inches in diameter

at the mouth, widening to $7\frac{3}{4}$ inches in greatest diameter at 2 inches underneath the brim, and tapering to a base of 3 inches in diameter. Round the widest part is a kind of hollow moulding, and across it are placed a series of small loops, six in number, at intervals of $3\frac{3}{4}$ inches apart. The whole surface is covered by shallow chevrony markings, and the upper and lower edges of the hollow moulding are ornamented by rows of triangular impressions, while the bevelled inner side of the lip is covered by markings as of the teeth of a comb.

Fig. 46. Urn from Cist at Glenkill. ($\frac{1}{4}$.)

The flat bottom shows, like the Brown Head urn, an ornament of triangular impressions. They are not arranged, however, in a cross, but in a double row round the margin.

5. *Knockankelly Cist* (Dr J. Jamieson).—In the year 1886, some workmen employed in some operations on the farm steading of Knockankelly at Whiting Bay, exposed a cist in the process of levelling a small hillock, within a gunshot from the shore. The cover stone was 20 inches below the surface, and was of sandstone such as is found on the adjoining shore. It measured 4 feet long, nearly the same broad, and was 6 inches thick. Beneath it was a cist 2 feet 6 inches in length and 1 foot 6 or 7 inches in breadth, measured inside.

The bottom of the cist was covered by fine white sand to the depth of

an inch; below this there were 2 inches of rough gravel, and below this again pure white sand.

Within the cist were a human skull, some long bones and a few pieces of ribs and vertebra. No charred wood was seen and no relics, save an urn which was found in the south-east corner of the cist.

The urn was of the "food-vessel" type (fig. 47). It measured $6\frac{1}{4}$ inches in height, and was $6\frac{3}{8}$ inches in diameter at the mouth. It widened slightly below the brim to $6\frac{3}{4}$ inches, and then narrowed below to a flat bottom $3\frac{1}{4}$ inches in diameter. Round the widest part was a slightly hollow band, bounded by two lips ornamented with "diamond-

Fig. 47. Urn from Cist at Knockankelly. ($\frac{1}{4}$.)

pointed" markings. The rest of the surface was marked by a chevron pattern. There is no mention of any ornament on the bottom.

B. CISTS COVERED BY LARGE FLAGS WITHIN THE AREA OF A CIRCLE OF STANDING STONES.

I have explored only one sepulture of this class; and though the results were negative as regards relics, I propose to describe the details of the structure, because it presents certain features which do not completely harmonize with those of the cists discovered within the area of the circles explored by Dr James Bryce.[1]

[1] *Proc. Soc. Ant. Scot.*, vol. iv. p. 449.

In all the circles which he excavated a cist was found occupying the central point, but in two cases another was discovered in an eccentric position. The cists were carefully constructed, and covered by large slabs. I shall take as an example the single granite circle (No. 4 on his plan). It is formed of four coarse granite blocks, standing about 3 feet high, and approximately in the cardinal points. It is not a perfect circle, but rather an ellipse with its longer axis, 21 feet long,

Fig. 48. Urn from Cist within Stone Circle on Mauchrie Moor, 7½ inches high.

directed N. and S. In the centre, 3 feet 4 inches from the surface, was a cist 3 feet in length by 1 foot 4 inches broad, and 2 feet deep, covered by a very large stone. In this cist was found a bronze pin or awl, an urn in fragments, some bones, and three rude arrow-heads of flint. No bronze implements were found in the cists within the other circles, but arrow-heads and flakes of flint were frequent. The urns were all of one type. They were wide-mouthed and flat-bottomed,

tapering in the lower part, contracting to the mouth in the upper, and richly ornamented either over their whole surface, or only on the upper segment (figs. 48, 49).

The Drumidoon Cist stands on the farm of that name, under a ridge that runs up from the sea (fig. 50).

Seven feet west of the cist, which is directed N. and S., is a low standing stone rising 2 feet above the ground—2 feet 11 inches broad and 1 foot 1 inch to 1 foot 5 inches thick.

Fig. 49. Urn from Cist within Stone Circle on Mauchrie Moor, 6½ inches high.

Lying prone close to this is another, somewhat pointed stone, 6 feet 8 inches in length and 4 feet broad at its base, while to the north three stones of the same general character, but not quite so long, lie upon one another. These several stones I take to be the survivors of a circle of standing stones of which there is mention in the *New Statistical Account* in the description which I understand to refer to this cist and circle. In 1845, the date of that work, there were "several vertical stones standing round the cist." The same publication gives an account of the finding

of an urn containing ashes, which was carried off by those engaged in the operation.

The capstone now lies exposed. It is a very large irregular flag, 8 feet 6 inches in its longest diameter, and 7 feet across, and is 12 inches thick at one side, 6 at the other. Its weight must be at least three tons. It rests somewhat displaced on the lateral stones of the cist, which is approximately three feet square, but as the west and north stones are displaced, it is not possible to determine its dimensions exactly. The

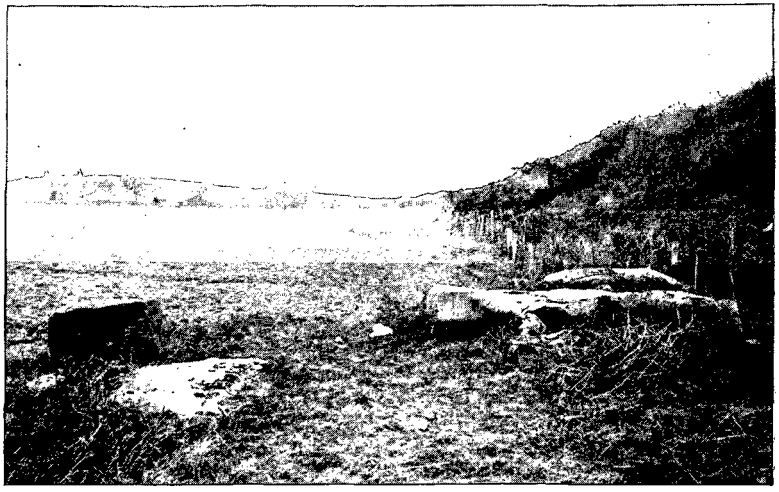

Fig. 59. Cist and Circle at Drumidoon.

west side has a long thick slab 5 feet 6 inches in length, 10 inches in thickness and 3 feet in depth, while the east side is built of two stones 3 feet in length set one above the other. The south end is filled by a slab 3 feet long, set at right angles to the west stone, 2 feet within its free end. The north stone measures 2 feet 6 inches, but has been displaced and now lies obliquely. By removing this we gained access to the cist, but found no relics. It had been roughly filled with stones by the previous exploring party. In the soil outside the cist I picked up a

number of pieces of wood-charcoal, and there were patches of brick-red earth, which may have been burned. There was no flooring slab in the cist.

I have described the characters of this cist, although the results of the exploration, as far as relics are concerned, is negative, because in its huge flagstone, irregular construction, and large dimensions it differs materially from the cists which were found by Dr Bryce within the stone circles on Mauchrie Moor.

To complete the picture of the burial customs as exhibited in the island of Arran, I may refer to the discovery of a cinerary urn at Ballymichael,[1] near Shiskin, in 1863. There is no record of the circumstances of the find, but the Six-inch Map locates a find of an urn and flints on an elevation above the road opposite the farmhouse of Ballymichael, and it is perhaps worth while mentioning that here there is a standing stone, the survivor, I was told, of a number of others, on this knoll. It is possible, therefore, that this urn burial was placed within a circle of standing stones.

The urn, which is preserved in the Museum, is a large cinerary urn of the usual type, with a broad projecting band or lip round the mouth, without ornament. It measures 12 inches high, 11 inches across the mouth, and 4 inches at the base.

The urn contained, besides ashes, calcined oval-shaped chips or flakes of flint, which show a pure white fracture, and appear to have been burnt with the human remains.

Part III.

CRITICAL ANALYSIS OF ARCHÆOLOGICAL DATA.

In gathering together the general results of these explorations, I shall take the facts regarding the structures described in Part II. first, and proceed from the better known to the less well known type.

In the first place, it is noticeable that whereas the interments in the

[1] *Proc. Soc. Ant. Scot.*, vol. v. p. 185.

cairns, and in the circles on Mauchrie Moor, are characterised by a general resemblance in their underground features, they differ in their overground or accessory characters. At Clachaig limekiln cairn, the cist has been placed in the ready-made cairn of the megalithic builders. At the Flagstaff cairn, two cists have been deposited in an oval mound of earth and stones. At Brown Head there is a small round cairn of stones, while at Blackwaterfoot there was a huge pile of stones over the cist. At Glenkill and Knockankelly the cist seems to have been placed without any overground structure to mark its site; on Mauchrie Moor the cairn is replaced by a circular setting of standing stones; at Drumidoon there is, or rather has been, a setting of standing stones; but the cist itself presents features which prevent it being classified strictly with the short cists. It is rather a single megalithic cist, but as no relics were discovered it is impossible to say how it ought to be placed.

At Blackwaterfoot cairn, and in the circles on Mauchrie Moor, the interment has its age defined by the finding of bronze. In all the other cists, though no metallic object was discovered, the character of the pottery is identical in type, and corresponds in every respect with that found locally, as well as elsewhere, associated with bronze objects.

Thus all these interments must be referred to the type of culture which prevailed during the age of bronze.[1]

Turning to the larger group of cairns with a segmented megalithic structure, I must enter into greater detail, as the type is less well known. I shall analyse the results under several heads.

1. *Structural Features.*—The differences in the *cairn* itself are probably to be considered as accidental; and though no direct evidence is obtainable, it may be assumed that the megalithic structures which now stand bare were at one time imbedded in a cairn; whether it had a defined ground plan, or a setting of standing stones, is uncertain. There are indications of certain accessory features in some unexplored cairns in Arran, and I hope that their excavation will throw some light on this

[1] This statement does not exclude the possibility that the earlier short cists may have been antecedent to a knowledge of metals.

point. The monuments of somewhat similar character in Ireland have frequently settings of stones.

There is no doubt as to the central megalithic structure. It presents certain definite uniform features, the type remaining the same in all, in spite of certain minor differences, concerning chiefly the size and character of the blocks or slabs which, set on end or edge, form the structure, and the number of compartments or cists into which it is divided.

The exact direction of the compass in which it is built seems unessential. In Arran and Kintyre and at Largie the bearing is approximately N. and S., sometimes to the W., sometimes to the E. of north; while in Islay and at Kilchoan the direction approaches more nearly to E. and W.

In every instance I have personally explored, a definite structural plan is evident. Each compartment is formed of two lateral stones, between the ends of which a transverse slab is wedged, so as to form a three-sided space, which was closed when the succeeding side stones with their transverse slab were placed in position, and so on till the number of compartments or cists was completed. In Arran, in three instances, the south end, apparently completed last, was left open. At Clachaig the second compartment was closed; but it is a question whether the south end of the structure had not been broken down by the disturbers of the cairn who placed in it the secondary interment. The structures in Islay are too imperfect for conclusions to be safely drawn on this point; but both at Ballynaughton and at Beacharra in Kintyre the terminal cist is closed by a slab, so that it would appear that this incompleteness of the cist is not an essential feature. The transverse slabs are placed at different levels below the tops of the lateral stones. When, as at Clachaig, they are low down, the structure has the appearance of a chamber, subdivided in its deeper part into compartments; when they are nearly on the same level the appearance is that of a series of cists placed end to end. The number of compartments or cists varies, but three appears to be the normal number; their dimensions range from 3 feet 6 inches to 6 feet in length, and 3 feet 4 inches to 5 feet in width.

The actual evidence available is insufficient to determine whether in all cases there were covering slabs, but it is probable there were; though at Clachaig and Beacharra the number of smaller slabs found in the compartments may possibly have represented what once was some sort of built roofing structure. The roofing slabs cannot have covered in the compartments or cists separately, but must have rested, as they do or did at Largie, on the tops of the lateral stones, roofing in the space between them.

That no sort of approach passage existed is certain, and that the structure itself is not a passage is equally certain. As the burials in the compartments or cists were multiple, there must have been some access to them, but when the covering slabs were in place no such access could have been possible, except at Clachaig and Largie. The ground plan, as has been said, shows that the structure was built from one end, and it thus seems not impossible that the compartments may have been added sucessively as required, rather than the whole built at one time.

The Largie example differs from those I have described in having some walling of smaller stones, and, like the Clachaig structure, partakes more of the character of a segmented chamber than the others. In the matter of the "rude portal" it is also peculiar. At Kilchoan there is the added structural feature of pillars for the support of the covering flags. As this must have been a provision necessary from the unequal heights of the lateral stones, it suggests a possible solution of the difficulty as to how the large flags were supported on the lateral slabs at Tormore.

2. *Character of Interment.*—Both at Largie and Kilchoan the presence of burnt bones seemed to indicate burial by cremation, and Canon Greenwell founded on this a theory of priority of cremation in Scotland. In Arran, at Torlin and Clachaig, the burial was by inhumation; at Ballynaughton in Islay, and Beacharra in Kintyre, there is no evidence either way except the negative evidence of the absence of burnt bones. At Cragabus some of the remains certainly were unburnt; but there were some fragments of charred bone, though there

is no evidence that they were human bones. At Sliddery Water and Tormore cists some fragments of unburnt bones were found, but the whole of the floor of every compartment had a layer of charcoal.

It has been proved (1) that this was practically all wood-charcoal, and (2) that if there was any bone ash it was only in small particles and in minute quantity. Thus the facts, coupled with the negative evidence of the absence of burnt bones, tend to weigh down the scale on the side of inhumation.

Where human remains were actually found, the multiple burial characteristic of Stone Age sepulchres prevailed. The disarray of the bones, the close apposition of skulls of different individuals, and the grouping of the bones in the corners at different levels, indicate successive interments in the same cist. For the disorder of the bones two explanations suggest themselves. The bodies may have been placed in a sitting position doubled up in the corners, and when the soft parts disintegrated, the bones, being unsupported, fell into irregular heaps, and were further disturbed by later interments, or the bodies may have been dismembered before burial.[1] The former seems the more plausible explanation.

The charcoal layers at the bottom of the cists at Sliddery and Tormore, if the burial was after cremation, should have yielded burnt bones. In their absence we are forced to the conclusion, that either the charcoal represents merely the remains of the fire of the funeral feast, or that cremation had been so partial that the bones were not sufficiently burned to resist disintegration like completely calcined bones.[2]

[1] For evidence as to the practice of dismemberment before final burial in the Stone Age, see especially Cartailhac, *La France Préhistorique*.

[2] Sophus Müller, arguing from the analogy of the customs of certain existing savage races, explains the presence of charcoal and some incinerated bones in the "chambered tombs" in Denmark, by supposing that fires were lit within the chamber at each opening of the vault in honour of the dead. As the bones are found in confusion, owing, he believes, to the practice of successive interments in the same chamber, some of the bones of the earlier dead may readily have been accidentally burnt (*Nordische Altertumskunde*, 1897).

3. *Pottery.*—All the vessels, though the number is very limited, hitherto referred to the Stone Age in Scotland, are made of dark coloured ware, have wide mouths with a thick lip, or recurved rim, are usually small in size, and have always a round bottom. When ornamented the pattern is simple, usually confined to the neck, and formed of straight lines in groups. The chevron pattern is conspicuously absent.

From the segmented megalithic structures in Argyleshire we have a single specimen from Largie with a round bottom (fig. 51) springing from a vertical neck. The lip has a projecting rim, and the whole vessel is covered by shallow flutings. At Kilchoan there is the record

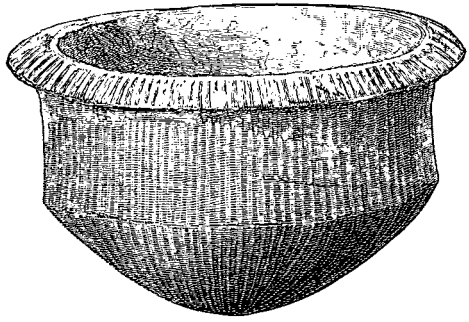

Fig. 51. Urn from Largie Cairn.

of a vessel in fragments, with mouldings, and the same vertical flutings. My own series of vessels includes specimens with close affinities to the Largie urn — and all may be included in a very distinctive group.

Several types are to be recognised, but they were found associated together in the same deposit. Certain of the ruder sort belong rather to the coarse type of domestic pottery, and several have the distinctive feature of possessing ears or handles on the neck. The more highly finished vessels have features all their own. No. 4, from Beacharra, resembles the urns found by Dr Smith in the chambered cairn of

Achnacree in Arygleshire, but the lip is thin and has no rim. No. 2, from the same place, resembles Canon Greenwell's Largie urn, in the character of the decoration on its body, but its neck slopes inwards to the thin-lipped mouth, and the pattern on the neck, though also of shallow scraped lines, is quite different, and links it with No. 6, and with the Clachaig cup. These differ, however, from it in having a vertical lip and an increased inclination of the neck. The decorative scheme, though different from anything hitherto recorded, yet preserves in its general features the Stone Age type. Though so unusual in their shape for vessels of this size, their affinities in other respects are all with the specimens hitherto referred to the Stone Age in Scotland, and they stand in sharp contrast to the urns found associated with bronze relics.

4. *Implements.*—Nothing but stone implements were found. The majority are of flint, including an arrow-head, knives, scrapers, flakes and a core, but there are two specimens of later type—the polished stone axe from Clachaig, and the polished and perforated stone hammer from Tormore.

To sum up: the several characters of the structure itself, the multiple burial, the general features of the pottery, and the absence of bronze, all combine to furnish strong presumptive evidence that the constructors of these cairns were still in the stage of neolithic culture.

In certain respects, however, the cairns differ from those hitherto regarded as belonging to the Stone Age in Scotland. The megalithic structure, apart from the doubtful points in the features of the covering cairn, differs essentially from that which occupies the core of a true chambered cairn, in the absence of the passage, in the complete segmentation into independent compartments or cists, and in the general absence of walling of smaller stones. Therefore the cairns I have described, as well as those at Largie and Kilchoan, which have been hitherto grouped with the chambered cairns, must be included in a class by themselves, which may be defined tentatively as follows:—

"A class of sepulchral cairns, not certainly known to have either a

definite ground plan or setting of standing stones, containing a segmented megalithic structure built of large lateral slabs, without walling of smaller stones; probably in all cases covered by large flagstones, and divided by septal slabs into a series of independent compartments or cists, to which there is no approach by means of a passage; in each compartment are found multiple burials by inhumation, perhaps in some cases after cremation, associated with the remains of animals, chiefly of the domestic mammals, with implements of stone, and pottery consisting invariably of round-bottomed vessels." The distribution, so far as yet known, is the south-west corner of Scotland, in Arran, Argyle, Kintyre, and Islay.

The description of the overground appearances of certain "Kistvaens found in the Stewartry of Kirkcudbright," by Mr Fred R. Coles,[1] suggests that perhaps some of them in that locality might on exploration prove to be of the same type as the Arran group of monuments.

The very marked contrast within so isolated and limited an area as Arran, between the phenomena presented by the two classes of sepulchres in their structural features, in the character of the interment, in the shape and ornament of the pottery, and in the type of the implements, is of great importance.

The island has been the meeting point of two wholly different types of custom and culture, and apart altogether from the occurrence of metal, the one type represents the customs and culture which prevailed during the age of stone, and the other, those which prevailed during the age of bronze. This general statement would be in no way shaken by the discovery of a bronze object in some future excavation in one of the megalithic monuments, nor even if it were admitted that the earlier short cists—supposing it were possible to define which were earlier and which later—belonged to a stage antecedent to the knowledge of metals.

I shall now take up the evidence of an anatomical nature regarding the primitive inhabitants of the island.

[1] *The Reliquary*, vol. iii. No. 1 (1897).

Part IV.

ANATOMICAL DESCRIPTION OF HUMAN SKELETONS.

I. Megalithic Builders.

Owing to the disarray of the skeletons, already several times alluded to, it was not found possible to identify the individual bones of each. I am therefore obliged to describe the several bones collectively. The remains from Clachaig and Torlin were carefully kept separate, but in my account of their characters I shall throw them all into one group, as the separate study of them has brought out no distinctive features, and I have no kind of doubt that they all belonged to individuals of one race.

The bones were extremely fragile. The slightest touch reduced many to powder, and as in many cases they lay under stones of some magnitude, the raising of the stones frequently broke them to fragments. Many were decayed in one part, and well preserved in others—a feature noted also by Professor Rolleston in bones from the Long Barrows. The articular extremities were in most instances defective, while the dense bone of the shafts had been better preserved. The colour varied, some being yellow in tint and very light, while others were brown or grey and heavier.

Notwithstanding the obstacles to the drawing of a complete picture, enough material is available to enable me to determine with fair certainty the physical characters of these remote islanders.

1. *Bones of Trunks and Limbs. Vertebræ.*—A considerable number of vertebræ were gathered, but there is nothing special to remark regarding them—except that in the majority of specimens the size of the bodies was small, probably most being female bones.

Sacrum.— Only two whole sacra were obtained. Both show a comparatively slight degree of curvature. The first has a maximum length of 117, and the same figure represents the greatest width at the base, giving the low index of 100. The second, probably female, measures 104 in length, by 110 in breadth with an index of 105·7. The indices are considerably below the average of modern British bones, and it is to be regretted that a larger number were not found entire, as

it would have been interesting to know whether the majority of the skeletons showed this primitive character. For the same reason the fragmentary state of the *pelvic bones* is to be regretted, as it is not possible to obtain an idea of the characters of the pelvis.

Clavicle.—There are nine bones, five right and four left altogether, and none paired. Two are remarkably long and straight, measuring 162 and 160 mm. The other bones are shorter, being 141, 139, 136, 131, and 128 in length. The last is a fragile and diminutive female bone. Besides these, one immature clavicle without its epiphysis was found at Clachaig.

The *Scapulæ* were all too fragmentary for reconstruction.

Humerus.—Eighteen bones in all were recovered, nine right and nine left, but none can be identified as paired bones, and only four are entire, two male and two female specimens. The male bones are very well marked, with prominent tuberosities and well-defined deltoid impression—the female show a great contrast in length and marking. The longest male bone measures 348 mm. or $13\frac{3}{4}$ inches, being well up to the average of modern European bones. On the other hand, the shortest female specimen is 292 or $11\frac{1}{2}$ inches, which is below the average of modern British female humeri. In one bone, probably female, there is an intercondylar foramen—a feature which, though occasionally present in modern European bones, is more frequent in those of the existing lower races of men, and was found by Broca to be specially frequent in Stone Age humeri.

2. *Bones of Forearm.*—In all there are portions of seventeen adult ulnæ, eight right and nine left, and of ten adult radii. The maximum lengths of three male ulnæ is 277, 267, and 247, and of two female, 217 and 216. One entire male radius measures 234 mm. from head to tip of styloid process. The extreme shortness and slenderness of the female bones is remarkable. The radius and ulna of a child were found at Clachaig.

Femur.—Portions of twenty-one adult bones, nine right and twelve left, were recovered, but none were certainly paired. Besides adult bones, two immature bones were found in each set of cists.

The accompanying table gives the measurements it was possible to take.

	Torlin.										Clachaig				Children.		
Side and Sex.	L. M.	R. M.	R. M.	L. M.	R. M.	R. M.	R. M.	L. F.	L. F.	L. F.	L. M.	R. M.	R. M.	L. M.			
Maximum length, . .	..	447 ap.	..	..	..	..	..	413	..	..	..	..	..	..	282	227	..
Oblique length, . .	..	..	..	..	..	..	..	409	..	..	..	..	..	..	..	..	..
Upper third. Ant. post. diam.,	23	25	27·5	27	..	..	..	25	22	24	22	24	21	22	19	13	20
Upper third. Trans. diam., .	31	37·5	36·5	37	..	..	..	30	28	32	32	35	30	35	23	17	27·5
Platymeric index, . .	74·1	66·6	75·3	73	..	..	..	83·3	78·5	75	68·6	68·5	70	62·8	82·6	76·4	72·9
Middle of Shaft. Ant. post. diam.,	30·5	29	31	..	33·5	30	29·5	27	..	..	27	28	27	31·5	20	13·4	..
Middle of Shaft. Trans. diam., .	23·5	29	27·5	..	28·7	25·5	26	25·5	..	..	24·5	27	24	26·5	18	12·6	..
Pilasteric index, .	129·7	100	113	..	116·7	117·6	113·4	106·8	..	..	110	103·7	112·5	118·7	111	106·3	..

The gluteal ridge in all the bones is well marked, and in five out of six specimens in which the upper end was entire there is a distinct third trochanter. There is in all the male bones a prominent "infratrochanteric ridge"—distinct from the gluteal line. Taking the transverse diameter at the most projecting part of this ridge, an average platymeric index for eight male bones comes out at 69·8, a decided, but not every marked degree of platymery. The average for three female bones is 78·9, and though the number of specimens is smaller, the contrast with the male bones is marked. None of the bones presented the degree of flattening of the femur from the "Mackay Cave" at Oban described by Sir William Turner, though one with an index of 62·8 comes fairly near it. In a female bone from the "Distillery Cave" the index was 78·6, the same as the average of my specimens. The absence of a marked infratrochanteric ridge, and flattening of the bone in female specimens, is in keeping with the theory that this character is due to the development of the muscular fibres springing from this part of the bone; but it is noteworthy that in the femur of a young child measuring 227 mm. without the epiphyses, there is a distinct infratrochanteric ridge, and an index of 76·4; while in another older, but with none of the epiphyses united, the index is 72·9.

The linea aspera is moderately prominent, and the degree to which the antero-posterior diameter exceeds the transverse in the middle of the shaft varies greatly.

The important fact of the maximum length of the bone could unfortunately be ascertained only in one bone.

Tibia.—Nine adult bones in all were recovered.

The accompanying table gives the chief measurements.

Three whole specimens, judging from their shortness and smoothness, are apparently female bones. One of them is a remarkably short tibia, being only 310 mm. in maximum length. Its head is somewhat retroverted, but this feature is not marked in the other bones. There is a distinct antero-posterior convexity of the outer condylar surface in several, but not in all the specimens, and in two the surface curves

sharply downwards posteriorly. In all the bones except one, there is a more or less marked facet on the anterior border of the lower extremity.

	Torlin.					Clachaig.					
	M. R.	M. L.	F. L.	F. L.	F. L	M. R.	M. R.	M. L.	M.? L.	Children.	
Maximum length, .	362?	..	343	327	310	..	..	..	..	..	..
Ant. post. diameter, .	40	42	33·5	32	28	37·4	38·5	38	29·6	17	18
Trans. diameter, .	23	27	23·5	22	17	25	21	20	18·3	14	17
Platycnemic index, .	59·5	64·2	69·6	68·7	60·7	66·3	54·5	52·6	61·8	82·3	91·8

There is a marked degree of platycnemia in the majority of the tibiæ. The average index of six male bones is 59·8, and of three female 66·. The lowest figure is 52·6, representing a vary marked degree of lateral flattening. In two very young bones the indices are 82·3 and 91·8.

The Fibulæ are much broken; none of the specimens show marked fluting.

The bones of hand and foot call for no remark. The astragali show a slightly faceted area on the upper aspect of the neck, corresponding, no doubt, to the facet on the lower border of the tibia.

Stature.—Unfortunately the data are very meagre for the determination of the stature; and I must content myself with saying that all the indications point to the stature of the male not exceeding 5 feet 5 inches, and to that of the female falling below 5 feet. The woman who possessed the very short tibia must have been a good deal shorter than this; as, if we take the proportion of that bone to the stature as 22·1 per cent., her height would be 4 feet 7 inches, while taking the femur presumably female, with a length of 413, the stature would be 4 feet 11 inches.

Skulls.—Unfortunately the majority of the skulls were broken into such fragments that it has been possible to reconstruct only a comparatively small number. Four were obtained practically whole—and I have been able to build up the calvarium in three others.

Age and Sex.	Torlin.			Clachaig.		
	A. Past Middle Life. M.	B. Adult M.	C. ?	A. Adult M.	B. Adult F.	C.
Cubic capacity,	1480 c.c.	...	...	1560 c.c.	...	...
Glabello-occipital length,	186	201	210	197	186	198ap
Glabello-nasal length,	174	184	...	191	175	...
Ophryo-occipital length,	181	197	...	194	185·5	...
Basi-bregmatic height,	136	132 ap.	...	132·5	132	...
Vertical index,	73·1	65·6	...	67·2	70	...
Minimum frontal diameter,	96	...	...	102	103	...
Stephanic diameter,	120	114	...	118	121	...
Asterionic diameter,	111	116	...	111	116	...
Maximum breadth,	140	134	...	139	139·3	140ap.
Cephalic index,	75·2	66·6	...	70·	75	70·
Horizontal circumference,	517	528 ap.	...	542	525	...
Vertical transverse arc,	307	309	...	298	300	...
Longitudinal arc. Frontal segment,	132	125	...	136	128	...
Longitudinal arc. Parietal segment,	125	125	...	136	137	...
Longitudinal arc. Occipital segment,	123	110	...	123	...	...
Longitudinal arc. Total,	380	390	...	395	376 ap.	...
Length of foramen magnum,	34·	...	...	39·8	...	...
Basi-nasal length,	99	...	...	98	97	...
Proportion of vault to base,	2·85	...	...	2·86	...	...
Basi-alveolar length,	94	...	...	92	89	...
Gnathic index,	95	...	...	93·8	91·7	...
Inter-zygomatic breadth,	132	134	...	139	135	...
Inter-malar breadth,	117	...	...	121	120	...
Nasio-mental length,	...	125	...	126	...	...
Nasio-alveolar length,	67	70	...	72	62	...
Complete facial index,	...	94	...	90·6	...	...
Upper facial index,	50·7	52·2	...	51·8	46	...
Nasal height,	53	55	...	55	49	...
Nasal width,	24	24	...	23·7	25	...
Nasal index,	45·2	43·6	...	43·2	51	...
Orbital width,	41	...	...	43·5	43	...
Orbital height,	33	...	...	32	31	...
Orbital index,	80·4	...	...	73·5	72	...
Palato-maxillary length,	...	54	...	55·5	47·5	...
Palato-maxillary breadth,	...	62	...	65·5	60	...
Palatal index,	...	114·8	...	117	126·3	...

Skull A. from Torlin (fig. 52) is the skull of an individual beyond middle life, for the sutures are in great measure obliterated. Though the muscular markings are not strong, and the lower jaw is absent,

the general characters indicate that it is the skull of a man. It is of fairly large dimensions, with a cubic capacity of 1480 c.c. of mustard

Fig. 52. Skull A, from S. compartment, Torlin.

seed, which I selected for cubing instead of shot because of the fragile state of the bones. It corresponds very nearly to the average of 1492 c.c. given by Sir William Turner for fifty modern Scottish skulls.

The cranial bones are moderately thick. The glabella and supraciliary ridges are moderately prominent, the vault is moderately high, and has an even and gentle curve, sloping downwards behind to a projecting occipital region, on which the occipital point is placed high above the slightly marked occipital protuberance. The frontal segment is greater than the parietal, and this again is approximately equal to the occipital. The parietal eminences are prominent for a male cranium, and the greatest parietal width is placed high up, so that the sides below incline somewhat inwards, giving an ill-filled appearance to the skull in the norma occipitalis. The region of the sagittal suture is somewhat elevated, and the outline from behind is distinctly pentagonal. There is a very marked depression close to the asterion in the line of the lambdoidal suture, and the corresponding elevation within lies above the level of the groove for the lateral sinus. In the norma verticalis the zygomatic arches are just seen.

The cephalic index, 75·2, places the skull in the mesaticephalic group —and the altitudinal index is lower than the latitudinal, by reason of the height falling below the width.

The face is orthognathic in an eminent degree, and is moderately long. The nose is moderately high, and the orbits rectangular, with their outer angles depressed, and the outer rim of the orbit is unusually blunt. The malar bones are square.

Skull B (fig. 53) lay almost touching C (fig. 54) in the same corner as A, but two feet below it. The left frontal and temporal regions are broken out, and in spite of the greatest care the base broke away when the skull was lifted, so that some reconstruction was necessary. It must have belonged to a comparatively young adult male. In general characters it differs considerably from A, and its cephalic index, 66, is hyperdolicocephalic. There is a want of symmetry in the occipital region, the right side being depressed. There is thus some suggestion of posthumous pressure in an oblique direction from the left temporal to the right occipital region, but that the excessive index is *wholly* due to this cannot be admitted, for the height still falls short of the breadth;

Fig. 53. Skull B, from S. compartment, Torlin.

and further, while the frontal and parietal segments are equal, and below the average dimensions of these arcs, the relatively great length of the skull is due to the greatly elongated occipital region.

The glabella is prominent, the forehead is low and receding, sloping gradually back to the vertex, from which again the backward slope is even and very gradual to the prominently projecting occipital probole. The occipital point is very high up, and the arc of the vault very low. The sagittal suture is elevated, so that the parietal bones slope steeply to the region of the slightly marked eminences, below which the sides are flat, the left side being somewhat more rounded than the right. The depression at the asterion is less marked than in A. The shape is a very elongated oval; the zygomatic arches hardly show at all in the norma verticalis; but owing to the great projection of the occipital bone, a considerable part of the squamous portion is seen in this view. The gnathic index is an uncertain quantity owing to the imperfection of the base, but though more prognathic than A, it is yet well within the orthognathous series. The face is leptoprosopic, or long and narrow, and the nose leptorhine. The lower jaw is fairly massive, the lower border of its body being thick, but the chin is somewhat flat, the angle is well marked and slightly everted, and the coronoid relatively high.

Skull C (fig. 54).—Only the vault could be reconstructed, the base being hopelessly broken and imperfect. The chief point is the remarkable length of this skull, 210 mm. In general features it closely corresponds to B, beside which it lay. The frontal bone is relatively very short, and the bulbous occipital region is a very striking feature. On the inner face of the occipital bone there is a distinct depression or fossa on each side of the internal occipital crest and above the lateral sinus, for the occipital poles of the cerebral hemispheres. Skull B also shows these depressions in a marked degree. These last two skulls are excellent examples of the form of skull called kumbecephalic by Wilson.

Clachaig Skull A (fig. 55) is a remarkably well-preserved specimen, the lower jaw being its only imperfect portion. It lay, as stated before,

within a few inches of the clay vessel represented in fig. 12, and it must, I believe, have been coeval with it. It is a massive and capacious skull, with thick cranial walls. It is the skull of a man in the prime of life, as the sutures have not begun to be obliterated, and yet the crowns of the teeth show a considerable amount of wear. Its cubic capacity is 1560 c.c. of mustard seed—well above the average of modern Scottish skulls. The glabella and supraciliary ridges are well marked, and the

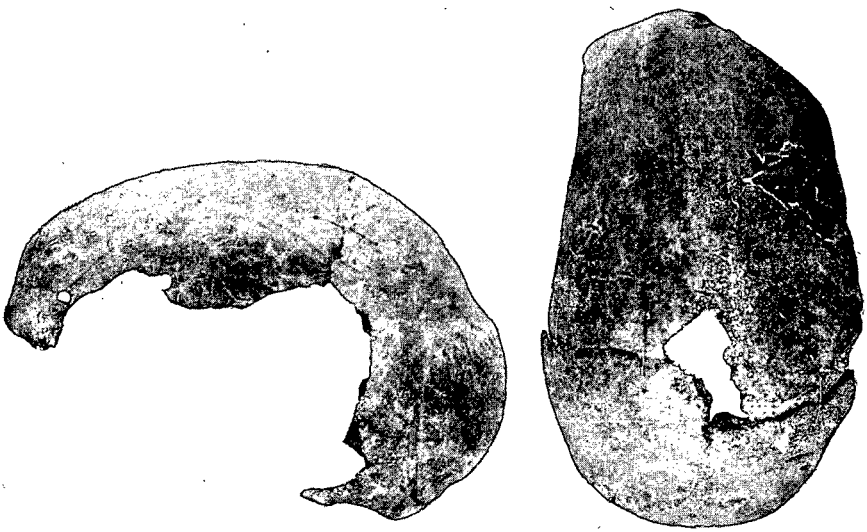

Fig. 54. Skull from S. compartment, Torlin.

forehead is high and well arched, in contrast to the specimens just described. The vertex corresponds closely to the bregma, and for some distance behind this the vault is somewhat flat, so that the backward slope is more vertical. The occipital squama is globose, and prominent. The occipital point is placed well up to the lambda—the inion is prominent. The under aspect of the occipital bone is much depressed and rounded, so that the skull rests upon it, and not on the condyles. The great projection of the skull behind the auditory meatus is a very

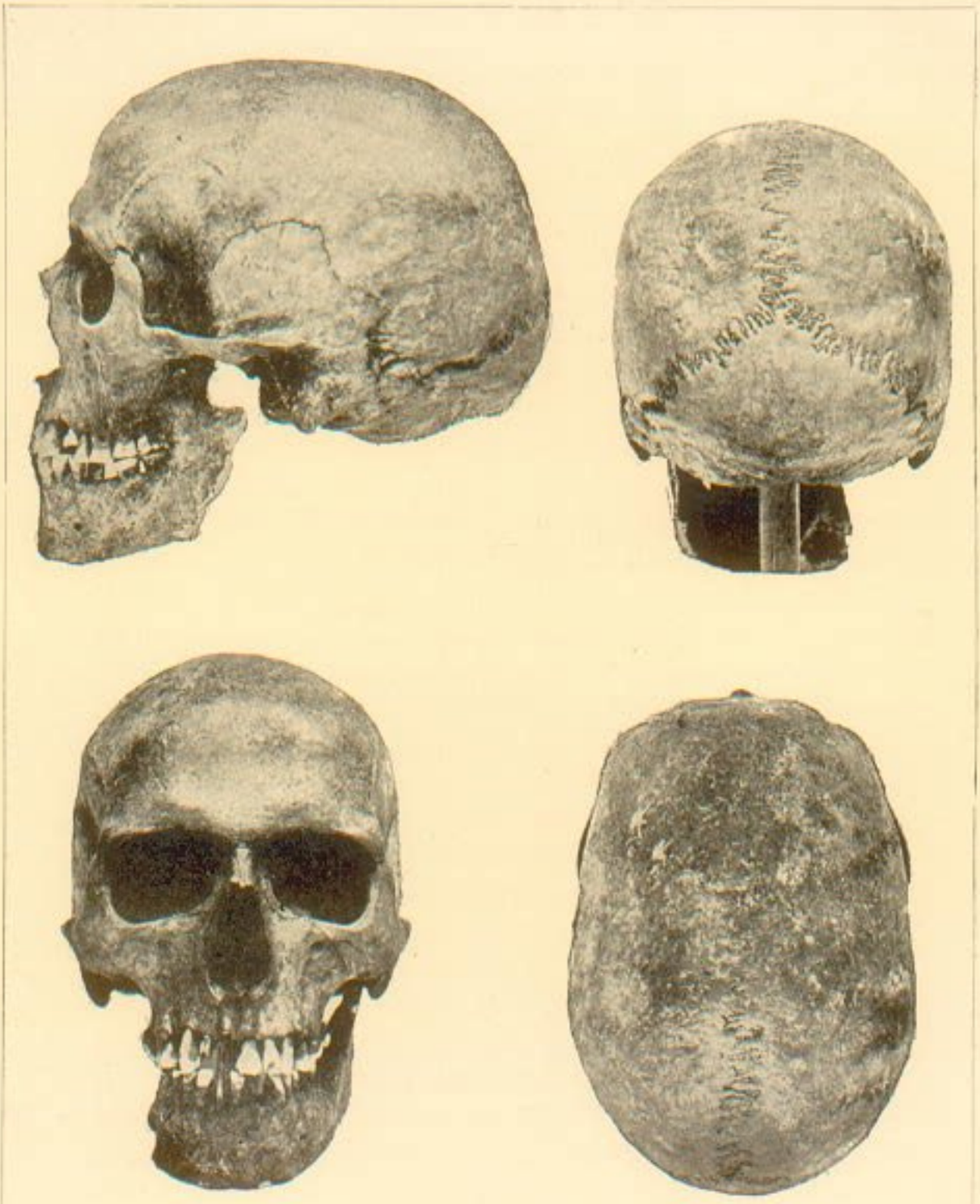

Fig. 55. Skull A, from Clachaig Cairn.

marked feature. The frontal and parietal arcs are exactly equal, and both are greater than the occipital. The side walls are nearly vertical, there being only a difference of $3\frac{1}{2}$ mm. between the maximum breadth on the lower part of the parietals, and the breadth between the slightly marked parietal eminences. The norma occipitalis is pentagonal, and the skull has a wall-sided character. The basi-bregmatic height is less than the width, so that it is a relatively low skull. It is a typically dolichocephalic cranium, with an index of 70. It is phænozygous. The gnathic index places the skull well within the orthognathous group. The face is eminently leptoprosopic, and the nose leptorhine. The lower jaw has a massive body, but the projection of the chin is relatively slight, and the coronoid process is comparatively low. The teeth are very large, and the lower jaw has that character of relative turgidity in the region of the molar teeth, referred to by Professor Rolleston, as is to be observed in the skulls from the Long Barrows.

Skull B (fig. 56), from Clachaig, in spite of the absence of the lower jaw, is to be regarded as the skull of a female well advanced in life; the sutures are in great part obliterated, and the crowns of the teeth well worn. Allowing for sexual differences, its general characters closely conform to the last skull. There is greater flatness of the vertex—greater prominence of the parietal eminences. The parietal arc exceeds in length both the frontal and the occipital. The facial region presents, however, features which distinguish it from all the other skulls. The maxilla is especially short and low, giving a very low gnathic index, and also a low upper facial index—so that the face is chæmoprosopic. The malar bones are very square and deep, and their anterior surfaces are almost on a level with the nasal processes of the maxillæ, and owing to the shortness of these bones their lower borders are on a level with the alveolar processes. The shortness of the maxillæ, combined with considerable relative breadth, gives a high palato-maxillary index.

The orbits are rectangular and droop at their outer ends, and the outer part of the orbital rim is rounded off to a remarkable

degree. The nose is mesorhine, whereas in all the other skulls it is leptorhine.

Calvarium C, Clachaig (fig. 57).—The skull of which this was the

Fig. 56. Skull B, from Clachaig Cairn.

only portion that could be restored was found crushed between two stones. The bones are remarkably light and thin, compared to the other skulls. The glabella is very flat, the forehead vertical, and the vertex

well arched, with a long and gradual backward slope. There is an os triquetum or præ-interparietal bone. The maximum length is 198, and the maximum breadth is about 140, giving a latitudinal index of 70.

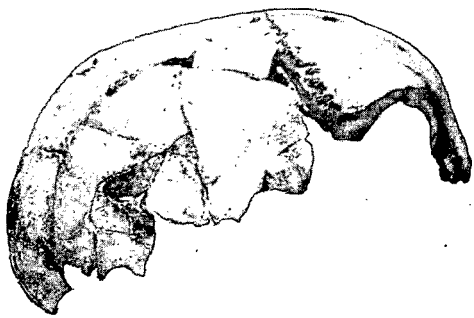

Fig. 57. Skull C, from Clachaig Cairn.

Calvarium D, Clachaig (fig. 58).—This skull is thicker and heavier than C, and approximates to B in the general characters. The posterior

Fig. 58. Skull D, from Clachaig Cairn.

slope is more vertical than in C, and though it is too imperfect for measurement, the gradual slope of the vault behind and the prominent occipital probole identify it as a dolichocephalic skull, and place it in the

same group as the others. The frontal arch is very low, more so than in any of the other skulls.

Besides the specimens described, fragments of six other skulls have, owing to their broken and decayed condition, defied reconstruction. Two portions of the cranial vault among these—one probably from a young person, the other, from the thickness of the bones, probably from an adult—show a persistent frontal suture.

Lower Jaws.—As was to be expected, the mandible of a number of skulls has been preserved when the skull itself was not recoverable. In all, there are fifteen adult and two children's jaws. Seven of them are sufficiently entire to give the ordinary measurements.

Sex.	M. Torlin B.	M. Torlin C.	M. Clachaig A.	?	F.	F.	F.
Symphysial height, .	36	...	31·5	31	28	26·3	28
Coronoid height, . .	76	68·5	67	74·5	51·5	50	54
Condylar height, . .	65	67	...	60	60	51	52
Gono-symphysial length,	94	...	...	...	81	85	82
Intergonial width, . .	...	...	...	97	86·5	90	...
Breadth of ramus, .	37	...	...	32·5	39·5	40	35

All these bones are those of adult persons, with the teeth moderately worn, and none edentulous. In the majority the teeth are moderate in size; in certain they are distinctly larger than those of modern Scottish jaws. Those of No. 3, belonging to the Clachaig Skull A, Mr Oswald Fergus informs me, are almost a third larger than any set he has seen in his practice as a dentist; and in examining the whole series he was further struck by the absence of caries to any extent. One jaw shows an impacted "wisdom," and in another there is only one pair of incisors. The crowns of the teeth are in nearly all cases expanded and worn quite flat, the surface being oblique in a number—looking inwards in the upper, outwards in the lower jaw.

In general proportions there is great variation. In the jaws certainly male, the symphysis is deep, the lower edge of the body is massive, and

the chin square. The mental protuberance projects but slightly, and the mental tubercles are not distinct, so that the chin, while square and massive, is flat and vertical. There is a discernible amount of the turgidity in the molar region, described by Rolleston as sometimes marked in Long Barrow specimens. The angle is well marked, but only in one case is it everted, and the ramus is of moderate width. The coronoid is approximately of equal height to the condylar process, except in the powerful jaw of Torlin B, where it is specially high.

The jaws certainly female present marked differences. The symphysis is shallow, the body much slighter; further, the symphysis is not flat but concave, owing to the eversion of the lower border. The mental protuberance is moderately developed. The angle in every case is very open, the ramus short, and the coronoid low and the sigmoid notch shallow. Certain of the specimens are intermediate in type, such as No. 4.

In five specimens the mental foramen is placed opposite the interval between the bicuspid teeth, in nine it is situated further back; the jaws, therefore, in this respect would seem to show a resemblance to the Long Barrow specimens in which Professor Rolleston specially notes this feature.

Of the two immature mandibles the one shows the six-year-old molar fully erupted. The central incisor is still within the alveolus, so that it must have belonged to a child between six and seven. The crowns of the milk molars are worn much as those of the permanent molars of the adult—a fact suggestive of the conditions of feeding under which the children were reared. In the other mandible the first permanent molar is just appearing above the alveolus, so that the child to whom it belonged must have been in the fifth year of life.

Looking at the group of crania as a whole, in spite of individual differences there is no question that all belong to the same general type. The degree of diversity in the indices is more than paralleled in certain groups of Long Barrow skulls. It is of more consequence to observe the absence of any brachycephalic feature. They all possess in an eminent degree the characters of the dolichocephalic type. They are all, further, rela-

tively low skulls, only one (Torlin A) rising into the metricocephalic group. All are more or less phænozygous; the gnathic index places them all low down in the orthognathic series. The facial index is leptoprosopic in the male skulls, but in the female it is chæmoprosopic; it is important to notice that the low figure here is due, not to increase in breadth, but to the extreme lowness of the maxillæ. It is an accidental and individual trait. The nasal index is leptorhine in two, mesorhine in two; the orbits are microseme in all.

II. Short Cist Builders.

In none of the short cists which I have opened were there more than fragments of bones. It is fortunate, however, that I can refer to two

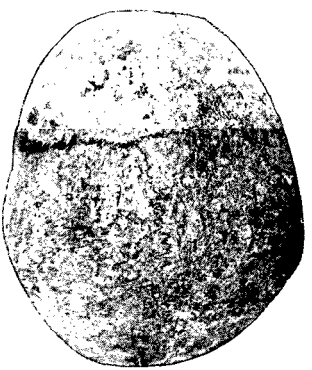

Fig. 59. Skull from Short Cist in Stone Circle, Mauchrie Moor.

specimens which present a very striking contrast to the earlier skulls. In one of the cists within the Tormore circles on Mauchrie Moor, a skull and some fragmentary long bones were recovered by Dr James Bryce. As I have said above, the relics associated with this interment place it without any question in the Bronze Age. The cranium is preserved in the National Museum of Antiquities, and fig. 59 reproduces a photograph of the specimen taken by myself. It is unfortunately imperfect, the

face, the base, and the greater part of one side being absent. The shape of the vault, however, which is perfect, shows that it is a brachycephalic skull. Professor Allen Thomson, who described the remains, compared it with a cranium described by Professor Daniel Wilson as having been found in 1833 in a stone cist below the foundations of the old steeple of Montrose. He gave such measurements as it was possible to take, and the following are the chief of them:—

Maximum antero-posterior diameter, .	7 inches,	177·8 mm.
Maximum transverse diameter, . .	5·7 ,,	144·7 ,,
Greatest horizontal circumference, .	20·4 ,,	518·16 ,,
Antero-posterior arc from root of nose to supposed place of external occipital protuberance, . . .	11·75 ,,	298·35 ,,
Frontal arc, ...	4·8 ,,	121·8 ,,
Parietal arc, ...	5 ,,	127 ,,
Distance from meatus auditorius to vertex, ...	4 ,,	111·6 ,,
Cephalic index,.		81· ,,

We have a description by Professor Cleland of the human remains found by Dr Jamieson at Knockankelly.

The bones were those of a boy of 10 or 11 years of age, and about 4 feet 2 inches in stature.

The long bones were strong and well marked for the age, the thigh bones were stout both in shaft and neck, and the linea aspera was well marked. The oblique line of the tibia was remarkably distinct, but there was no platycnemism.

The skull had been a well shaped skull, but had suffered from posthumous distortion, and the right side was imperfect. The position of greatest breadth was placed in the course of the squamous suture. The amount of breadth was estimated by doubling the distance from the broadest part of the surface on the complete side to the mesial plane.

Greatest breadth,	6·25 inches.
Greatest length,	6·6 ,,
Coronal breadth,	4·5 ,,
Zygomatic breadth,	4·2 ,,
From between incisors to front of foramen magnum,	4·4 ,,
Height from front of foramen magnum,	5·0 ,,
Orbito-nasal angle,	90°

"In a skull so young, race characters are liable to be masked by those of the particular age. But these measurements give a very high index of breadth to length, viz., 93; and even allowing for errors arising from the way in which the breadth is calculated, and from post-mortem distortion, it is obvious that this skull is as brachycephalous as those of the Short Barrows."

From archæological data, the conclusion was reached in Part III. that in early times the Island of Arran had been a meeting-place of two wholly different types of custom and culture. The anatomical evidence now brought forward brings out an equally striking contrast in the skull form of the earlier and later settlers. The megalithic builders were a dolichocephalic race of short stature; the short cist builders were a brachycephalic race, probably (from analogy) of higher stature. The local evidence as to the latter is fragmentary, but when the evidence as to the physical characters of the short cist builders in other parts of the country is taken into account, there is no doubt that the contrast in skull form is not accidental, but that we have actually to do with a distinct racial type.

The local contrast in skull form thus established, completes the significance of the prehistoric conditions in the island of Arran. The very sharp contrast in customs and culture is explained by the meeting of two racial types.

Part V.

We have seen in the foregoing sections that the phenomena presented to the observer by the graves of Arran, afford conclusive proof of a

sequence of cultural stages, and of a succession of racial types. The available area for habitation in the island is so limited that it is impossible to think of two races in different phases of culture simultaneously occupying the land.

The local conditions in Arran express, in epitome, the conditions prevailing in the country as a whole.

Two races of different physical type, practising different burial customs, and manifesting different qualities of culture, meet in the transitional stage between the age of Stone and the age of Bronze.

The earlier race were displaced or gave up their peculiar burial customs in favour of those of the new comers before, so far as we yet know, they had acquired a knowledge of metals. The later race certainly introduced bronze into Scotland, but whether they brought it with them or acquired a knowledge of it from the South after their arrival, there is no actual evidence to show.

The short cist burials in Arran, beyond their importance as manifesting contrasting conditions, do not call for any special comment here, save this, that the local evidence is in favour of a thesis which I think could be perhaps maintained for the country as a whole, viz., that the essential idea of the contracted size of the short cist is related to the new custom of burying the dead severally and independently in the contracted position formerly necessitated by the custom of multiple interments in a limited space.

The main point of departure is clearly not the practice of cremation, nor is it the megalithic idea that has been given up. The one factor which affects all the other phenomena is the character of the interment. The megalithic cists are tribal or family vaults; the cairn over them is a monument to a large number of dead. The short cists are coffins for single individuals, and the cairn or circle is related as a rule to a single central or principal interment, and therefore a monument to a single individual. It is true that cists are sometimes found arranged in groups or cemeteries, but each cist is quite independent of the others, and in the main the above statement is accurate.

The cranial characters of the Arran brachycephali are entirely in agreement with those of the short cist people on the mainland of Britain. Sir William Turner[1] has given statistics of seventeen skulls from sepulchres of this class in Scotland. The average index of twelve was 81·4, while in other five it was 74, so that the majority were brachycephalic. The occurrence of the elongated form of skull in short cists may be explained by the absorption of the earlier race in the later population.

It is outside my purpose to deal with the origin of these Brachycephali. They are usually supposed to have been the vanguard of the Celts, and probably came, as far as their immediate origin is concerned, from North East Gaul. It is necessary merely to notice (1) that in Denmark in its Stone Age a brachycephalic element was present, short skulls being found in some of the megalithic tombs; (2) that early in the later Stone Age, an intrusive brachycephalic race or races were already established in Belgium, north-east and central France. Whatever be their origin, they ranged westwards and southwards in France during the Stone Age, so that everywhere there is a duality of type found in the tombs, except in the extreme west—the part least affected by brachycephaly being defined on the east by a line from Normandy to the sources of the Garonne.

It is very generally stated that the Brachycephali came into Britain with the Bronze, but this distribution of races in the Stone Age on the Continent, combined with the facts of the distribution of the sepulchres of the Dolichocephali in this country, and especially in Scotland, point to the possibility that the Brachycephali, spreading from the south and east, were already established in Great Britain in their Stone Age, and acquired a knowledge of Bronze later, after their settlement. Such a view, which is that of Canon Taylor, meets the archæological facts as well as the other, even though it be conceded that, owing to identity of customs and culture in other respects, it is impossible to distinguish their premetallic from their postmetallic phase.

I must now refer more particularly to the megalithic builders of

[1] Royal Institution Lecture, March 26, 1897.

Arran, with the view of determining how far it is possible to trace their origin, and to place them among the prehistoric races of Britain.

For many years the physical characters of the neolithic inhabitants of South Britain have been well authenticated by fairly numerous discoveries of their osseous remains in the Long Barrows, and there has been defined what is known as the "Long Barrow" race. In Scotland and in Ireland they have been rather inferred than actually proved. Thus in Scotland very few skulls have been found which can with any degree of certainty be referred to the age of Stone or the primitive race.

Sir Daniel Wilson as long ago as 1850 came to the conclusion that the primitive inhabitants of North Britain were dolichocephalic. He selected a form of skull to which he gave the name of kumbecephalic, as the primitive form of cranium, but none of the specimens on which he founded his hypothesis were referred to structures which would now be recognised as of neolithic age. The skull which might most probably be referred to that stage, was said to come from a large cairn near Nether Urquhart, containing two large vaults or chambers, one of them 6 feet in length. This Nether Urquhart skull is in every respect identical with my specimens Torlin B and C, but it is clear that this excessively long and low skull is merely an exaggerated example of its class.

One or two skulls from the chambered cairns[1] are dolichocephalic, and the two skulls from the Oban caves described by Sir William Turner[2] are of the same class. The two latter agree in all essential respects with my specimens, Skull B with an index of 70·2 closely resembling Skull A from Clachaig, and A with an index of 75·4 being

[1] Owing to the persistence with which, in books and writings on the subject, the Caithness crania described by Professor Huxley appear in support of prehistoric ethnographical generalisations, I think it is necessary to point out that they did not come from "chambered cairns" in Caithness, as often loosely implied. The long cists, or, more properly, stone-lined graves, in which they were found had no necessary relation to the refuse heaps where relics were alone found. The skulls have no claim, nor did Huxley make that claim for them, to be aboriginal, and they must be wholly left out of account in any consideration of the physical characters of the aboriginal race.

[2] *Proc. Soc. Ant. Scot.*, vol. xxix. p. 410.

comparable with A from Torlin, the index of which is 75·2. As compared with the Long Barrow skulls from England, the Arran specimens are to a somewhat exceptional degree platycephalic, in respect of the height index being invariably less than the breadth index. This is not the case in many Long Barrow skulls, otherwise the cranial characters in the two sets of specimens are identical in every way. The skull from Clachaig labelled A is the most typical. I have compared it with the skulls in the Oxford Museum belonging to the Greenwell collection, and with those of the Thurnam collection at Cambridge under Professor Macalister's care, and find the identity of type completely vouched for. Further, the degree of individual variation is quite paralleled by the skulls in these collections. It may therefore be accepted as substantiated, that the Arran megalithic builders belonged to the same race as the Long Barrow people of England.

It is now generally admitted that in neolithic times a dolichocephalic race of short stature occupied the whole of Britain and Ireland. Further, they were a northern branch of a southern race, who in the later phases of their peculiar culture erected megalithic sepulchres. Their centre of dispersion probably was Northern Africa, and according to Sergi,[1] they belonged to the same stock who in pre-Aryan times occupied both sides of the Mediterranean basin, and formed the primitive substratum of population in all Northern Europe. The Long Barrow people were an offshoot from the Western or Iberian branch of this Mediterranean or Eurafrican stock.

This last statement, in the form of the Iberian hypothesis, has long met with acceptance in this country, and I need not recapitulate here the anatomical evidence on which it is founded. It will suffice to state that the Arran megalithic builders, as representatives of the "Long Barrow race," or "Dolmen builders," possessed physical characters—so far as can be judged from the study of their osseous remains—similar to those of the neolithic dolichocephalic race, who in Spain and France buried their dead in caverns, natural or artificial, and in megalithic tombs or

[1] *The Mediterranean Race*, Contemp. Sci. Series, 1901.

dolmens. At the same time there is nothing to sharply distinguish them from the race who raised the megalithic monuments in the countries to the east.

This Long Barrow race, however, cannot have been the earliest immigrants from the south. They belonged to the later period of the Neolithic Age; and the question now arises, Can we place the megalithic builders of the south-west of Scotland among these later settlers, or determine the route which they followed to get there?

To seek an answer to these questions, it will be necessary to examine the affinities of their sepulchral structures, and the relationships indicated by the objects found in their graves.

The Arran type of megalithic structure belongs clearly to the dolmen class, but I have refrained up to this point from using this term, as its connotation is too wide.

With regard to the affinities of these Arran structures within the British Isles, their general character distinguishes them from any other group of megalithic structures, save the elongated trough-like monuments in Ireland, forming one variety of "giant's grave," and their serial segmented character, from any but one type of this structure.

In a recent elaborate work on the Dolmens of Ireland, W. C. Borlase has gathered together all the information available regarding the megalithic structures in Ireland. They run to the large number of 898, containing 780 dolmens, 50 chambered tumuli, and 68 of uncertain character, exclusive of unopened cairns, and of such stone circles as are not associated with one of these monuments.

He gives many plans representing structures formed of parallel placed slabs forming a trough-like space, covered in by flagstones. The large proportion now stand denuded, but many certainly were at one time covered by cairns, at least to the level of the capstones, and many have settings of standing stones. The greater number of the plans represent merely the overground characters of the denuded structures, and relatively few of the monuments have been properly excavated. None exhibit in the ground plan the regular segmentation of the structures I

have described. On the other hand, Col. Wood Martin[1] represents a type of structure essentially similar to certain of the Arran monuments; and the figures and descriptions of the megaliths at Creevykeel, Drummaskibbole, Cloghmore, Cabragh, in Sligo, and Bundoran in Donegal, make it clear that he has observed the same set of structural features as are to be seen on this side of the Channel. At the same time, while on the Scottish side the structural plan is invariably linear and simple, it would appear that in Ireland, in certain instances, it became more complicated, and the series of cists assumes a T-shaped or X-shaped figure in ground plan.

The character of the interment in some of these Irish structures must have been the same as in my examples. Both cremation and inhumation were practised. Thus to quote from Wakeman[2]: "The principal Knockninny 'giant's grave' (in Co. Fermanagh) extends as nearly as possible N.W. and S.E., and is composed of above 25 sandstone slabs. There is no trace of any covering. The interior is divided by stone partitions into three chambers, all of which were found to contain portions of human skeletons largely mixed with bones of oxen, sheep and other mammals. The bones do not appear to have been subjected to the action of fire, although small pieces of charcoal were found with them. They lay in utter disorder and at various depths." Unfortunately the poverty of relics from these Irish structures prevents the comparison being pushed further than the structural characters and similarity of custom will carry us; but it is sufficient to demonstrate a close connection, from the earliest times, between the south-west corner of Scotland, and Ireland.

On the Continent somewhat analogous structures seem to occur in Brittany, among the more ordinary types of megalithic monument.

In the north, Danish and Swedish archæologists have ventured to lay down a chronology of the megalithic monuments. They refer the single-chambered, three-sided dolmens to the earliest stage; but the pottery

[1] *Rude Stone Monuments of Ireland.*

[2] Quoted by Borlase, *Irish Dolmens*, p. 227.

associated with them indicates that the culture was already far advanced beyond anything manifested at a corresponding stage in Western Europe or the British Isles. Then came the chambered tombs, or giant's chambers, with a class of pottery wholly different, as we shall see, from that seen in the west; while lastly, the slab graves or Hällkista, poor in pottery, belong to the latest phases of the stone culture. These Hällkista are built of many thin slabs to form long, narrow, and shallow chambers, sometimes divided into two compartments and generally open at one end. There is no approach passage, and admission to the vault would have been impossible through the low open end. It is therefore supposed that to obtain a second access to the common vault, the capstones must have been removed. The Arran type of structure has a certain resemblance to these slab graves of Scandinavia, but the regular segmented character is wanting in the Danish monuments.

Whatever may be the variation in the structural features of the megalithic sepulchres in different countries or localities, the same burial customs are to be observed. Whether the sepulchral vaults be natural caves, artificial grottos, or slab-built chambers, the interment is multiple and successive. This custom necessitated an approach passage, such as is seen in any of the varieties of chambered structures; and hence it seems not unreasonable to suppose that the structures without a passage, indicating a departure from the original idea, belonged to a later phase.

Notwithstanding, so far as I am aware there are no archæological data which could establish a chronology in the various neolithic sepulchres in Britain; and the most that can be said is that probably these Arran sepulchres belong to a late phase of the Stone culture. Beyond linking the Arran megalithic builders to those of Ireland, the affinities of the sepulchral structures do not carry us very far. The pottery, however, gives clearer indications of relationships further afield.

In the Long Barrows of England, pottery is very scarce, and it is always represented by mere fragments. These have belonged to rude clay vessels, probably in general with rounded bottom, like the one from Norton Bavant Long Barrow, depicted by Dr Thurnam in *Archæologia*,

vol. xlii. It is made of thin dark-coloured paste, is devoid of any ornamental pattern, but has two small handles on the neck. It is in every respect similar to the ruder sort of fictile vessel, in the group described in this paper. All the vessels discovered in Scotland in the chambered cairns, as pointed out first by Dr Joseph Anderson, have been round in the bottom, often provided with a flattened rim; and when decorated, the pattern is simple, composed of groups of straight lines, or vertical fluted markings. They are, moreover, generally small in size; but in the Unstan cairn in Orkney, where a very large number of fragments of pottery were found, a few vessels which could be reconstructed were in the form of large flat basins, generally with a vertical rim, ornamented by groups of oblique lines alternating in direction in neighbouring spaces. One vessel only had a flat base, a fragment of which was recovered. This Orkney group possesses very individual characters—and outside it the pottery of the chambered cairns is only known from the fragments found in the Caithness group, and two vessels, one whole, and another represented by a fragment, found by Dr Smith in the chambered cairn of Achnacree in Argyleshire.[1] At Largie, in the megalithic structure without a passage, the urn previously referred to (fig. 51) was recovered. It was a type unknown to Canon Greenwell, who discovered it; but as I have shown in the body of my paper, it finds its place in the group of vessels I have described. Fictile vessels which have been actually taken from the interior of the dolmen monuments in Ireland, seem as rare as the skulls; and for the particular class of structure resembling the Arran monuments there is, so far as I know, no material available for comparison. The group of vessels, therefore, from the megalithic cists in the south-west of Scotland is, in so far as all save the simpler and ruder vessels are concerned, unique in this country. It is, further, harmonious within itself, and I have therefore been tempted to give it a somewhat exhaustive scrutiny—with the view of determining whether its affinities on the Continent would bear out the conclusions come to on physical anthropological

[1] *Proc. Soc. Ant. Scot.*, vol. ix. p. 409.

grounds, that the affinities of the early settlers in Britain were Iberian.

There is no general work on the prehistoric sepulchral pottery of Europe, and indeed the materials can hardly be said to be yet available for such a work. With the exception of one variety, known to archæologists in this country under the name of the "drinking cup," which occurs, sporadically all over Europe, at the end of the neolithic or beginning of the Bronze Age, and is regarded as having an Eastern origin, the pottery in different areas has characters in a measure peculiar to the district in which it is found. The "drinking cup" type even shows local modifications of the general form and decorative design. This is, of course, just what might be expected, but added to the multitude of minor variations it makes an effort to trace affinities difficult and uncertain.

The following brief account of some of the main points in the relationship of the pottery described in this paper, does not pretend to be exhaustive. It is put forward tentatively with the diffidence of one who is not a professed archæologist, but it claims notice, (1) because of the inherent probability of its main contention; and (2) because, if well founded, it adds a factor to the study of the origin of the Stone Age culture in this country.

In the first place, a very common feature of neolithic pottery from all kinds of sites—from the lake dwellings, from caves and grottos, and from sepulchres—is that the vessels are rounded on their under aspect, so that they could not have stood by themselves, but must have been placed in a hollow, or supported by stones in a fire if used for cooking. This feature is common also to the later domestic pottery in Britain, and the form survives to the present day, as shown by Sir Arthur Mitchell, in the rude craggans of the village pottery in the Hebrides.

Such rude round-bottomed vessels have been found in caverns—as at Engis, and the cave of Petit-Modane. According to Philippe Salmon,[1] the pottery found in the grotto of Nermont in Yonne shows an ascending scale of workmanship, which can be detected in the vessels from the

[1] *Matériaux pour l'Histoire*, etc., vol. xxi.

several strata of occupation. The earliest type from the lower layers is a simple undecorated or thick clay bowl-like vessel of the same type as our urn from Beacharra (fig. 32). In the middle layer occur vessels of the same type, decorated with rows of dots, or with perforated handles for suspension. In the upper layer the same general type is preserved with better workmanship and more decoration.

The pottery from the Danish shell mounds is known only from fragments. There are two forms, a large, flat, round-bottomed basin-like vessel, and another, ewer-like form, with a rounded body ending in a pointed base, constricted at the neck and widening again at the mouth. It is interesting to note that both forms occur on domestic sites in Spain, and the latter is the most ancient type of Spanish pottery, according to Siret.[1] I think we may take it, however, that the commonest form in neolithic sites is the shallow, round-bottomed, bowl-like vessel with a wide mouth, though cylindrical flat-bottomed vessels are also found.

The decorative pattern is invariably either in the form of dots impressed by a pointed implement, or straight lines in groups with varying directions, but almost always at right angles. It is only in the later stages that a sharp angular arrangement of the lines of the pattern is seen.

On Plate I. is given a selection of types from the megalithic monuments of the Danish peninsula and Sweden. The group is very individual, and the variety is extraordinary; and while one or two vessels show the general character of vessels from the Western series, and especially interesting is the parallel between the vessel with the eyes, and that from Spain (Plate IV.) with the same motive, the great majority are wholly unrepresented in the West. They, moreover, show a type of decorative pattern very rare in the other groups, and corresponding to the decoration seen on vessels of the Bronze Age in Britain. Müller[2] states that they correspond to types seen further south in Germany.

Montelius[3] defines two routes by which cultural influences from the

[1] *L'Anthropologie*, vol. iii., 1892.
[2] Sophus Müller, *Nordische Altertumskunde*, 1897.
[3] *Die Chronologie der Ältesten Bronzenzeit*, etc., 1900.

South reached the North, the first and earlier, the Western or coast route, from North Africa by way of the Iberian peninsula and France and the British Isles; the second later, but already established in the Stone Age, the Southern, direct across the continent of Europe from the Balkan peninsula and the shores of the Adriatic to the Danube, and thence up the rivers of Germany to the north. The ornamental motives on these vessels, such as fig. 12, Plate I., can be traced, says Montelius, from the eastern Mediterranean, over Austria and the German lands to Scandinavia.

It is clear, therefore, that any affinity of the Scottish pottery with that of the lands to the east is very remote, and that until the coming of the Brachycephali and the Bronze Age no influence came from that direction. What of the coast or western route?

Plate II. represents a group of vessels of neolithic age from France. Fig. 1 is from the neighbourhood of Paris, and fig. 2 from a neolithic site in the Seine valley. The remainder are from the dolmens of Côtes du Nord, Finisterre, and the lower Loire. The vessels from the grottos of the Marne, according to Cartailhac,[1] are rare, and most of the megaliths of the Paris basin, and even of the west centre, have little pottery. These vessels are simple in form (fig. 1, Plate II.) and rudely made of coarse earthenware. In the region of Cevennes, the vessels are generally in fragments, and the greater number are in the form of small goblets with straight sides, or bowls without feet. The ornamentation is rudimentary, and handles are rare.

The pottery from the dolmens of Brittany is very abundant relatively; almost all the vessels have rounded bottoms, and any decorative design is uncommon. Some have handles pierced for suspending the vessel. The vessels figured at 9, 11, 12 are very frequent. The upper part or brim is flat, inclined inwards, and joins, at an angle or shoulder, the rounded under section. They are therefore very similar to several of the Scottish vessels.

The region over which this pottery is distributed is the area of the dolmens, and corresponds to the region, as we have seen earlier, least

[1] *La France Préhistorique.*

affected by intrusive brachycephaly. Is the rare flat-bottomed cylindrical vessel also a foreigner from the East?

Plate III. represents examples of the very rich sepulchral pottery of the Pyrenees (Hautes et Basses Pyrénées). Fig. 1 repeats precisely the simple unornamented type with returning brim found in Brittany, and fig. 2, though the decoration shows an angular arrangement of the lines, is not very dissimilar to the Clachaig and Beacharra vessels. Cylindrical flat-bottomed urns also, but rarely, occur (figs. 13–16), as in Brittany. The remaining figures on the plate represent vessels from the very end of the Stone Age and beginning of the Bronze, and are interesting as showing a further development of this type of vessel on special lines. Fig. 3 shows a device which enables the vessel to stand by itself. Instead of making the vessel with a flat base, a crown of small feet has been affixed to the round bottom. A few of the later vessels, still with the neolithic ornament (figs. 4 and 5) have a flattened base, but the majority have the crown of feet. Again, the small handles pierced for suspending the vessel grow out into prominent features, and the shoulder is richly chased; and lastly, even on into the Bronze Age, the old form is retained (fig. 17), with its crown of feet, while three of the loop handles have disappeared, and one, enlarged, is retained for holding the cup.

The Pyrenees were the last refuge of the Iberian race in France. In the modified form of megalithic tombs in which this pottery is found, and in the pottery itself, we may perhaps have a survival and development on special lines of the culture peculiar to them.

Plate IV. is a selection of vessels from Spain. It is an interesting fact that almost all the pottery from Spain is rounded in the bottom. Figs. 12–15 are late neolithic, and the remainder, selected from the atlas of the Brothers Siret,[1] belong to the early bronze age of the south-east of the peninsula. The vessels are from sepultures of the short cist type, and the crania found with them are in the great majority of cases dolichocephalic. The majority of the urns are simple round-bottomed bowls (fig. 1) with or without handles (fig. 2), and without ornamental pattern.

[1] *Les Premiers Ages du Métal dans le sud-est de l'Espagne*, 1887.

A considerable number (figs. 4 and 5) have the upper part greatly elongated, so that it exceeds in height considerably the rounded base. In fig. 10 we have the simple bowl-like vessel placed on a base to form a cup.

In Portugal the same simple bowl-like round-bottomed vessel is seen—and it may be noticed, though I have omitted from consideration the "caliciform" or "drinking cup" type of vessel, that certain vessels with the peculiar zonular pattern of that type, and the same general form, found in the early bronze age artificial sepulchral grotto of Palmella, are rounded on the under aspect. Further, in connection with Palmella a certain small urn for suspension, with a brim or upper surface nearly horizontal, is exactly like certain small urns or incense cups found in Ireland.

Returning to the groups of urns from the megalithic structures without a passage in the south-west of Scotland, there is little question that at least a suggestive resemblance to them can be traced along the dolmen track to the south, a resemblance not shared to the same degree by the pottery of peoples in the same stage of culture to the east; but the closest affinities are to the pottery of the dolmens of Brittany and to the earlier vessels from the Pyrenees. Notwithstanding, the Scottish group has special characters of its own—indicating a local development on the same general lines.

Thus—while, apart from geographical probability, the skull form might have come either from the south or from the east—the pottery can only have come from the south; and gathering together the whole argument, we may say with *certainty* that the Arran megalithic builders were a tribe of the Iberian race who came direct from the south, and with *probability* that they represent that race in one of the latest phases of their independent culture in the north. One question yet remains: Coming from the south, by what route did they reach the south-west corner of Scotland?

Borlase,[1] arguing very reasonably from the distribution of the megalithic and chambered tombs in Great Britain and Ireland, brings

[1] *Loc. cit.*

the main stream of the Iberian race, in the later period of the Neolithic Age, from the north-west corner of France, along the western coast of England and up the Irish Channel. Successive waves of immigration spent themselves on both sides of the Channel. The inroads into England were in great part confined to the western seaboard, but one great Long Barrow wedge was driven into the interior up the Severn Channel to Gloucestershire and Wiltshire, and on through Staffordshire and Derbyshire to Yorkshire. In Ireland the movement was from east to west, and spread over its whole surface.

The sharp isolation of the Dolmen type of monument to the south-west corner in Scotland might in this view be readily explained; and the Arran Iberians might be considered either as an eastern outpost of a western tribe, or as the representatives of a late wave of immigration directly up St George's Channel.

I am tempted to carry the suggestion of Borlase further, and to apply this possible solution of my local problem to the conditions in the country as a whole.

Judging from the great number of the relics of the Stone Age in Scotland, the country must have been thickly populated at that epoch. While the short cist graves are very numerous, and occur in practically every parish, the sepulchres undoubtedly neolithic are remarkably few, and their distribution suggestive of only partial occupation. May not the explanation perhaps be that Scotland—whatever may have been the distribution of the earliest inhabitants in the first period of the new Stone Age, of whom we know nothing—was peopled in the later neolithic period by two separate streams of immigration—the Iberians of the megalithic and chambered tombs on the west, and the short cist builders on the east? While the former ranged on the west along the seaboard to the Orkney Islands and the Pentland Firth, the latter, settled first in the great Midland plain and Border country, spread northwards and westwards, ultimately to replace the Iberian customs and culture in every part of Scotland, and to establish universally that type of custom and culture which persisted and prevailed during the Age of Bronze.

		No.	Name of Cairn.	Explorer.	Implements of Stone.	Objec s of Metal.
Cairns with Megalithic Cists.	Arran. Kintyre.	1	Torlin. Four compartments.	Eben. Duncan and T. H. Bryce.	Knife of flint.	..
		2	Clachaig. Two compartments.	Eben. Duncan and T. H. Bryce.	Polished axe of greenstone.	..
		3	Sliddery Water. Three compartments.	T. H. Bryce.	Arrow-head leaf-shaped, and scraper of flint.	.
		4	Tormore. Three compartments.	T. H. Bryce.	Polished and perforated hammer of gabro, three knives and worked flakes of flint.	..
		5	Beacharra. Three compartments.	Kintyre Scientific Association. Descriptions, T. H. Bryce.	Knife of flint.	..
	Islay.	6	Cragabus. Three compartments.	T. H. Bryce.	Many flakes of flint and a core.	
		7	Ballynaughton. Three compartments.	T. H. Bryce.	Flake of flint.	..
	Argyleshire.	8	Largie. Four compartments.	Canon Greenwell.	Five arrow-heads, three knives one broken, and flakes, all of flint.	.
		9	Kilchoan. Three compartments.	Rev. J. R. Mapleton.	Knife of carnelian, implement and flakes of flint.	..
Cairns with Short Cists.	Arran.	1	Blackwaterfoot.	T. Wallace and T. H. Bryce.	..	Triangular dagger blade of bronze, gold fillet.
		2	Brown Head.	T. H. Bryce.	Flake of flint.	..
		3	Clachaig (No. 2 *supra*) secondary interment.	T. H. Bryce.	Scraper of flint.	..
		4	Clachaig Flagstaff mound.	T. H. Bryce.	Flakes of flint.	..
		5	Glenkill, Shiskin.	James Tod.	..	..
		6	Knockankelly.	Dr Jamieson.	..	..
Circles with Short Cists.	Tormore Group, Arran.	1	Circle II., cist A.	J. Bryce, LL.D.	Four arrow-heads of flint.	..
		2	Circle III., cist A.	J. Bryce, LL.D.	Several arrow-heads of flint.	..
		3	Circle III., cist B.	J. Bryce, LL.D.	Two arrow-heads of flint.	..
		4	Circle IV.	J. Bryce, LL.D.	Three arrow-heads of flint.	Pin or awl of bronze.
Circle Cist. Unclassified.		5	Drumidoon.	T. H. Bryce.	..	

Ornaments.	Pottery.	Human Remains.	Animal Remains.
..	*Round-bottomed* dark-coloured clay vessel without ornament: small ears or handles.	Interment multiple; both sexes; all ages; skulls *Dolichocephalic.*	Pig, lamb or kid, fox, dog, otter, birds, fish.
..	(*a*) *Round-bottomed* dark-coloured vessel without ornament; four small handles. (*b*) Thin, hard-baked dark-coloured vessel with *round bottom*, and horizontal brim, ornament groups of straight lines and dots.	Interment multiple; both sexes; all ages; skulls *Dolichocephalic.*	Ox, pig, lamb or kid.
.	*Round-bottomed* dark clay vessel with shoulder and small handles; no ornament.	One fragment femur *unburnt*; much charcoal.	..
..	Fragments of dark-coloured ware with trace of ornament of impressed lines and dots.	Minute fragment; unburnt bone; much charcoal.	..
Shuttle-shaped ornament in jet.	Six urns *all round-bottomed*, some without ornament; some with ornament of shallow flutings or of groups of horizontal and vertical lines.	..	..
..	(*a*) Fragments, plain dark ware. (*b*) Fragments with ornament of straight lines.	Fragments of bones both *burnt* and *unburnt.*	Jaw, teeth, and vertebra of ox.
..	..	Minute fragment unburnt bone.	..
..	*Round-bottomed* vessel with lip, and covered by vertical flutings.	*Burnt* bones; also *unburnt*, said to belong to secondary interment.	Cow's tooth; ox bones.
..	Fragment of urn with vertical flutings.	Burnt bones in corners; fragment of *unburnt* bone.	Two small cow's teeth.
..	..	..	..
Fourteen perforated discs of jet.	Urn of "food-vessel" type; two mouldings; covered with chevron pattern; ornament on bottom.	..	..
..	Urn of "food-vessel" type, with mouldings and chevron pattern.	Fragments of *unburnt* bones.	Skull and upper jaw of young pig.
..	Fragments of urn, "food-vessel" type.	..	..
..	Urn of "food-vessel" type, chevron pattern; small loops; ornament on bottom.	..	..
..	Urn of "food-vessel" type, chevron pattern.	Bones of young person; skull, *Brachycephalic.*	..
..	Richly ornamented urn with *flat bottom*, with mouldings, and coming in to mouth in stages.	..	..
..	Urn of same character.	..	..
..	Urn of same character.	Long bones; young adult; skull, *Brachycephalic.*	..
..	Fragments of urn same type.	Fragments of bones burnt (?)	..
..	..	..	..

PLATE I.

Group of sepulchral pottery from megalithic monuments, Denmark and Sweden. Though pottery is abundant, whole vessels rare.

Figs 1, 3, 4, 7, 10 belong to the class of bowls and cups. Fig. 3 is said to be the most ancient type. Fig. 4 remarkable for its decorated cover.

Fig. 2. A vessel for suspension, not uncommon. One such is known in Britain, preserved in the Wiltshire Archæological Society's Museum. See *Reliquary*, vol. iii. part i.

Figs. 5 and 6. Vessels from a monument of the Dolmen class, and supposed, therefore, to be the most ancient.

Fig. 9. A beaker-shaped vessel from Höi, Böstrup, Denmark.

Figures copied from Sophus Müller, *Ordnung af Danmarks Oldsager*, 1895; Madsen, *Afbildninger af Danske Oldsager af Mindesmærker*; and Sophus Müller, *Nordische Altertumskunde*, 1897.

Figs. 11 and 12. From Ganggrab in a Grabhugel at Quistofta, near Helsingborg, Sweden. Montelius, *Antiquités Suédoises.*

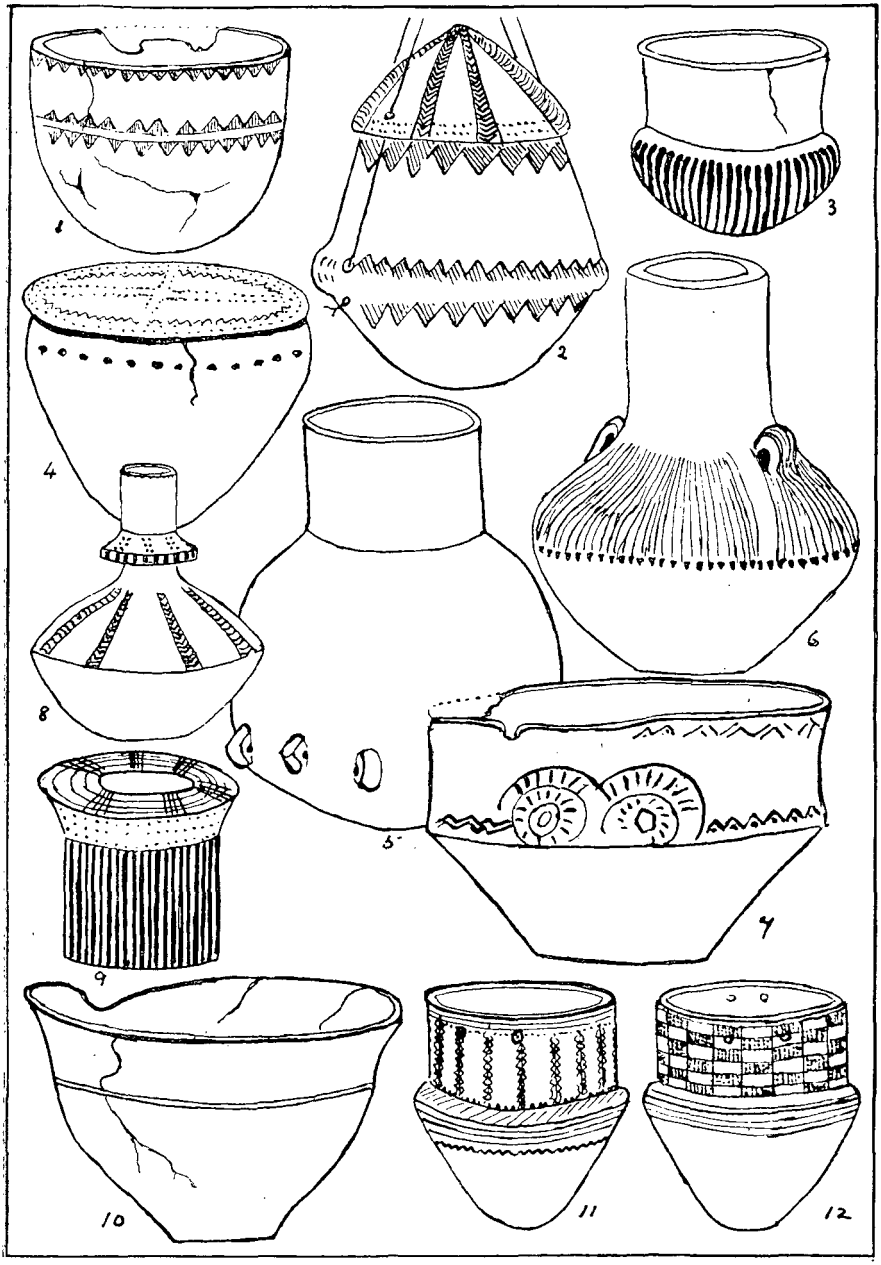

PLATE I

PLATE II.

Group of sepulchral pottery of Neolithic Age. France.

Fig. 1. Cylindrical vessel from neighbourhood of Paris. Cartailhac, *La France Préhistorique.*

Fig. 2. Vessel of same type, 18 cm. high and 18 cm. diameter at mouth, from St Mammés, Seine et Marne. E. Toulouse, *Anthropologie*, 1894.

Fig. 3. Tall flat-bottomed vessel found with 7, 8, and 9 in Dolmen, Kervadel, Finistère. *Matériaux*, vol. xvi.

Figs. 4 and 14. Flat-bottomed vessels, unornamented, from Dolmen, Grand-carreau-vert St Michael. Out of thirteen vessels the remainder were rounded in the bottom, like examples figured at 5, 6, and 13. P. de Lisle du Drenene. *Matériaux*, vol. xx.

Fig. 7. Vessel found with 3, 8, and 9 and a quantity of others at Kervadel, Finistère. Fig. 8 was 16 cm. high and 18 cm. at mouth, bottom round. *Matériaux*, vol. xvi.

Fig. 10. From foot of the Menhir Kerlay in Plobannalec, Finistère. *Matériaux*, vol. xvii.

Fig. 11. From Dolmen, l'Estridiou, Finistère. Chatellier, *Matériaux*, vol. xii. (Upper part of this vessel has been drawn too much inclined.)

Fig. 12. From Drun Plestan, Côtes-du-Nord, 19 cm. in diameter at mouth, 10 cm. deep—one of sixteen vessels, nearly all round-bottomed. Jules Lemoine, *Matériaux*, vol. xviii.

Fig. 15. From Kerugon, Finistère. Chatellier, *Matériaux*, vol. xiii.

Fig. 16. From Dolmen, à galerie de l'Estridiou, with vessels of types 9, 11, 12 ; ornament in relief.

Fig. 17. Vessel from tumulus of Penker-ar-Bloa, Finistère ; ornament in relief. Chatellier, *Matériaux*, vol. xv.

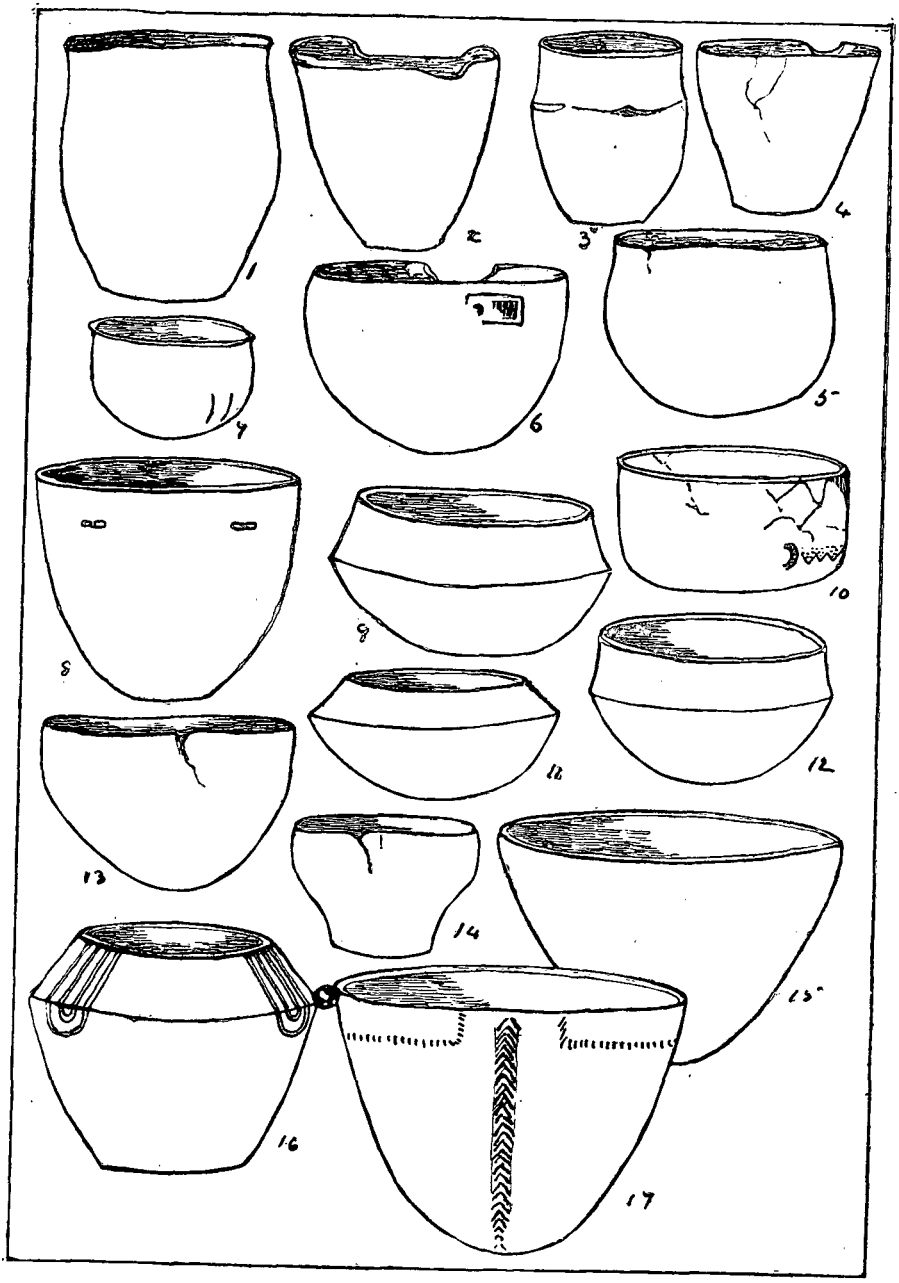

PLATE II.

PLATE III.

Group of sepulchral pottery from the Pyrenees.

Figs. 1, 2, and 3. Vessels of Neolithic Age from tumuli on Plateau de Ger, near Tarbes.

Fig. 16. A cylindrical urn from a tumulus on the Plateau de Ger, associated with a vessel with a circle of small feet and supposed to be neolithic. The above are taken from an account given in *Matériaux*, vol. xx., by Cartailhac, of the collection of Colonel Pothier at Tarbes.

Fig. 4. Vessel from a chamber or cist within a tumulus on the Champ de tir de l'École d'Artillerie at Tarbes. No implements. *Matériaux*, vol. xvi. p. 212.

Fig. 5. Vessel of neolithic type, but with other urns of later type, and associated with implements both of bronze and iron. Le Puyo Hourmiao Pontacq. Piette, *Matériaux*, vol. xviii.

Fig. 6. Vessel from Tumulus Haliade Bartrès. *Matériaux*, vol. xvi.

Figs. 7, 8, 10, 11, 12, 13, and 14. Vessels from Allée Couverte Taillan, with axe-head of stone and lance-head of flint.

Fig. 15. Vessel from Allée Couverte Haliade. One of a number of this type. End of neolithic period. One chalice-shaped vessel with horizontal band ornament. *Matériaux*, vol. xvi.

Fig. 9. Vessel from Le Puyo Espy. Axe-head of stone. *Matériaux*, vol. xviii.

Fig. 17. Cup-like vessel from Le Puyo Hourmiao ; implements of bronze. *Materiaux*, vol. xviii.

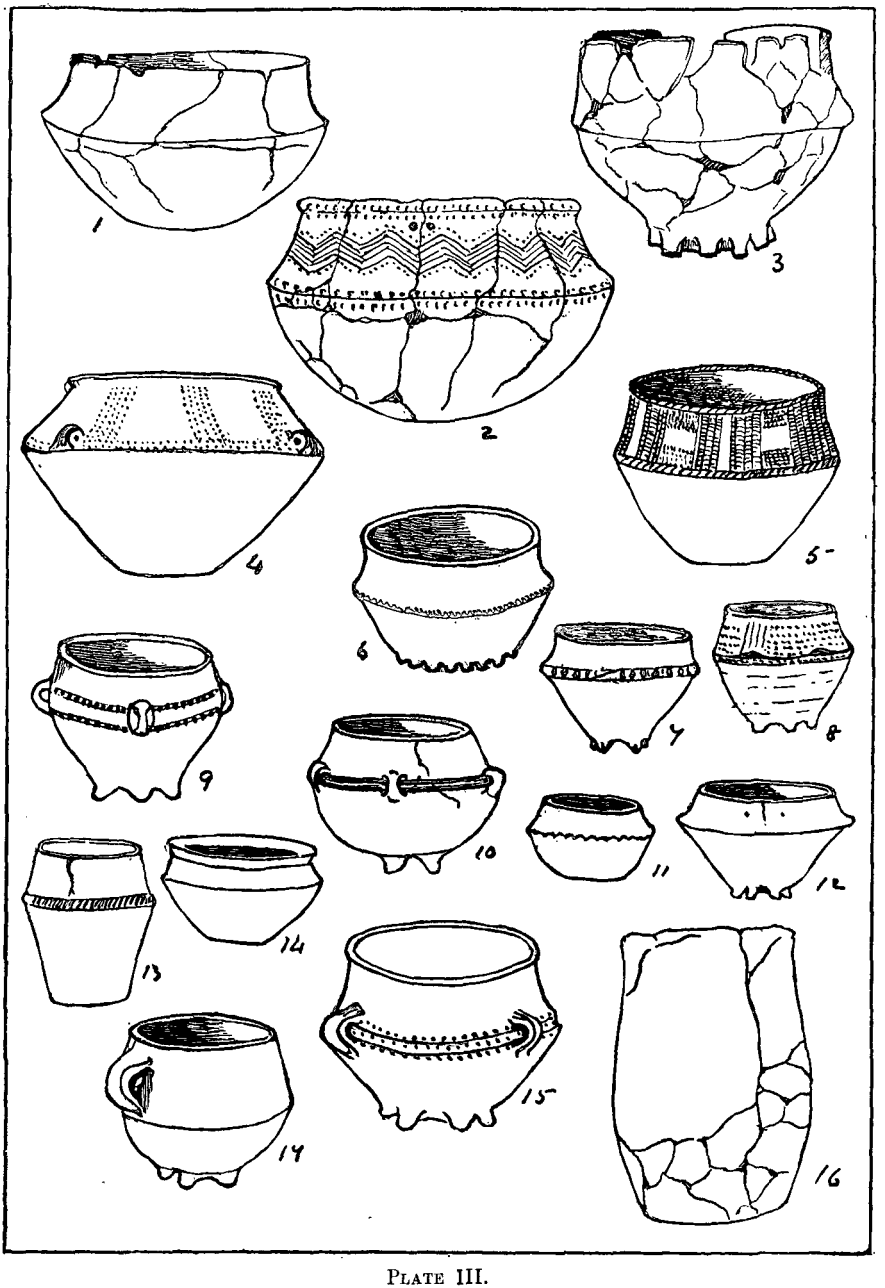

PLATE III.

PLATE IV.

Groups of sepulchral pottery from Spain belonging to the late Neolithic, Copper, and Early Bronze Ages.

Fig. 1. Vessel from a sepulchre at El Argar, S.E. Spain.

Fig. 2. Vessel from a sepulchre at La Pernera, S.E. Spain.

Fig. 3. Vessel from a sepulchre at La Pernera, but similar vessels found at El Argar, Feunte Alamo, etc.

Figs. 4 and 5. A common type of vessel from all the localities in S.E. Spain.

Fig. 6. From El Argar, but a common type found in the sepulchres in all the other localities.

Fig. 7. Vessel of a type not apparently common, from Fuente Alamo.

Fig. 8. Flat-bottomed vessel from El Argar.

Fig. 9. From sepulchre at Fuente Alamo.

Fig. 10. Cup with pedestal from Fuente Alamo, but occurs in other localities.

Fig. 11. From Sepulchre at Fuente Alamo.

Figs. 1 to 11 are taken from the atlas of the brothers Siret—*Les Premiers Ages du Métal dans le sud-est de l'Espagne.*

Figs. 12 to 15, belonging to the transitional phase between stone and bronze, and associated with implements of copper, are copied from L. Siret. Article in *L'Anthropologie*, 1892.

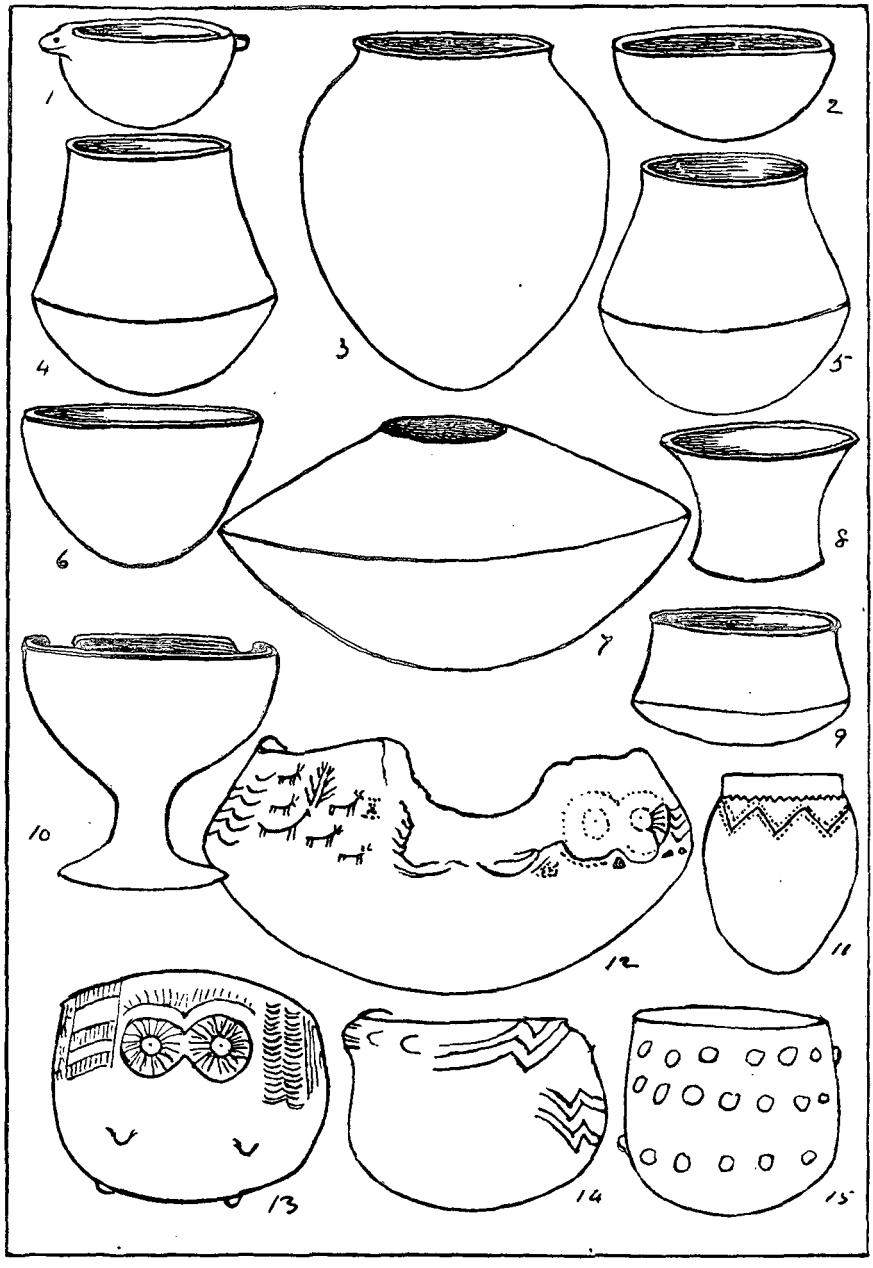

PLATE IV.