

I.

I.—NOTICE OF AN ANCIENT KITCHEN-MIDDEN NEAR LARGO BAY, FIFE,
EXCAVATED BY W. BAIRD, ESQ., OF ELIE. By ROBERT MUNRO,
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During a short visit to Elie, in the month of May 1900, my wife and I strolled one day to St Ford Links, on the eastern shore of Largo Bay. After wandering for a few minutes among the grassy undulations, now occupying what was formerly a considerable stretch of blown sands overlying an ancient sea-beach, we observed one prominent mound which presented a broken surface on its southern aspect. On stepping into the sandy hollow, I was rather surprised to find over its floor some fragments of old bones, among which I recognised some of the sheep, ox, and pig. These bones, though evidently of some antiquity, had a bleached appearance, as if exposed to the weather for a considerable time. While wondering what could have brought them to such a locality, my wife handed me a bone pin (fig. 5), highly polished and tapering at both ends, which she picked up at my feet. This, of course, intensified our curiosity, and so we began poking with sticks and improvised implements at the base of the sand-bank, with the result that we discovered a stratum of black earthy matter, from which we extracted a number of decayed bones, and a portion of a large antler of the red deer. This led to the surmise that the bleached bones found exposed in the sand-pit (now forming part of a cart-track which here traversed the links) had come from the same bed of earthy matter, which had formerly extended over its floor. That a quantity of sand had been removed from the locality at some former period was very apparent, but the fact was actually corroborated by the tenant on the adjacent farm of Kineraig, who informed me that some twelve years ago the sand required for building a farm-steading had been carted from the mound.

On ascertaining that the sand-pit was on the property of W. Baird, Esq., I called next day on Mr Jamieson, his factor, to ask permission to make some excavations into the remaining portion of the sand dune, so

as to ascertain more precisely the nature of the discovery. On explaining the circumstances, he at once agreed to supply a few men to carry out my intentions, on condition that any relics which might be found would be preserved in name of the proprietor, who would thus retain the privilege of deciding as to their final destination.

Digging in blown sand is not laborious work, and so three men speedily cleared a trench in face of the exposed sand bank. The section thus formed disclosed a bed of the same dark earthy material, about 2 feet thick and 11 paces in length (from east to west), containing charcoal, ashes, and decayed bones, and stretching beneath the sand dune to an unknown extent.

The height of the superincumbent sand varied from $1\frac{1}{2}$ feet on the west side to 4 feet on the east side, and its surface was covered with a coating of grass, whose rootlets penetrated deeply into the sand. It is worthy of note that the dark earthy bed, which alone contained the animal remains, was not immediately below the highest part of the mound but lay nearer its western end, thus showing a greater accumulation of blown sand on the lee side of the prevailing western sea breezes. We then cleared away the superjacent sand for a couple of yards further back and carefully examined the underlying bed. In the course of this operation we collected more than a barrowful of animal bones, several fragments of deer horns, and a sprinkling of sea shells of the ordinary edible molluscs, some of the shells, however, being waterworn as if picked up on the sea-shore. Also, we found the following worked objects: fragments of an ornamented toilet comb (fig. 2), a circular disc of bone perforated and turned on the lathe, probably a spindle whorl (fig. 6), a dagger-like implement made of the horn of a roe-deer (fig. 8), and a curved object of iron, greatly corroded (fig. 12). As these results were highly satisfactory, we resolved to continue the excavation, so as to determine, at least, the extent of the refuse bed. The operations of the following day were not quite so successful, but, nevertheless, a few things were added to the list of relics. The unearthing of a rude piece of sculpture, representing a human head, was an exciting episode, to which I shall after-

wards refer. On the morning of the third day, owing to the inclemency of the weather, we had to discontinue the operations, and, as I was returning home next day, the further exploration of the midden was postponed indefinitely.

Shortly afterwards Mr Baird came on a flying visit to Elie, and, on being informed of the discovery of the midden, he and his factor visited the site of the excavations, and, while poking with their sticks in face of the relic-bed, Mr Baird was so lucky as to find another toilet comb (fig. 1), more perfect and more highly ornamented than the former, together with a polished bone pin (fig. 3), the two relics being close to each other. Thinking this kind of work rather interesting, he gave instructions that no further excavation would be carried on till the autumn, when he himself would be resident at Elie House. However, owing to the wetness of the season, I understand that only one afternoon was devoted to the exploration of the midden, so that on the approach of winter the work still remained unfinished. The only relic discovered on that occasion was a small piece of reddish pottery, which, as we shall afterwards see, is of some value in determining the date of the midden.

As it was desirable to have the excavation completed in time to enable me to read a report of the investigation at the Society of Antiquaries before the close of the current session, I wrote to that effect to Mr Jamieson, with the result that the proprietor kindly allowed me to finish the work at my own convenience. For this purpose I went to Elie in the end of March, and so the excavation of the midden was completed on the 1st of April of this year.

The principal relics then discovered were a much-corroded spear-head of iron having three barbed prongs (fig. 11), and a fragment of pottery of the same character as that formerly discovered. As the second piece of pottery was disinterred by myself, I was enabled to locate its precise position at six inches below the surface of the relic-bed. Both fragments lay within a couple of yards of each other, and they have all the appearance of being portions of the same vessel.

Owing to the uncertainty as to how much of the kitchen-midden had been destroyed when the sand-pit was first opened, it is impossible to give its dimensions very accurately. It was of an oblong shape, and measured (after making an allowance for the portion previously destroyed of 3 paces further south) about 16 paces in length (north to south), and 11 paces in breadth. A few feet from its northern margin the black earthy matter was intercalated with two thin strata of blown sand; also at the north-east corner it projected a few feet beyond the main outline. No stones indicating structural arrangements were anywhere met with, but there were many stones of various sizes—none, however, larger than could be easily thrown on the bank from the hands of the workmen—which showed evidence of having been subjected to the action of fire. Neither were there any well-defined fire-places observed, except near the north-east margin, where we came upon a superficial deposit of charcoal, some 2 inches thick, and a couple of yards in diameter. About 9 inches below this charcoal bed there was a thin layer of blown sand projecting for a few yards from the margin, which suggested an interrupted occupation. As a rule, however, the refuse heap, especially on its western margin, terminated almost abruptly. The osseous remains, though freely interspersed everywhere throughout the black earthy stuff, were in greater abundance in its southern portion, where every spadeful turned up contained several bones. All the bones were very much decayed, and some of them when handled felt unusually light, as if their mineral matter had entirely disappeared. Even some of the deer horns were so fragile that they crumbled among one's fingers, but after exposure to the air for some days they became hardened. This unusually decayed state of the organic remains does not necessarily indicate greater antiquity, but rather physical conditions exceptionally favourable to decomposition.

To me the most novel feature of the midden was the large number of selected water-worn pebbles, varying in size from a goose's egg to a moderate-sized turnip, which were found throughout all parts of the débris. The majority of them appeared to have been broken before

becoming embedded in the stuff, and of those which were turned up whole some actually split into two or more pieces in one's hands while being cleaned. Although I carefully examined many of the more likely specimens to be used as hammer-stones, none was detected which bore decided marks of such usage. It is, however, quite possible, if not probable, that some of them would have been used as hammers for breaking bones, an operation which I fancy could have been performed without impressing on their surface any special markings. Along the east border of the refuse bed, and about the middle of its northern half, we came upon a small cairn (about a barrowful) of these stones.

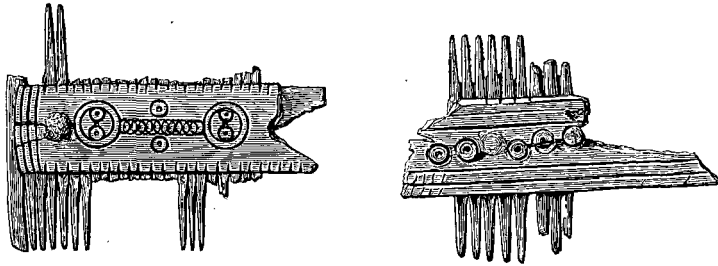
The kitchen-midden lay over fine sand within the area of the 25 feet raised beach, but whether any portion of this underlying sand had been blown into position I could not say. At any rate, there would not be more than a few feet between the base of the relic bed and the sea gravels of the former beach. Its distance from Shell Bay, the nearest part of the present sea-shore, would be about a quarter of a mile; but on the north of this bay the links extend westwards for upwards of a mile, till they join the rocky promontory of Ruddon's Point. Cocklemill Burn flows in a sinuous bed, some 500 or 600 yards to the north of the site of the midden, and in its course to Largo Bay exposes some excellent sections of the underlying stratified beds, on which the sand dunes became subsequently deposited.

DESCRIPTION OF THE RELICS.

Stone.—Except the water-worn pebbles which we regarded as heating-stones, no stone implements showing marks of usage as hammer-stones, such as are so commonly found on crannog sites, were disinterred from the Elie kitchen-midden. There were, however, several elongated pebbles which looked as if they had been used as smoothers, also a few pieces of unworked cannel coal or shale.

Bone.—Portions of two double-margined toilet combs (figs. 1 and 2). Both these combs were constructed on the same plan as three nearly perfect specimens discovered on the crannog at Buston, Ayrshire, and to

which they bear a striking resemblance both in form and ornamentation. (See *Ancient Scottish Lake Dwellings*, figs. 217, 218 and 219.) Each comb is composed of three or four flat pieces of bone with neatly-formed teeth at both ends. These pieces, forming the body of the comb, are placed close together and enclosed between two transverse bands kept firmly in position by two, three or four iron rivets. The more perfect of the Elie combs (fig. 1) has only two iron rivets, one at each end of the transverse bands. These bands are $2\frac{1}{4}$ inches long, but, as the en-



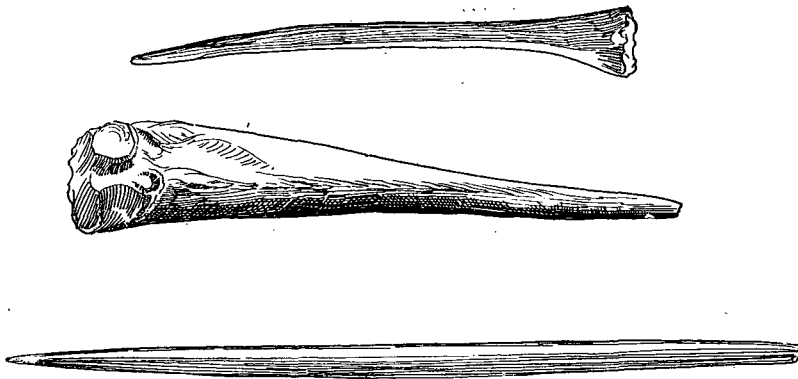
Figs. 1, 2. Double-margined combs, found in the kitchen-midden at Elie.

closed plate at each end projects about the eighth of an inch, the total width of the comb would be $2\frac{1}{2}$ inches. The elements of its ornamentation consist of incised circles with central hollow dots variously arranged. Near each end of the transverse plate there are two concentric circles close to each other, the outer being about $\frac{5}{8}$ inch in diameter, surrounding two smaller circles sufficiently large, when placed in a line, to occupy the diameter of the inner of the circumscribing circles. Between these two groups there is a row of incised circles overlapping each other, and at the extreme ends of the transverse band there are three incised lines running across its entire breadth. The ornamentation on the obverse band is precisely similar, so much so that one might suppose they had been made from a common stamp.

Of the second Elie comb, also a double-margined specimen, only two fragments were found, including a portion of one of the transverse bands. This latter is ornamented with a row of incised small circles extending

lengthways along its middle and having on each side two deeply incised lines (fig. 2). The portion of it still extant measures 2 inches in length, but, as it is defective at both ends and contains three iron rivets, this comb would appear to have been larger than the former.

It may be observed that incised circles, single or double (concentric), with a central dot, are well-known designs not only in Britain during Romano-British times, but also in Ireland. In *Ancient Scottish Lake Dwellings* I have given illustrations of several combs in addition to the three already mentioned from Buston, viz., one from the crannog in Loch



Figs. 3, 4, 5. Bone Pins found in the kitchen-midden at Elie. ($\frac{1}{2}$.)

Inch-Cryndil (p. 59), one from the crannog of Ballinderry, Ireland (p. 278), a third from the Broch of Burrian, Orkney (*ibid.*), and a fourth from the Romano-British town of Uriconium (p. 279).

The design on one of the Elie combs, viz., a circle enclosing two circles, each having a diameter of half the former, is not common. I have seen it on fragments of pottery from the lake village of Glastonbury; also it appears on a bone comb, of different construction, found in a kitchen-midden on the 'Ghegan rock,' near Seacliff, in East Lothian (*Proc. Soc. Ant. Scot.*, vol. viii. p. 375).

Three pins (figs. 3, 4, 5).

A bone disc or spindle-whorl (fig. 6), which has evidently been made

by means of a turning-lathe, has the appearance of two truncated cones placed base to base. Its greatest diameter is $1\frac{3}{8}$ inch, and its thickness

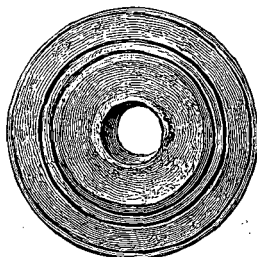


Fig. 6. Bone Whorl found in the kitchen-midden at Elie. ($\frac{1}{4}$.)
is $\frac{5}{8}$ inch. The perforation has a raised rim, and at variable distances it is surrounded by three incised circles—a system of ornamentation which is precisely repeated on the other side.

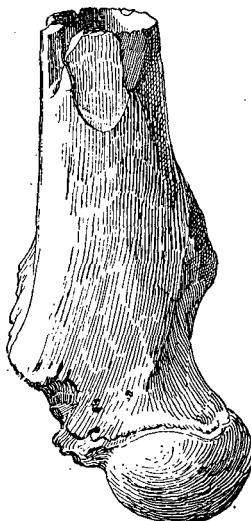
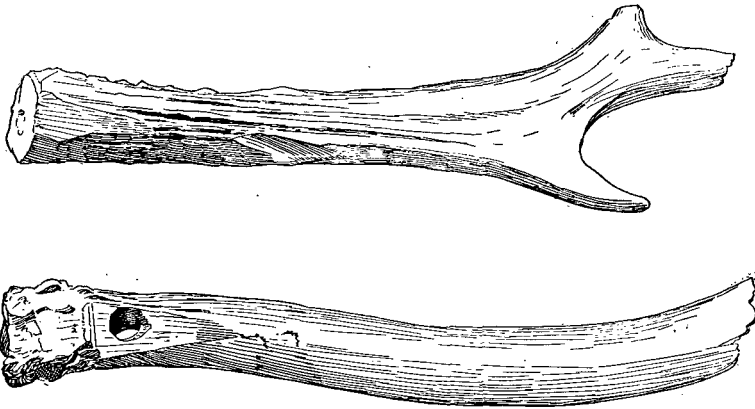


Fig. 7. Vessel made from the leg bone of an ox. ($\frac{1}{2}$.)

A curious vessel, which might have been utilized as a drinking-cup, is made from the femur of an ox. The bone was broken right across its

long axis, 5 inches from the head, and the orifice neatly chipped all round into a thin edge (fig. 7). There were several other terminal ends of similar bones, which might have been used to hold liquid, but few of them showed any intentional workmanship. I observe that similar objects, mostly collected on broch sites, are preserved in the National Museum—some of which appear to have been used as pestles or rubbers. No doubt the primary object in breaking these long bones was to get at the marrow, just as is done at the present time; and if the fracture was straight across, either end could be used as a rude kind of drinking-cup.



Figs. 8, 9. Beam of Stag's Horn and Horn of Roe-deer. ($\frac{1}{2}$.)

Two or three leg bones of animals, especially ulnar bones, might have been used as daggers, being pointed at one end while retaining the natural head at the other.

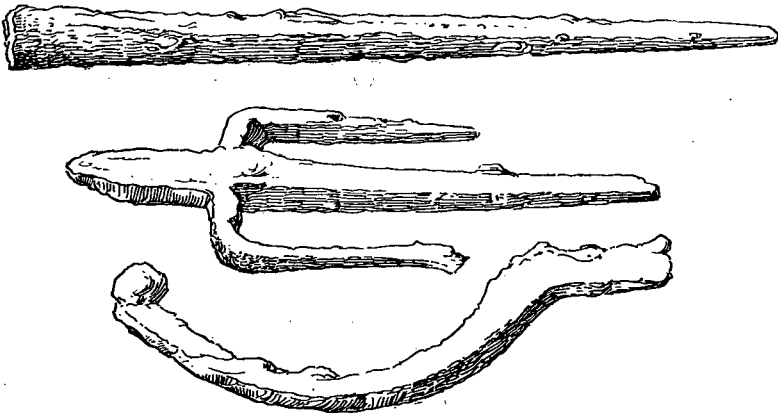
Deer-horn.—The horn of a roe-deer (fig. 8) has its burr end smoothed by a sharp cutting instrument, but I find the tip of the middle tyne has been broken off since it was discovered. A similar weapon was found in Lochspouts crannog, Ayrshire (see *Ancient Scottish Lake Dwellings*, fig. 174).

Another dagger-like implement (fig. 9) was made of the first year's horn of a red-deer. It is 10 inches long without the tip (which was

broken off before it became embedded in the débris), and shows cutting marks and a small perforation at the burr-end.

There is also a slender splinter cut from the beam of a stag's horn, showing marks of a sharp-cutting instrument. In addition to these objects, which were evidently worked for specific purposes, there are several portions of massive stag-horns showing marks of cutting implements, as well as a few separate tynes. Among two or three fragments of whale bones there is one with the marks of a sharp axe on it.

Iron.—(1) A chisel 6 inches long and rather less than half an inch in



Figs. 10, 11, 12. Iron Implements from the Kitchen-midden at Elie. ($\frac{1}{2}$.)

breadth at the cutting edge (fig. 10). (2) An eel spear-head with three barbed prongs, the two side ones being considerably shorter than the middle prong which is $3\frac{1}{4}$ inches long (fig. 11). By this arrangement it would appear that the fisher always took aim at the eel with the central prong, and if the stroke missed by a little to the right or left, the corresponding shorter prong would be sure to transfix the fish, unless the aim of the operator was very wide of the mark. (See Rau on Pre-historic Fishing, *Smithsonian Contributions to Knowledge*, vol. xxv. p. 271). (3) A curved object, 4 inches long, with a knob at one end and the decayed stump of a flat projection at the other (fig. 12). Among the odds

and ends recently dug up on the site of the Roman Camp at Delvine, I saw an iron object very similar to the above. The latter is less oxidised, and has in the corresponding missing part of the other a spike tapering to a sharp point. Both objects suggest a fixed hook for suspending articles upon. All the iron articles from the midden are converted into such masses of oxide that only their outlines can now be made out.

Brass or Bronze.—A small thin band, about an inch in length, with a hole at one end, is the only fragment of brass or bronze discovered. It was bent double like a clasp, but so fragile that it has crumbled into minute fragments.

Pottery.—Two small fragments of a reddish, wheel-made earthenware, showing traces of having been covered with a bright red glaze like that of ‘Samian Ware.’ Their texture is, however, harder than that of ordinary Samian; and hence Dr Joseph Anderson, to whom I submitted the fragments, thinks they belong to that class of Romano-British pottery known as ‘False Samian.’ Both fragments appear to be parts of the same dish indicating a kind of plate, some 8 inches in diameter, and rather less than an inch in depth.

To perplex antiquaries in their difficult researches by stealthily introducing foreign objects into excavations, so that they may fall into the hands of the explorers and be accepted by them as genuine relics, seems to afford a peculiar pleasure to some minds. I regret to say that the discovery at Elie was not allowed to pass without supplying an incident of this kind. On Friday evening (Mafeking day) we left the trench with a perpendicular facing of 6 feet, the lowest 2 feet being the relic bed. It was thus possible, by making a horizontal hole, to insert an object into the interior of the latter stratum. On the following morning, after the superficial sand had been removed and we had proceeded for about a quarter of an hour with the investigation of the relic bed, one of the men brought me what appeared to be a large worked stone, but so blackened with adherent soil that nothing could be made of it. I was at the moment writing notes at a little distance from the trench, so

while the man was fetching a pail of water from a pond near at hand, I examined the position of the object in the débris, and there could be no doubt that it lay under 4 inches of undisturbed black earth. My suspicion of its genuineness was first aroused by the readiness with which the mere pouring of a little water completely washed off all its adherent earth. In a few moments we had before us a quaint-looking piece of sculpture, in the form of a human head, with a face which reminded me of that cut on a boy's turnip-lantern on Halloween. On the back of the head I noticed some scaly exfoliations of sun-dried paint, a fact which was proof positive that at no distant date the figure had done duty elsewhere. The demeanour of the men seemed, however, so consistent with honesty that I hesitated to charge them with the fraud, and I merely remarked that it looked like the ornament on a country gentleman's gate-post. So I sent a message to Mr Jamieson to come and see the remarkable find. When he arrived, I whispered to him to ask the men from whose premises they had stolen the figure. But after a little talk both of us became satisfied that there was no duplicity on their part. During the afternoon a visitor assured me that he had seen the object before, but he could not recollect where. Meantime, Mr Jamieson was on the alert, and by Monday morning he found a clue which to my mind completely solved the mystery, and so the hoax fizzled out ingloriously. In the local paper the incident was thus referred to—"It is rumoured that some would-be wits planted a piece of rude stone carving which had once been seen about the Ferry, along with a rusty chisel, hoping for a laugh at the antiquary's expense; but the joke did not come off, as the searchers at once recognised the fraud." My chief reason for noticing the above attempt to perpetrate a stupid practical joke is the statement in the local paper about the chisel, which, I believe, to be a mistake. The chisel was found near the same place as the figure-head, but it has all the appearance of being genuine, and its oxidised condition is precisely similar to that of the other iron objects associated with it. Indeed, it would be difficult, if not impossible, to find anywhere on the surface an iron implement with such a mass of rust as that which envelops the

kitchen-midden chisel. Besides, the latter is too fragile to bear such rough handling as its transportation to the excavations would entail.

GENERAL REMARKS.

Kitchen-middens are not peculiar to any age nor to any stage in the progress of human civilisation no more than the consumption of food, and hence their archæological value depends entirely on their contents and the period to which they belong—both of which are matters for consideration and research. The relics of human occupation and industry brought to light by the excavation of the Elie kitchen-midden, though not numerous, appear to me to afford an instructive object-lesson of the methods by which the unwritten records of a country can be utilized by the historian when the ordinary materials of historical research are either in abeyance or non-existent. The correct interpretation of antiquarian remains is the highest function of the science of archæology, and hence its generalizations ought never to be accepted as final without having been subjected to the most intelligent criticism that can be brought to bear on them. This, however, is not the proper place to discuss at length the grounds on which important deductions are founded. My remarks on this topic will therefore be very short—merely a brief statement of some of the conclusions suggested by the archæological facts above recorded.

(1) The date of the remains can, with a tolerable amount of certainty, be assigned to that obscure period of Scottish civilisation which intervened between the final departure of the Romans from Britain and the dawn of true history. The toilet combs are so similar to those found on the Buston crannog that we cannot be far astray in regarding them as products of the same stage of culture. Now, among the débris turned up from the lowest portion of the refuse heap at Buston, there was a gold coin which Sir John Evans identified as one of a class of trientes of the 6th or 7th century, found almost exclusively in England, and probably of Saxon origin. As this coin, from its position, would be among the earliest relics of the crannog, we cannot be far off the mark

in dating the combs to the 7th or 8th century. The style of their decoration has no special determinative value, as incised circlés, single or concentric, with a central hollow dot, occur on objects belonging both to Late Celtic and Roman civilisations. The occurrence of these elements of ornament in various combinations during the Early Iron Age seems to be altogether independent of races or nationalities, being, as already mentioned, found on combs from the Scottish brochs, Irish and Scottish crannogs, and Romano-British towns. They are also common on early Anglo-Saxon remains. The fragments of False Samian ware are also in harmony with the above view.

(2) The precise limitation of the space occupied by the débris, more especially the abruptness of its margin on its western side, suggests that it was surrounded by some kind of enclosure. In the absence of any evidence of a stone structure, we have to fall back on the idea that it was a wooden house. Indeed, if we have correctly located the position of the midden on the chronological horizon, we could not expect the former, because at that time the ordinary inhabitants of the country had not generally adopted the custom of building their dwelling-houses of stone. Cæsar (V., c. 14) informs us that most of the inland inhabitants in Britain did not sow corn, but lived on milk and flesh, and were clad with skins. The same author in another place (V., c. 12) describes the number of the people as countless, and their buildings as being exceedingly numerous, for the most like those of the Gauls. From Tacitus we learn that the Germans were unacquainted with the use of mortar and tiles, and that in the construction of their houses they used "rude unshapen timber, fashioned with no regard to pleasing the eye." Associated with these houses, they had subterranean caves which they used as stores and winter retreats (Germ., c. 16). Again, Strabo states that the Belgæ lived in "great houses, arched, constructed of planks and wicker, and covered with a heavy thatched roof" (Book IV., c. iv. s. 3). With reference to thatched houses, Cæsar (V., c. 43) informs us that in time of war such habitations were dangerous because the Gauls used to set them on fire "by discharging with their slings hot balls made of burnt or

hardened clay, and heated javelins, upon the huts, which, after the Gallic custom, were thatched with straw."

Now, if Cæsar is correct in his assertion that the houses of the Britons were like those of the Gauls, then the former must also have been constructed of wood and thatched with straw or rushes. That this was really the case we have remarkable evidence in the discovery of the Scottish crannogs, all of which furnish positive proof that these dwellings were constructed of timbers. Although many of the inhabitants of Britain had ample opportunities of studying and copying the Roman method of constructing houses, forts, and bridges of stone, yet it may be questioned if these innovations had speedily taken root in the country. At any rate we know that in the time of St Ninian, about the beginning of the 5th century, the early churches were constructed of wood. The monastery established by St Columba at Iona was of "wattles and clay, or at best, of oak planks"; and the huts of the monks, as late as the time of Adamnan, were constructed of wood. (See *Ireland and the Celtic Church*, by Stokes, 3rd ed., p. 116.) We have every reason to believe that the huts of the common people, as well as the houses of the wealthier classes, continued to be built of wood up to the 11th or 12th century. Even the early Norman castles, known to us under the name of *Motes*, were entirely constructed of wood and fortified with palisades. Not a trace of the wood used in the construction of these habitations remains to the present day except fragmentary beams and piles on the sites of the lake dwellings, which have been preserved from decomposition by the mere accident of becoming submerged in the surrounding lake or its muddy deposits. In a dry atmosphere like that of Egypt, submergence in sand is one of the best antidotes to aerial disintegration; but in this country a sandy matrix actually facilitates the process of decay, owing to its readiness to become alternately wet and dry. Thus the thatched roof and timbers of the modest house which formerly sheltered the pastoral farmers and deer hunters of Elie have succumbed to the natural law, and nothing of it now remains except the dark mouldy earth of our kitchen-midden.

(3) The food refuse showed that the occupiers fared sumptuously on a dietary consisting chiefly of the produce of herds of cattle (two varieties of the ox having been recognised), sheep, and swine. Venison was also relatively abundant, as the deer-horns, representing both young and old, indicate some ten or twelve individuals. The fact that an eel-spear, precisely similar to specimens dredged from the Kilconquhar loch, which abounds with eels, was found in the midden suggests that the early inhabitants of Fife indulged in the sport of spearing eels. Some years ago, when excavating the crannog in Lochan Dughail, in Argyllshire, I was informed by an eye-witness that that loch, before its drainage, was full of eels, and that, when the waters were let off, they could have been caught in hundreds; but as no one in the district would think of eating an eel, they were allowed to die a lingering death. But whatever be the origin, antiquity, or extent of this prejudice in Scotland against the use of eels as an article of diet, we have satisfactory evidence that the inhabitants of this part of Fife, in Romano-British times, had no such prejudice. Perhaps the taste was acquired by contact with Roman epicures, who regarded eels as a great luxury. Marine shells, those of the common limpet being most abundant, were not present in such quantities as to suggest that the edible molluscs of the coast formed a staple ingredient in their food. They were probably too well off with their herds of domestic and wild animals to require the extraneous aid of the latter means of existence, which appears to have been resorted to in Scotland only in times of great scarcity. The fact that no quern, or any kind of stone implement that could have been used for the trituration of corn, has been found in the Elie midden, is not only a singular feature, but a marked contrast to the remains discovered on the contemporary crannog-sites in the South of Scotland, in all of which the quern is a constant and conspicuous relic. Even the keepers of the watch-tower at the ford of Dumbuck had their quern and ground their own corn. It would appear that the grinding of corn in those days was as much part of the domestic economy of each household as the baking of bread; and the practice was only interfered with when

water-mills began to be used for the grinding of corn. The absence of querns would therefore suggest that the midden folk, like so many of the Britons in the time of Cæsar, were not agriculturists, but pastorals and hunters, probably of nomadic habits. At Dumbuck, many of the bones in the refuse heap had been scorched and partially burnt, showing that the meat had been roasted; but at Elie, not a single bone showed the slightest trace of having been subjected to fire,—a peculiarity which will be reverted to immediately.

The absence of pottery (except the two fragments of False Samian) points to the use of wooden dishes such as were found at Lochlee.

(4) Only one other problem remains to be discussed, viz. :—the special function of the heating stones. Although my attention has on many occasions been directed to the large number of water-worn pebbles found on crannog sites, many of which showed unmistakable signs of having been exposed to great heat, yet I always felt some hesitation in accepting the theory that they were 'boiling-stones,'—a theory founded on the well-known practices of some modern rude tribes who are described as boiling meat in this manner in the skins of the slain animals. (See Tylor's *Anthropology*, p. 266.)

In my report of the excavation of the Lochlee crannog they are thus referred to: "A large number of round stones, varying in size from $\frac{1}{2}$ an inch to 3 inches in diameter, some having their surfaces roughened and cracked as if by fire, but others presenting no marks whatever, were met with. The former might have been used as heating-stones for boiling water in wooden vessels,—the only ones found on the crannog,—the latter as sling-stones or missiles" (*Ancient Scottish Lake Dwellings*, p. 103). In face, however, of the great preponderance of heating-stones at Elie (to estimate their bulk at a cartload would be within the mark), and the total absence of real hammerstones, querns, etc., we have a combination of archæological phenomena which, in my opinion, gives reasonable grounds to suppose that for ordinary culinary purposes, requiring the medium of boiling-water, the most common and best method of procuring it was by heated stones. Indeed, the poorest class of people,

nomadic hunters, etc., had probably no other means at their disposal, not being able to procure pans or pots of metal after the Roman fashion; and dishes of earthenware were not well suited to withstand the heat of an open fire. Sir Arthur Mitchell, who has paid much attention to Scottish archaic customs, and their occasional survival into the present day, thus writes of heating-stones:—"Before the use of metals, and while the people had no other vessels in which to hold water, or milk, or other fluids, except vessels of stone or such clay vessels as were described in a former lecture, it is evident that the heating of these fluids, when that was desired, would prove a matter of some difficulty by any procedure to which we are accustomed. We hear of the Scotch in times past seething the flesh of the animal they killed "in the skin of the beast, filling the same full of water; and Froissart tells of their cooking their beef in skins stretched on four stakes. But it was not thus they commonly heated a fluid. This was done by the simple process of placing a hot stone in the vessel which contained the fluid, and which could not itself be safely subjected to the direct action of the fire. Now it happens that this practice is still followed in some remote parts of Scotland, and especially in the remote islands. Even when there are iron vessels in the house, the fluid is sometimes by preference placed in a vessel of earthenware and heated by plunging into it a hot stone—one or two stones being kept constantly in the fire to be ready for this use. I possess more than one stone which I found so employed in Shetland. These heating-stones soon crack and fall to pieces, and thus require to be frequently replaced. In form they are elongated, and they weigh from two to four or five pounds. It has been often stated to me that the cooking or heating of certain fluids is best done in this way, just as some people think that the best way of heating ale or porter is by plunging the hot poker into it" (*The Past in the Present*, p. 121).

In recording the relics found in a kitchen-midden on the Ghegan rock, Dr Stuart describes two rounded pebbles of trap-rock as boiling-stones, "which," he adds, "exhibit the cracked appearance characteristic

of stones that have been made red-hot, and suddenly cooled by being plunged into water (*Proc. S. A. Scot.*, vol. viii. p. 359). Among the contents of shell-mounds in Aberdeenshire, described by Charles E. Dalrymple, Esq. (*Proc. S. A. Scot.*, vi. p. 425), heating-stones are thus noticed:—"The surface of this mound was covered with shingle, but with many large stones intermixed, and many shells, both of which had evidently been exposed to the action of fire, while most of the stones appeared as if they had been red-hot at some time, being split and cracked as well as discoloured."

I have to express my great obligations to Dr R. H. Traquair, F.R.S., LL.D., of the Museum of Science and Art, Edinburgh, for the following report on the osseous remains. The bones were in such a state of decay that they were not suitable specimens for entering on a minute analysis of any special characters which they might have possessed. In subjecting them to Dr Traquair, all I aimed at was a general determination of the animals which formed the diet of the inhabitants.