

XIII.

A SHELL-HEAP AT POLMONTHILL, FALKIRK. BY R. B. K. STEVENSON, M.A., F.S.A.Scot., KEEPER OF THE MUSEUM.

Attention was drawn about the middle of January 1940 by Mr Samuel Smith, Corresponding Member of the Society, to the exposure of a large

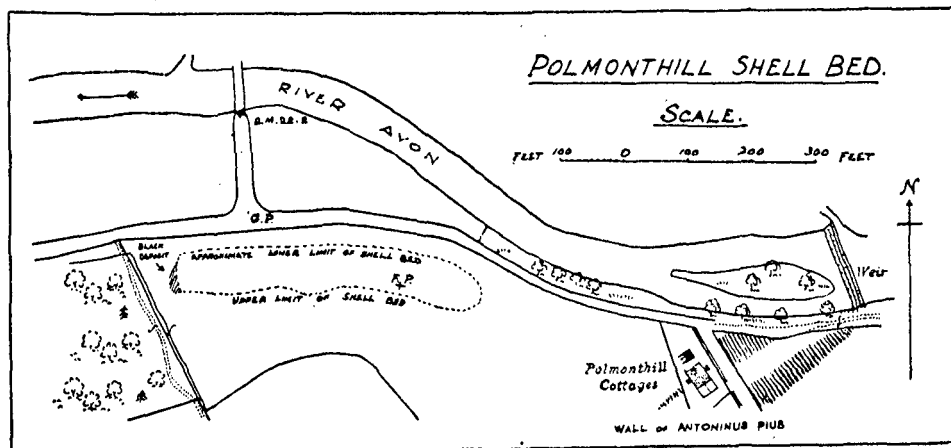


Fig. 1. Plan of Polmonthill, showing the position of the shell-heap.

shell-heap by a mechanical excavator digging a clay pit into the hillside on the farm of Polmonthill, near Falkirk (O.S. 6" Map (1921), Stirlingshire. Sheet No. XXXI. N.W.). The site was visited several times by Mr W. Manson, of H.M. Geological Survey; Dr M. Macgregor and Dr J. B. Simpson, both also of the Survey, accompanied him on one occasion. On the three occasions that I visited the site, in the middle of January and the middle of February, the ground was frozen hard; at points, indeed, the face of the pit was thickly coated with ice. This prevented any archæological excavation of the pit—for which kind permission was received from Messrs Crowley & Russell, Contractors, Glasgow—but unfortunately did not seriously retard the working of the pit, so that the shell-heap was entirely removed before the thaw came (fig. 1).

The heap was situated on the left side of the River Avon, where it debouches on to the Carse. It was approximately 25 yards wide, and ran for 170 yards along the gentle lower slope of the hill overlooking the Carse, its upper edge nearly coinciding with the foot of a fairly steep bluff. It may be said that the base of the heap lay on an incline rising from 32 to 47 feet O.D. Two or 3 feet of soil washed down the hillside covered the layer of shells, which had itself a thickness of 3 to 4 feet in the centre, and occasionally more. Immediately below this was the surface of the boulder clay, strewn in parts with a layer of stones weathered or eroded out of the clay. Besides smaller pebbles there were boulders, sometimes of consider-

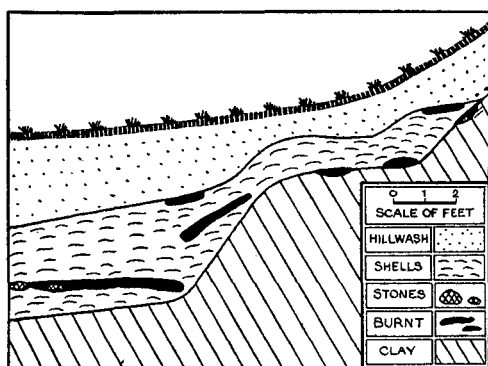


Fig. 2. Composite section through back of Polmonthill shell-heap.

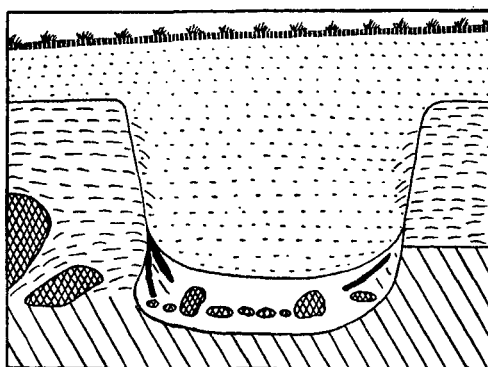


Fig. 3. Pit in Polmonthill shell-heap.

able size. It appears that the shells were heaped on to the beach of the Firth of Forth at the Avon mouth when the sea was, relative to the land, some 30 feet higher than at present (Pl. XXII, 1). The layer of shells rose at a gradient of approximately 1 in 5 to the upper part of the beach, where the spread of stones was almost entirely absent, and piled up against a steep bank, which at one point, where the section was cleared by Mr Smith, rose $3\frac{1}{2}$ feet in 3 feet. While the shells were accumulating, slips of earth from this bank had covered some, and then further shells accumulated on top. At some points the shells tailed off rapidly at the top of the bank and ceased after a few feet; but at the place shown in the composite section (fig. 2), in a small cut made with great difficulty by Mr Smith, the heap continued nearly horizontal for a couple of yards and ended banked up against another steep rise. It may be suggested that the main bank marks the head of the beach. The significance of the local level strip above, with a secondary heap, is however not clear.

The vast majority of the shells were oysters (*Ostrea edulis* L.), of which there were perhaps six or seven million valves. But there were occasional



1. Polmonthill: shell-heap overriding a dune on the old beach.



2. Superimposed hearths: the pick resting on the lowest, the trowel in the topmost; the ruler marks the base of the shell-heap.

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mussels (*Mytilus edulis* L.) and winkles (*Littorina littorea* L.), cockles (*Cardium edule*), and a few buckies (*Buccinum undatum littorale*, King). The oysters consisted of single valves lying flat on top of one another; excepting for an occasional isolated stone and, at one point, a thin streak of sand, there was no admixture of sand or pebbles, such as there would have been if the shells had been deposited by the sea. The strongest evidence, however, to show that the heap was actually a prehistoric midden was the amount of burnt material to be seen, consisting of thin layers undisturbed by sea action and sometimes containing distinguishable scraps of charcoal. One of the layers, with 6 inches of shells between it and the beach pebbles, started from the western side of a very large boulder as if in a spot slightly sheltered from the east wind. In these burnt layers, but rarely elsewhere among the shells, were numerous stones, mostly burnt, while in some cases flat stones had been laid to form rough hearths several feet across. Near the southern, landward, edge of the heap the burnt layers became more numerous, and Pl. XXII, 2, shows four superimposed, the lowest being a regular hearth with its back (exposed later) against the bank at the head of the beach.

Beyond the edge of the shells, some of it uphill but more particularly beyond the western and eastern ends of the heap, was a spread of black matter, apparently burnt, up to over 1 foot thick containing no shells but numerous heat-fractured pebbles, some as large as two fists.

The small samples of charcoal from the hearths and one from the black spread have all been identified as oak.

A few hour's pecking at the frozen face of the exposure with a small pick, mostly in the neighbourhood of hearths, unfortunately failed to discover any worked or utilised stone.

Despite this lack of artifacts, the midden from its general character, its association with the "25-foot beach" just subsequent to the period of maximum submergence, and the oak charcoal, which would be in keeping with the Atlantic climatic phase, may be referred to the mesolithic period.¹

The heap just described is one of a series in the neighbourhood, all lying at about the same height above sea-level, including one on Mr Smith's farm of Mumrills a couple of miles westward. There are several accounts of these, the best being by J. Peach.² "A line of interesting kitchen-middens runs along the bluff for half a mile or so on either side of where the River Avon enters the Carse. A section across a heap fifty yards long by twenty wide was exposed in a road cutting, and showed many successive layers of shells—principally oysters—to a depth of three feet without the bottom being visible. The remains of fire-places were plentiful among the shells. Oysters seem to

¹ A similarly placed shell-heap, also without artifacts, was excavated at Rough Island, Strangford Lough: see *The Irish Stone Age*, p. 141, by H. L. Movius, who discusses British raised beaches very fully.

² Para. 109 of the Geological Survey's *Memoir* to Sheet 31, 1879.

have been preferred by the makers of the midden, though they had also used the *Anomia*, the big 'horse-mussel' (*Modiola*), the common mussel (*Mitylus edulis*), the whelk (*Buccinum undatum*), and periwinkle (*Littorina littorea*). Fragments of the large edible crab (*Cancer Pagurus*) were also present. All the valves of the oyster were separate except such as had been empty, which still had barnacles or zoophytes in their interior. The mussel and other shells were found in separate nests and not indiscriminately throughout the mound. Layers of sand were also found among the shells. All the middens observed occur on the bluff itself or just at its base, as if, when it was the limit of high water, the people who formed the middens, after searching the shores during low water, had retreated thither to enjoy their feast while the tide covered their hunting ground." The section described by Peach is possibly the same as that described by D. Grieve.¹ A side road from Inveravon Castle to the Bo'ness-Polmont road exposed a section of about 90 feet, with a maximum height of 5-6 feet, through a bank of shells on the east side of the Avon. Besides the very large oysters, consisting of single valves lying promiscuously, were mussels, cockles, winkles, razor shells, and a portion of *Tapes pullastra*. No sand, stones, or sea debris were intermixed, so that the shells were not sea-borne. There were a few streaks of carbonaceous matter, but no hearthstones, chiefly near the bottom and towards the lower end. A "causeway" was discovered, which he thought to have been a Roman road. The Vallum, however, lies further inland than he supposed, and Sir George Macdonald used to wonder if the "road" was its stone base; but Mr Smith suggests that it may have really been the shingle beach that was noticed.

Similar shell-heaps have been found elsewhere along the east coast of Scotland. At Stannergate, near Dundee, such a heap was separated from an overlying Bronze Age cemetery by seven or eight feet of earth.² Other heaps occur at the mouth of the Ythan, Aberdeenshire.³

The shell-bed near Kinneil, Bo'ness, described by Callander,⁴ and apparently the midden of a metal-using people to judge from the sawn antler tines found, was well below present high-water mark. It was, however, so close to the present channel of the Avon that there must be considerable doubt as to whether the antler fragments were really *in situ*.

There remains to be described briefly a feature in the shell-heap at Polmont which particularly attracted Mr Smith's attention, but which had to be removed before the bad weather allowed of a careful examination. As this was not anticipated, only a very rough sketch was made (fig. 3). A pit had been dug right through the shells and into the boulder clay. In the exposure it was 9½ feet across at the top of the shells, and its bottom was 7 feet below the same level. The upper 5 feet were filled with earth similar

¹ *Proc. Soc. Ant. Scot.*, vol. ix. (1870-71), p. 45.

² *Ibid.*, vol. vi. (1864-65), p. 423.

³ *Ibid.*, vol. xiii. (1878-79), p. 303.

⁴ *Ibid.*, vol. lxiii. (1928-29), p. 314.

to the hill-wash above the shells, and, in the circumstances at any rate, no distinction was possible. The sides of the pit were nearly vertical, and made a sharp angle with the top of the shells. There were oblique streaks of shells in the pit at various levels, for a few shells had slithered in from the sides as the pit was being filled up. The natural clay at the very bottom of the pit had been reddened as if by heat, and above this were 6 inches of red ash. Then came a layer of flat stones showing signs of burning. These sloped up from the face of the exposure, as if the section was nearer the south side of the pit than the centre, a supposition supported also by the slope of the clay at the bottom. Besides the flat stones there were two larger blocks. Above the stones was a foot or so of red and black burnt material, and black bands sloped steeply up the sides of the pit to about 4 feet from the top of the shells, from which came a few trickles of lime—burnt shells.

Speculation as to the purpose or date of this pit must be omitted, in view of the absence of artifacts and the lack of evidence to show how the sides were kept vertical. It may be noted, however, that the pit had been dug from above the top of the shell-heap (and is thus later than the heap) for it did not splay out at the top, that there were no shells in it except what few had come from the sides, and that red ash was visible nowhere else about the shell-heap. Finally there was a hollow on the surface of the ground, which may, however, probably be discounted as it was not coincident with the top of the pit as far as this could be estimated. The only suggestion of a remote date for the pit is its general character, and the fact that a sample of charcoal from the base of the black layer below the stones was oak, like the other samples from elsewhere in the shell-heap.

I must thank Mr Smith for much help, information and many suggestions; Mr R. A. Milligan for the site plan; Mr M. Y. Orr and Miss M. I. Platt for identifying respectively the samples of charcoal and shells.