

V.—*An Old Man and Woman; or, Human Bones in a Scrobicularia Bed at Newton Abbot, Devonshire.* By WILLIAM PENGELLY, F.R.S., F.G.S., &c.

(Read 18th April 1889.)

ON 7th September 1885, while travelling in Scotland, I received a letter from Messrs Watts, Blake & Bearne, clay merchants, Newton Abbot, Devon (hereinafter called "Newton"), stating that during an excavation, then in progress, for the reception of a new gas-holder at the Newton Gas Works, a human skull and other bones had been found which were probably worth attention; that an iron key had been found in the same excavation; and that, at their suggestion, Mr Clarke, manager of the works, had put aside the finds just mentioned, in order that I might examine them if disposed to do so.

On going to Newton on 27th September 1885, I found the excavation completed, and the new gas-holder in its place, but not quite finished. Mr Clarke not only received me most kindly, but presented me with all the objects which had been put aside, as well as the memoranda he had made respecting them, and added to my obligations by the clear answers he gave to all my questions.

The excavation is in the "Marshes," west-north-westerly from Newton Railway Station, and about a quarter of a mile from it as the crow flies. It is on the right shore of the tidal estuary of the river Teign, from the nearest point of which it is about 1100 feet distant. Mr James Barry, river surveyor, kindly informs me that the surface of the ground adjacent to the excavation is 2·14 feet above the equinoctial spring-tide level at Newton.

The deposits passed through in making the pit were, in descending order:—

1. Vegetable soil,	2 feet.
2. Fine sandy mud of very dark colour, .	11 "
3. Gravel, generally well rounded, but containing a few sub-angular stones,	2 "
4. Light coloured clay (the "pipe-clay" so largely exported from the district), the bottom of which was not reached,	6 "

Total depth of the pit, 21 feet.

The "fine sandy mud"—the second bed—was the only one in which any organic remains or other objects of interest were

observed. In it, from top to bottom alike, there were shells of *Scrobicularia piperata*, Linn., and *Ostrea edulis*, Linn. The former were so abundant that, in the language of the workmen, there were "hundreds of thousands of 'em," and judging from the number I observed in a large heap of the sandy mud which had not been carted away, they must indeed have been very plentiful. I noticed in this heap several instances of the valves united and closed as when the mollusc was alive. The oysters, though less numerous, were very far from being rare. Of the few I collected, the exterior of one was covered with *Serpulæ*, the outer surface of another was traversed with numerous minute perforations, while a "dead shell" had on its inner surface a few *Serpulæ* and a considerable patch of *Flustra*.

Bones of mammals, I learned, had been tolerably numerous in the scrobicularia bed, but until the human skull and a few bones found with it were dug up, no attention had been paid to them. This find was met with 12 feet below the surface; that is, 10 feet below the top, and 1 foot above the bottom, of the bed. An inspection of the heap of deposit already mentioned enabled me to add to my collection a portion of the horn of a red deer (= *Cervus elaphus*, Linn.), which the workmen assured me had been dug out of the same bed, but they could not state at what depth it occurred.

The only artificial article noticed was the large iron key already mentioned, which is presumably of no great antiquity. It was met with 3 feet below the surface, that is, 1 foot deep in the scrobicularia bed.

I was by no means unprepared for the shells already mentioned, nor do I doubt that their original occupants had lived and died where the shells were found, for it may be safely concluded that the area now under notice is a silted-up portion of the estuary of the Teign, of which it is a part of the present shore. This river, a few years ago, by undermining a portion of its left bank, about a quarter of a mile north-eastward from the pit for the new gas-holder, laid bare a considerable accumulation of shells of scrobicularia and oyster, of which, when at the spot, I took specimens, and also of the deposit in which they lay. Some of the oysters have the minutely perforated exteriors which, as already mentioned, characterise some of those at the gas works.

A consideration of the presence of the shells found in 1885, and of their parasites, as well as of the level they occupied in relation to the existing tidal levels of the district, led me to enquire whether or not they afforded any evidence of a change in the relative level of sea and land in the locality.

The few bones found with the human skull were a femur,

a scapula, part of a maxilla containing two teeth, and a vertebra; all human except the vertebra, which belonged to some larger form. All the human exuviae, except the maxilla, have been submitted to Mr J. G. Garson, M.D., of the Royal College of Surgeons, London, and his decision respecting them, confirmed by Mr A. Macalister, M.A., M.D., the Cambridge Professor of Anatomy, to whom also they have been submitted, is briefly as follows :—

The skull is that of a woman, and of what is known as the *Round-Barrow* or *Brachycephalic* type.

The femur has lost its distal extremity, but is otherwise tolerably perfect, and has undergone but little abrasion. When entire it could have been but little, if at all, short of 19 inches long. Its proportions are robust, and the *Linea aspera* is strongly developed. It is undoubtedly the thigh bone of a male, and if the height of a human being can be even approximately calculated from the length of the femur, he must have been a decidedly tall man.

The scapula, also that of the right side of a man, has undergone some damage at parts of its edges, but has suffered little from friction; and, like the femur, is above the ordinary size.

The portion of Maxilla has been submitted to Mr E. B. Pearman, a distinguished dentist at Torquay, who has kindly favoured me with the following statement respecting it :—

“The relic is a fragment of the human superior left maxilla, containing the empty sockets of the central and lateral tooth, a canine firmly embraced by its alveolus, and a first bicuspid with part of its alveolus. The age of the subject must have been about sixty; and from the wearing away of the enamel of the canine and bicuspid, the subject must have done some hard work. The whole of the *pointed* canine is gone, and ground to the dentine, which is highly polished. On first looking at the case, I thought that by the empty sockets of the central and lateral, the teeth had been lost during life; but, on touching with a probe, I found they only contained dust, so the subject certainly died with those teeth in. The curve above the empty sockets, which, with the right superior maxilla, helps to form the floor of the nares or nostrils, is well defined, as is also the palatal bone.

“(Signed) E. B. PEARMAN.”

“17th August 1886.

“4 PARK PLACE, TORQUAY.”

It is obvious from what has been stated, that the bones represent two human individuals, and the two sexes; but, if we may trust the anthropologists, they both belonged to the *Brachy-*

cephalic race. (See Greenwell and Rolleston in "British Barrows," ed. 1877, p. 654.)

Returning now to the question of levels. The late Mr R. A. C. Godwin-Austin, F.R.S., F.G.S., spoke of "the range of *Scrobicularia piperata* being from low water to four fathoms beneath" ("Quart. Jour. Geol. Soc.," xxii. 5); and the late Mr J. Gwyn Jeffreys, LL.D., F.R.S., stated of the same species: "Habitat: beds of mud and clay at low water mark, and as deep as four fathoms seaward" ("Brit. Conch.," ii. 445-6). The latter author makes the following statement respecting the oyster: "Habitat: 0·45 fathoms" (*Ibid.*, ii. 39).

It is stated in the "Channel Pilot," Part I., "published by order of the Lords of the Admiralty" (ed. 1874, p. 16), that the spring tides at Teignmouth rise 13 feet; and this is in accordance with a communication with which the harbour master has favoured me. Now, remembering that, as previously stated, the top of the scrobicularia bed is now permanently a few inches above the highest spring tide high water, it follows that the top of the bed is upwards of 13 feet above spring tide low water, and the bottom of the said bed is fully 2 feet above spring tide low water. In other words, the top of the bed can at present never, even at spring tides, be quite reached by salt water; and the lowermost 2 feet of the bed, if covered with water at all, can only be covered with perfectly fresh water during several hours twice every day.

If it be assumed that the local tidal phenomena were pretty much the same when the scrobicularia bed was deposited as they are at present, and that *Ostrea*, *Scrobicularia*, and *Serpula*—though able to live for short periods in water, having but little salinity—have their normal highest level nowhere above the level of low water, the figures just produced apparently necessitate the conclusion, that in the locality under notice there has been a change in the relative level of land and sea, whereby the land has become relatively higher by at least 13 feet than it was during the deposition of the said bed. If, however, we suppose the base of the bed at the pit was, at the time of its deposition, 4 fathoms below the level of low water—the maximum assigned by naturalists to *Scrobicularia piperata*—the change of relative level must have been fully 26 feet.

In the foregoing speculation it has been tacitly assumed that the scrobicularia bed was never more than 11 feet thick at the area of the pit. It is possible, however, that after the close of its deposition it may have been shorn of some feet of its thickness by denudation before the lodgment of the vegetable soil—the uppermost bed. This, however, could only have the effect of augmenting the change of relatively level.

Geologists are well aware that near Hope's Nose, Torbay, south-easterly from Newton Gas Works, at a distance of about seven miles as the crow flies, there is a fine example of a raised beach, replete with shells of oyster and such other molluscs as now live in the bay; that its height shows an elevation of little, if at all, less than 30 feet; and that corresponding beaches occur elsewhere in the bay, as well as at frequent intervals westward to the Land's End. It will be seen that this elevation corresponds very closely in amount with the maximum hypothetical elevation of the scrobicularia bed.

It must not be concealed that, so far as I am aware, no *Scrobiculariæ* have been found in any of the raised beaches just mentioned, the materials of which, however, are anything but likely to have formed a suitable habitat for them. I learn from Mr A. R. Hunt, F.G.S., F.L.S., of Torquay, who has devoted much time and attention to the conchology of the Torbay raised beaches, that he has found in them shells of twenty-seven species of molluscs, and that scrobicularia is not among them. Geologists, however, need not be reminded that *Ostrea edulis* and *Scrobicularia piperata* were members of the British molluscan fauna as early at least as the era of the crag deposits of East Anglia.

Geologists familiar with the coasts of East Devon and West Dorset are aware that there is no trace of a raised beach along the entire coast between Hope's Nose and Portland Bill; and, knowing also that the cliffs throughout this interval consist of comparatively perishable rocks, they conclude that in all probability such beaches formerly existed there, but that the cliffs have been wasted by the waves, and the raised beaches have perished with them.

If I have correctly interpreted the Newton phenomena, we have evidence that Devonshire, east of Hope's Nose, shared in the upheaval which is attested by the raised beaches near, and west of, that headland; and we have an intimation that between Torbay and Portland such evidence must be sought, not in the sea cliffs, but in the plains through which the rivers flow. There is reason to believe that evidence of this kind will to some minds be more conclusive than the most striking raised beaches.

With regard to the occurrence of the human bones not more than one foot above the bottom of the bed in which they lay, two hypotheses may be entertained:—

1st. That they were less ancient than the era of the deposition of the bed, and that they sank through the fine sandy mud to the place they occupied.

2nd. That they were coeval with the bed.

The first hypothesis has two aspects:—

(a.) That the entire human bodies—flesh and bone—of which

they are remnants, sank through the deposit. This does not appear to me to be tenable, since the specific gravity of the human body is so very nearly the same as that of water, the pressure of a body on the bottom must be too inconsiderable to enable it to overcome the resistance of even a mass of fine sand. Moreover, this hypothesis would lead us to expect that two complete, or nearly complete, skeletons would have been disinterred by the workmen instead of a very few bones only.

(b.) The second aspect is that instead of the entire skeletons, a few naked bones—perhaps simply those now in my possession—were all that were ever lodged on the bed, and that from their greater specific gravity they would have a more decided tendency than entire bodies to sink into the mud. There can be no doubt that this aspect is less untenable than its rival. Nevertheless, even a naked bone would lose very nearly two-thirds of its weight in water, and it is obvious that the form of a scapula is very unfavourable for such sinking as is here contemplated. Moreover, the iron key, which would lose more than one-eighth of its weight in water, sank no farther than 1 foot deep—if it sank at all—in the sandy mud, while the bones sank in it, if at all, to a depth of 10 feet. On the whole I decidedly prefer the second hypothesis, namely, that the bones were coeval with the part of the bed on which they lay. With regard to *Scapulae*, I remember that in my early sea-faring days it was held that on account of their form they were capable of floating on the surface of the sea, and would thus afford a witch a splendid opportunity for coming aboard. In fact, our skipper never allowed a scapula of a sheep to be thrown overboard until a large hole had been made in it with a marline-spike, so as to prevent its being used as a “witch’s boat.”

According to my interpretation of the facts, the man and woman represented by the relics under notice were as old as the era of the deposition of the raised beaches of Devonshire, and therefore older than the period of their upheaval; but for this we are by no means unprepared, as the molluscs of the said beaches limit them to a post-glacial age; and the caverns of the neighbouring Torbay district have undoubtedly established for Devonshire man a very early post-glacial, if not, as I believe, a pre-glacial antiquity.