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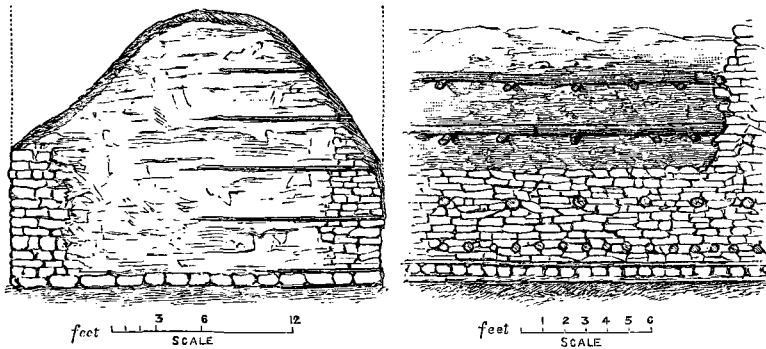
#### NOTES ON THE RAMPARTS OF BURGHEAD, AS REVEALED BY RECENT EXCAVATIONS. BY HUGH W. YOUNG, F.S.A. Scot.

The writer of these notes having considered it advisable in the interests of science to have the few remaining portions of the ancient fortifications at Burghead thoroughly examined and excavated as far as possible, a commencement was made on the 1st of July last year. Some thirty years ago the Elgin Literary and Scientific Society voted a small sum of money for the same purpose, but the amount had been too small to give satisfactory results, and the examination was therefore partial. This excavation, however, revealed an old wall of logs and stones mixed. I began, therefore, to search for this log wall, and having found it at the extreme end of the north-east rampart, I followed it for some 70 feet. The enormous mass of rubbish made the work one of the greatest difficulty, owing to the masses of stones and earth breaking

away and filling the openings made. The north-east rampart is about, on an average, 25 feet high above the road on the seaward side, about 60 feet wide at the bottom, and what remains of it is about 400 feet long. The height varies. Having proceeded digging along both faces of the wall, I resolved to cut the rampart right through at a distance of 50 feet from the end. The sea-face of the wall was of solidly-built stone. The stones were, many of them, apparently hammer-dressed, and a good many had distinct chisel marks. What remained of this facing-wall of the rampart was 9 feet 7 inches in height, and stood on a beach of rolled pebbles. The foundation was of large, round boulder-stones, but flattish on the upper and lower sides. These stones were about 16 inches long in face of wall, and some 12 inches deep by 9 to 10 inches high. The next row consisted of very large stones, flat, and some of them as big as 2 feet 6 inches by 18 inches in depth, and 5 inches thick. The next row of stones was smaller, perhaps a foot to 16 inches by 11, but large stones appeared at all heights of the wall. At a height of 6 feet I picked out a face stone, 26 inches by 20 inches. The stones were all freestone, brought from a distance of one or two miles.<sup>1</sup> The thickness of this outer facing-wall of the rampart at the bottom was about 3 feet, and at the height of 9 feet might be 20 inches to 2 feet. The facing on the inner side of the rampart-wall was 3 feet 7 inches thick at the foundation. About 4 feet was all that remained of its height, and the two walls, with the mass of stones, wood, and rubbish between them, gave a total width to the rampart of 24 feet. The two facing-walls are joined and strengthened by oak logs. The logs cannot be measured, as the state of decay is very great. Some of them I traced fully 12 feet into the rampart. These logs were joined across by oak planks and logs, riveted together by iron bolts. Whether they had been mortised it was impossible to tell. To judge from the holes in the face of the wall from which the ends of the logs had decayed, these beams would be from 6 to 9 inches square, and the planks 2 to 3 inches thick by 10 inches to a foot wide. It was impossible to tell whether they had been hewn or sawn, and it was also impossible to say if the logs had been round or square. The planks, how-

<sup>1</sup> It is very curious that the Burghead freestone does not appear to have been used in this rampart.

ever, had undoubtedly been hewn. The bottom of the inner facing-wall rested on oak planks or logs laid on the beach. On these were laid large round boulder-stones similar to those in the foundation of the outer facing-wall. On this row of boulders was another layer of decayed oak extending several feet into the wall. Above this were several rows of thin flat freestones, not dressed; and then at a height of 3 feet a row of logs placed at intervals, and running right through the facing-wall and into the rampart a long distance. Here the facing-wall was at its highest, but in the rampart, rising behind and above it, layers of oak were found 3 feet apart to the top. A similar row appeared 3 feet further on, so that while there was a distance of 3 feet between every log in the perpendicular row, the rows were also placed 3 feet apart. In one part,



Figs. 1, 2. Diagrammatic section and elevation of rampart at Burghead.

near the bottom of the wall, however, I found a difference. There the logs were run into the wall every 9 inches, with one stone between (see figs. 1, 2).

Having opened the trench right through the rampart, we came to the bottom, which was paved from side to side, with boulder stones carefully chosen, and fitted to each other. Below these the pebbly beach had been levelled to receive the foundation.

The central portion of the rampart rose fully 7 or 8 feet above the top of the outer or sea-facing wall, so that this formidable fortification had probably been not less than 20 feet high. All through the stone and

earth packing of the rampart between its facing-walls were large boulder stones.<sup>1</sup>

There is, I believe, no rampart in Great Britain resembling this one at Burghead. To find analogous structures we must go to the sites of some of the ancient Gaulish Oppida, and for an account of their defensive structure, to Cæsar. In the volume for 1874 of the *Congrès Archéologique de France* an account is given of these old Gaulish walls, and the section given (p. 456 of that volume) is almost the same as a section I saw at Burghead. There are differences, however, and the Burghead wall had been a far superior work in many ways to those of France—

- 1st. The stone rampart at Burghead has thicker and stronger facing-walls on both faces, these being (except in one part of the inner facing-wall) two, and sometimes three stones thick, whereas the Gaulish facing-walls are usually one stone.
- 2nd. The outer face at Burghead is entirely of stone, so that the logs do not appear on the outside face of the wall at all.
- 3rd. The Burghead rampart is causewayed, that is, it has a foundation course of boulders, adding enormously to its stability and strength, whereas Cæsar describes the Gaulish walls as having the logs laid on the bare ground, though the upper tiers of logs were usually packed with stones below and above.
- 4th. The inside wall at Burghead has layers of oak *planks* (evidently

<sup>1</sup> About 300 feet south from this cut the style of the wall changed greatly; the quantity of oak seemed to be doubled, and the stone face between the logs was only one stone thick. So great was the quantity of rotten oak that it looked as if a plank had been laid almost between every tier of stones. The state of decay was, however, too great to attempt an accurate drawing. One plank I drew out was fully 7 feet long, and had likely been twice that length. I do not think that lime was used in the construction of this wall; I did not find any traces of it. The builders of this wall evidently used the materials at hand, viz., the oak trees of the forests of Duffus, and the freestones of Hopeman. A piece of lime cement was found at a depth of 7 feet under the rubbish at the bottom of the wall. It was composed of very small quartz stones and finely-powdered lime, and it had been poured between rounded stones in a liquid state. This it showed plainly by its shape. The lime was very white, and black specks appeared in it like charcoal. I do not think, however, that this mortar had been in the rampart, but likely in some building inside the fort.

not logs), perhaps 2 to 3 inches thick, and 18 inches wide. These planks are laid between the rows of facing stones, and serve to give an amount of coherence to the work which the Gaulish walls seem to want, and would enable the whole mass to settle down into a more perfect stability.

- 5th. The stones in the Gallic walls are described as having no mark of hammer or chisel. The stones in the sea-face wall at Burghead, and also in the inside wall, show many that seem to have been chiselled, and the sea-face stones are many of them hammer-dressed. The chisel marks are made with a small pointed tool, and when the stones are newly dug out are very distinct, but they soon fade away when exposed to the air, and become faint.

With these points of difference, and they are not slight, and all improvements, the ramparts of Burghead and Gaul are identical.

Cæsar describes the Gallic walls as follows :—

“ But this is usually the form of all the Gallic walls. Straight beams connected lengthwise, and 2 feet distant from each other at equal intervals, are placed together on the ground ; these are mortised on the inside, and covered with plenty of earth. But the intervals which we have mentioned are closed up in front with large stones. These being thus laid and cemented together, another row is added above in such a manner that the same interval may be observed, and that the beams may not touch one another, but equal spaces intervening, each row of beams is kept firmly in its place by a row of stones. In this manner the whole wall is consolidated until the regular height of the wall be completed. This work, with respect to appearance and variety, is not unsightly, owing to the alternate rows of beams and stones, which preserve their order in right lines, and besides, it possesses great advantage as regards utility and the defence of cities, for the stone protects it from fire, and the wood from the battering-ram, since it (the wood) being mortised in the inside with rows of beams, generally 40 feet each in length, can neither be broken through nor torn asunder.”<sup>1</sup>

The 40 feet referred to is not the width of the wall, but evidently means that they were mortised in lots, 40 feet in length ; at least so I understand it.

<sup>1</sup> *Cæsar's Gallic Wars*, book vii. section 23.

We must now turn to the discovery of the Burghead wall, 600 feet distant from where I made the first cut through. The wall here was underground, and about 4 feet of it was standing. It was the same style of wall, but the masonry was of enormous strength, the stone wall being nearly 6 feet thick. The Elgin Literary Society found a wall thirty years ago, described by Dr James Macdonald as containing no oak, and the spot where this wall seems to have been got corresponds with the wall I found, as likely being the inner face of the same wall. I could perceive no traces of oak here, but I could not penetrate very far owing to the proximity of houses. I did not dig for the inner wall, as it is mentioned as being found at a depth of 6 feet. This strong wall without oak (if it be without oak) is exactly at the corner where the rounded angle is in General Roy's plan of Burghead. The Gallic walls had many parts also without oak logs. Oak appears only to have been used in the spots where the battering-ram could act, and this suggests that the fortifications at Burghead were raised by a people familiar with the attack of the battering-ram.<sup>1</sup>

A few extracts from the article on these Gallic walls given in *Congrès Archéologique de France* will, I think, be interesting.<sup>2</sup> I fear the translation will not be very elegant, but it will be as literal as I can make it.

It would seem that these singular fortifications (of wood and stone) were not peculiar to the Gauls. We find them at the same epoch among the Dacians. At the time of the conquest of Dacia by Trajan, from 101 to 106 of our era, the strong places of that people were defended by ramparts like those which now occupy us. Upon Trajan's Column, indeed, are seen Roman soldiers engaged in demolishing a wall formed of alternate beds of beams and of stones.

<sup>1</sup> Some years ago a pile of catapult stones was found on the ground where the second rampart stood, near the churchyard. They were artificially shaped like an acorn, and had flat bottoms cut by a chisel. One of these is in my possession, and weighs 7 lbs. exactly.

<sup>2</sup> "On the Fortifications of the Gaulish Cities of Murcens, Uxellodunum, and Impernal (Luzech), in the Department of the Lot," *Congrès Archéologique de France*, Session XLI. I desire to acknowledge my indebtedness to Dr Joseph Anderson for calling my attention to this paper, and also to Sir Arthur Mitchell for kind assistance and aid.

It has been shown that the relative arrangement of the beams, whether along the wall or across, was not always the same, and that it varied with the configuration of the ground, the height of the construction, and the nature and dimensions of the materials employed.

The wall of Murcens lay directly on the rock ; the outer circumference was formed by blocks of stone of large size, which had received no preparation for being used in the work. As to the filling of the interior of the wall, it consisted sometimes of stones and pebbles, sometimes of earth, following the nature of the materials most commonly found near the place where they were used.

The beams in the courses of wood were placed at right angles to the exterior line of the enclosure of the rampart, and very regularly separated by a distance of  $2\frac{3}{4}$  yards from axis to axis, as the spaces left by their disappearance prove ; they projected slightly on the exterior facing, and occupied in length all the breadth (*largeur*) of the wall.

The transverse beams were solidly bound between them, in the exterior of the wall, by two other ranges of longitudinal beams hidden in the mason-work of the centre of the wall. The first lay at 1 yard 3 inches from the face of the wall, and the second was  $1\frac{1}{4}$  yard from that. The joining of the beams along and across to their point of intersection was in the middle of the wood, by notches. Long bolts or nails of iron, squared, which are still found standing at the crossing of the beams, serve to consolidate, and render them almost indestructible. This first bed of wood placed horizontally is found at  $1\frac{1}{3}$  yard above the foundation of the wall.

The regularity of the spaces left by the decomposition of the wood, and the straight lines which show the nails of the different rows of beams, prove in the most evident manner that the pieces of wood put into the work were straight themselves, and that their joining was really by notches of equal depth, for the inferior level of the conduits of the cross-beams correspond exactly to those of the longitudinal beams, which would not be the case had they been placed above each other at their point of meeting. These same indications also establish that the pieces of wood employed had a diameter of from 10 to 12 inches (32 to 35 centimetres), and that they had not been regularly squared.

On this first frame of wood thus placed is raised, about a thickness of  $1\frac{1}{3}$  yard, a mason-work and packing of pebbles in the interior, including all the breadth determined by the transverse beams.

A second layer of wood in every way like the first was placed over this mason-work, but in such a way that the beams of the second layer alternate by regular intervals with those of the first row.

The construction was continued thus till the wall had attained the desired height, which was originally  $6\frac{1}{2}$  yards at this point.

The cross conduits (drain-like spaces left where the beams had rotted) leave

no doubt of the length of the wood which they held ; it was incontestably nearly  $7\frac{1}{2}$  yards, like the breadth of the wall. . . .

Where the wall is strongest at Murcens there were four rows of conduits left by the disappearance of an equal number of transverse beams, in which bolts of iron were still erect in their places at the crossing of the beams.

The direction and place of the longitudinal beams are as plainly shown as the position of the transverse beams. But here their arrangement differs totally from anything we know or find described by Cæsar.

The pieces of wood in each bed, instead of alternating on the face of the wall with equal intervals, like chequerwork, are all laid one over the other, and correspond in the vertical construction, whilst the longitudinal beams reproduce the position *en quinconce* of the transverse beams. To give the construction the maximum of solidity possible to it, the layers of wood were much nearer each other ; an interval of hardly 18 inches (50 centimetres) separates axis from axis in such a way that they are found nearly in contact with one another.

The pieces of wood serving as interior crossings were thus combined : the two rows of the first bed were distant, the first 19 inches from the outside circumference, and the second  $1\frac{3}{4}$  yard. The two lines of the layer immediately above corresponded to the middle of the intervals left by those of the lower bed, and lay, the first 1 yard 4 inches, and the second  $2\frac{1}{2}$  yards from the visible face of the wall. This alternate order was followed without change throughout the entire height of the rampart.

The packing of the wall (with stones, pebbles, and earth) was executed without any particular care, unless around the beams, where large stones had been arranged by hand, so as to encase them, and give them more stability. It is to this arrangement of stones that are due those conduits preserved after the disappearance of the wood, and in which the iron nails or bolts are found.

We have gathered in these holes numerous pieces of charcoal, in the form of minute plates. These cavities contain a large quantity of ashes or rather dust, white and unctuous to the touch, such as is left on the destruction of woody fibre by slow and continued fermentation, caused by damp. This is evidently the result of the decomposition of the wood.

On the fifth row of beams there lay, all the length of the wall, a bed rather more than a quarter of a yard (25 to 30 centimetres) thick, of a plastic yellowish clay, of which considerable quantities exist on the plateau. This bed of clay, at such a height, filled the same office as the cope in modern works, and prevented the rain from filtering into the lower part of the construction.

It need hardly be remarked that there is no trace of cement or mortar in the walls of Murcens, any more than in the other Gaulish works before the Roman conquest, as it was not known in Gaul till then.

The exterior facing of the wall is composed of rough stones of middling size,



of a limy nature, without preparation, arranged without art, and showing the rustic aspect of dry stones. The thickness of the facing of the wall arranged by hand is more than half a yard (60 centimetres), without any connection with the materials of the packing. The profile is vertical to the full height of the wall, and lies on the rock.

The inner facing of the wall, like the outer, was vertical at the base, but at a certain height, not fixed, but subordinate to the accidents of the ground, it is raised in grades or successive steps to the top of the wall, where the thickness is reduced to a little more than half of that of the base.

At a part of the fortification naturally well defended, the pieces of wood were very thin.

At the summit of the platform, and on the last layers of mason-work, we recognised the foundations of a stone parapet, which continued all round the wall.

What has been taken for lime in the wall is nothing but calcareous earth, blackened by the smoke and calcined by the powerful action of some forge of which it had formed part before being taken as packing for the wall.

We estimate that the average height of the walls was from 5 to 6 yards, and 10 or 12 yards at the weakest points. The breadth of the foundations varied from 5 to 12 yards.

The wood and iron constituted the strength of these walls; the other materials were of no other use than to give facilities to lay the beds of beams, and to give them weight to add to their resistance. The strength of the wall was always in proportion to the quantity of wood in it.

The bolts or nails of iron which fastened the beams had all square tops, and tapered to the point. The best preserved are about 12 inches (32 centimetres) long. Among the packing were found an auger and some other iron tools like those still in use. The bolts are placed in the cavities left by the beams with such geometrical regularity that, one being found, it is easy to know where the next will be discovered. At Murcens, whatever the length of the cross beams may be, they were never in any case bound by more than two placed lengthways.

At Impenal the walls are constructed in the same general way, but they differ in certain details, which show that they lent themselves to modifications imposed by the nature of the place, and of the materials proper to each country. Like that of Murcens, the wall of Impenal rests on the levelled rock, and because of the smaller size of the beams (longitudinal) there are three instead of two. The inner face of the wall, instead of decreasing in thickness to the top step by step, was embanked to the top, so as to form a platform 6 yards broad. At some of the curves the beams were placed like divergent rays. The ends of the beams projecting outside the walls were rounded as a protection against the battering-rams.

In some of the walls at Uxellodunum the external facing, instead of being vertical, is inclined, and the profiles of rough stones, far from following a regular plan, are placed above each other in successive grades, in such a way that each row, whatever its strength, recedes from the face of the one beneath about three-fifths of its thickness.

Neither annals nor tradition teach us the precise epoch to which to assign these remarkable works. All that we know is that they existed in a good state of preservation in the time of Cæsar.

We know, from various passages in Cæsar, that the Gauls knew how to increase the hardness and durability of wood by submitting it to a superficial burning to get rid of the bark and the sap, which are the chief causes of its decomposition.

The small bits of charcoal found where the wood has decayed in the walls give us certain proof that the pieces of wood used in the walls had probably undergone this process.

The knowledge of cement and mortar which the Romans carried to Gaul, and of which our ancestors were ignorant, made a revolution in the art of building. Those cements replace the wood advantageously, and give walls and other buildings greater solidity, and much greater durability. This is why at the end of the Roman occupation the use of wood in works of defence was totally abandoned, the new walls of the Gallo-Roman towns, which were substituted for the ancient fortifications in Gaul, being built of thick and solid stone and mortar.

Several of the descriptions I have translated might have been written about the rampart of Burghead, so great is the resemblance. The French walls appear to have depended on the iron and wood structure to a greater extent than Burghead, but still the quantity of oxidised iron to be picked up at Burghead in the wall is very great. The length of the bolt at Burghead I could not determine, so rotten was the iron, but they were likely not under 8 inches in length by nearly an inch broad, and had square heads. The French nails, again, are 8 to 12 inches long, and the head simply the bolt made flat.

While on the subject of the French walls, I may remark on another point. The Gallic forts seem to have had no dividing walls. I found at Burghead that the lower fort appeared to be divided by a very strong wall into two parts. This cross wall runs out at right angles at about 200 feet from the lower or east end of the fort. It has been a very strong wall—4 feet 3 inches thick, of solid masonry, and is evidently

part of the same builders' work. I could not trace it further than some 18 or 20 feet, as it ran into a hilly place.

The question that remains to be answered is, Who built this wonderful wall at Burghead? A most amazing piece of work it is, and only one who has worked at it can have any idea of the labour entailed on the builders.

No similar wall exists, so far as known, in Britain, and the conclusion seems evident that the builders were not a native race, and that this fort was for the protection of a colony. Almost nothing in support of any theory, however, has yet been found in the way of objects—not a coin (of any antiquity) or a piece of pottery in all the diggings. A blue melon bead, and a bone hairpin, with swelled shaft, like those of Uriconium, however, point to the Roman period. If any British pottery had been got it would have been something, and the Gallic walls and towns are full of native pottery, but no distinctive ware of any kind has come to light at Burghead.

Before closing, it may be well to explain the complete sweep made at Burghead of everything except these ramparts—the rock well, or bath, and the graveyard.

About 1818 the proprietors resolved to fill up a small bay where the present herring-curing stations now stand, and to accomplish this two lines of rails were laid to the summit of the promontory to carry down the material.<sup>1</sup> The whole of the north-west ramparts were hurled down the hill, and deposited in the bottom of the bay, the full waggons running down and carrying up the empty ones. No less than a height of 18 feet of ramparts, and the whole upper surface of the high fort, now lie below a line of curing-stations, and I suppose many antiquities are there buried. The cross ramparts were hurled each into its foss, and are now built over, and the many coins, battle-axes, and spear-heads then found were given to any English tourist who came that way.

Thus was the rubbish disposed of, while the good stones were picked out to make the harbour, and how many inscribed and incised stones are in these harbour piers may be left to sad conjecture.

In conclusion, I wish to state that my experience of General Roy's

<sup>1</sup> A contract for the removal of 20,000 cubic yards of rampart is in my possession.

plans give me a very strong opinion of the accuracy of his measurements. By his measurements alone I found the underground wall after my own search had been in vain. His plan of the promontory itself is all wrong, but *it* was likely a fancy sketch without measurement.

I have been most anxious to excavate some of the walls near the old bath or well, but owing to the proximity of houses I have found it almost impossible to do so.

I managed, however, to drive a short tunnel into the mound on the right-hand side of the bath. I found we were digging into a mass of ruins, and had to stop for fear of bringing it down on the top of the "well." However, this digging proved that the bath or well is the centre of an enormous pile of tumbled-down walls. These had been buildings of great height and size, which must have stood over the bath. The fall of the buildings, no doubt, choked up the rock-chamber, and formed the great mound shown on Roy's map. Among these ruins were many bones.

I also managed to run a small cutting into the left-hand side, sufficiently far to ascertain that no second chamber could likely exist between the "bath" and the outer wall of the ramparts. If there is any other cavity, it must be outside the fortifications altogether.

There still remains to be examined the high rampart of the upper fort, but from various causes I find it impossible to excavate it at present. It is likely that near the point it has not been disturbed, but it is not possible for me to go into this matter at present.

Walls crop up all round the area of the bath or well, and show that undisturbed buildings rest beneath the present surface, but the ground is all feued and built upon, and cannot be explored. Many problems lie hidden in this spot, and some day they may come to light.

I have refrained in this paper from any speculative remarks. When all the facts about Burghead are gathered—and they are very far from being all gathered yet—it will be time enough to form a theory.

There is work for the excavator in the upper rampart for many months, and I find that a small portion of one of the cross ramparts still exists near the churchyard. At present we have only ascertained the great and undoubted antiquity of Burghead, and that everything about

it, except the Celtic Church, is unique in this country. There is no rampart of wood and stone, no incised bulls, no bath exactly shaped like the one at Burghead, to be found in the British Isles; and the subject is really worthy of the most careful consideration.