DARTMOOR BLOWING HOUSES
(SUPPLEMENT)

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AFTER my paper on the above subject was in print it appeared to me that I had not made it sufficiently clear that the term " Blowing Houses " has been used to describe buildings in which, in some instances, there is no proof that smelting was ever carried on. In theory at least there may have been buildings exclusively devoted to either of three purposes of the tinners ; (a) the *blowing house* proper, where the ore was smelted, (b) the *knocking mill*, where the ore was reduced to powder by a primitive form of stamps, driven by water-power, an alternative name being clash or classe mill, (c) the *crazing mill*, where the ore, after being stamped in the knocking mill, was ground to a finer powder between granite millstones.

That one building sometimes served all three purposes may be seen at *Gobbet* (10), where there are mould-stones, mortar-stones and crazing mill stones. That many buildings served as both blowing houses and knocking mills is certain ; there are at least eight known buildings in which both mould- and mortar-stones have been found. On negative evidence, i.e., the apparent absence of any mould-stone where mortar-stones have been found, or of any mortar-stones where a mould-stone has been found, there are many buildings which may possibly have been restricted to a single purpose, either stamping or smelting. Hence the title of my paper in Vol. lxxii of the *Transactions of the Devonshire Association* had better been " The Tinners' Mills on Dartmoor," since all buildings provided with waterwheels were described as " mills " by the tinners.

There is another point on which I feel that the paper which I published, in 1940, may be misleading. I certainly spoke of the mortar-stones in a manner which involved that they were used for the crushing of tin-ore and slags by hand. This has been the general assumption. But many years ago my father suggested that these mortar-stones may have been the dies or anvils between which and the stamps the ore was crushed. At the time at which he wrote we had little knowledge of the knocking mills, and were not in a position either to question or confirm the suggestion. I had already written

and published before I realised that now there were available criteria by which the matter might be determined.

In the first place, with very few exceptions, these mortars are arranged in groups of two or three. Two mortars, if in the same plane, must of necessity have a common axis, but it is also found that where three occur their centres lie in a straight line. This linear arrangement is consistent with their use in connection with stamps lifted by cams or pegs set in a horizontal cylinder or axle.

Further, the more part of the groups of either two or three mortars will be found on stones which are roughly rectangular, and allow no more than a reasonable margin outside the mortars. Two examples may be cited from *Nosworthy* (32). Of these one stone has mortars on one face only, which are spaced 9½ inches apart, centre to centre; their average diameter is 9 inches, the stone is 1 foot 2 inches in length by 1 foot 4½ inches in width. The other stone has a pair of mortars on each of two adjacent faces; on one face the mortars lie 9½ inches apart centre to centre, are 7½ inches in diameter, and the face of the stone measures 3 feet by 1½ feet. On the adjacent face the mortars are set at 9⅜ inch centres and are 6½ inches in diameter; the face of the stone is 3 feet in length by 1 foot 2 inches in width. The spacing, centre to centre, thus varies between the extremes of 9½ to 9⅜ inches, a divergence full consistent with the use of the stones under one and the same pair of roughly framed stamps, in fact negligible.

At *Black Tor Falls* (35) a pair of mortars on one stone are at 10¼ inch centres, and a pair on another stone at 10 inch centres. At *Deancombe, Outcombe,* (38), three pairs are respectively at 10¾, 10 and 10 inch centres.

The stone at *Little Horrabridge* (39) which presents four mortars in approximate line on one face is unique as far as at present known, but it is no exception to the rule that three truly associated mortars are the limit; the four really form two pairs, and the pairs have no common axis. Centre to centre the one pair is spaced at 13½, and the other at 12½ inches, see plate 29, fig. 1. Two other stones on this same site, each with a pair of mortars, yield central distances of 13½ and 12 inches, respectively.

Often, on a stone of which the length and breadth are approximately equal there will be found four mortars set quadrilateral-wise, and not infrequently another four mortars will be found on the reverse of the stone. In every such instance the mortars resolve into pairs.

The least spacing of centres which I have measured has been 9 inches, and the greatest has been 14 inches. Ten inches is, perhaps, the most frequent dimension.

I cannot see how these conditions should arise, or would serve any useful purpose were the mortars used with pestles worked by hand. But there are such as would be essential with batteries of mechanically operated stamps; and the dimensions cited accord well with the spacing of the bearings where there is good reason to believe that such stamps were once in operation. It is notable that the mortar-stones, being of carefully selected fine-grained granite, were not infrequently diverted from their original purpose, to which by continued use and wear they had become unfitted, and converted into bearings for the axles driving the stamps.

I conclude that CAREW'S statement (1602) as to procedure in Cornwall might be applied to Dartmoor :—" The stone . . . is first broken in peeces with hammers; and then carryd, either in waynes, or on horses backs, to a stamping mill, where three, and in some places sixe great logges of timber, bound at the ends with yron, and lifted up and downe by a wheele. driven with water, doe breake it smaller " ; with this amendment, that for " three and in some places sixe " there should be substituted *two and in some places three.* His reference to drying the ore before stamping it suggests that in some buildings where open fireplaces are found, but no mould-stones, the fireplace might have been used for drying the ore prior to stamping, if overmoist, " by the fire in an yron cradle or grate."

Since the year 1940 further information has become available as to the blowing houses at *Black Tor Falls* (34–35). At 34, on the left bank of the Meavy, Mr. P. H. G. Richardson, R.N., of Dousland, found the stone bearing of the waterwheel lying on the top of the wall of the wheel pit. He has very kindly given me facilities for examining it. The material is quartz-schorl rock, which has taken a good polish in the bearing. The stone has a somewhat irregular outline; its extreme length is a trifle over 6 inches, its height a little under $5\frac{1}{2}$ inches, and it is 3 inches thick. The upper edge, plate 30, fig. 1, shows a much-worn bearing which extends completely across the thickness of the stone. A dotted arc in the figure indicates the position of a second bearing, which has seen little wear, and occupies a part only of the depth of the stone (on the right hand lower corner as drawn). Fig. 2, on the same plate, is from a photograph.

Notwithstanding the dimensions of the larger bearing, it may be doubted whether the diameter of the iron axle much exceeded one inch; it was certainly not more than one and a half inch.

Black Tor Falls, right bank (35), during the winter of 1940–1941, either in consequence of natural decay or, as I fear, following the robbery of stones from the building, the furnace

collapsed and the clavel or lintel has disappeared. This same disturbance, from whatever arising, extended also to the south-east angle of the building, where it has had the effect of disclosing the position and detail of the entrance doorway, a matter not before apparent. I am accordingly able to give a revised plan, see Plate 29, fig. 2.

Two further mortar stones were found during the year 1941, both lying to the south of this house, one of them in the bank of the stream, where it had been uncovered by a flood, and the other, found by my wife, but a few yards from the house.

Documentary Evidence. I have on my shelves a large-, paper copy of RISDON'S *Devon*, which bears the armorial bookplate of HENRY WOOLLCOMBE, Recorder of Plymouth, 1833–1837, and the later bookplate of Dr. William Woollcombe. The book is interleaved and extra-illustrated, in part with engravings, in part with sepia drawings by HENRY WOOLLCOMBE, who has also made manuscript notes on the margins and the interleaves, and has affixed press cuttings to the margins. Most of these cuttings are from archæological notes contributed to the local press, some apparently by WOOLLCOMBE himself. Among these excerpts is one from the *Western Times*, December, 1830, which runs as follows :— " Buckland Abbey, 10. Thomas Whyte was the next Abbot and was still living in 1530. Among other leases I find one dated 1 November, 1511, granting to William and Jane Dunster the reversion of an estate, ' apud Lader Torre, cum uno molendino pulsatili ad stannum pulsandum infra Manerium nostrum de Walkhampton ' ". Term 70 years, Rent fixed at 9s. 8d. A mill for beating tin would be a " knocking mill." In the present instance the building referred to was almost certainly that near *Nosworthy*, (32), but there is another possible identification, *Riddipit*, (33). Mortar stones are found on both sites, and, up to the present, moulds have not been seen at either. *Lader Torre* is an earlier form of *Leather Tor*.

There is one other matter which I might well add as confirmatory of my previous statement that peat charcoal was early used for smelting tin. On the 31st July, 18 John, 1216, John granted to William Briwere the custody of the Castle of Lydford with all its appurtenances. Pursuant to this we find that on the 3rd May 3 Henry III, 1219, the king directs a writ to William Briwere, commanding him to permit the men of Joan, Queen of England, to dig, burn and lead away from the turbary of Dartmoor to her Stannary as they used and ought.

It is impossible to attribute to the word " burn " any meaning other than " convert into charcoal," since none would desire to literally *burn* peat, and lead away the ashes.