

Great Western Railway
By a Correspondent of the Wilts Independent
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Messrs Lewis and Brewer's Contract at the Box Tunnel (Part 1)

One of our greatest achievements to the accomplishment of this stupendous undertaking was found to exist in Box Hill, a large extent of elevated ground lying directly between, and almost equidistant from Chippenham and Bath. This hill, the highest part of which is almost 400 feet above the proposed level of the railroad, could not be avoided; to make an open cutting through it was impossible; and to perforate it was thought by many equally so.

Nevertheless, Mr Brunel with that boldness for which he is so celebrated, adopted the latter plan, and accordingly it was determined that a tunnel one mile and three quarters in length, forty feet in height, and thirty feet in width, should be made through the hill. The extraordinary attempt at boring through this immense mass, consisting in great part of solid beds of freestone, was commenced in the summer of 1836, and will, it is hoped, be completed in 1841.

The difficulties that have stood in the way of the performance of this great work, particularly that part of it on the east, or Chippenham side, have been appalling; but hitherto they have been surmounted by the enterprise, skill and perseverance of Mr Lewis of Bath and Mr Brewer of Rudloe, the gentlemen who contracted with the Director for the completion of that portion of the work. Their contract runs from shaft number 8, which is sunk at the proposed mouth of the tunnel on the east side, to a point 300 yards towards shaft number 7, and altogether 2,418 feet from the entrance at the Chippenham end; this portion Messrs Lewis and Brewer confidently expect to be able to finish in January next.

Independent of the difficulties arising from the laborious nature of the undertaking, the constant flow of water into the works from the numerous fissures in the rock has been constantly most annoying, and in the rainy season so formidable as almost to destroy all hope of being able to contend with it. In November 1837, the steam-pump then employed being quite inadequate to the task of making head against it, the water increased so fearfully, having filled the tunnel and risen to a height of 56 feet in the shaft, as to cause the total suspension of the work till the July following. This would have caused many persons to have abandoned the work in despair; but Messrs Lewis and Brewer, determined to fulfil their contract if possible, erected a second pump worked by a steam-engine of 50-horse power, and had the satisfaction of vanquishing their enemy, and resuming their work. A few months afterwards (in November 1838) the works were again stopped by an influx of water, which, however, was got under in ten days, the engine discharging 32,000 hogsheads of water a day.

The tunnel between shafts no 7 and 8 (1,520 feet in length) is entirely finished at the roof, and for six feet below it, where the base is 14 feet wide; but halfway between the two shafts there still remain about 350 feet of cutting to be done, which is

expected to be cleared by the end of October. In this portion of the work, Messrs Lewis and Brewer commenced their operations at each end, working towards the centre, and when the two cuttings closely approximated, much anxiety was felt lest a straight line should not have been kept, and the union of the two portions of the work should not have been true; but on breaking through the last intervening portion of rock, the accuracy of the headings was proved, and to the joy of the workmen - who took a lively interest in the result - and to the triumph of Messrs Lewis and Brewer's scientific working, it was found that the junction was perfectly level, the two roofs forming an unvarying line; while at the sides, the utmost deviation from a straight line was only ONE INCH AND A QUARTER. This in a cutting of 1,520 feet, began at opposite ends, and worked towards a common centre, is perhaps unexampled in the annals of tunnelling.

Notwithstanding the unfortunate accidents with which Messrs Lewis and Brewer have had to contend, and the probability that these accidents will deprive them of that fair profit which ought to attend such an adventure, their spirits have never given way; and the obstacles which have crossed their path, have only incited them to greater efforts to complete their undertaking in the time stipulated for in the contract. At this time, they are using extraordinary efforts to make up for the delay which the irruption of the water occasioned; nearly 400 labourers now being employed by them.

The cutting on the Chippenham side has hitherto been - and it has already extended 2,000 feet - through one solid bed of freestone or superior Oolite, in many places 130 feet thick, and lying upon a bed of fuller's earth, or clay, 120 feet in thickness; under which blue marl, resting upon lias clay, is found. So uninterrupted and compact is the rock through which this end of the tunnel passes, that no masonry is required in any part of it - the stone itself forming sides and roof and nothing being required at the bottom but the rails on which the carriages will run.

In a work like this, where nothing but stone is met with, a great deal of gunpowder is necessarily used in blasting the rock. On Messrs Lewis and Brewer's contract alone one ton is consumed every week or ten days: this enormous quantity is used in charges of from 2 to 3 lb each. Coals also are in great demand; 35 tons being used weekly.

Of course, from the nature of the work, accidents frequently happen; these are in many instances attributable to carelessness. Every precaution is taken by Messrs Lewis and Brewer to prevent their occurrence, and, in order to secure their workmen from want while suffering under illness, or accidents, these gentlemen have induced the men to contribute to a fund, from which the sick receive 1s a day each, and those who have met with accidents 1s.6d a day each. The adoption of this plan has given general satisfaction to the men whose liberal wages enable them, by a small sacrifice, to provide for themselves when unable to follow their usual avocations.

The preservation of life, under circumstances of the greatest danger, has been sometimes almost miraculous, as the following anecdote will show. A few weeks

ago, a man was about to *fire a shot* - that is, to blow up a piece of rock. He had prepared the hole for the charge, and was in the act of pouring gunpowder into it from an iron canister, containing about 20 lb, which he held under his arm, when a drop of water having fallen from the roof, upon the wick of his candle, most imprudently placed close by the hole, a spark flew from it into the powder, causing a most terrific explosion. The canister was burst to atoms, but not one piece entered the unfortunate man who held it; he was dreadfully burned, his clothes were torn off, his hair and eyebrows were destroyed; and his skin burned off all around his body; but, wonderful to relate, his sight was uninjured; and although from the action of the flames he was miserably wounded and disfigured; he is now a fair way of recovery. Some of his fellow workmen, who were at a distance of several yards, were knocked down and severely scorched.