

the railway company to do something in this matter, they at last undertook to proceed with the scheme. I have a few extracts here which I made more than twelve months ago from the work to which I have alluded. I observe that the hon. gentleman from Alberton made some brief reference to this same work. On the 2nd of November, 1881, Mr. Walker, the engineer to whom the hon. gentleman alluded, received orders from Sir John Hawkshaw to go on with the whole of the works as rapidly as possible. He says:

"The contract had contemplated that for the first eighteen months only the works under the shoots—

I may explain to the House what the meaning of that term is. It is simply the channel of the River Severn, which may be represented as something like a sheet of paper doubled together, the top of the water being under the crease—

"should be proceeded with; but it took, as nearly as possible, twelve months from the date of signing the (2nd) contract to clear the works of water. Twelve months more had been used in completing the heading under the river, securing the old shafts, sinking the new ones, and commencing the brick work under the shoot and under the salmon pool."

It has been supposed that the principal difficulty of building this great work would be in passing under that bed of the Severn River, consequently when the second contract was entered on, directions were given that the grading should be, I think, 15 feet lower than had been originally contemplated, thus showing that the apprehension of the engineer was from the bursting in of the water under the tide way. It only shows the great uncertainty which prevails in any undertaking such as that proposed by my hon. friend, even though it should be reported on by competent engineers in our own country, or should those men who carried through the tunnel under the Severn be employed. It is almost impossible for any engineer to predicate what difficulties may be encountered. These engineers presumed that their difficulties would arise from the deep bed of the Severn River. They actually encountered scarcely any difficulties in that respect: but the difficulties they did encounter and which cost them in the course of the work immense sums of money to counteract arose from a different source. They arose from sources which we are likely to encounter if we undertake to carry the tunnel under the Straits of Northumberland; they

arose from springs. Here is a description of one of the great springs that was met with. This is what the engineer says in his report in 1885, after he had proceeded very far with the undertaking:

"On opening out the full sized tunnel, the fissure through which the great spring had passed was found to follow a most erratic course. In one place it passed directly across the tunnel from side to side, nearly at right angles to the centre line of the work. At another place it passed from side to side in an oblique direction, running for some small distance directly under one of the side walls. At another point where the tunnel had been perfectly dry, while the mining was done, the lifting of almost the last stone out of the invert set free an immense body of water which no pumps underground could cope with. At another point the water burst up from a hole 18 feet deep under the invert with such force that stones the size of a man's fist dropped into the water would descend into the water about 10 feet, and then begin to flutter like a leaf in the wind, and be thrown out again by the water."

Hon. gentlemen must see that it is by no means easy even for a most experienced engineer to be sure what impediments he will meet with in working under water. These gentlemen, experienced as they were, formed no idea of the difficulties they would have to encounter in meeting this spring. They anticipated that their difficulties would be from the salt water from the channel of the Severn. They met no difficulty there, but they did meet very great difficulty elsewhere. I have here a statement of the amount of water that they had to handle. The report says:

"The minimum quantity of water pumped when dealing with the big spring was 23,000,000 gallons daily; the maximum quantity was 30,000,000 gallons daily. For more than a year the average quantity pumped daily was 24,000,000 gallons."

But after all, a statement as to so many millions of gallons gives one a very inadequate idea of the amount of water represented by it, and accordingly the author of that work has elucidated it still further by this statement:

"To give an idea of this immense quantity of water, it is sufficient to supply a town of the size of Liverpool or Manchester, and in one year would form a lake 1000 acres in extent and 10 yards deep."

There was no more appearance of that spring when the work was undertaken, perhaps not so much as there is at the Straits of Northumberland, and hence it is that great caution should be exercised before the Government undertake a work in which they are likely to meet with such formidable difficulties.

Hon. Mr. ABBOTT—Could my hon. friend state the cost of the Severn tunnel?