was now nearly broad daylight—and "We were in!" told them they were "in" and rushing down a clearly perceptible decline towards a point 100 feet below the bed of the broad estuary. In a trice watches were out and windows down, the first to keep time, the other to test ventilation. The inrush of the icy-cold air, as clear and as pure as if the trip across was being made in the old way—over instead of under the channel—showed the latter was all right. The submarine journey, if such it may be called, proved to be more like a run through a pretty deep cutting than through a tunnel four and a quarter miles long. For about three minutes and a-half after entering there was no mistaking the fact that a sharp gradient was being descended, then a momentary rumble as the train passed over the curves of the arc—for the tube dips in the centre—and then the locomotive, at an ever-decreasing speed, climbed the opposite gradient, to emerge once more into daylight in eight minutes and forty-nine seconds.

As before remarked, the ventilation of the tunnel is little short of perfect. During the construction of the work a fan over eighteen feet in diameter, discharging 60,000 cubic feet of air per minute, was used. This has now been replaced by a fan forty feet in diameter and twelve feet wide, made on the same principle as those used at the Mersey and a portion of the Metropolitan tunnels. The tunnel is twenty-six feet wide and twenty feet high from the double line of rails to the crown of the arch inside the brick work. The rails are laid on longitudinal sleepers. The tunnel has been lined throughout with vitrified bricks set in cement, and no less than 75,000,000 bricks have been used in this work.

This vitrified brick wall has a thickness of three feet in the crown of the arch beneath the shoots, but as the tunnel rises from this lowest point on a gradiant one in ninety one way and one in one hundred towards the Gloucestershire side, the thickness is gradually reduced to two feet and three inches.

The total length of the Severn tunnel is 4 miles 624 yards. The St. Gothard tunnel is 9½ miles, Mount Cenis tunnel 7½ miles, Ariberg tunnel (Austria) 6½ miles; there is a tunnel in Massachusetts 4¾ miles; the Standege tunnel, on the London and North-Western, is three miles long, and the Box tunnel rather less. But the special feature of the Severn tunnel lies in the fact that 7¼ miles of it have been constructed from 45 to 100 feet below the bed of a rapid flowing tidal estuary, offering engineering difficulties which make it the most remarkable tunnel in the world.

There would be no such gradient on the proposed tunnel under the Northumberland Strait. The deepest water that was met with on the survey last year was 96 feet. Bayfield's chart shows that on the proposed soundings I ask for to-day the average would not be more than about 60 feet or 10 fathoms, and as a consequence there should be no such gradient as the one I have referred to. Another advantage of the shorter line is that the water not being deep at the centre we should not have so much of an ascent both ways. I mention those facts so as to impress upon the minds of hon. gentlemen that the difficulties of ventilation are not of such very great moment as may at first appear. It is true that some hon. gentlemen—not in this House I am glad to say—have attempted to set up their opinions with regard to this particular question. As for myself, I have never set up my opinion. I am neither a civil engineer nor a mechanical engineer, but when I have the authority of some twenty of the best engineers not only in England, but in the United States and Canada, surely it is not too much to say that if I do err on this particular question I err in good company. The first engineer whose opinion is favorable is Sir Frederick Bramley, chief of the engineering corps in England. The next is Sir Charles Fox, who built this tunnel which I have been describing. The next is Mr. Greathead and his consulting engineer, Sir John Fowler. The next is Walter Shanly, of Montreal, A. L. Light, of Quebec, Prof. Bull, of New York University, and Geo. P. Rothwell, the engineering expert of the New York *Engineering and Mining Journal.* Then we have General McAlpin, who is well known in this country in connection with the harbour improvements in Montreal. He was previously known as the chief engineer of the United States Army and Navy for some fifteen years, and is now consulting engineer of some of the largest railways in the United States. Then we have General Newton who, up to a recent time, was chief engineer of the United States Army, and is now consulting engineer of the Arcade Railway, New York. Then we have Sandford Fleming, of Canada, and Mr. Onderdonk, who is also well known in this Dominion, having built the mountain section of the Canadian Pacific Railway in British Columbia. Then we have Marcus Smith, Ver-