

non Smith, C. C. Gregory, W. R. Hatton, chief engineer of the Harlem River Railway, Professor Wahl, of the Franklin Institute, Philadelphia, which bears the reputation of being one of the highest institutions on engineering questions in the world. No man can launch before the 60,000,000 of people of the United States any question of machinery, or any question relating to engineering, unless he has got the approval of the Franklin Institute. It is an institution founded and sustained by wealthy men who have left money for its maintenance; and within those walls are to be found the best talent which money can secure throughout the world. This Institute has pronounced in favor of the enterprise. I will not trouble the House with reading the opinions of all those men, but I shall take the opportunity of quoting the opinions of two or three of them. The Premier of Prince Edward Island, looking over those plans and at this model, found some fault with the project inasmuch, he said, as he did not then think the subway could be built. I said, "the best thing you can do, as Premier of the Province, is to address a letter to Mr. Walter Shanly, C.E., asking the question and see what his reply will be." Mr. Sullivan did so, and put these three questions to him, after we got the borings:—

"Can this work be built? Is it practicable and feasible? How long do you think it would take in building it? For what sum of money could it be built?"

Mr. Shanly, under date of January 30th, 1886, answered those questions as follows:—

"I consider the construction of such an undertaking on the very ingenious plan proposed by Mr. H. H. Hall, of New York, to be entirely practicable, and that the work might be completed within three years from the time of actual commencement. As to the cost, I have not myself visited the locality, but have carefully examined the plans and soundings exhibited to me by Mr. Hall. I have had a great deal of information, but more will be required, that is to say, further surveys and borings are necessary before an accurate estimate of the cost of the work could be arrived at. My opinion is that it should fall within five millions."

Mr. McAlpin's opinion is that the work can be done. He says:—

"During the last three years I have frequently been consulted by Mr. H. H. Hall in regard to the plans of his patented process of subaqueous tunneling and have occasion to examine and advise in regard thereto and have carefully considered its applicability for operating under great depths of water.

The process of securing the machine at the proper level in the bed of the channel, that of forcing it forward as the excavation progresses (aided by the water jet acting upon the earth in front) the use of an incorrosive shell for the tube and many other devices to accomplish the object aimed at with the greatest economy have all been attained in this process.

From the descriptions which have been furnished to me of the character of the bed of the Northumberland Straits, where it is proposed to use this process, I am of the opinion it will accomplish the work in the most successful and economical manner that can be devised, and with judicious management there is no doubt in my mind of the complete success of this process at the Straits."

Mr. R. P. Rothwell, editor of the *Engineering and Mining Journal*, says:

"With ordinary care in construction, there should be no great practical difficulty or danger in executing the work of laying a tube of almost any dimensions in this way; and usually the cost of doing the work should be less than tunneling in heavy ground. I have had some experience in sinking a shaft by the use of hydraulic jacks pushing down a sinking frame corresponding to Mr. Hall's caisson, from the permanent lining corresponding to the tube, and from this experience I conclude that Mr. Hall's method, when managed with intelligence and knowledge of shaft sinking and tunneling, presents the elements of practical success."

Mr. A. L. Light, C. E., of Quebec, says:—

"I see nothing that is very difficult or impracticable in carrying out the scheme. I think if once unwatered and completed its working or maintenance afterwards, will probably be attended with very trifling expense. There may be difficulties about the ice, or danger from the anchorage of vessels, that I am not prepared to give an opinion upon, but I presume that upon these points you have already obtained the information and are satisfied about the risks. I have not gone into the estimates, and can give no opinion as to their sufficiency, the few details given, are no doubt correct as far as they go, but you require very much more information as to the depths of water, the form of the bottom, and the material that will have