that must be observed is that a mean must be established between time and head. If a turbine be placed in the bottom of the river channel, one would, when the tide was out, have the greatest available head of 30 feet, but we have reduced to the minimum the time from which the wheel is uncovered till it is again covered by the return tide; while if we locate the wheel higher, we will gain more time but lose the head. On the other hand, there is one thing in our favor, an abundance of water. Within sight of where I write are the remnants of two old tidal mills, one was used for grinding, the other for light wood-working machinery. I remember distinctly seeing the latter in operation. I recently designed a pier, and attempted to combine with it sufficient power development for the working of crane and hoist, the power being stored in the form of compressed air. My design was a series of rectangular timber boxes or pontoons, air tight, set directly under the pier, and moving up and down between timber guides. Considerable lifting power could thus be obtained, but after all we could use only the top of the tide, unless on a very bold shore where piers are rarely built or used. And even with this difficulty solved, I am of opinion that ice would have frozen the pontoons fast to the guides. Returning to power from dams directly across river channels, there are places near me where tidal rivers 300 to 1,000 feet wide at their mouths are filled and emptied twice in twenty-four hours, and for a distance of two to four miles inland, while along their banks villages are paying high prices for electric lighting with coal. In these cases I think there is little doubt as to both feasibility and economy. Outside of these conditions, I do not see at present any hope of practical application of tidal power.

WM. RAND,
County Engineer.

Canning, Nova Scotia.

AN ELECTROLYSIS PROOF CONDUIT.

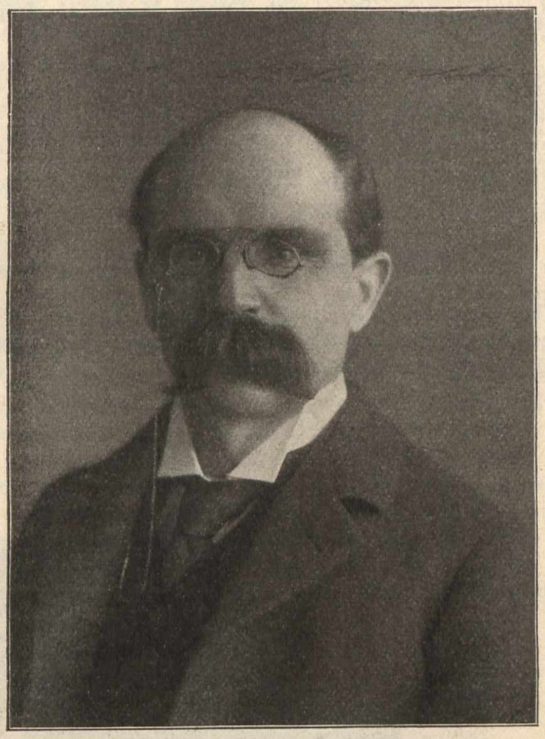
No feature of a conduit for use in underground electrical work is more important than that which will give thorough protection to cables from electrolytic action. The amount of money spent by telephone and electric light companies in replacing cables which have been enclosed in conduits not electrolysis proof, is very considerable. With a view of entirely overcoming the evils due to electrolysis, the American Conduit Company have been successful in producing a bituminized fibre conduit which is moisture proof, non-abrasive, non-corrosive, a perfect insulator and absolutely electrolysis proof. Exhaustive tests made of this conduit enable the company to guarantee it against breakdowns for systems employing a current of from 25,000 to 30,000 volts. Actual tests have been made up to 60,000 volts before any breakage occurred. Another remarkable feature of this conduit is its extreme lightness and the ease with which it can be handled, two men being able to carry a crate containing 140 feet of three-inch duct. Being made in seven-foot lengths and the method of joining unit to unit being very simple, it is claimed that with unskilled labor a greater amount can be laid in a less time, with fewer men and at a lower cost than any other conduit, which owing to greater weight and shorter lengths, require skilled labor and more men. Several millions of feet of this conduit is in use in Chicago, Kansas City, San Francisco, Portland, St. Louis, and other cities; large contracts have been made during the past year with some of the most important railroads, lighting and telephone companies in the United States. From the testimonials received from engineers of companies using this conduit, there is no doubt that its merits are such as will ensure its adoption by a large number of telephone, electric light and power transmission companies in the United States and Canada.

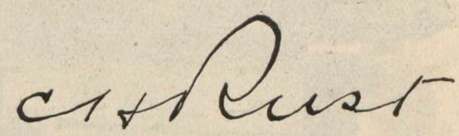
The American Conduit Company have just established a large factory at Philadelphia, which, together with their factories at Chicago and Los Angeles, will enable them to accept contracts and make prompt deliveries to any point in the United States or Canada. Complete details of the cost of laying under all conditions, and estimates will be given of the cost of constructing underground systems, on application to their nearest office.

THE AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS.

The recent convention of this society, held at Indianapolis, was of more than usual interest to Canadians from the fact that its president for the past year has been City Engineer, C. H. Rust, of Toronto, Ont. Mr. Rust's election to that position was no doubt due not only to the society's appreciation of the value of his wide experience and counsel in the matter of municipal improvements, but also to the high reputation as a beautiful and well managed city, which Toronto has gained in the minds of the many Americans who visit that city, much of the credit for which is due to the able administration of the City Engineer's department by its chief. It is, nevertheless, gratifying to find Canadians taking such a prominent part in the proceedings of societies, representative of the municipal engineers of the largest cities in the United States.

In his presidential address, Mr. Rust referred to many important matters relating to municipalities, among them being the growth of street railway systems, the necessity of





using a heavier type of grooved girder rail in place of the T rail preferred by the railway officials. The time had come when municipalities should insist on all feed wires being placed underground. The question of sewage disposal had been brought prominently before the municipalities. Every city, of course, was a special study in itself, but where suitable soil was available, land treatment, after septic action, was the most satisfactory method for this country. The prevention of the unnecessary use of water deserved the earnest consideration of municipal officers. In European cities forty to fifty gallons per head, per day, was considered sufficient for all purposes while in some American cities 150 to 200 gallons was used. Regarding municipal ownership there was no doubt that every city should operate its own waterworks and lighting plant. Attempts, sometimes successful, were made by capitalists to corrupt municipalities in order to obtain franchises. This would be abolished by municipal ownership. The frequent change of officers, caused by the introduction of politics into municipal government in American cities, was much to be deplored. The Canadian system of appointing officials was more satisfactory. An official could not be a good engineer and in addi-