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THE TELEGRAPH IN CANADA.

XXXIII.

It is but a few months since a scientist, Professor Houston, expressed the following opinion of the coming discoveries of science: We may not unreasonably expect future progress to present these five features: electricity produced direct [from coal, the steam engine entirely replaced by the electric motor, aerial navigation effected, production of light without heat, and the application of electricity to the curing of disease and prolonging of life.

Any one of these features would, if realized, constitute an event in the progress of an age of marvels. But that men and women of the present generation should see them all in operation is too much to expect, rapid and great as is the advancement of the recent years. Science has been known to linger long upon the very verge of a great discovery, different inventors aiming and experimenting for years with the same object in view. In telegraphy, for example, the great want was, for a time, a means of re-inforcing a weak current to enable it to do certain work. This was provided by Morse's laboriously perfected invention of the relay. Prof. Henry and one or two men in Europe were long at work on this problem, but confessed that Morse had found the missing link.

One of the greatest needs of telegraphic communication was a means of producing a sustained current. For twenty or thirty years various experimenters with telegraphic methods employed frictional electricity. This was done in Spain, in Switzerland, in Scotland, in Germany in the last century; and in 1827, Harrison Dyar, of New York, built a line of poles with a single wire on glass insulators on Long Island, using "common," i. e., frictional electricity. But this was hard to control and easily dissipated. Apparently, Dyar did not know of the voltaic pile, although that was exploited as early as 1800. It was based upon the discovery of Galvani, who accidentally found that contact with the muscles of a frog, of a scalpel that had lain near an electrical machine, produced spasmodic action. Galvani tried iron and copper for his galvanic

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Smith, one of the company's electricians, do the work of 3,000 cells of battery.

Those who have no reverence for the past may feel disposed to laugh at the efforts of early days to secure insulation. Ezra Cornell's plan of fifty years ago was to have two plates of glass laid flat and the wire (carefully wrapped in cloth saturated with gum shellac) laid between them. Over these plates was nailed, on each cross-arm, or rather block, a wooden cover as a protection. These were not long in favor; bureau knob pattern insulators of earthenware succeeded them. What were known as the "Brooks," or more commonly the boot-book insulators, were for a while in favor. Then came those of umbrella shape, made of hard, black flint glass, some of which are still in use on the Montreal Company's lines or on those of the Western Union. For one winter, some twenty-five years ago, a sort of insulator was employed made of wood and covered with tin to prevent breakage. These were put up between Montreal and Portland, but soon abandoned. The "Pond" insulator was of wood with a zinc cap, the whole saturated with a compound supposed to secure insulation, and some of these are still in use. Originally, or before the days of cross-arms, an L-shaped iron was driven into the telegraph pole, and a glass cap was placed upon the upright part of it. But this proved faulty. The type most largely used by the Great North-Western Company in Canada, which does not differ materially from those used on the Canadian Pacific Telegraph, is one of glass, shaped like a reversed U, with an indentation to receive the wire. This is a pattern arrived at after much experimenting and comparing. The shape and strength are such as reduce to the lowest percentage the breakage produced by the efforts of the small boy in city or country to hit "them there glass things" with stones. Mr. Dwight and Mr. Cox, and various of the superintendents and inspectors of the company, consulted long and earnestly about the matter. For a time, and over a limited area, the general manager decided to try the white porcelain ones. But "youth loves a shining mark"—if so daring a parody may be allowed—and the white insulators were soon replaced by green glass.