

trical transmission is most important,—if indeed it be now possible to put a limit on anything connected with electricity, with or without the aid of a wire. If, as reported, Lord Kelvin has placed the profitable limit at 300 miles, this is sufficient to utilize the greater part of the water power upon the two watersheds north of the St. Lawrence River.

Professor Elihu Thomson says “Up to the present time it was practicable to transmit high pressure currents a distance of 83 miles using a pressure of 50,000 volts. If a voltage higher than that were used the electricity would escape from the wires into the air in the form of small luminous blue flames.”

As showing how far we are yet behind nature, Prof. Thomson says the estimated voltage from a lightening discharge ranges from twenty to fifty million volts.

Wherever the raw material for electro-chemical, electro-metallurgical, or other industries, affords sufficient inducement, and the water power is at hand, the forest will be penetrated much more rapidly than heretofore, and settlements advanced in new directions.

What can be done in this direction is best illustrated by the development of a single industry in the wilds of Minnesota north of Lake Superior, and adjoining Canadian territory. Over four hundred miles of standard gauge railways have been built, through what was a trackless wilderness in 1885, to reach iron ore beds, the ore from which is shipped to Lake Erie and thence again railroaded 200 miles into Pennsylvania. This one business has, in mines, railways, docks and fleets of steamers, required an investment of \$250,000,000, and has led to as low a rate, by water, as 1 cent per bushel for wheat between Chicago and Buffalo, and 20 cents per ton for coal from Lake Erie to Duluth, nearly 1000 miles. One-half of the charcoal iron, and more than half of the pig iron made in the U. S., is smelted from Lake Superior ore.

ELECTRIC RAILWAYS.

The substitution of electricity for steam as the motive power for railways on many roads is regarded as inevitable sooner or later. It has already taken place as regards suburban railways, notably in the case of the Charlevoix road and Hull and Alymer railway, where water is doing the work which has heretofore been done by coal. The chief obstacles to an early change on the larger roads are the hundreds of millions invested in locomotives, and the very large outlay required to equip existing steam roads with the electric system. The principal inducement would be the passenger service, owing to the increased speed possible,—it being confidently stated that, with electricity, a speed considerably over one hundred miles per hour could be attained. Moreover there