Recent Science.

Telegraphy without Wires.

The Rev. W. H. Dallinger, LL.D., F.R.S., says there has long been a conviction that ultimately it would be found possible to transmit telegraphic messages, under proper conditions, without the usual wires. No doubt it will be accomplished, but Mr. Edison has a scheme that to him appears full of promise. He has discovered that if sufficient elevation be obtained to overcome the curvature of the earth's surface, and to reduce to the minimum the earth's absorption, electric telegraphing or signalling between distant points can be carried on by induction, without the use of wires connecting such distant points. This discovery is especially applicable to telegraphing across bodies of water, thus avoiding the use of submarine cables, or for communicating between vessels at sea, or between vessels at sea and points on land; but it is also applicable to electric communication between distant points on land, it being necessary, however, on land (with the exception of communication over open prairie) to increase the elevation in order to reduce to the minimum the induction-absorbing effect of houses, trees, and elevations in the land itself. At sea, from an elevation of one hundred feet, he can communicate electrically a great distance, and since a sufficient elevation can be had by utilizing the masts of ships, signals can be sent and received between ships separated a considerable distance; and by repeating the signals from ship to ship, communication can be established between points any distance apart, or across the largest seas, and even oceans. The collision of ships in fog can be prevented by this character of signalling, by the use of which, also, the safety of a ship in approaching a dangerous coast in foggy weather can be assured.

In communicating between points of land, poles of great height can be used, or captive balloons. At these elevated points condensing surfaces of metal or other conductor of electricity are located. Each condensing surface is connected with earth by an electrical conducting wire. On land this earth connection would be of usual character in telegraphy. At sea the wire would run to one or more metal plates on the bottom of the vessel, where the earth connection would be made with the water. The high-resistance secondary circuit of an inductive coil is located in circuit between the condensing surface and the ground. The primary circuit of the induction coil includes a battery and a device for transmitting signals, which may be a revolving circuit-breaker operated continually by a motor, either electrical or mechanical, and a key normally short, circuiting the circuit-breaker or secondary coil. For receiving signals he locates in the said circuit, between the condensing surface and the ground, a diaphragm sounder, which is preferably one of his special electro-motograph telephone receivers.—*Wesleyan Methodist Magazine.*

Great Speed on Railroads.

Have we reached the limit of express-speed on railroads? Many think we are near it, not because we can not get any higher power than that now at our disposal, but because the resistance of the air increases so much faster than our speed that presently we shall not be able to force our locomotives against it. Hiram S. Maxim, however, is not of this opinion, provided we make our trains of proper shape. The resistance, he says, is due to the irregular form of our trains; if we make a locomotive with smooth, fine lines, as we make a yacht, it will glide through the air as the boat does through the water. Some progress has already been made in France along these lines by fitting locomotives with pointed prows or air-shields. Mr. Maxim's idea appears in the following paragraphs, which we quote from his article in the "electrical number" of *Cassier's Magazine:*

"I see no reason why we might not expect to double the speed of steam-driven railroad trains. Ordinary electric trains should travel at the rate of 90 to 100 miles an hour and express trains at, say, 120; but in order to do this it would be necessary so to construct the carriages as to enable them to pass through the air without any great resistance. The train should be pointed at both ends, and have the appearance of being all in one piece: even the wheels and axletrees would have to be boxed in. I find in my experiments that atmospheric skin friction on a smooth surface is so very small that it need not be considered as a factor at all, but the power required to drive a rough or irregular body through the air is very great

"In the steam-driven train great power