

NOTES FOR TEACHERS.

ELECTRICITY WITHOUT WIRES.—In the opinion of leading electricians, one of the next great steps forward in electrical development will be the doing away with wires for the transmission of electricity. Our present methods for the transmission of electric energy are held to belong to a primitive stage of the science. All the paraphernalia of wires, poles, etc., that are now necessary, are regarded as crude, clumsy and wasteful; belonging to a period of development corresponding to that in the growth of a child where it cannot walk without support. In the coming period all necessity for these things will be done away with, and the methods for the transmission of the marvelous energy that has been harnessed to do the work of the world will be as invisible as the flow of the fluid itself. The harness will disappear, and Ariel will do his subtle service with no outward token of his existence save in the effects produced. That such will be the case is held by electricians to be no wild fancy. Men like Dolbeare, Thomson and Tesla look forward to it with confidence—a confidence which would seem to be justified by the fact that, to a limited extent, its feasibility has already been demonstrated. And, when the theoretical soundness of any proposed method has once been demonstrated, its practicability is pretty certain to follow. Experience with the more familiar forces has accustomed us to look for tangible instrumentalities as a necessity in the transmission of any power. We see that water cannot be carried except in something to hold it, as in pipes, and in the same way we think it must be necessary to have wires for conducting electricity. But the field in which electricity operates belongs to an entirely different realm from that where other mechanical forces work. Water power proceeds from the

operation of a liquor upon solids, and steam and wind powers from gaseous substance upon solids. But the field of electricity is in the mysterious element of the ether—an element that is as material as the others in a manner, pervading as well as enfolding all other substances, but in itself absolutely intangible to our senses, and known only by the effects which it produces, or for the production of which it forms the medium.

While sound is transmitted in the air, light and heat, as well as electricity, are transmitted in the ether, and the laws governing them have been discovered to be identical. So for the transmission of electrical energy only the medium of the ether is essential, and how to utilize this medium directly, without the intervention of wires or other conducting agencies, will be the great task of the future for electricians. Electrical impulses imparted to the ether may be conveyed to an indefinite distance. The capacity to receive and transmit them depends upon the delicacy of the instrument used. With a mechanism sufficiently responsive, it is conceivable that such impulses might be received between distances as far apart as the ends of the earth. The flashes of the aurora borealis, sweeping instantly from horizon to zenith, give us an idea of the vastness of space which such impulses may be made to cover. The telephone has been used for a considerable distance without wire, and in the same way telegraphic communication has been carried on over a distance of several miles. It is only necessary to systematize these methods to apply them in regular practice.

It seems probable that the transmission of intelligence without wires will be the first result in this direction, and that the transmission of light, heat and power will follow. The saving