

measure demonstrated. But the wave motion lay not in the realm of matter, wherein consisted the waves of sound, but in that of a medium daringly conceived for the occasion and since accepted as a reality—the luminiferous ether. A luminous particle of matter gives rise in the ether to a vibratory motion which is conveyed in all directions very much as are the waves caused by a pebble falling on a smooth surface of water.

"Thou canst not wave thy staff in air,
Or dip thy paddle in the lake,
But it carves the brow of beauty there,
And the ripples in rhymes the oars
forsake."

The particles of water move up and down and the wave proceeds in a horizontal direction. In considering the motion of the particles of ether and water this difference is to be noted: in the case of the water the particles move in a vertical direction only; while in the case of the ether the particles move now horizontally, now vertically, and again at an angle to the horizontal direction: it may be said that they move at all angles in the plane perpendicular to the direction of propagation. When a ray of light is passed through Iceland spar it is doubly refracted, that is, it gives rise to two independent rays possessing the peculiarity that the vibrations of the ether in each ray do not vary in direction, as in the original ray, but are always perpendicular to a certain plane. Such rays are termed polarized rays of light, and the plane referred to, the plane of polarization.

In this connection Faraday made an important discovery which was the starting point of Dr. Hendricksen's experiments with light, and which is analogous to that of Oersted's, and which shows that light, electricity and magnetism are forms of motion not independent in their nature. Faraday discovered that when a ray of polarized light is passed through a

strong magnetic field its plane of polarization is changed. He caused a ray of plane polarized light to pass through a piece of borate of lead, a very dense kind of glass, placed between the poles of a strong electro-magnet. On passing an electric current through the coils of the magnet the plane of the polarization of the rays was rotated. When the direction of the current was reversed the direction of rotation of the plane of polarization was reversed. In this discovery is the germ of that of Dr. Hendricksen's. The rotation of the magnet by the electric current in Oersted's experiment showed the connection between electricity and magnetism, and its subsequent elaboration is the transmission of sound by the telephone. The rotation of the direction of vibration in the ether within a magnetic field showed the connection between light, electricity and magnetism. Dr. Hendricksen guided by the analogy of the phenomena in the case of sound set to work in parallel lines with light. The essential point in the telephone is the reproduction of the vibrations of the air caused by the speaker at the transmitter. Hendricksen's object was by means of an electric current to reproduce vibrations of the ether. This by the way, is very different from the mere production of light caused by the electric current as we see it in the electric lamps. It is the exact reproduction of the vibration in its original plane, period of vibration, and wave length, and consequently the reproduction of the same color and intensity.

A few words in regard to Dr. Hendricksen and his discovery. His father was a physician at Malmoe, a seaport of southern Sweden, and died young. The younger Hendricksen, has been long employed as an assistant in the laboratories of the University of Lund, where by patient industry he has attained his eminence in the field of science, and the likelihood of being one of the immortals through