

to see the physical significance of this correspondence.¹ "I have deduced the relation between the statical and dynamical measures of electricity, and have shown by a comparison of the electro-magnetic experiments of MM. Kohlrausch and Weber with the velocity of light as found by M. Fizeau, that the elasticity of the magnetic medium in air is the same as that of the luminiferous medium, if these two coexistent, coextensive, and equally elastic media are not rather one medium."²

After having pointed out this remarkable correspondence and other analogies between electrical and optical properties which could be verified by experiment, Maxwell seems to have felt satisfied that a dynamical or kinetic explanation of electric and magnetic phenomena based upon rotary and translational motions and elastic strains in the magnetic field was quite possible. The detailed descriptions given in his earlier papers he looked upon merely as crude mechanical devices by which some of the known effects of magnets and currents could be described. The valuable result was, that the electro-magnetic field could be looked upon as a mechanical system; that the observed actions at a distance could be conceived as communicated through this mechanical system in definite measurable time; and that certain analogies had been pointed out as existing between

52.
"Elastic disturbances"
of the same
medium.

¹ 'Philos. Mag.,' January and February, 1862; 'Coll. Papers,' vol. i. p. 492.

² Cf. 'Coll. Papers,' vol. i. p. 500: "The velocity of transverse undulations in our hypothetical medium, calculated from the electro-magnetic experiments of MM. Kohlrausch and

Weber, agrees so exactly with the velocity of light calculated from the optical experiments of M. Fizeau, that we can scarcely avoid the inference that light consists in the transverse undulations of the same medium which is the cause of electric and magnetic phenomena."