optical, electrical, and magnetic phenomena, which by carefully devised experiments might be verified and extended.

Through Maxwell, following on Faraday and Thomson, the treatment of electric and magnetic phenomena had thus entered on a similar stage to that which the treatment of optical phenomena had attained half a century earlier through Young and Fresnel. A kinetic or mechanical view, more or less precise and definite, had been propounded; a considerable number of facts had been brought into connection, into line and order; the direction which experimental research must take had been indicated; and finally a correspondence had been established between two great groups of phenomena, those of electricity and magnetism on the one side, those of light on the other. It might have been expected that Maxwell would now take the same course as that taken by Fresnel about the year 1820, and perfect his views by giving his theory of molecular vortices greater precision and definiteness—*i.e.*, by perfecting the electromagnetic model, as Fresnel and others perfected in their time the system of vibrations by which they visualised the processes of light. This is not the method which Maxwell adopted.[1] In his later and more important

[1] The progress of Maxwell's reasoning is clearly marked in the three memoirs, belonging respectively to the years 1855, 1861, and 1864, of which the last appeared in the 'Transactions' of the Royal Society, and which are reprinted in the first volume of the 'Collected Scientific Papers.' The first memoir on "Faraday's Lines of Force" adheres strictly to the mathematical formulation of Faraday's conception, much in the spirit of Thomson's many expositions. The second, on "Physical Lines of Force," follows Faraday in the attempt to take the original symbol in real earnest as a physical arrangement, and devises, or applies for that purpose, the theory of molecular vortices. The third memoir, which is by far the most important and original,