firmed, that light takes time to travel from one point in space to another. Wherever time is involved in a phenomenon, motion of something is suggested, and this something, as well as the nature of its motion, become subjects of speculation. At the beginning of the nineteenth century two distinct theories existed regarding these matters. Both had succeeded in explaining and calculating satisfactorily a large number of the phenomena of light as exhibited by mirrors and lenses, as well as in optical instruments and crystals. One of these theories, the so-called emission, emanation, or corpuscular theory of light, held that luminous bodies send out minute particles which travel in straight lines, and, impinging upon the eye, create the sensation of light. The rival hypothesis, the undulatory or vibratory theory, held light to consist in the periodic wave-motion of a substance called ether, which was supposed to exist everywhere, filling all space and interpenetrating all ponderable matter. Both theories are kinetic or mechanical theories, and for their development require the analysis of certain modes of motion. Both had to formulate their respective notions as to the something that moved. Both could point to analogies in other domains of natural science. There existed at that time similar corpuscular explanations of the phenomena of heat, of electricity

5. Undulatory and emission theories.

6. Both theories kinetic.

velocity they move, how distant they are from us, and much else besides," a prediction which, since the invention of spectrum analysis and various controversies connected with the subject, has been brilliantly verified by the discoveries of Sir William Huggins (1868), Fox-Talbot, and others. That Doppler's principle is really none other than Römer's was remarked by P. G. Tait in 'Light' (2nd ed. p. 220). See also Rosenberger, 'Gesch. d. Physik,' vol. iii. p. 708 *sqq*.