32. The clue furnished by the phenomena on which it depends.

in giving a mechanical explanation of the dark and bright lines of the spectrum, upon which Kirchhoff and Bunsen founded spectrum analysis about the year 1860.

Wollaston[1] had in 1802, on examining the solar spectrum (the succession of rainbow colours expanded on a white screen placed behind a prism of white glass through which a narrow beam of sunlight is made to pass), noticed that with a sufficient enlargement black lines in great number could be detected. Fraunhofer,[2] in Munich, made a special study of them, named them by letters of the alphabet, and compared the solar spectrum with the spectra of artificial terrestrial sources where light is created by combustion or incandescence. He found that these spectra differed, the peculiar colour exhibited by various flames being defined in the spectra by special bright lines of different colours. Thus notably the two dark lines called by him D in the solar spectrum were replaced in the spectrum of a flame in which a volatile salt of sodium was present, by two bright lines: Brewster found the same coincidence of others of Fraunhofer's lines with the bright lines of a flame in which nitre was volatilised. Very similar and very accurate observations of A. Miller as to the identity of the dark lines D in the solar spectrum with the two bright lines of the sodium flame were explained by Sir G. Stokes about the year 1850 by the following theoretical reasoning: The sodium

33. Sir G. Stokes.

[1] "A method of examining refractive and dispersive powers by prismatic reflection" ('Trans. of the Royal Society,' 1802).

[2] Fraunhofer, whose epitaph, "approximavit sidera," describes beautifully his life-work, was led to the discovery of the lines named after him in his investigations of the "refractive and dispersive powers of various kinds of glass" for the purpose of improving the achromatic telescope ('Denkschriften der Münchener Akademie,' vol. i., 1814-15).