a valid explanation of the maintenance of solar heat. In fact, "as to the sun, we can now go both backwards and forwards in his history upon the principles of Newton and Joule." [1]

50. Spectrum Analysis.

But further means for testing the correctness of these theories were afforded by the invention, in 1859, of Spectrum Analysis. It was found that the composition of the light of luminous bodies, as revealed by prismatic scattering in the spectrum, enabled us to tell a good deal about the nature of the body itself from which the light emanated. We can tell whether the body is shining with its own or with reflected light, what are the constituents of the incandescent body, whether it is an incandescent solid or an incandescent gas; also whether the body is in motion or not. The nebular hypothesis supposed that the planetary system owed its origin to incandescent, perhaps gaseous, matter, which, through the force of attraction, was collected in different centres: the discoveries of thermodynamics and of spectroscopy have enabled us to expand and correct some of the assumptions of this theory, and to add new features to its minuter elaboration. It is not necessary that the matter which was originally scattered through space and was gathered into attracting centres should be itself incandescent or gaseous; it may have been cold and solid like dust; rising in temperature and becoming incandescent only through the conversion of arrested motion into heat, which again was maintained for some time through accession of new matter or progressive shrinkage, but which must in a calculable time be radiated away, leaving a

[1] Lord Kelvin, *loc. cit.*, vol. ii. p. 131.