lower, a layer (the *reversing* layer) of intensely hot vapors, lying probably next to the inner brilliant photosphere, gives spectroscopic evidence of the existence of incandescent iron, manganese, cobalt, nickel, copper, and other well-known terrestrial metals.[5]

It is to be observed, however, that in these spectroscopic researches the decomposition of the elements by electrical action was not considered. The conclusions embodied in the foregoing paragraph have been founded on the idea that the lines seen in the spectrum of any element are all due to the vibrations of the molecules of that element. But Mr. Lockyer has suggested that this view may after all be but a rough approximation to the truth; that it may be more accurate to say, as a result of the facts already acquired, that there exist basic elements common to calcium, iron, etc., and to the solar atmosphere, and that the spectrum of each body is a summation of the spectra of various molecular complexities which can exist at different temperatures, the simplest only being found in the hottest part of the sun.[6]

The spectroscope has likewise been successfully applied by Mr. Huggins and others to the observation of the fixed stars and nebulæ, with the result of establishing a similarity of elements between our own system and other bodies in

---

[5] On spectroscopic research as applied to the sun, see Kirchhoff and Bunsen, "Researches on Solar Spectrum," etc., 1863; Angström, "Recherches sur le Spectre normal du Soleil"; Lockyer, "Solar Physics," 1873, and "Studies in Spectrum Analysis" (International Series), 1878; Huggins and Miller, Proc. Roy. Soc. xii., Phil. Trans. 1864; Roscoe's "Spectrum Analysis," with authorities there cited. An ingenious theory to account for the conservation of solar energy was suggested by the late Sir C. W. Siemens (Proc. Roy. Soc. xxxiii. (1881) p. 389). It requires the presence of aqueous vapor and carbon compounds in stellar space, which are dissociated and drawn into the solar photosphere, where they burst into flame with a large development of heat, and then passing into aqueous vapor and carbonic anhydride or oxide, flow to the solar equator whence they are projected into space.

[6] See also the opposite views of Dewar and Liveing, Proc. Roy. Soc. xxx. p. 93, and H. W. Vogel, Nature, xxvii. p. 233.