

served by him. He also conjectures β to be variable.* Since 1843, I have, as a rule, found Polaris fainter than β Ursæ minoris; but from October, 1843, to July, 1849, Polaris was, according to my registers, fourteen times brighter than β . I have had frequent opportunities of convincing myself that the color of the last-named star is not always equally red; it is at times more or less yellow, at others most decidedly red."† All the pains and labor spent in determining the relative brightness of the stars will never attain any certain result until the arrangement of their magnitudes from mere estimation shall have given place to methods of measurement founded on the progress of modern optical science.‡ The possibility of attaining such an object need not be despaired of by astronomers and physicists.

The probably great physical similarity in the process of light in all self-luminous stars (in the central body of our own planetary system, and in the *distant suns* or fixed stars) has long and justly directed attention to the importance§ and significance which attach to the periodical or non-periodical variation in the light of the stars in reference to climatology generally; to the history of the atmosphere, or the varying temperature which our planet has derived in the course of thousands of years from the radiation of the sun; with the condition of organic life, and its forms of development in different degrees of latitude. The variable star in the neck of the Whale (Mira Ceti) changes from the second magnitude to the eleventh, and sometimes vanishes altogether; we have seen that η Argûs has increased from the fourth to the first magnitude, and among the stars of this class has attained to the brilliancy of Canopus, and almost to that of Sirius. Supposing that our own sun has passed through only a very few of these variations in intensity of light and heat, either in an increasing or decreasing ratio (and why should it differ from other suns?), such a change, such a weakening or augment-

* *Observations at the Cape*, § 259, note 260.

† Heis, in his *Manuscript Notices of May*, 1850; also *Observations at the Cape*, p. 325; and P. von Boguslawski, *Uranus for 1848*, p. 186. The asserted variation of η , α , and δ Ursæ majoris is also confirmed in *Outlines*, p. 559. See Mädler, *Astr.*, p. 432. On the succession of the stars which, from their proximity, will in time mark the north pole, until, after the lapse of 12,000 years, Vega, the brightest of all possible polar stars, will take their place.

‡ *Vide supra*, p. 96

§ William Herschel, *On the Changes that happen to the Fixed Stars*, in the *Philos. Transact.* for 1796, p. 186. Sir John Herschel, in the *Observations at the Cape*, p. 350-352; as also in Mrs. Somerville's excellent work, *Connection of the Physical Sciences*, 1846, p. 407.