

greater number are round, or somewhat oval, and either sharply defined, or indistinct and vaporous at the margins. The disks of many of these nebulæ present a very uniform light, while others appear mottled, or of a peculiar texture as if curdled. No trace of condensation round a central point has ever been observed. Lord Rosse has recognized five planetary nebulous spots to be annular nebulæ, having one or two central stars. The largest of these planetary nebulæ is situated in the Great Bear (near β Ursæ Maj.), and was discovered by Méchain in 1781. The diameter of the disk* is 2' 40". The planetary nebula in the Southern Cross (No. 3365, *Observations at the Cape*, p. 100), with a disk having a diameter scarcely equal to 12", exhibits the brightness of a star of the 6.7th magnitude. Its light is indigo-blue, and the same color, which is very remarkable in nebulæ, is observed in three other objects of the same form, although in the latter the blue is less intense.† The blue color of some planetary nebulæ does not militate against the possibility of their being composed of small stars; for we find blue stars not only as the individual members of a pair of double stars, but even stellar clusters composed entirely of blue stars, or of the latter interspersed with small red and yellow stars.‡

The question whether planetary nebulæ are very remote nebulous stars, in which our telescopic vision is unable to recognize the difference between a luminous central star and the vaporous envelope surrounding it, has already been considered in the beginning of my *Delineation of Nature*.§ Would that Lord Rosse's colossal telescope might finally be the means of

* If we consider the planetary nebula in the Great Bear to be a sphere having an apparent diameter of 2' 40", "and assume its distance to be equal to the known distance of 61 Cygni, we shall obtain an actual diameter for the sphere, which is seven times greater than the orbit described by Neptune."—*Outlines*, § 876.

† *Outlines*, p. 603; *Observations at the Cape*, § 47. There is an orange-red star of the eighth magnitude in the vicinity of No. 3365; but the planetary nebula retains its deep indigo-blue color when the red star is not in the field of the telescope. The color is, therefore, not the effect of contrast.

‡ *Cosmos*, vol. iii., p. 136, 208, and note. The companion and the main star are blue, or bluish, in more than 63 double stars. Indigo-blue stars are intermixed in the splendid, many-colored clusters of stars, No. 3435 of the Cape Catalogue (Dunlop's *Catalogue*, No. 301). An entirely uniform blue cluster of stars is observed in the southern heavens (No. 573 of Dunlop; No. 3770 of Sir John Herschel). This cluster has a diameter of $3\frac{1}{2}'$, with prolongations measuring 8' in length; the stars are of the 14th and 16th magnitude. (*Observations at the Cape*, p. 119.)

§ *Cosmos*, vol. i., p. 85, and note. Compare *Outlines*, § 877.