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NEW PLANETARY AND PECULIAR GASEOUS NEBULAE

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Ten nebulae, to which attention was drawn when studying the Palomar Sky Atlas, are described. A number of these are listed in the Sharpless Atlas of H II regions. Some of the described nebulae are planetary, the others are peculiar diffuse nebulae.

While examining the Palomar Sky Atlas for planetary nebulae on Abell's list (see [1] in this regard), we noticed several gaseous nebulae that might be planetary. Some of them were not on any list of gaseous nebulae that we know of, and so are apparently new, whereas others are listed as H II regions in Sharpless's catalog [2]. We shall describe them here. The coordinates are referred to 1900.0.

No. 1. $1^h43^m.5$, +53°24'. Diffuse nebula. The main, southern, part is quite bright and is brighter in the blue than in H_α. This is unusual for diffuse nebulae. The bright part is shaped like a horseshoe, pointed toward the west. Its size is 1'.3 × 1'.5. A straight, broad, faint tail extends northward from it, and can be traced for more than 4'. The exciting star has not been identified. There is little absorption in the region (see Fig. 5).

No. 2. $4^h11^m.8$, +52°49'. In the red, this is a faint round nebula, brighter in the middle, but with a well-defined ring structure around the edge. The ring is very thin (4" to 10"), with a diameter of 3'.0. Hardly a trace of it is visible in the blue. The apparent nucleus is bright, about $14^m.5$, but it is not blue and perhaps it is not actually the central star. This would appear to be a typical planetary nebula, type IIIb in our classification (see Fig. 4).

No. 3. $6^h09^m.5$, +13°51' = Sharpless 269. From its shape, we might call this the "Butterfly Nebula." On the Atlas prints, its image is black in red light and gray in the blue. The size is 3' × 2' in the red, 2' × × 1'.5 in the blue. For the nucleus at the center, m_{pg} = = 15.5. A strong absorption band runs across through the nucleus from north to south; more likely, this is a nonluminous region. The emitting regions on the east and west are wing-shaped, brighter toward the nucleus. If the band is a dust structure, the object is a diffuse nebula, but it is more likely to be a bifurcated planetary. Other bifurcated nebulae are NGC 650/651, 1514, 2371/2372 (very similar to the present object), 2440, 3587, 7027, and others (see Figs. 1 and 1a).

No. 4. $6^h09^m.9$, +12°25' = Sharpless 271. Very bright in the red, in fact so overexposed that the nucleus is not visible. Size 1'.7 × 1'.8. Hardly visible near the nucleus in the blue. On the blue print, m_{pg} = 14. The nebula is horseshoe shaped, with a band extending out from the middle. Perhaps this is a planetary nebula.

No. 5. $6^h10^m.2$, +14°18' = Sharpless 267. A very faint round patch in the red, brighter toward the center. Invisible in the blue. Apparent diameter 4'.5. It is hard to single out the nucleus from the group of stars in the middle. This may be a planetary nebula.

No. 6. $7^h26^m.5$, −15°13' = Sharpless 300. Like the preceding nebula, this is a faint rough formation without a clear boundary; the apparent diameter is 2'.5, and it is invisible in the blue. There is a star cluster near the center.

No. 7. $7^h36^m.8$, −18°45'. A nebula peculiar in that the blue print shows a faint half-ring 3'.0 in diameter, surrounding a faint bright patch near the star BD −18°1967 = HD 62,001, $8^m.5$, B9. In the red, only the central condensation is faintly visible. This may be a planetary nebula with a faint nucleus, since there are a number of faint stars near the B9 star (see Fig. 3).

No. 8. $18^h28^m.2$, −5°01' = Sharpless 61. In the red, an overexposed, almost round spot 2' in diameter. In the blue, only the central part around a bright 12^m star can be seen faintly. There is a 17^m star next to the 12^m star. This may be a planetary nebula, for its shape is regular and its edge is sharp.

No. 9. $18^h57^m.0$, +2°00' = Sharpless 71. Overexposed in the red, with a kind of dark band in the middle and with extremely faint appendages; the edge, however, is sharp. The bright part measures 2'.5 × 1'.3. In the blue, this is evidently a planetary nebula in the form of a broad ring, one-half of which is far brighter than the other. There are two stars in the center, one of which should be the nucleus (see Figs. 2 and 2a).

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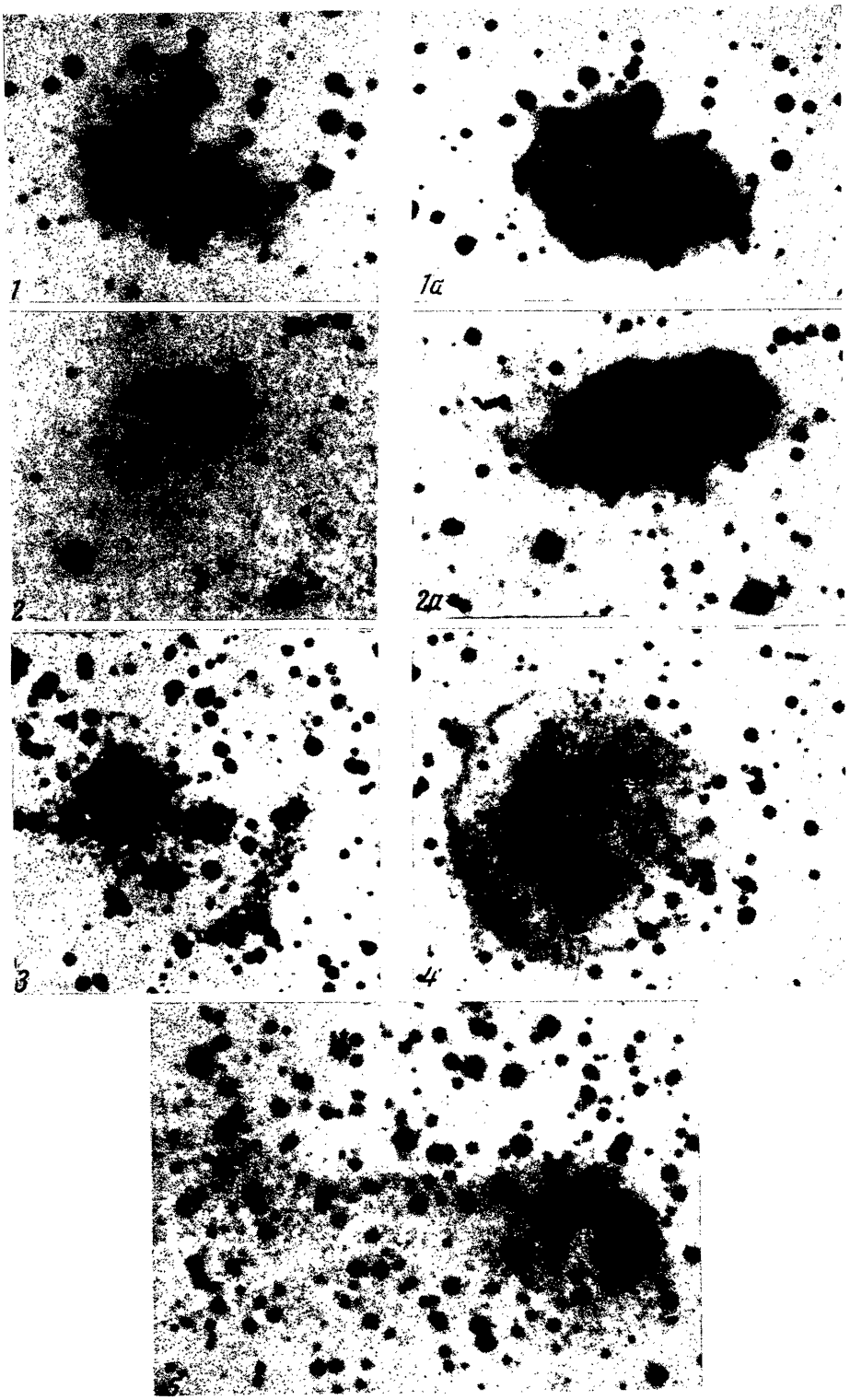

Reproductions of the nebulae from the Palomar Sky Atlas prints; scale, 1 mm = 4". Figures 1) and 1a) No. 3 in blue and red light; Figs. 2) and 2a) No. 9 in the blue and red; Fig. 3) No. 7, blue; Fig. 4) No. 2, red; Fig. 5) No. 1, blue.

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