

FROM THE NIGHT SKY - 16

John Larard

THE WELL-KNOWN CONSTELLATION of Orion contains within its boundary one of the finest nebulae in the heavens, which is depicted on the cover of this issue. Since it was first observed by Johann Cysatus in 1618 the "Great Nebula" has been the subject of intense interest and study. William Herschel set out on his great career by observing it on 1774 March 4, and later his son John Herschel viewed it from the Cape of Good Hope, in 1830. Other observers - Lassell, Otto Struve, and Secchi - all paid special attention to it. Perhaps in these modern times we have solved many of its problems, but the nebula still remains for the amateur a curious and mysterious object.

Many years ago, in 1952, I had my first sight of the nebula through a xl7 hand-held naval telescope. I did not see much except that the haze of nebulosity appeared a little larger than with the naked eye. But exactly two years later I viewed the nebula through a 3-inch refractor x70 and it was much more impressive. At the very centre of the irregular nebulosity the famous trapezium of stars forming Theta Orionis could be seen. The appearance of the nebula was then somewhat figure-8 shaped.

In 1964 December the Great Nebula was seen with the 8-inch refractor at Mill Hill, x73. My observation book reads:

"1964 December 31, 22.32 UT. The nebulosity was very pronounced and extended for a great distance to the N of Theta Orionis and S.f. that group. Curious lines of nebulosity extended across the p. edge and to the north of this the boundary of the nebula was difficult to define - it was really a staggering sight. Many stars lay in the field and a large star N.f. was seen to be surrounded by nebulosity. The Trapezium was noted x73 but an increase of power to xl68 was sufficient to show two more stars in the group."

The fifth star E was discovered by Wilhelm Struve in 1826, and the sixth, F, was found by John Herschel in 1830. Seven stars are now known. The Great Nebula was marked No 1976 in the New General Catalogue, and the entry shows that words are superfluous to describe it:

!!! Theta Orionis and the great neb.

Webb observed: A considerable aperture will show how beautifully one large star, nearly opposite the great dark opening, is

encompassed by a spiral mass of haze. Clear weather must of course be chosen, and the lowest power which will bring out the trapezium is most likely to give a satisfactory contrast with the exterior darkness. - 29 Twyford Street, London N.1.

OBSERVING VARIABLE STARS: THE PROBLEMS

John Isles

2. External factors

1. Colour response of instrument. A function of time in the case of a reflector, while imperfect achromatism in refractors is said to cause the systematic over-estimation of red stars by up to 0.1m. If the mirror is re-aluminised regularly, and we are as consistent in our choice of instrument for each star as its variation permits, any residual systematic error can be corrected for, if required, when the observations are analysed, by applying constant corrections to each observer's results to bring them on to a common light-curve. This will also take account of systematic differences between observers caused by differing colour vision or observational technique. The correction will vary from star to star, according to the degree of redness. Sidgwick's remarks (OAA p.296) should be disregarded.

2. Vignetting, the falling-off of the brightness of the image towards the edge of the field, causes no problems if each star to be examined is brought successively to the centre of the field, and those near the edge are ignored.

3. Atmospheric absorption. The atmosphere acts as a colour filter of varying density. Red stars are enhanced relative to white ones at low altitudes, so observations should be made in such conditions only when there is no alternative, and comparison stars at the same zenith distance should be selected if the field is large enough for differential absorption to have a significant effect. Remember that the tables of absorption given in many books are very unreliable.

4. Haze. R G Andrews noted that the very red star U Cygni took a nose-dive relative to its comparison stars when haze passed across the field. B A Carter (in less rural conditions) finds the effect to be negligible; while in central London Isles finds that red stars actually appear brighter in haze. The reason for the disagreement is presumably that urban haze is illuminated from below, providing