

THE NEBULA SURROUNDING η ARGÛS.

In the autumn of 1882, several expeditions proceeded to the Southern Hemisphere, by order of the British Government, to observe the Transit of Venus; one of these was instructed to take up a position near Brisbane, Queensland.

I had long desired an opportunity of observing the nebulae of the Southern Hemisphere, which from their declination south are invisible in the British Isles, and with this object I joined the expedition under the command of Captain W. G. Morris, R.E., with whom was Lieut. (now Captain) Darwin, R.E.

The instrument I had provided was an achromatic telescope, by Merz, of $6\frac{1}{4}$ inches aperture, mounted on an equatorial stand by Cooke, with a very good clock movement. This (together with the other instruments) was erected in the grounds of the Radcliffe Observatory, Oxford, in July; after a course of preliminary observations had shown it to be all that could be desired both for excellence of optical definition and stability of mounting, it was carefully packed, and we sailed from London, on August 24th, arriving at Brisbane, on October 26th. Here we waited several days while selecting a suitable position for the Observatory, the choice finally falling on Jimbour, a station 170 miles from Brisbane, and 12 miles from Macalister, on the Southern and Western Queensland Railway. Situated on a gentle eminence overlooking the great plain of the Darling Downs, with an almost uninterrupted horizon, and at an elevation of about 1,000 feet above sea level, Jimbour was a very suitable spot for astronomical observations. By November 6th, the equatorial was erected in a temporary wooden hut, and the adjustments so far perfected that I could settle down to regular work, and determined to make η Argûs my special study. Between this date and December 6th, the weather was so favourable that observations were only interrupted on two occasions. I found the best definition to be between midnight and dawn, and the Nebula surrounding this Star was many times observed at about two or three o'clock a.m., under the most favourable conditions.

I employed an eye-piece with a very large field of view, and a magnifying power of about 80 for delineating the general outlines of the Nebula, but a power of 136 was found advantageous for laying down the positions of some of the smaller Stars. On first viewing the Nebula with this low power, four conspicuous Stars strike the eye, forming a sort of irregular square; each of these Stars has a more or less numerous assemblage of smaller ones in its immediate vicinity, so that the field of view may be roughly said to include four clusters; among these latter, several beautiful double Stars may be discerned and the Nebula is seen stretching in curious complicated folds around and beyond them.

On the night of November 10th, and the early mornings of the 13th, 17th and 18th, I made a rough sketch of many of the brighter Stars, and the more conspicuous portions of the Nebula, and then proceeded to compare my work with the elaborate plate in Sir John Herschel's "Cape Observations."

When comparing Sir John Herschel's drawing with the Nebula as seen in an achromatic telescope, it must be remembered that Herschel's plan is reversed right for left, but not inverted, and so is better viewed when held up and examined as a transparency from the back. η Argûs has no longer the brilliancy which distinguished it in 1837, when it equalled α Centauri, and was far superior to Rigel.

After this date many other sketches of various portions of the Nebula and the adjacent Stars were made. These sketches form the basis of the two plates which accompany this paper. The one shows simply the Stars in their proper relative positions, with the numbers given by Herschel, and the other, the same field, together with the convolutions of the Nebula.