

die ab und zu sternartig erscheint. — März 12. Comet nicht mehr zu sehen.

Comet 1893 I. Jan. 15. Nur vier Durchgänge wegen Versagens des Registrierapparats bei 25° Kälte. Beobachtung daher ganz unsicher. — Jan. 23. Der Registrierapparat hört bei 17° Kälte schon nach zwei Durchgängen auf zu functioniren.

Comet 1893 II. Juli 15. Comet im Fernrohr von der Helligkeit eines Sterns 2. Grösse, von einer Nebelhülle umgeben. Schweif nicht erkennbar. Höhe 10°.

(17) Thetis. Dec. 19. Grösse 10.8.

(18) Melpomene. April 17. Grösse 9.8.

(24) Themis. Juni 15. Beobachtung nicht gut, weil der Himmel nicht ganz klar.

(41) Daphne. April 11. Grösse 9.0. — April 12. Grösse 9.0 bis 9.1.

(43) Ariadne. April 23. Grösse 8.9; Planet also heller als im Berl. Jahrb. angegeben. — April 24. Grösse 9.2; der Planet ist 2 Stufen schwächer als BD. — 16°3751 und 4 Stufen heller als BD. — 16°3757. Ersterer Stern ist in der BD. zur Grösse 9.0 und letzterer zu 9.6 angegeben.

(57) Mnemosyne. Nov. 10. Grösse 9.8. — Nov. 13. Grösse 9.8.

(65) Cybele. April 8. Grösse 10.7. — April 10. Grösse 10.7.

(68) Leto. März 12. Grösse 11.0. — April 8. Grösse etwa 11.7. Luft schlecht. — April 9. Die Angabe für die Beobachtungszeit ist vielleicht um 5<sup>m</sup> zu vergrössern. — April 10. Grösse 11.4.

(71) Niobe. Sept. 13. Beobachtung wegen eintretender Bewölkung abgebrochen.

(78) Diana. Mai 17. Beobachtung wegen eintretender Bewölkung abgebrochen, unsicher.

Jena 1895 März 31.

(79) Eurynome. Juli 4. Beobachtung wegen störenden Mondscheins bald abgebrochen.

(82) Alkmene. Jan. 26. Grösse 10.2. — Febr. 8. Grösse 10.1. — Febr. 15. Grösse 10.3.

(89) Julia. April 5. Grösse 11.0. — April 8. Grösse 11.0. — April 9. Grösse 11.0. — April 10. Grösse 11.0.

(92) Undina. Febr. 16. Berechnete Grösse 11.4 stimmt, Planet jedenfalls nicht schwächer.

(113) Amalthea. März 12. Grösse 10.3. — März 23. Grösse 10.3. — April 5. Grösse 10.5.

(118) Peitho. Oct. 5. Planet jedenfalls nicht heller als 10<sup>m</sup>. — Oct. 27. Beobachtung wegen eintretender Bewölkung abgebrochen, unsicher. — Nov. 9. Grösse 10.5. — Nov. 10. Grösse 10.5.

(129) Antigone. April 14. Grösse 9.2.

(133) Cyrene. April 18. Grösse 11.0.

(164) Eva. Mai 21. An der Grenze der Sichtbarkeit, besonders da die Luft nicht ganz rein. Unzuverlässige Beobachtung. — Mai 22. Die Einzelbeobachtungen nicht gut mit einander übereinstimmend.

(202) Chryseis. April 12. Grösse 11.0. — April 13. Grösse 10.7.

(258) Tyche. Febr. 9. Nur wenige Durchgänge wegen mangelhaften Functionirens des Registrierapparats.

(313) Chaldaea. Febr. 8. Grösse 9.8. — Febr. 15. Grösse 9.8 bis 10.0.

(326) Tamara. Oct. 12. Beobachtung unsicher, wegen eintretender Bewölkung abgebrochen.

(349) Dembowska. Febr. 16. Grösse 9.5. — März 4. Grösse 11.5. In Folge der sehr dunstigen Luft Planet oft kaum gesehen. — März 25. Grösse 10. — April 18. Grösse 11.0.

(354) (1893 A). März 4. Grösse 10.5. — März 22. Grösse 9.8.

Otto Knopf.

## On a great photographic nebula near Antares

and on the nebulosity of  $\nu^2$  Scorpii,  $c^2$  Scorpii and the stars BD. — 19°4358-9 and BD. — 19°4361.

By E. E. Barnard.

For fully ten or twelve years I have known of a vast region of nebulosity in Scorpius near Antares.

I tried a number of times to locate this nebulosity, but could never definitely settle its extent and exact position. I first knew of its presence in my early comet seeking, having come across it repeatedly in my sweeps. I have looked it up a number of times since being at the Lick Observatory, but the examination was always unsatisfactory.

On June 15, 1892 a careful survey of it was made with both the 6 $\frac{1}{2}$  inch and the 12 inch refractors. When I first came here, I found that a portion of this nebulosity seemed to center about a couple of small stars north of Antares. To this refers the following note made June 15, 1892:

»A couple of years ago I found two stars involved in very large diffused nebulosity. They are strongly nebulous in the 6 $\frac{1}{2}$  inch and in the 12 inch, but are best seen in the 6 $\frac{1}{2}$  inch. The stars are about 8 $\frac{1}{2}$  and 9 $\frac{1}{2}$  mag., the

following star being the brighter. They are 1°8 north and 42' preceding Antares. This region and preceding it for some distance seems to consist of a vast but very diffused nebulosity.«

My work on the photography of the milky way having carried me into this region, I made an exposure of 2<sup>h</sup> 20<sup>m</sup> with the Willard lens about Antares, on 1895 March 23.

The resulting negative showed a vast and magnificent nebula, intricate in form and apparently connected with many of the bright stars of that region, including Antares and  $\sigma$  Scorpii.

The brighter and more complicated portions of the nebula center about  $\rho$  Ophiuchi, 22 Scorpii and a couple of small stars occupying the center of the equilateral triangle formed by  $\rho$  Ophiuchi, 22 and  $\sigma$  Scorpii. (These two stars are Cord. DM. — 24°12683-4 and are in, for 1875.0, 16<sup>h</sup> 17<sup>m</sup> 47<sup>s</sup> — 24° 9.3 9<sup>m</sup> 6 and 16<sup>h</sup> 17<sup>m</sup> 52<sup>s</sup> — 24° 10.3 8<sup>m</sup> 0.)

1895 JAN. . . . . 138  
 About these stars, it is strongly and very irregularly condensed. The greatest mass or masses — for it is gathered in cloud-like forms — is around the three stars of  $\rho$  Ophiuchi. Each of these centers of condensation has peculiar rifts or long vacancies in it.

On March 30<sup>th</sup> another exposure at the same place was begun, but the sky hazing up only 2<sup>h</sup> 18<sup>m</sup> could be given. This plate was defective. The previous results however were verified in every particular. On this last date also, the same duration of exposure was given with the small »lantern lens« 1½ inch diameter and about 5 inches equivalent focus. This lens gives a large but rather poor field, and the scale is about 10° to the inch. The picture with this small lens was indeed remarkable — not so much with reference to the nebula, though new points about it were brought out — but the sky itself in that region was shown to be very wonderful. The Willard lens had shown that the nebula occupied a singularly blank region from which large vacant channels diverged towards the east. The plate with the small lens, showed that these channels among the stars ran irregularly eastward for fully 15° or 20° — connecting there with other vacancies and lanes; the whole giving the picture a most remarkable appearance.

This photograph with the »lantern lens« shows that the great nebula extends in a faint diffused manner southwards for two or three degrees beyond Antares and  $\sigma$  Scorpii. It also shows a large long nebula involving the star  $\nu^2$  Scorpii and about 2° or 3° long. This object is also shown on the Willard picture, but very near the edge of the plate.

$\sigma$  Scorpii has a large diffused mass of nebulosity extending northwards from it which can be fully traced on the picture to a connection with the greater and brighter nebulosity about  $\rho$  Ophiuchi.

This magnificent nebula is one of the finest in the sky, and as it involves so many of the bright stars in that

Mt. Hamilton, Cal., 1895 April 12.

*E. E. Barnard.*

## Note on the variable star T Centauri, Cord. GC. 18609.

By Lieut. Col. *E. E. Markwick*, F. R. A. S.

With reference to a list of new variable stars announced by Mrs. Fleming, and communicated by Prof. E. C. Pickering in No. 3269 p. 71 of the *Astronomische Nachrichten*, I beg to state that the variability of the star Cord. GC. 18609 (= 252 of Centaurus in the *Uranometria Argentina*) was first publicly announced by me in the *Gibraltar Chronicle* of 1894 July 13. This is clearly referred to in the »*English Mechanic*« of 1894 Aug. 3, letter 36462, wherein it appears the star had then varied between 8½ and 6¼ magnitudes. From a paper communicated to the British Astronomical Association which is found at p. 247

region it would imply that they are essentially at the same distance from us.

I have attempted to make a drawing from the negative to accompany this paper for illustration, but the result, on account of intricate form of the nebula, was too unsatisfactory to send.

I shall soon be able to give a more prolonged exposure, the result of which will be published.

From its dimensions, its individual peculiarities, and its occupying a region almost devoid of stars and which is the center of great radiating lanes or vacancies among the stars, this nebula scarcely has an equal for interest in the sky.

The nebula about  $\nu^2$  Scorpii is highly suggestive of being also an important object. I shall soon give a special exposure on it to determine its peculiarities.

Both plates with the Willard lens show the 5.6 mag. star  $c^2$  Scorpii  $Y_3$  6807 (1860.0  $\alpha = 16^h 3^m 41^s$   $\delta = -27^\circ 34'$ ) to be surrounded with a feeble nebulosity. They also show the two stars BD. — 19° 4358.9 and 4361 (the latter of which for 1855.0 is in  $16^h 12^m 1^s - 19^\circ 46'$ ) to be strongly involved in diffused nebulosity which is slightly extended n p and s f.

Following are the positions of some of the stars mentioned and whose places I have not given.

$\rho$  Ophiuchi =  $Y_3$  6907 7.0 mag.  
 1860.0:  $16^h 17^m 12^s - 23^\circ 7'$

$\sigma$  Scorpii =  $Y_3$  6870 2.7 mag.  
 1860.0:  $16^h 12^m 41^s - 25^\circ 15'$

22 Scorpii =  $Y_3$  6922 7.0 mag.  
 1860.0:  $16^h 21^m 29^s - 24^\circ 50'$

$\nu^2$  Scorpii =  $Y_3$  6810 4.1 mag.  
 1860.0:  $16^h 3^m 52^s - 19^\circ 6'$

Vol. V of the *Journal*, it will be seen that I commenced regular observations for variability on 1894 May 6, and on May 26 variation was evident. It is curious that the star should have been thus observed independently by different observers each ignorant of what the other was doing.

I may observe that the star has quite recently reached a maximum, between the 5<sup>th</sup> and 6<sup>th</sup> magnitudes. I have not yet been able to ascertain if it has a regular period. In April it was not much above 10<sup>th</sup> mag. In all, 84 different observations have been secured with either binocular or 2¾ in. telescope, refractor.

Gibraltar 1895 June 14.

*E. E. Markwick.*