

The star on that day, when the sky cleared up for a few hours, was of magnitude, 4.5; it appears then to have decreased considerably in brightness, for Schmidt estimated the star on November 24, at magnitude 3. The colour of the star is not remarkable—yellowish-red; the spectrum is one of the most interesting that I know. It is the coloured band crossed by numerous (from eight to ten) dark bands, and besides there are several bright lines visible.

I have prepared an accurate drawing of the spectrum, which exactly agrees with a drawing made shortly before by Dr. Lohse. At the very first sight the spectrum of the new star appeared to me entirely different from those of the reddest stars, and a later accurate comparison with the drawing has enabled me to discover no satisfactory connection either with the so frequently met with band spectrum III.a, or with the rare class III.b (Secchi's type, III. and IV. respectively). Of the bright lines there was one specially conspicuous in the farthest red, as also one on the boundary of the green and blue, and two lines in the blue. In the yellow and green appeared some very bright stripes (? bands), which I, however, cannot consider proper bright lines (of which the specimen of glowing gas consists), but of which I believe there are places in the spectrum, which, by contrast with the neighbouring dark absorption bands, stand out conspicuously. In the case of the very marked band spectra of Class III.a, one has very often, and especially with a disturbed sky, the impression that there are bright lines in the spectrum, while with favourable atmospheric conditions, it is clearly perceived that regions of the spectrum deficient in lines in the neighbourhood of dark bands produce that impression.

The observations were made by means of a small spectroscope formerly described by me. With a larger Browning instrument some measurements were later attempted, and one of the bright lines undoubtedly recognised as the second hydrogen line F. The lines in the blue gave the wave-lengths 474 and 470 mill. m.m. Bright places in the spectrum (very possibly bright lines) were further observed with 512 and 498 mill. m.m. wave-lengths. We did not manage to measure the red lines.

In further characterising the spectrum, I might state that the blue and violet, in comparison with other stars which showed a band spectrum, was very well seen, and that, at all events, in consequence of the proportionally small general absorption which this part of the spectrum undergoes, the colour of the star differs little from the mean star colour.

On December 8 I succeeded in confirming and completing the observations herewith sent. I estimated the star at magnitude 5—perhaps it was even less. By means of the small spectroscope several measurements were obtained of bright lines and stripes (? bands) of the spectrum; especially was it possible to observe very accurately the position of the red lines, and to identify them with the red hydrogen line C. The following further measurements were made :—

Wave-lengths.	
587-589	Bright lines.
469-470	
526-528 (E)	Bright stripes, very possibly bright lines.
513-514	
507-509	
497-499	
485-486 (F)	Bright line.

The state of the atmosphere was bad, and very often the observations were interrupted by clouds for a long time. The double numbers for the wave-length should indicate the limits within which the particular line lies according to the measurements. It is hereby evident that besides the hydrogen lines C and F the line D₂ (wave-length 487-5) appears bright in the spectrum of the star. The magnesium line (6) I have not been able

to see bright, but I have repeatedly measured a bright stripe, somewhat more broken than 6, which very possibly is identical with a bright line which, under special circumstances, stands out as the brightest line in the spectrum of the hydrocarbons. A line appeared to me to shine out temporarily in the violet, apparently the third hydrogen line in the neighbourhood of G.

I hope to be able, ere the star becomes too weak for spectroscopic research, to obtain some more accurate measurements in the positions of the bright lines.

I may in conclusion add the remark that in the constellation Cygnus there are three stars,¹ whose spectra are without parallel; we have therefore, in a tolerably circumscribed space of the sky, including Schmidt's new star, four objects which give a spectrum entirely differing from the many hundred stars examined hitherto.

H. VOGEL

Since the receipt of the first account of Dr. Schmidt's Nova the weather here has generally been of the most unfavourable character, and it was not until January 2 that the new star could be examined with the 15-inch refractor of this observatory. On the evening of that day the Nova was of about the seventh magnitude and of a decided red colour. The spectrum, as shown in a spectroscope of Dr. Vogel's construction, was of surprising brilliancy, and consisted of a faint continuous spectrum interrupted by five bright lines. The positions of these lines determined in parts of the scale of the instrument, and afterwards reduced to wave-lengths by comparing the spectra of moonlight and various elements are as follows :—

No.	W. L.	Mill. m.m.	
1	655		Intense bright red.
2	581		Middle of a rather bright band in the yellow, fading off rapidly on both sides.
3	504		Bright, well-defined line.
4	486		" " "
5	456		Faint line in the violet.

It is remarkable that four of these wave-lengths agree closely with those of bright lines previously observed. Nos. 1 and 4 are obviously the C and F lines of the hydrogen spectrum. No. 3 coincides almost exactly with the brightest line of gaseous nebulae, and lastly, No. 2 corresponds very nearly with one of the bright lines in the spectra of the three remarkable stars in the Swan, pointed out by Messrs. Wolf and Rayet, and subsequently observed by Dr. Vogel (see *Berichte d. Königl. Sächs. Ges. der Wiss. Math. Phys. Cl.*, 1873, p. 556 ff.). As yet it has been impossible to confirm the above results, but considering the great interest of the subject I venture to lay this imperfect account before the readers of the *Astronomische Nachrichten*.

RALPH COPELAND

Lord Lindsay's Observatory, Dunecht, January 8

Yesterday night I observed the star of M. Schmidt; it was about the seventh or eighth magnitude, of a colour tending to greenish, but yellower than on the preceding day. The spectrum is formed of two strong lines, of which one corresponds to hydrogen and the other to magnesium. The sodium was still more marked and bright. There was besides another line in the violet, probably also hydrogen. The red of this gas is very weak and does not bear measurement. Besides these four very beautiful lines there were a number of small lines between D and the magnesium, but the space where are the two bright lines of magnesium and the F and the H is almost devoid of light. After these two bright lines towards the violet there is a dark gap, and then follows a group of very fine lines. So that the description given by M. Cornu is correct: only the bright lines are not bordered by nebulosity, but are as perfectly defined as the bright lines of nebulae.

Rome, January 9

P. A. SECCHI

¹ E. D. No. 4001, 40013 + 35°; 3956 + 36°; by Wolf and Rayet discovered, by me accurately examined. Communicated to the *K. Sächs. Gesellsch. der Wiss.*, December 12, 1873.