mental powers. At the age of sixteen he entered the establishment of a pharmaceutical chemist, and was actively engaged for eight years in this occupation. His hours of leisure were devoted to scientific study, and his aspirations gradually rose above the narrow limits in which he was confined. These longings were gratified in 1820, when he was enabled to enter the University of Berlin as a student of physics. With restless energy Poggendorff entered upon his chosen field and quickly gave evidences of more than ordinary talent. In 1821 Oken's *Isis* contained his first paper, "Physico-chemical Investigations upon the Magnetism of the Voltaic Pile." In this article he describes his discovery of the electro-magnetic multiplier or galvanometer, formed by carrying a wire several times round a magnetic needle in a vertical plane; an apparatus which with Schweigger's later improvements, is in universal use. Other articles on closely-allied subjects appeared at this period in Gilbert's *Annalen*. The abilities of the young physicist were soon recognised, and he received from the Royal Academy of Sciences at Berlin the post of "observator," which enabled him to continue his scientific investigations. The leading *savants* of the day—G. Rose, H. Rose, v. Buch, Alexander v. Humboldt, Mitscherlich, and others—gave him also a warm welcome into the circle of their friendship.

In 1824 Poggendorff conceived the plan of issuing a new physico-chemical journal on a more extensive basis than any other hitherto existing in Germany. The above-mentioned investigators, as well as Berzelius, Arfredson, Bonsdorff, and other prominent foreign chemists and physicists promised a hearty co-operation in the new enterprise. Before the completion of the preparations, the death of Prof. L. W. Gilbert, of Leipzig, who for twenty-five years had issued Gilbert's *Annalen der Physik*, left that periodical without an editor. Poggendorff entered at once into negotiations with the publisher. The result was that he edited the seventy-sixth and closing volume of Gilbert's series, and then issued the first number of the *Annalen der Physik und Chemie*. This was the decisive step of Poggendorff's life. Although but four years had elapsed since the commencement of his university studies, he brought to the new undertaking a breadth of knowledge, a keenness of discrimination, and a true love and enthusiasm for his work which, united with the warm co-operation of leading investigators, gave the *Annalen* at once a prominent position among scientific periodicals. The somewhat exacting duties of the new position did not prevent the continuance of his researches. In 1827 he invented the magnetometer for the measurement of minute magnetic variations. At this time, also, papers appeared from him on the vibrations of light, on the aurora borealis, on the law of diffusion of gases, on the decomposition of chemical compounds, on the relations between the elements of ternary compounds, &c., all of which evidenced a comprehensive grasp of the varied departments of chemistry and physics In 1834 he received the degree of Ph.D. from the University of Berlin, and in 1844 the degree of M.D. from the University of Königsberg. In 1834 he was elected to the position of extraordinary professor of physics at Berlin, in which relation he continued to the time of his death. The Royal Academy of Sciences at Berlin elected him to membership in 1839, and the most important of his subsequent researches were published in the *Transactions* of the Academy. These were confined almost exclusively to galvanism and electricity, and form altogether one of the most valuable and extensive contributions which has been made to our knowledge in this department. His labours were chiefly directed to the study of electro-chemical and thermo-electric phenomena, methods of measuring the intensity of the galvanic current, the laws of galvanic polarisation, the resistance of various conducting mediums, &c., as well as the invention of numerous pieces of apparatus applicable in this branch of physics. In 1837 Prof. Poggendorff was actively engaged with Liebig in the preparation of the first volume of the well-known "Handwörterbuch der Chemie," but was unable to continue his co-operation in the succeeding volumes. A series of biographical sketches, "Lebenslinien zur Geschichte der exacten Wissenschaften," appeared from his pen in 1853, and were followed in 1863 by a compendious "Biographisch-literarisches Handwörterbuch zur Geschichte der exacten Wissenschaften." This book of about 3,000 pages includes the biographies and fragments of works and papers of the scientific men of all nations and all times, and involved an immense amount of time in the preparation.

Valuable as were the experimental results and encyclopædic labours of Prof. Poggendorff, they assume a subordinate position by the side of the great life-work on which his energies were chiefly expended. In the long series of over 160 volumes of the *Annalen der Physik und Chemie*, he has left behind him the most enduring monument to his zeal and devotion in the cause of science. His rare combination of talents, his fine critical powers, his unflagging industry, and his long period of service render his scientific editorial career strikingly similar to that of the recently-deceased founder and editor of the *Revue des deux Mondes* in the world of politics and letters. The translation of the articles of foreign investigators formed no small part of his editorial labours. The seventy-six contributions of Faraday alone occupy between two and three volumes, those of Brewster and Regnault require each over a volume. It has been calculated that about one-fifth of the total number of volumes of the *Annalen* would be occupied alone with the editor's translations. The original plan of making the *Annalen* a complete record of all advances made in both chemistry and physics gradually became impossible, as the opportunities and incitements for original research increased. With the appearance of the various chemical serials in Germany, the department of chemistry became less and less prominent, until the *Annalen* has assumed an almost purely physical character.

Ever watchful to detect and recognise merit in fellow-labourers, he stood upon peculiarly intimate and friendly relations with a large proportion of his extensive staff of contributors. Their feelings of love and respect found opportunity for expression three years ago, when many of them gathered to celebrate the fiftieth anniversary of the foundation of the journal. The occasion was very fitly observed by the presentation to the aged editor of a jubilee volume of the *Annalen*, compiled under the direction of the contributors, and containing special articles from a number of leading physicists. The hope then expressed that it might be followed by many more volumes under his editorship was not destined to be fulfilled. He had reached his eighty-first year with unimpaired possession of mental and physical powers, when death suddenly removed him from his sphere of earnest, useful activity, after a brief and painless illness. A large assembly of men famous in literature and science, gathered at the burial ceremonies, to pay the last tribute to the memory of their departed friend. It is not alone in science that Poggendorff will be missed. His kindly, genial, appreciative disposition endeared him in the hearts of men from all classes of society; and the generous hospitality of his home will not easily be forgotten by those who have learned to know him in the midst of the family circle.

T. H. N.

THE NEW STAR IN CYGNUS

THE following three letters are published in *the Astronomische Nachichten*, Nos. 2115, 2116:—

On December 3 I received the news of the discovery of the new star in Cygnus, but the unfavourable weather did not allow me to search for it till the 5th.

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	Bright stripes, very possibly bright lines.
526–528 (E)	
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 D_3 (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 :—

		Mill. m.m.	
No. 1	W. L.	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 nebulæ, 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 nebulæ.

Rome, January 9 P. A. SECCHI

[1] B.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.