Stars having Peculiar Spectra.
New Variable Stars in Aquarius, Delphinus, and Camelopardalus.

Communicated by *Edward C. Pickering*, Director of Harvard College Observatory.

An examination of the photographs of stellar spectra taken recently at the Harvard College Observatory with the 8 inch Draper Telescope, has led to the discovery of the following objects of interest. On Plate 2224, taken November 8, 1890 the hydrogen lines *G* and *h* are bright in the spectrum of a third type star whose approximate position for 1900 is in RA. $20^h 41^m.2$, Decl. $-4°26'$. On Plate 2542 taken December 20, 1890 a star whose approximate position for 1900 is in RA. $20^h 41^m.3$, Decl. $+18°58'$ shows a similar spectrum. As these spectra resemble that commonly shown by variables of long period, photographic charts of both regions were examined and the following approximate magnitudes obtained.

RA. $20^h 41^m.2$, Decl. $-4°26'$ [Aquarius], on Oct. 18, 1888, Nov. 8, Nov. 13, Dec. 12 and Dec. 15, 1890, magnitude 8.6, 8.6, 8.4, 9.1, and 9.6 respectively. The magnitude given for November 8, was obtained from a spectrum plate.

RA. $20^h 43^m.1$, Decl. $+18°58'$ [Delphinus] one June 30, July 29, Aug. 15, Sept. 25, Sept. 29, Oct. 11, Oct. 28, Nov. 28, Dec. 19, Dec. 20, and Dec. 22, 1890, magnitude <11.2, <10.0, <11.0, <10.4, <11.9, <11.6, <11.2, 9.3, 8.6, 9.0, and 8.7 respectively. The magnitude given for December 20 was obtained from a spectrum plate. Spectrum plates of this region were also taken on June 1, Aug. 8, Aug. 14, Sept. 19, and Nov. 26, 1890. The star does not appear on any of these plates and consequently we may assume that on these dates it was fainter than the tenth magnitude.

On Plate 2553, taken December 19, 1890, and on Plate 3681 taken on June 29, 1889, the stars DM. $+63°83$ magn. 9.5, and Cord. GC. 23416, magn. 7.2, whose approximate positions for 1900 are in RA. $0^h 37^m.5$, Decl. $+64°14'$, and RA. $17^h 12^m.1$, Decl. $-45°32'$, show a spectrum consisting mainly of bright lines and similar to that of the stars in Cygnus discovered by Wolf and Rayet.

The photometric measures of DM. $+62°596$ magn. 6.6 (Dunér II.7) whose approximate position for 1900 is in RA. $3^h 33^m.2$, Decl. $+62°20'$, (Camelopardalus) made at this Observatory were discordant and differed greatly from the magnitude given in the Durchmusterung. Photographic charts of this region, having ten minutes exposure, were therefore taken with the 8 inch Draper Telescope, in order to determine whether the disagreement was due to errors in measurement or to variations in the light of the star. On October 15, 1890 the star was too faint to appear on a plate having this exposure. Accordingly, on October 17, a chart plate having thirty minutes exposure was taken on which the star was seen, and it has since been followed by taking chart plates having thirty minutes exposure. The following approximate magnitudes 7.4, 7.5, 7.5, 7.3, 7.5, 7.5, <8.7, 8.1, 8.5, 8.5, 8.8, 8.1 and 7.8 found from plates taken on Jan. 3, Febr. 13, April 1, April 5, April 11, April 16, Oct. 15, Oct. 17, Nov. 19, Nov. 25, Dec. 5, 1890, Jan. 16 and Febr. 1, 1891 respectively, show that the star is variable and is now approaching its maximum.*) A correction of -3.6 magnitudes has been applied to the photographic measures of this star to render them comparable with visual observations.

Harvard College Observatory, Cambridge Mass., 1891 Febr. 7. *M. Fleming.*

*) Der durch seine tiefrothe Farbe bekannte Stern (Birm.-Esp. 75) ist bereits von Birmingham in A. N. 1843 als wahrscheinlich variabel angegeben worden. Meine Grössenschätzungen in den Helsingfors-Gothaer AG. Zonen sind: Z. 557, 1878 Febr. 4, $6^m.8$ feuerroth; Z. 558, 1878 Febr. 7, $7^m.5$ roth; Z. 667, 1880 Januar 21, $6^m.6$ feuerroth. *Kr.*

Zur Theorie von Algol und λ Tauri.

Von *J. Plassmann.*

Bald nach dem Bekanntwerden meiner Beobachtungen über das secundäre Minimum von Algol und λ Tauri äusserten sich mehrere Astronomen (so Hr. Gore privatim und im Journal of the British Astr. Association Nr. 3, Hr. Berberich in der Naturwissenschaftl. Rundschau Nr. 7) in dem Sinne, dass bei Algol die beobachtete Einbiegung in der Curve einer Occultation des Satelliten durch den Hauptstern zugeschrieben werden müsse. Diese sehr plausible Erklärung reicht aber wohl allein noch nicht aus. Sie verlangt nämlich offenbar, dass die Curven-Abschnitte, welche zwischen Ende und Anfang von zwei ungleichnamigen Occultationen liegen, nach wie vor als horizontale Linien zu betrachten sind. Während für Algol diese Annahme sich mit meinen Zahlen (A. N. 3016) kaum vereinigen lässt, konnte man bei λ Tauri des geringfügigen Materials wegen noch einen Zweifel zulassen. Inzwischen habe ich aber (bis Febr. 12) die Anzahl der Beobachtungen, die sämmtlich bei guter Luft und in Abwesenheit störenden Mondlichtes angestellt wurden, auf 144 gebracht. Die daraus gezogenen Mittelwerthe enthält folgende Uebersicht, in welcher l und s die frühere Bedeutung haben; n ist die Anzahl der benutzten Beobachtungen, jede aus vier Stufenschätzungen bestehend.