RA. $5^h 40^m.6$ (first). $H\beta$ bright and broad.

RA. $5^h 40^m.6$ (second or third). $H\beta$, $H\gamma$, and $H\delta$ bright and broad.

RA. $5^h 41^m.0$. $H\beta$, $H\gamma$, and $H\delta$ bright and sharp.

Harvard College Observatory, 1897 Sept. 28.

The line called $H\beta$ by Dr. Stewart in the first, ninth, and tenth of these objects is probably the line 5007, characteristic of gaseous nebulae. The line called $H\beta$ in the fourth, sixth and seventh objects is probably the line 4688, characteristic of spectra of the fifth type.

Edward C. Pickering.

Photographic Magnitudes.*)

In determining the photographic magnitudes of the stars it is a matter of great importance to know how much their relative brightness will vary on different plates, or on different portions of the same plate. It is especially important to determine the amount of this error since it is not easily eliminated and has been supposed to be large by some persons not familiar with stellar photographs. A moment's investigation of photographs of the same portion of the sky shows that this source of error is small, so small that it is not readily determined by direct measurement. The uniformity of different portions of the film is shown by allowing the stars to trail over the plate. The different portions of the trails appear equally intense, and no variation is perceptible to the eye. A much more delicate test was found in the discussion of a series of measures, made by Miss E. F. Leland, of the variables discovered by Professor Bailey in the Cluster Messier 5. Sixty-three of these variables were compared on 41 plates by Argelander's method, with a sequence of comparison stars. Estimates were made of the difference in grades of each variable from the next brighter and the next fainter star of the sequence. The sum of these differences gives the interval between the comparison stars and combining all the results gives, in general, several measures of each interval on each plate. Each comparison star in turn may then be regarded as a variable and its changes in light determined from the next brighter and next fainter star of the sequence. Comparatively few measures were made of the six brightest and the three faintest stars of the sequence. The five intermediate stars were measured on 41, 39, 38, 30 and 30 photographs respectively. The corresponding ranges in the measures derived from each plate, none being rejected, were 0.14, 0.10, 0.12, 0.15, and 0.08 magnitudes, and the average deviations, 0.02, 0.01, 0.02, 0.03 and 0.02. The largest residual was 0.10 and this depended upon two estimates only. We find, therefore, that on the average, five stars were measured on 35 plates with a range of 0.12 magnitudes and an average deviation of 0.02 magnitudes. The total number of estimates from which these results are derived is 4294. The average deviation 0.02 includes:

1st. The errors of observation which are increased by the fact that four estimates enter into each determination, but are diminished since on the average twelve determinations were made of each interval on each plate.

2d. Errors due to neglecting hundredths of a magnitude, the computation so far being made only to tenths.

3d. Errors due to irregularities in the film which enter with their full value into the result.

Since the combined effect of these three sources of error is only ± 0.02, it is evident that neither of them can be large. The errors due to the film are in fact so small that there is no evidence that they exist and more delicate methods of measurements are required to render them perceptible.

Harvard College Observatory, 1898 Jan. 4.

Edward C. Pickering.

*) Harvard College Observatory Circular No. 22.

Anzeige.

Nachdem die Expedition in den Besitz des bisher in den Händen der Erben des früheren Herausgebers, Prof. C. A. F. Peters, befindlichen Depots der Astronomischen Nachrichten von Band 1–99 gelangt ist, sind auch Bestellungen von Bänden und Nummern aus dieser Serie an die Expedition der Astr. Nachr., Kiel, Wrangelstr. 6, zu richten.

Band 1–31 sind complet nicht mehr vorhanden, wohl aber eine grössere Anzahl Nummern aus diesen Bänden, welche im Austausch gegen andere ältere Nummern abgegeben werden können. Die Expedition sucht speciell Nummern aus den Bänden 2–11 und würde für Ueberlassung von solchen sehr dankbar sein.

Band 32 ist einzeln nicht mehr verkäuflich, dagegen werden von Band 33–99, ebenso wie von den späteren Bänden, soweit sie geschlossen sind, einzelne Exemplare zum Preise von 12 Mark pro Band abgelassen. Bei Abnahme einer grösseren Serie von Bänden tritt Preisermässigung ein, über welche in jedem besonderen Falle die Expedition Auskunft zu ertheilen bereit ist. Einzelne Nummern aus den Bänden von Band 32 an können, wenn vorräthig, behufs Completirung zum Preise von 60 Pf. von der Expedition bezogen werden.

Kiel 1898 Januar 25.

H. Kreutz.

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