

FAINT STARS WITH LARGE PROPER MOTIONS.—Mr. Furuhjelm's investigation of the proper motions of the stars in the Helsingfors astrographic zone (39° to 46° N. decl.), between R.A. 0h. and 12h., has already been noticed in NATURE. He has now published a smaller list (*Öfversigt af Finska Vetenskaps-Societeten's Förhandlingar*, Bd. lix., Afd. A., No. 22), which extends from R.A. 0h. to 24h., but includes only stars the annual proper motion of which is $0.5''$ or more. They are sixty-three in number, but the proper motions of more than half of these had already been published. However, more than twenty are new, being faint stars of the 10th or 11th photographic magnitude. They have been derived by the aid of the blink microscope from pairs of plates taken at intervals of several years. The author believes that the list contains all the stars in the zone down to the 11th magnitude, whose P.M. amounts to $0.5''$. In a separate publication he gives a detailed study of the faint star which he found in 1914 to have the same P.M. as Capella. His final result for its P.M. is $+0.0071s.$ in R.A., $-0.434''$ in decl., Boss's values for Capella being $+0.0082s.$, $-0.429''$. The place of the small star (the photographic magnitude of which is 10.6) for 1900.0 was 5h. 10m. $1.20s.$, $+45^{\circ} 44' 21.5''$, that of Capella being 5h. 9m. $18.04s.$, $+45^{\circ} 53' 47.0''$. The distance between them is $12' 4''$. Making allowance for the greater distance of Capella from the sun, the system shows a close analogy to that of α Centauri and its distant companion, which Mr. Innes has named Proxima.

PERIODICITY OF SOLAR RADIATION.—In continuation of the preliminary work of Clayton (NATURE, vol. c., p. 14), Dr. C. G. Abbot has made a further investigation of possible periodicities in the short-interval variations of the "solar constant" (Smithsonian Miscell. Collections, vol. lxxix., No. 6). The method adopted was to calculate the coefficients of correlation between the solar constants of given days and those of one to forty days later, as observed from 1908 to 1916. There appears to be no well-marked periodicity which persists through the whole period of observation, but some of the results for individual years are of interest. Thus, in 1915, a period of about twenty-seven days, doubtless associated with the solar rotation, was strongly shown, the observations suggesting that one side of the sun was hotter than the other during several rotations. This result is of considerable importance as furnishing additional evidence that the short-period variations are of truly solar origin. The year 1916 was unique in giving indications of a period of about $3\frac{1}{2}$ days.

THE SPECTRUM OF MIRA.—The bright lines recorded in the spectrum of Mira by Stebbins in 1903 have been further investigated by W. S. Adams and A. H. Joy (Pub. Ast. Soc. Pac., vol. xxx., p. 193). Some additional lines are shown in a photograph taken on March 2, but the principal interest attaches to the suggested identifications of the lines. Apart from the well-known lines of hydrogen, the bright lines appear to be mainly due to iron and magnesium, and in each case the lines involved are those which have their greatest intensity at low temperatures. The brightest line, next to the lines of hydrogen, is the magnesium line $\lambda 4571$, which is the most characteristic line of the flame spectrum. Similarly, the iron lines which occur are those of the low-temperature groups *a* and *b* of the classification of Gale and Adams. The lines in question make their appearance, or at least become more intense, as the star approaches its minimum of light, and it would seem that the radiating gases undergo a reduction of temperature as the star becomes fainter.

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THE NEW STAR IN AQUILA.

THE following estimates of brightness of Nova Aquilæ made by M. Paul Blanc at Fourcalquier are included in Circular No. 27 of the Marseilles Observatory:—

Date	h.	m.	Mag.	Date	h.	m.	Mag.
June 8	21	10	1.0	June 21	22	20	2.8
9	21	55	0	22	21		2.8
9	22	40	0.2	23	21	40	2.9
10	22	15	>1.0	24	21		3.0
13	22	15	1.0	25	21	15	3.3
14	21	45	1.2	27	22		3.9
15	22	15	1.5	28	22	50	3.9
18	21		2.3	29	21	20	3.6
19	21	30	2.3	30	22	50	3.6?
20	22		2.5				

Details are also given of determinations of the brightness of the nova in the wave-lengths 645, 558, and 412 made at Florence by M. Maggini. The observations indicate that the nova did not radiate as a black body.

The following collection of references to the history of the nova prior to the outburst in June has been communicated by Dr. C. Easton, of Amsterdam:—1892, August 14, Algiers Astrogr. Chart No. 341 (Zwiers), mag. 8.8; 1894, September 21, Barnard's Photographs of the Milky Way, Publ. of Lick Obs., vol. xi., plate 59 (Easton), mag. 10.5; 1895, June 26, Algiers No. 141 (Jonckheere), mag. 8.8; *id.*, 1909, August 20, mag. <8.8 (*vide* NATURE, No. 2537); 1909, June 20, M. Wolf, *Ast. Nach.*, No. 4949, mag. 10.5; 1910, Franklin Adams Chart, mag. <8.8; 1912, July, Bailey's N. Milky Way, Harvard Annals, vol. lxxx., No. 4 (Nijland). In Barnard's photograph of 1894 the nova is 20 mm. from the left, and 5.5 mm. from the bottom of the plate. Dr. Easton remarks that there seems to be sufficient evidence of the variability of the nova.

Messrs. I. Yamamoto and Y. Ueta, of the Kyoto University, inform us that they independently discovered the new star on June 11, during an expedition to observe the recent total eclipse of the sun. Owing to the rainy season very few observations were secured, but it was observed that the star became fainter and redder until June 29, when there was a slight recovery. The star is still easily visible to the naked eye, being now between the 4th and 5th magnitudes. On August 10 Prof. Fowler noted that the green nebular line was the most conspicuous feature of the visible spectrum.

Father Cortie sends the following records of observations on August 13 and 15. On the former date the star, according to Mr. Butterworth, was of magnitude 4.3 visually and 4.7 photographically. The maximum of brilliancy has shifted from the red to the green, and the image in the telescope has lost its ruddy hue, and is of a blue tint. In a McClean spectroscope H_{α} was very much reduced in brightness; a yellow line, presumably D, was seen, and vivid bright lines at 5007, H_{β} , 4640, and about H_{γ} . The following wave-lengths of the principal bright bands were determined from a photograph: 3867, H_{δ} , H_{ϵ} , H_{ζ} , 4363, 4640, 4680, 4713, H_{β} , 4958, and 5007. The bands about H_{γ} , and 4640 were the brightest. On August 15 H_{γ} and 4363 were the brightest. The mean width of the hydrogen bands is about 50 Ångström units. While the bands at H_{γ} and 4640 are triple in character, H_{β} is composed of a double band. The spectrum on the dates named was almost exactly like that of Nova Persei in August and September, 1901, when its magnitude was between 6 and 7.