

Your paragraph is otherwise correct, more so than one in a contemporary which said that Italian herdsmen were exterminating the flower; *they*, at all events, are not likely to show such Alpine prowess.

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Scientific Club, 7, Savile Row, W., August 13

OUR ASTRONOMICAL COLUMN

THE COLOURS OF α URSÆ MAJORIS AND ARCTURUS.—Mr. T. W. Backhouse, writing with reference to the periodical change of colour in α Ursæ Majoris, indicated by the observations of Herr Weber, of Peckoloh, of which mention was made recently in this column, remarks that after watching it for several months he concludes the variation must be very slight. Mr. Backhouse observed with a small binocular, power $2\frac{1}{2}$, with which he estimated the depth of colour as compared with β Ursæ Majoris and β Ursæ Minoris, which are respectively bluish and deep orange, not the actual colour of the star. Representing the difference between the two stars of comparison by a scale from 0 to 1, "the depth of colour of α Ursæ Majoris only varied from $\frac{1}{4}$ to $\frac{3}{4}$ on this scale, so that the whole range of its variations was less than $\frac{1}{2}$ of the difference between those two stars, probably not greater than can be accounted for by errors of observation. The greatest depth of colour, assuming β Urs. Maj. and β Urs. Min. not to vary, was observed on January 6, March 18, and April 11, which are not long after Weber's times of minimum." Mr. Backhouse adds that if any period is indicated by his observations, it is more likely to be one of three months than any other.

Herr Weber observed with a Steinheil achromatic of $2\frac{3}{8}$ inches aperture and $3\frac{1}{2}$ feet focal length, power, 90. For details the reader may consult *Astron. Nach.*, Nos. 1663 and 1773.

Writing on the subject of periodical variation in the colour of a fixed star, we recall some observations by Prof. Julius Schmidt, now director of the observatory at Athens, published upwards of twenty years since, from which he concluded that a very marked change of colour had taken place in the light of Arcturus at least in the year 1852, as compared with ancient observations, and indeed with quite recent ones. On March 21, 1852, while waiting for a meridian observation of Arcturus at the Observatory at Bonn, Prof. Schmidt remarked to his surprise, that this star, which for eleven years previously he had considered one of the most decidedly red stars in the heavens, was, to the naked eye, only yellowish white, or as he says, to speak more correctly, "matt graugelb." During the transit there was no ruddiness either in a dark or illuminated field, and on going out into the open air and comparing Arcturus with other stars of the first magnitude, he found it light yellow, even Capella showing more colour. A comparison with Mars, which he had often previously made since the year 1841, was no longer possible, as with reference to the colour of the planet, "Arcturus appeared as a white star." Thormann, on the same night, considered the star "a dirty yellow, like the colour of slightly tarnished brass." The star was often observed at Bonn in this year, and though Argelander was at first sceptical as to any variation of colour, at the end of March he was convinced that Arcturus "exhibited no deeper yellow tinge than Capella, and that red was entirely absent." On May 11 Schmidt considered there was hardly an appreciable difference in colour from that of Capella. He considered that the circumstance of the star having lost for a certain time in the year 1852 every trace of redness was no illusion, but was quite confirmed. Arcturus was one of the six $\nu\pi\omicron\kappa\iota\beta\beta\omicron\upsilon$ or fiery red stars of Ptolemy, in which list Sirius, now without a trace of ruddiness, was also included.

The difficulty and uncertainty attending observations on the colours of the stars are considerable for reasons which are sufficiently obvious. There is, perhaps, no more striking instance of the little

value attaching to isolated observations or observations not undertaken for the special object, than that afforded by the binary star γ Leonis, of which Struve says: "Est stella duplex in hemisphærio boreali pulcherrima et splendore et coloribus," and the colours he assigned in the "Mensuræ Micrometricæ," golden for the larger star, and greenish-red for the smaller one, have been repeated with trifling variation of terms by subsequent observers. Yet on the 'date of discovery of the duplicity of the star by Sir W. Herschel, February 11, 1782, we find he assigns for the colours "L. white, S. white, inclining a little to pale red," differences which, but for the reason just mentioned, might well countenance the idea of a total change in the colours of both components. It may be added that in γ Delphini, we have a very similar case.

THE SYSTEM OF 40 6° ERIDANI.—M. Camille Flammarion communicates some measures of 40 Eridani and its companions made early in the present year. For the epoch 1877'12, the following are the results of his observations:—

Stars AD	Position	$148^{\circ}0$	Distance	$37''2$
AE	"	339'2	"	109'9
AB	"	104'7	"	81'5
BC	"	130'0	"	4'' \pm

The secular proper motion of the star A is, according to

Struve, in R. A. ...	— 216'8 ...	in Decl. ...	— 342'3
Mädler, ,, ...	— 218'8 ...	,, ...	— 347'0

And as M. Flammarion remarks on allowing for the proper motion of the principal star, Prof. Winnecke's measures at the epoch 1864'84 compared with his own, show that the stars D and E do not form part of the physical system of 40 Eridani. His measures of A B agree with Struve's in proving that B, while partaking of the great proper motion of A, is yet approaching it slowly. C continues its rapid retrograde change of position with respect to B, the distance remaining nearly the same, and if the stars be regularly measured with powerful instruments, we must soon have sufficient data for an approximation to the elements of the orbit. When some one of the southern observatories possesses a heliometer, and we do not know of any instrumental addition to an establishment in a more southern latitude from which results of greater interest and importance in this branch of astronomy can be expected, the determination of the parallax of 40 Eridani, and it may be added of ϵ Indi ought to be amongst the first objects to which it is devoted.

THE THIRD RADCLIFFE CATALOGUE OF STARS.—In the late Annual Report of the Rev. R. Main, the Radcliffe Observer, to the Board of Trustees, it is stated that considerable progress has been made with the compilation of the third catalogue founded upon observations made at this important astronomical establishment, from 1862 to 1870, and additional assistance is proposed for its speedy completion, though no definite time is assignable for publication. The number of stars contained in the new catalogue is 4,389, or nearly twice the number included in the "second Radcliffe Catalogue," which was the first issued by the present director. The same Report mentions that the planet Mercury had been meridionally observed thirty-nine times during the year ending with June, 1877, a large number considering the difficulty attending the observations; but it is not the first time that the Radcliffe observer has had occasion to report successfully in this direction; some few years since we believe as many as forty-five observations were secured with the transit-circle in the course of the twelvemonth.

NEW MINOR PLANET.—A telegram from M. Stephan announces the discovery of a small planet by M. Borrelly, at Marseilles, on the 11th inst. At 8h. 35m. its R.A. was 21h. 19m. 50s., and N.P.D. $105^{\circ} 59'$; tenth magnitude.