On the Variability of α Cassiopeiæ. By W. R. Birt, Esq.

Some doubts having been expressed relative to the variability of *α Cassiopeiæ*, which I had the honour to discover in the year 1831, have induced me to give particular attention to the star during the preceding summer and autumn, the result of a very careful series of *eye-comparisons* fully confirming my previous conclusions as to the fact of the varying intensity of its light, although within narrow limits.

Sir John Herschel's determination of the magnitudes of γ, α, and β, in the table appended to his Cape Observations are as follows:—

γ 2·52, α 2·57, β 2·63;

In the course of my observations, extending from March 31 to December 1, 1859, I have seen α brighter than γ, and I have also observed it less than β, the most usual estimation of its magnitude being 2·57, that assigned to it by Sir John, this places it nearly midway between γ and β.

It is not my intention, in the *present communication*, either to attempt anything like a re-determination of the period, or to compare any of my observations during the past summer and autumn with those that I made in 1831, or others that are on record by various observers since, my object being to point out for the information of astronomers engaged with variable stars the epochs when I observed the star either brighter than the γ or less than the β. I have, however, attempted in the following tables to exhibit the *great irregularity* of the phases of brilliancy, indicating at the same time, in Table III., the progression from max. to min. and the reverse; the epochs of the *true* maxima, as well as brilliancy, as shown by a curve in most cases differing considerably from those greater brightnesses of the star which appear to be connected with a very remarkable feature which has been presented in the course of these observations: it is the alternation of brightness which the star has exhibited, even in the course of a single evening, nearly the same irregularity appertains to this feature as well as to the increase and decrease of brilliancy. The epochs of the principal instances are as under:—

1859, June 24 to July 7, August 19 to Sept. 1, Nov. 19 to 28.

On these occasions the light of the star has apparently been in a state of great fluctuation, nothing at all settled; one evening bright, the other dim; sometimes settled for a few hours, then suddenly brightening up or decreasing in its brilliancy; while on other occasions the course of the observations has been such as to induce the belief that for some little time, at least, the star has been steady at its brilliancy, very gradually increasing or

decreasing in brightness. During the alternations above alluded to, the γ and β have not appeared to participate, indicating that the alternations have rather occurred in connexion with the star itself than have been produced by fluctuations in our own atmosphere. On one or two occasions, but very rarely indeed, a suspicion has crossed my mind that both γ and β have exhibited a slight change of lustre, but nothing at all in any way comparable with the variations of α, the extent of which I estimate to be in accordance with Sir John Herschel's scale, about 0·3 of a magnitude.

Table I.

Epochs of greater brilliancy, the star nearly as bright or brighter than the γ.

1859.	G.M.T. d h m	Mag.	Interval days.	Remarks.
May	5 13 0	2·53		Sky very favourable.
	5 14 0		49·84	
June	24 10 0	2·50		Strong twilight.
	24 10 15		5·00	
June	29 10 15	2·45		Strong twilight.
			15·98	
July	15 9 45	2·50		Very clear, moon present.
			5·01	
July	20 10 0	2·47		Clear, moon present.
			29·95	
Aug.	19 9 0	2·52		Moon low.
			11·00	
Aug.	30 9 0	2·52		
			22·02	
Sept.	21 9 20	2·50		

Table II.

Epochs of minima or inferior brightness, the star generally less than β.

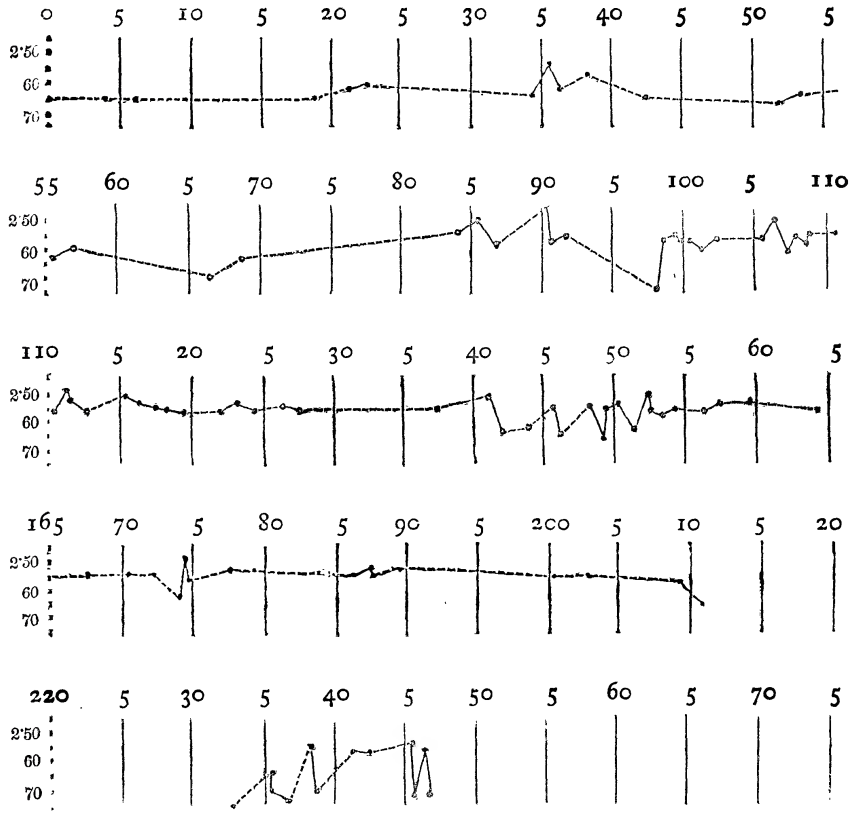
1859.	G.M.T. d h m	Mag.	Interval days.	Remarks.
April	19 10 15	2·65		Very clear.
			32·98	
May	22 9 45	2·65		Fine strong twilight.
			14·11	
June	5 12 30	2·70		Clear.
			31·92	
July	7 10 40	2·74		Moon just set.
			43·99	
Aug.	20 10 20	2·65		
			4·10	
Aug.	24 12 45	2·63		Clear, Milky way bright.
			2·84	
Aug.	27 9 0	2·65		
			25·07	
Sept.	21 10 40	2·65		
			36·02	
Oct.	27 11 0	2·67		
			22·83	
Nov.	19 7 0	2·74		

Table III.

Maxima and minima of α Cassiopeiæ, the maxima determined by the projection of a curve with intervals of increase and decrease.

1859.	Epoch of Min. d h m	Mag.	Interval days.	Epoch of Max. d h m	Mag.	Interval days.*
April	19 10 15	2·65	16·13	May 5 13 30	2·53	16·85
May	22 9 45	2·65	4·10	May 26 12 15	2·60	10·01
June	5 12 30	2·70	23·91	June 29 10 15	2·45	8·01
July	7 10 40	2·74	12·98	July 20 10 0	2·47	35·11
Aug.	24 12 45	2·65	18·08	Sept. 11 14 40	2·57	9·83
Sept.	21 10 40	2·65	14·83	Oct. 6 6 30	2·55	21·19
Oct.	27 11 0	2·67		No observation.		

Curve of the variation of the brightness of α Cassiopeiæ from March 31 to Dec. 2, 1859.



0 = March 31, 1859. Brightness of γ Cass. = 2·52, of β Cass. 2·63.

* Intervals between the maxima and *succeeding* minima.