ADDENDUM.

A note on this variable by Miss ANNIE J. CANNON in *Harvard Bulletin* **837** contains 2 more observations made during eclipse, viz: J. D. hel. M. T. Grw. 2416972·666, $11^m·5$ and 2418029·769, $11^m·4$, giving the phases according to my formula (2) to be $23^p·0010$ and $29^p·0063$ respectively. The corresponding points on Figure 1 are indicated by open circles. If the formula (2) is materially correct, the first of these 2 additional observations would mean, that the variable is constant during minimum for about ·01 of the period, but further material is needed to decide this point.

Light curves for YZ, VY, XZ and CT Carinae, by *F. W. Sohon.*

In view of the apparent connection exhibited between the shape of the light curve and the period of variable stars of δ Cephei type, it was thought well to determine the forms of these curves for certain variables whose periods should lie between 16.33 and 23.00 days, and thus fill a gap that was left in the original communication of Prof. HERTZSPRUNG on the subject in *B. A. N.* **96.** The special feature making desirable the determination of the form of the curve for stars of intermediate period, is the abrupt rise from minimum to maximum that was to be found in the case of those stars that have a period of about 23 days. In the curves for stars with a period of from 14 to 16 days an abrupt rise, indeed, also immediately precedes the maximum, but this takes place only during the latter part of the rising branch, not directly after the minimum phase has occured.

Four variables of the δ Cephei type with periods between 16^d and 19^d are shown on the plates of the η Carinae region. One of these stars, CT Carinae, has so far only been estimated on 91 Johannesburg plates. (*B. A. N.* **56.**) Three others YZ, VY and XZ are taken from Harvard Circular 170.

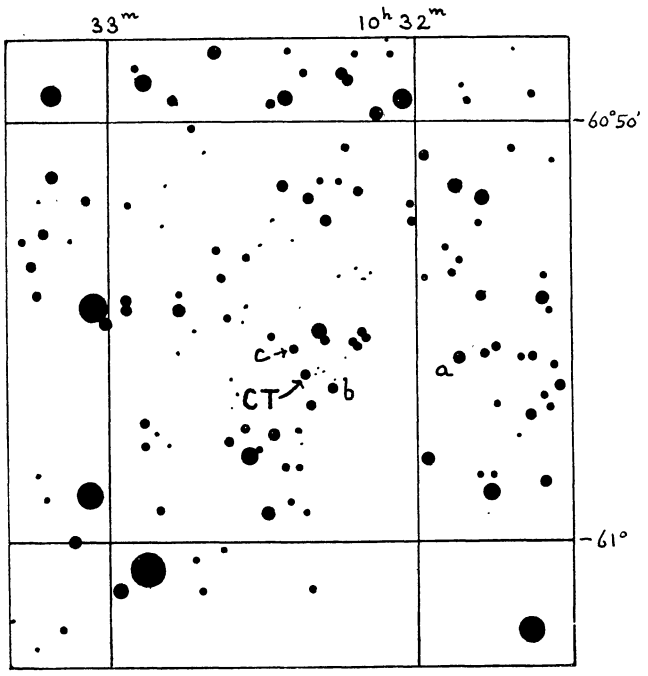
Star	C. P. D.	R. A.	Dec.	Adopted Period	Max.	Min.	Sp.
	° m	h m s	° ′	d	m	m	
YZ Car.	−58 2234 9.1	10 23 43.5	−58 42.7	18.159	9.0	10.7	G5
VY „	−56 3737 8.2	10 39 35.9	−56 57.0	18.984	7.8	9.2	G5
XZ „	−60 2497 9.4	10 59 5.0	−60 18.2	16.639	8.6	10.7	—
CT „		10 32 22.9	−60 55.9	18.078			

Estimates were made visually of the relative brightness of images of these stars on the same plates of the η Carinae region as were used by St. SZELIGOWSKI (*B. A. N.* **106**). The mean epoch of these plates is about J. D. 2424010. Arbitrary step values were assigned to neighbouring stars for purposes of comparison and these are given below.

The positions of the comparison stars used in connection with CT Carinae, which do not occur in the C. P. D., will be seen from the diagram.

Difficulty was experienced in estimating bright star images, especially when the colour of the variable

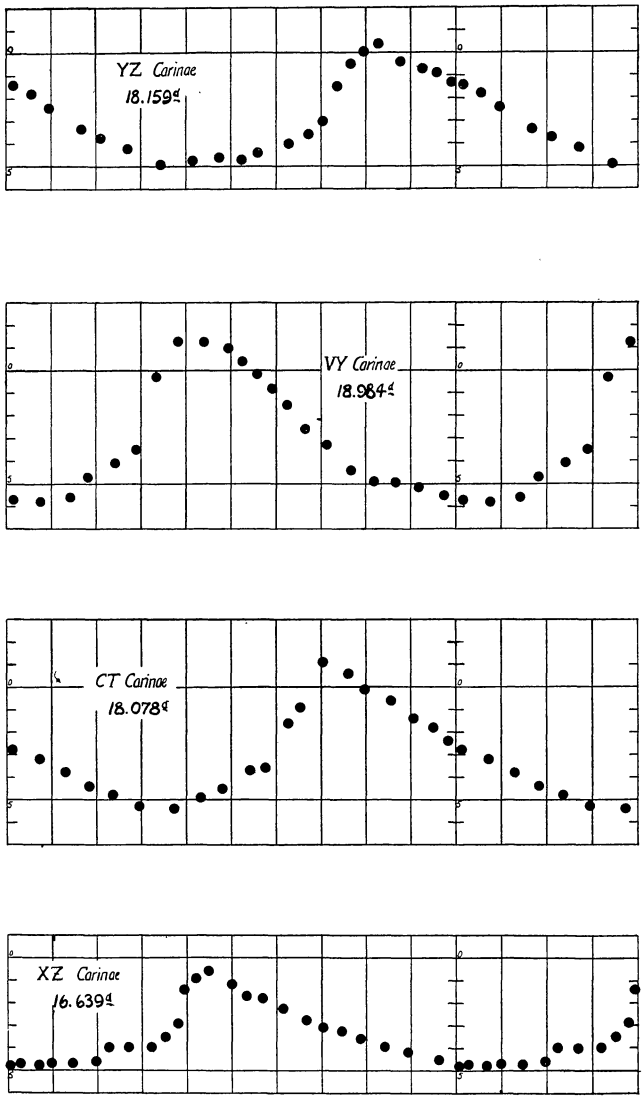
Variable Star	Comparison Stars	Sp.	Value assigned
	° m		
YZ Car	−58 2226 9.8	—	5
	−58 2229 8.9	B	0
VY Car	−56 3728 8.8	Fo	5
	−57 3731 8.6	B5	0
XZ Car	−60 2492 9.7		5
	−60 2498 8.5	B	0
	−60 2510 8.8		3
CT Car	a		0
	b		3
	c		5



differed markedly from that of the comparison stars. This difficulty was most noticeable in the case of VY Carinae. The light curve has been drawn with the adopted period of $18^d.984$, although a better representation of the rising branch of the curve was obtained when the period $18^d.940$ was tried. The flatness of the maximum, as well as the small range of variation obtained, suggests that the crest should perhaps have been considerably higher. Taking these difficulties into consideration it was decided, pending a more accurate determination of magnitudes for the comparison stars, to plot tentatively in terms of the arbitrary steps used in making the estimates. The following rather uncertain relations between the scale of steps used and the photographic Harvard scale were derived by comparison with the *C. P. D.* magnitudes as reduced to the Harvard scale according to the *Harvard Annals* Vol. **80.** In the case of VY the derived value of a single step is seen to be only $0^m.06$; this is due to the fact that, although the comparison stars were chosen of nearly the same brightness, the step interval was still taken as 5 steps. Even so, no greater estimate than — 2 was obtained.

$$\text{YZ Car. } m = 9.30 + 0.30\,s$$
$$\text{VY Car. } m = 8.80 + 0.06\,s$$
$$\text{XZ Car. } m = 8.25 + 0.42\,s$$

The phases have been calculated according to the formulas:



YZ Car. : P = .055068 (J.D. hel. M.T. Grw. — 2420000)
VY Car. : P = .052676 (J.D. hel. M.T Grw. — 2420000)
XZ Car. : P = .0601 (J.D. hel. M.T. Grw. — 2420000)
CT Car. : P = .055315 (J.D. hel. M.T. Grw. — 2420000)

The estimated steps are given in the table on the next page, and are represented in the diagrams.

The net result seems to be that in each case there is a hesitation in the rise from minimum to maximum, similar to that shown by stars of period about 14 days; that the hesitation is most marked in the case of XZ Car., which has the shortest period of the four. It would further seem that the hesitation is generally less pronounced and occurs gradually at a lower luminosity, as the period increases. It has finally disappeared entirely when the period has reached 23 days.

YZ Carinae			VY Carinae			CT Carinae			XZ Carinae		
n	*P*	*s*	*n*	*P*	*s*	*n*	*P*	*s*	*n*	*P*	*s*
30	.016	1.40	30	.027	5.72	30	.021	2.80	10	.006	4.84
30	.056	1.78	30	.080	5.78	30	.074	3.21	30	.028	4.67
30	.095	2.38	30	.143	5.58	30	.130	3.73	30	.070	4.83
30	.169	3.35	30	.181	4.65	30	.183	4.41	30	.097	4.70
30	.210	3.77	30	.244	4.08	30	.230	4.73	20	.146	4.70
30	.270	4.17	30	.290	3.50	30	.299	5.30	20	.176	4.55
30	.344	4.88	30	.336	0.30	30	.373	5.43	20	.199	4.60
30	.415	4.78	20	.382	— 1.30	30	.431	4.93	20	.225	3.95
30	.474	4.62	30	.440	— 1.28	30	.480	4.53	30	.270	3.97
30	.523	4.67	30	.496	— 0.95	30	.544	3.73	30	.321	3.97
30	.560	4.43	20	.525	— 0.38	30	.579	3.63	10	.353	3.50
30	.596	4.40	30	.559	0.22	30	.627	2.57	10	.370	2.87
30	.629	4.00	30	.591	0.82	30	.652	0.93	10	.394	1.40
20	.672	3.62	30	.624	1.48	30	.701	— 1.13	10	.420	0.95
20	.703	3.02	30	.665	2.63	30	.752	— 0.60	20	.449	0.63
20	.737	1.48	30	.712	3.25	30	.798	0.07	30	.501	1.23
20	.765	.52	30	.768	4.38	30	.856	0.60	10	.534	1.65
20	.796	— .05	20	.818	4.85	30	.906	1.40	30	.570	1.77
20	.828	— .38	30	.869	4.92	30	.950	1.83	30	.616	2.27
20	.878	.40	30	.920	5.15	18	.984	2.39	30	.668	2.80
20	.925	.70	34	.975	5.52	588			30	.703	3.13
20	.958	.88	604						30	.744	3.33
27	.990	1.26							30	.789	3.60
597									30	.841	3.90
									30	.894	4.20
									28	.963	4.52
									608		

ERRATA.

The declination of the eclipsing variable star *B.A.N.* **65***c* = DP Car. should be $-57°47'.1$ (1875) instead of $-59°47'.1$.

B.A.N. **77**, p. 209, Table I *for* J. D. hel. M. T. Grw. *read* J. D. M. T. Grw.