Estimates of BS Carinae made by W. S. Finsen and used for the derivation of provisional elements of this variable of W Ursae majoris type, by *Ejnar Hertzsprung*.

This star, $10^h43^m29^s{\cdot}5$, $-62°17'{\cdot}9$ (1875) is mentioned in *Circular* No. 46 of the Union Observatory as being probably of Algol-type. I therefore intended to include it in my investigation on eclipsing variable stars in the region of η Carinae, but as the examination of some plates did not convince me of the variability of this faint star, I gave it up. When however Mr. W. FINSEN asked me for work, I proposed him to take up this object, which he then estimated on 342 of my plates. After some unsuccessful trials Mr. FINSEN declared that he was not able to make anything out of the material, though he felt certain of the variability.

The estimates were made in steps on an arbitrary scale, the comparison stars being

a:	$10^h43^m30^s{\cdot}6$,	$-62°17'{\cdot}5$ (1875)	$1^s{\cdot}0$
b:	32·8	17·8	2.0

The frequencies of the different estimates were as follows:

estimate	·5	·6	·7	·8	·9	1·0	1·1	1·2	1·3	1·4	1·5	1·6	1·7	1·8	1·9	2·0
number	3	5	23	27	32	99	36	21	7	12	23	25	6	11	7	5

I then picked out the epochs, when the star was most certainly found faint, preferably on two consecutive plates. These epochs were following:

J. D. hel. M. T. Grw.	*E*	*O* — *C*
d		d
2423790·555	0	+ ·016
3813·493	157	— 8
3814·532	164	+ 7
3830·485	273	+ 19
3844·330	368	— 30
3857·348	457	— 29
3858·245	463	— 9
3876·402	587	+ 12
3878·465	601	+ 28
3879·307	607	— 8
3885·300	648	— 11
3916·330	860	+ 13
3939·278	1017	— 1
3944·253	1051	+ 2

From this table the period was estimated to be between $^d{\cdot}146$ and $^d{\cdot}147$. A least square solution, using the counting of epochs as indicated in the table, gave the formula:

$$\text{Min. J. D. hel. M. T. Grw. } 2423866^d{\cdot}298 + {}^d{\cdot}146253$$
$$\pm{\cdot}005 \pm {\cdot}000016 \text{ (m. e.)}$$

From the residuals $O - C$ the mean error of one epoch of minimum is found to be $\pm^d{\cdot}018$.

The phase of each observation was then calculated, expressed in fractions of the period, from the formula:

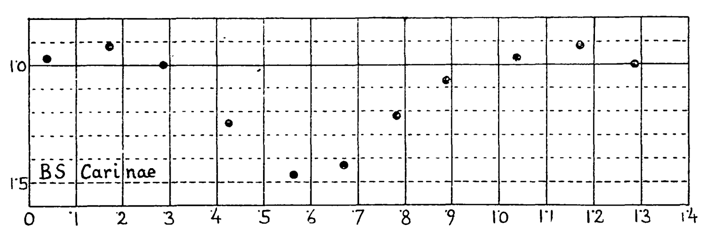
P = 6·8374447 (J. D. hel. M. T. Grw. — 2420000).

The 339 estimates, leaving out 3 marked as very doubtful, were then arranged according to phase and the following mean values found:

n	P	s	n	P	s	n	P	s
10	·000	·89	10	·309	·99	10	·697	1·48
10	·025	1·06	10	·338	1·03	10	·730	1·18
10	·043	·96	10	·369	1·22	10	·776	1·38
10	·064	1·04	10	·395	1·35	10	·808	1·09
10	·097	·85	10	·427	1·24	10	·838	1·13
10	·137	·95	10	·459	1·33	10	·864	1·18
10	·160	·89	10	·481	1·13	10	·885	1·17
10	·182	·96	10	·514	1·41	10	·911	·91
10	·205	·89	10	·569	1·48	10	·945	·96
10	·237	1·00	10	·610	1·53	9	·982	1·01
10	·259	1·02	10	.633	1·38			
10	.284	·98	10	·680	1.42			

From this the 8 normal places, which are represented graphically in the accompanying diagram, were derived, viz.

n	59	40	50	50	30	30	30	50
P	·038	·171	·286	·426	·564	·670	.772	·889
s	·97	·92	1·00	1·25	1·47	1·43	1·22	1·07



From the differences between estimates following each other in phase, the m. e. of a single observation was found to be $\pm\,^s{\cdot}28$. The range is $1^s{\cdot}55 - {}^s{\cdot}92 = {}^s{\cdot}63$ or only 2·25 times as large.