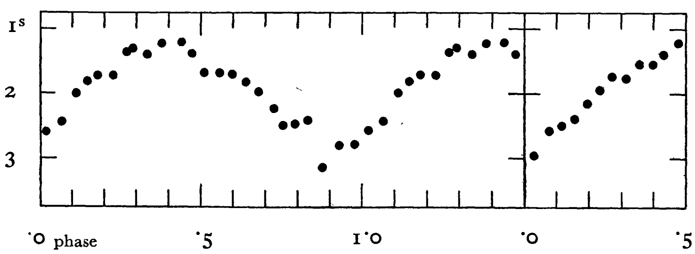
Phases have been computed with the aid of the formula:

$$\text{phase} = 6^{d-1}\cdot552288 \text{ (J. D. — 2420000)}$$

From the differences in brightness between observations following each other in phase the mean



error of a single estimate was found to be $\pm$ ^{s}·7 or about $\pm$^{m}·09. Then a mean light curve was computed, which is given in tabular form in Table *2a* and shown in the left part of the figure. It is characteristic for a variable of the W UMa type, the minimum being decidedly sharper than the maximum. The total range is very small, only 1^{s}·6 or just over ^{m}·2. This latter value is based on the measurements in the photometer, but the value of ^{m}·3 given by HERTZSPRUNG seems more likely.

TABLE *2b*.

mean phase	mean brightness	*n*
P	s	
·026	2·97	52
·073	2·60	52
·113	2·52	52
·153	2·42	52
·194	2·17	52
·234	1·95	52
·270	1·74	52
·314	1·77	52
·357	1·56	52
·396	1·56	52
·432	1·39	51
·476	1·22	51

The phase of minimum brightness, calculated from the whole light curve, is ^{P}·900. Finally a mean light curve has been computed by counting the phase from minimum without regard to sign. The details of this light curve are listed in Table *2b* and it is shown in the right-hand part of the figure.

Improved elements for the eclipsing variable DW Carinae,

by *Miss E. van den Hoven van Genderen.*

In *B.A.N.* No. 65 (*m*) E. HERTZSPRUNG announced the variability of the star C.P.D. — 59°2517, which is situated at a distance of only 15′ from the centre of the η Carinae nebula. From estimates on 251 plates he found the variable to be of the eclipsing type with a period of ^{d}·66382. The minimum is very broad and occupies ·35 of the period.

Because of the considerable increase in the number of plates the variable has been estimated by the writer on all the plates now available. The estimates were rather difficult on account of the nebula in which the stars are imbedded. The three following comparison stars have been used:

			s
a	C.P.D.	— 59°2507	·0
b	,,	— 59 2496	4·8
c			8·4

During minimum the variable is only little fainter than b. The difference in magnitude between a and b was found to be 1^{m}·2 from measurements made by Mr. C. J. KOOREMAN in the Schilt microphotometer on five plates taken with a coarse grating in front of the objective. Therefore one step corresponds approximately with ^{m}·25. From the 914 estimates 63 epochs of minimum were derived, which have been used for the computation of an ephemeris. The solution according to the method of least squares yields the following result:

$$\text{J. D. } 2424550^{d}\cdot362 + {}^{d}\cdot6638741 \text{ (E — 1149)}$$
$$\pm \;\; 5 \qquad \pm \;\; 24 \quad \text{(m.e.)}$$

The details of this solution are given in Table 1.

Phases were then computed with the formula:

$$\text{phase} = 1^{d-1}\cdot50631 \text{ (J. D. — 2420000)}$$

From the differences in brightness between observations following each other in phase, the mean error of a single estimate was found to be $\pm$ ^{s}·75 or about $\pm$ ^{m}·19.

The mean light curve is shown in the accompanying figure. The mean phase, the mean brightness and the number of observations for each normal point are given in Table *2a*. The minimum occupies at least ·45 of the period and evidently the period given above must be doubled in order to obtain the period of revolution. No difference in depth could be found between even and odd minima. The range is 2^{s}·8 or ^{m}·7. There is no evidence for ellipticity of the components as the brightness remains constant between phases ·55 and ·95.

TABLE I.

minima J. D. hel. M.A.T.Gr. — 2420000	epoch	O - C	minima J. D. hel. M.A.T.Gr. — 2420000	epoch	O - C
d		d	d		d
3787·53	0	— ·04	3970·23	275	+ ·09
89·53	3	— 3	4141·50	533	+ 8
91·53	6	— 2	76·60	586	0
99·51	18	— 1	90·43	607	— 11
3813·49	39	+ 3	98·51	619	0
15·44	42	— 1	4204·53	628	+ 5
17·46	45	+ 1	06·45	631	— 3
41·33	81	— 2	38·28	679	— 6
45·31	87	— 2	58·26	709	0
57·30	105	+ 2	62·24	715	0
71·24	126	+ 2	66·24	721	+ 2
78·50	137	— 2	4538·46	1131	+ 5
3902·42	173	0	50·37	1149	+ 1
04·41	176	0	5380·27	2399	+ 6
10·31	185	— 8	5447·21	2500	— 5
16·35	194	— 1	5686·26	2860	+ 1
28·30	212	— 1	5731·36	2928	— 3
30·30	215	0	73·24	2991	+ 2
32·29	218	— 1	75·23	2994	+ 2
34·27	221	— 2	77·21	2997	+ 1
36·29	224	+ 1	5922·56	3216	— 3
38·24	227	— 3	50·48	3258	+ 1
40·24	230	— 2	6120·41	3514	— 1
42·24	233	— 1	26·30	3523	— 10
44·20	236	— 5	6476·29	4050	+ 3
46·27	239	+ 3	6855·37	4621	+ 4
48·25	242	+ 2	83·22	4663	0
56·23	254	+ 3	7427·57	5483	— 2
58·20	257	+ 1	9097·23	7998	— 1
60·23	260	+ 5	9105·21	8010	+ 1
62·22	263	+ 5	07·21	8013	+ 2
64·23	266	+ 7			

From the observations between the phases ·89 and ·63 the phase of minimum was found to be ·2593. By counting the phases from minimum without regard to sign a reflected mean light curve has been constructed, the details of which are given in Table 2*b* and shown in the right part of the figure.

The mean density of the two components of this eclipsing system, expressed in the sun's mean density, is found to be ·055 for $i = 90°$, if the components are assumed to be equal and if the fraction of the period covered by each minimum is taken as ·30.

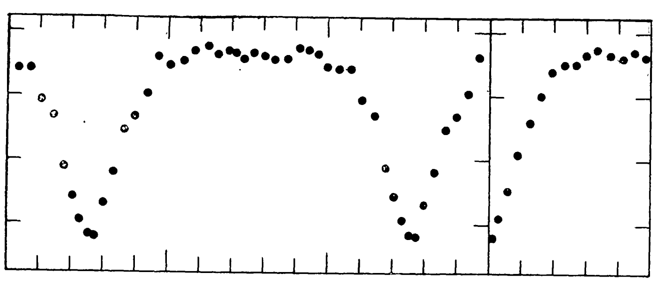


TABLE 2*a*.

mean phase	mean brightness	*n*
P	s	
·0311	2·60	30
·0695	2·60	30
·1053	3·07	30
·1421	3·33	30
·1788	4·13	30
·2053	4·57	30
·2276	4·95	20
·2505	5·17	30
·2738	5·20	20
·2997	4·70	30
·3305	4·20	30
·3651	3·53	30
·3998	3·33	30
·4333	2·97	30
·4685	2·40	30
·5063	2·53	30
·5479	2·47	30
·5852	2·30	30
·6249	2·23	30
·6574	2·37	30
·6906	2·30	30
·7123	2·33	30
·7376	2·43	30
·7696	2·33	30
·8027	2·37	30
·8357	2·44	32
·8747	2·43	32
·9100	2·27	30
·9408	2·30	30
·9666	2·37	30
·9959	2·57	30

TABLE 2*b*.

mean phase	mean brightness	*n*
P	s	
·0096	5·22	40
·0303	4·90	50
·0576	4·48	60
·0873	3·93	60
·1236	3·42	60
·1582	3·00	60
·1941	2·62	60
·2303	2·52	60
·2685	2·50	60
·3005	2·35	60
·3335	2·27	60
·3711	2·36	71
·4142	2·40	73
·4474	2·31	70
·4816	2·40	70