TABLE 3 *(continued)*

J. D. Hel. − 2430000	phase	Δm	J. D. Hel. − 2430000	phase	Δm	J. D. Hel. − 2430000	phase	Δm	J. D. Hel. − 2430000	phase	Δm
d	P	m	d	P	m	d	P	m	d	P	m
1330·4821	·194	− ·55	1671·4869	·211	− ·76	1739·4175	·708	− ·06	1797·3500	·105	− ·52
·4834	·212	− ·61	·4883	·230	− ·60	·4189	·727	− ·06	·3514	·124	− ·58
·4848	·231	− ·54	·4897	·250	− ·70	·4203	·746	− ·14	·3528	·143	− ·63
·4862	·250	− ·62	·4911	·269	− ·63	·4217	·765	+ ·03	·3541	·161	− ·69
·4876	·269	− ·53	·4925	·288	− ·54	·4231	·784	− ·06	·3555	·180	− ·67
·4890	·288	− ·59	·4939	·307	− ·51	·4245	·803	− ·06	·3569	·200	− ·59
·4904	·308	− ·54	·4953	·326	− ·51	·4259	·823	− ·04	·3583	·219	− ·63
·4918	·327	− ·41	·4966	·344	− ·44	·4272	·841	+ ·03	·3597	·238	− ·65
·4931	·345	− ·36	·4980	·364	− ·51				·3611	·257	− ·69
·4945	·364	− ·40	·4994	·383	− ·43	plate *6771*			·3624	·275	− ·51
·4959	·383	− ·26	·5008	·402	− ·37				·3642	·300	− ·50
·4973	·402	− ·23	·5022	·421	− ·39	1797·3334	·877	·00	·3659	·323	− ·53
						·3347	·895	− ·03	·3673	·342	− ·43
plate *6736*			plate *6761*			·3361	·914	− ·03	·3687	·361	− ·31
						·3375	·934	− ·07	·3701	·381	− ·33
1671·4745	·041	− ·38	1739·4065	·557	− ·13	·3390	·953	− ·06	·3714	·399	− ·27
·4759	·060	− ·42	·4079	·576	− ·17	·3403	·972	− ·11	·3728	·418	− ·24
·4772	·078	− ·50	·4092	·594	− ·18	·3417	·991	− ·14	·3742	·437	− ·19
·4786	·097	− ·59	·4106	·613	− ·15	·3431	·010	− ·22	·3756	·456	− ·22
·4800	·117	− ·71	·4120	·632	− ·03	·3444	·028	− ·26	·3770	·475	− ·19
·4814	·136	− ·84	·4134	·651	− ·11	·3458	·047	− ·37	·3784	·495	− ·14
·4828	·155	− ·82	·4148	·670	− ·10	·3472	·067	− ·43	·3798	·514	− ·19
·4842	·174	− ·80	·4162	·690	+ ·01	·3486	·086	− ·48	·3811	·532	− ·04
·4856	·193	− ·72									

A new Algol variable which probably shows orbital eccentricity, by *C. H. D. Steinmetz.*

The Algol variable treated here has a primary minimum with a range of $1^m·7$. A secondary minimum with a depth of about $^m·2$ is well indicated. Its position deviates considerably from the phase midway between the primary minima, indicating a minimal orbital eccentricity of ·19. A further confirmation is, however, much to be desired, as the present material is not conclusive.

The present variable of the Algol type was discovered by the writer when comparing Johannesburg plates in the blink microscope of the Kapteyn Astronomical Laboratory at Groningen.

The co-ordinates for 1875 are:

$$\alpha = 8^h\ 1^m\ 47^s·6$$
$$\delta = -25^\circ\ 10'·3$$
$$\lambda = 203^\circ$$
$$\beta = +3^\circ.$$

The star was estimated on 347 plates covering a field of 10° × 10° round 11 Puppis, which have been taken with the Johannesburg Franklin – Adams camera by Dr H. VAN GENT, Dr A. DE SITTER and Dr W. CHR. MARTIN.

FIGURE 1

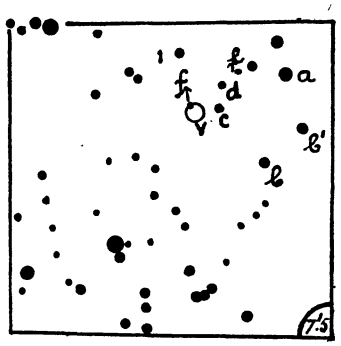

TABLE 1

Comp. star	Brightness (estimates)	Brightness (measures)	Brightness (star counts *Gr. Publ.* 43)
	s	m	m
a	0·00	− ·51	13·3
b	3·29	+ ·12	13·8
c	6·21	+ ·49	14·4
b'	—	− ·09	—
d	10·00		14·8
e	13·57		—
f	15·78		15·2

Figure 1 is a sketch of the surroundings of the variable showing the position of the comparison stars. In Table 1 details concerning the brightness of the comparison stars in steps and in magnitudes are given. The magnitudes were derived from star counts by the aid of *Groningen Publication* No. 43. Comparison star f is rather close to the variable, which circumstance disturbs the determination of the brightness near the maximum.

The period was determined from observations on rising and descending branches of the primary minimum and the following ephemeris was found:

J.D. Hel. M.A.T. Grw. of primary minimum =

$$2425969^d·466 + 3^d·56697$$
$$\pm\ 27 \quad \pm\ 12 \text{ (m.e.)}$$

TABLE 2

J. D. Hel. M.A.T. Grw. − 2420000	Phase	Brightness (measures)	Brightness (estimates) $\frac{(-\cdot51+\cdot17s)+m}{2}$	J. D. Hel. M.A.T. Grw. −2420000	Phase	Brightness (measures)	Brightness (estimates) $\frac{(-\cdot51+\cdot17s)+m}{2}$
	P	m	s m		P	m	s m
5739·2529	·000	− ·27	1·4 − ·27	6014·4266	·144	+ ·01	5·0 + ·18
6338·5230	·005	− ·06	1·9 − ·12	5643·4687	·146	− ·22	3·3 − ·08
5564·5044	·009	− ·26	1·4 − ·26	6064·3732	·147	− ·04	3·3 ·00
5564·5262	·015	− ·27	1·7 − ·24	6014·4485	·151	− ·06	3·3 ·00
6010·4016	·016	− ·24	3·3 − ·10	5643·4909	·153	− ·13	3·3 − ·04
5646·5824	·019	− ·39	1·9 − ·29	6014·4703	·157	− ·06	4·1 + ·06
6306·4710	·019	− ·25	1·7 − ·24	6303·4118	·161	− ·18	2·4 − ·14
6306·4945	·026	− ·22	2·4 − ·16	6014·4921	·163	− ·10	3·3 − ·02
5614·5289	·033	− ·36	1·1 − ·34	6303·4357	·163	− ·32	1·4 − ·30
6028·3092	·036	− ·41	0·9 − ·38	6014·5143	·169	− ·12	3·3 − ·04
5707·2788	·036	− ·05	2·8 − ·04	5561·5086	·169	− ·16	1·7 − ·19
6010·4726	·036	− ·46	1·7 − ·34	5561·5307	·175	− ·16	1·9 − ·18
6299·4145	·041	− ·24	1·7 − ·23	6014·5364	·175	− ·21	2·4 − ·16
5707·3003	·042	− ·07	2·4 − ·08	5654·2990	·183	− ·17	2·4 − ·14
6028·3310	·043	− ·33	1·9 − ·26	5654·3205	·189	− ·29	2·4 − ·20
6299·4363	·047	− ·24	1·7 − ·23	5950·3920	·192	− ·09	3·8 + ·02
5971·3007	·054	− ·29	1·7 − ·26	5654·3422	·195	− ·33	2·4 − ·22
5996·2833	·058	− ·28	2·2 − ·21	5704·2824	·196	− ·03	3·3 + ·01
5507·6121	·059	− ·04	2·8 − ·04	5950·4138	·199	− ·04	2·6 − ·06
6249·5461	·060	− ·20	1·7 − ·21	6303·5479	·200	− ·41	2·1 − ·28
5532·5884	·061	− ·06	2·4 − ·08	5704·3042	·202	+ ·02	3·3 + ·04
6324·4548	·061	− ·34	1·4 − ·30	6303·5697	·206	− ·34	1·9 − ·26
5996·3051	·064	− ·10	2·6 − ·08	6000·3818	·207	− ·10	2·4 − ·10
6249·5679	·066	− ·22	2·4 − ·16	5704·3260	·208	+ ·01	3·3 + ·03
6324·4766	·067	− ·28	1·7 − ·25	6000·4036	·213	− ·11	1·7 − ·16
9399·2040	·067	− ·16	2·1 − ·16	5653·4106	·214	− ·18	1·4 − ·22
5650·3228	·068	− ·24	2·2 − ·19	5653·4322	·220	− ·27	1·7 − ·24
5650·3450	·074	− ·19	2·4 − ·14	5968·3313	·222	− ·27	2·2 − ·20
9399·2282	·074	− ·27	1·9 − ·23	5968·3535	·228	− ·40	1·7 − ·31
5971·3911	·079	− ·41	1·7 − ·32	5943·4439	·244	− ·27	1·9 − ·23
9399·2483	·079	− ·47	1·9 − ·33	5893·5076	·245	− ·20	1·7 − ·21
9399·4129	·084	− ·16	1·9 − ·18	6093·2609	·246	− ·26	1·7 − ·24
5971·4129	·086	− ·34	1·7 − ·28	6264·4881	·249	− ·17	1·7 − ·20
5650·4139	·094	− ·16	2·1 − ·16	5943·4660	·251	− ·24	1·7 − ·23
5650·4357	·100	− ·17	1·9 − ·18	5893·5296	·251	− ·15	2·1 − ·15
5971·4805	·105	− ·48	2·2 − ·31	6093·2827	·252	− ·28	2·2 − ·21
6039·2915	·115	− ·09	4·5 + ·04	6264·5099	·255	− ·30	1·7 − ·26
5650·5036	·119	− ·21	1·8 − ·20	6036·2545	·264	− ·14	1·7 − ·18
6039·3133	·121	− ·03	3·3 + ·01	6036·2761	·270	− ·23	1·7 − ·22
5650·5254	·125	− ·10	2·4 − ·10	6086·2133	·270	− ·29	1·7 − ·26
6089·2665	·126	− ·25	2·2 − ·20	5615·3761	·271	− ·18	2·2 − ·16
6014·3605	·126	− ·08	3·8 + ·03	6086·2355	·276	− ·31	2·0 − ·24
5568·4948	·128	− ·33	1·7 − ·28	8219·3083	·283	− ·31	2·0 − ·24
6089·2887	·132	− ·17	2·1 − ·16	5715·2990	·284	− ·15	2·4 − ·12
6014·3823	·132	+ ·01	3·3 + ·03	7748·4740	·285	− ·19	3·3 − ·07
5568·5170	·134	− ·19	2·2 − ·16	8219·3298	·289	− ·25	3·3 − ·10
6014·4041	·138	− ·07	3·3 − ·01	7748·4955	·291	− ·15	3·3 − ·05
6007·2692	·138	− ·15	2·4 − ·12	5683·2669	·304	− ·16	2·4 − ·13
6064·3514	·141	− ·15	4·5 ·00	5758·1859	·307	− ·35	1·9 − ·27
6310·4799	·143	− ·28	3·3 − ·12	9407·2034	·309	− ·39	0·9 − ·38
6007·2910	·144	− ·13	2·2 − ·14	5683·2887	·310	− ·21	2·4 − ·16

The brightness in steps was then plotted against the phase calculated according to the formula:

$$\text{phase} = {}^{d-1}\cdot28035\,(\text{J.D. Hel. M.A.T. Grw.} - 2420000).$$

The phase of the primary minimum is ·532. Near phase ·15 a slight depression is apparent, which if interpreted as a secondary minimum indicates an eccentric orbit.

The star, thus being of unusual interest, was submitted to a more thorough investigation by measuring the plates at phases between ·000 and ·310 in the Schilt photometer.

The estimates have been reduced to magnitudes by means of the relation $m = -\cdot51 + \cdot17\,s$.

Table 2 gives the results from individual plates.

Table 3 and Figure 2 show mean results of phase and brightness of the complete light-curve derived from estimates alone.

The ranges of the primary and secondary minimum are about $1^m\cdot7$ and $^m\cdot2$ respectively, the photographic magnitude at maximum being $13^m\cdot5$.

As the accuracy of the measures is about the same as that of the estimates, which fact probably is due to the disturbing influence of comparison star f on the

FIGURE 2

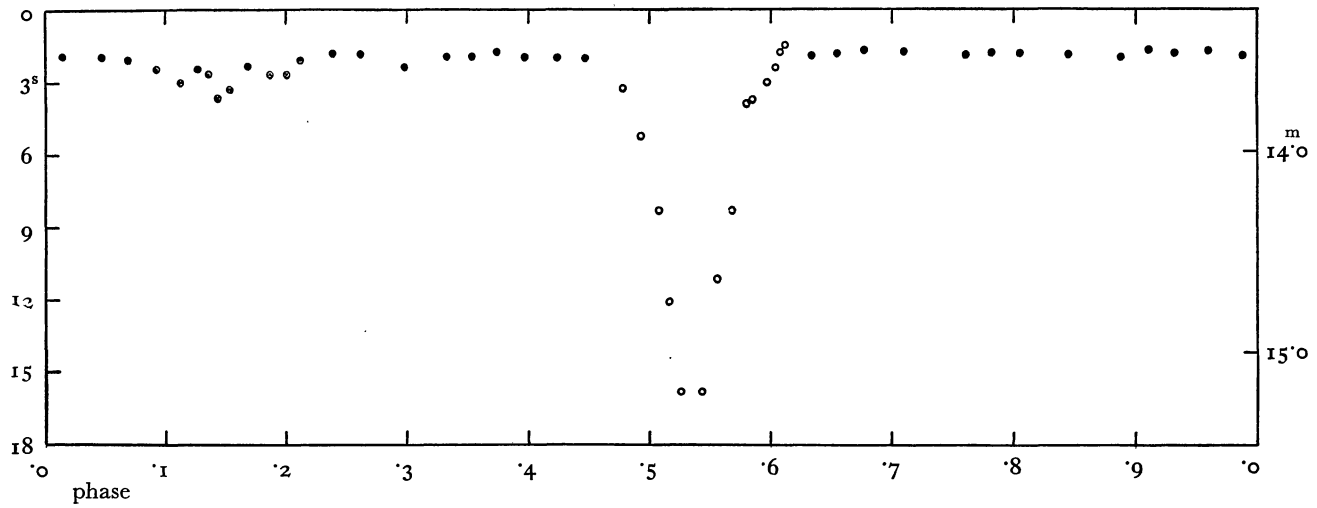

TABLE 3

n	mean phase	mean brightness (estimates)	n	mean phase	mean brightness (estimates)
	P	s		P	s
11	·014	1·90	3	·516	12·07
11	·047	1·95	3	·526	15·80
11	·069	2·06	3	·543	15·80
5	·093	2·46	3	·556	11·13
5	·113	3·02	3	·568	8·30
5	·127	2·44	3	·580	3·87
5	·136	2·66	3	·585	3·70
5	·144	3·66	3	·597	3·00
5	·154	3·28	3	·604	2·37
5	·169	2·32	3	·608	1·73
5	·187	2·68	3	·612	1·43
5	·201	2·68	11	·634	1·90
5	·212	2·10	11	·655	1·80
6	·239	1·80	11	·677	1·66
10	·262	1·84	11	·710	1·72
10	·298	2·36	11	·761	1·86
10	·333	1·96	10	·782	1·78
10	·354	1·91	10	·805	1·79
10	·374	1·71	10	·845	1·84
10	·397	1·94	10	·888	1·95
10	·424	1·97	10	·911	1·65
10	·447	1·99	10	·932	1·80
3	·478	3·23	10	·960	1·70
3	·493	5·20	11	·988	1·90
3	·508	8·30			

FIGURE 3

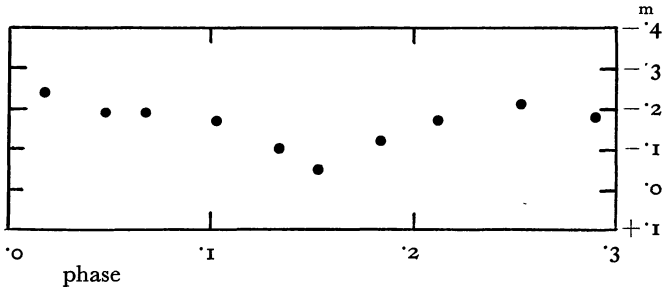

TABLE 4

n	mean brightness (measures)	mean phase
	m	P
10	— ·24	·018
10	— ·19	·048
10	— ·19	·068
10	— ·17	·103
10	— ·10	·134
10	— ·05	·153
10	— ·12	·184
10	— ·17	·212
10	— ·21	·253
12	— ·18	·290

photometer measures, the simple mean of the reduced estimate and the measurement has been used.

Mean values have been plotted against phase for the phase interval ·000 — ·310 in Figure 3 and are given in Table 4. The existence of a secondary minimum at phase ·15 seems to be well indicated but additional observations of higher accuracy are desired to put this conclusion on a firmer basis. The large difference in depth between the minima points to a considerable difference in surface brightness between the components, whereas for nearly all variables in which an orbital eccentricity has been derived from photometric data the difference in surface brightness seems to be quite small.

The possibility that the stars have not very unequal surface brightnesses, but that the considerable difference in depth of the minima is the consequence of the distances between the stars in the eccentric orbit being very different at the primary, respectively secondary, minimum in an orbit with inclination different from 90°, should not be overlooked.

The deviation of the secondary minimum from a symmetrical position relative to the primary minimum yields a minimum value for the eccentricity of ·19, when the orbital inclination is assumed to be 90°.