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COMMUNICATION FROM THE OBSERVATORY AT LEIDEN.

Provisional elements of 25 new variable stars in the constellations Sagittarius and Centaurus, by *W. Chr. Martin.*

The 25 variables forming the subject of this paper have been found and estimated on two series of plates taken by Dr. H. VAN GENT with the Franklin-Adams instrument at Johannesburg.

The first series, centre 12^h2^m $-44°7'$ (1875), containing 267 plates, extends from J. D. 2425348·34 to 6577·20; the second with centre 19^h0^m — 18°56′ (1875), containing 170 plates, extends from J. D. 2425441·41 to 6572·36.

The size of the plates is 20 × 20 cm, each plate covering a field of 10° × 10°.

The variables were found by comparison of pairs of plates in the blinkmicroscope.

J. D. Hel. Astr. M. G. T of plate pair compared in blinkmicroscope		blinked by	number of variables of the type Cluster, δ Cep or Algol and letter with which they are indicated in this paper	
		region 12ʰ — 45°		
2426396·5127	2426420·3824	H	3	*d, f, c.*
6324·5165	6388·3665	H	0	
5350·3492	5361·4022	vG	2	*a, b.*
5351·3471	5356·4374	vG	2	(*d*), *k.*
6093·4415	6094·4556	M	1	(*d*).
6087·4617	6102·2310	M	3	(*a*), *e, i.*
6513·2713	6514·2816	M	1	*g.*
5356·4637	5362·4002	M	3	(*d*), *h, l.*
		region 12ʰ — 19°		
2426118·5444	2426123·5484	M	19 of which 14 discussed in this paper viz.: *m* to *z.*	

The abbreviations used are H for E. HERTZSPRUNG
vG for H. VAN GENT
M for W. MARTIN.

Comparison of the results for these two regions, shows that cluster variables are about 10 times as frequent in the Sagittarius field as in the Centaurus field, in good agreement with the results obtained by VAN GENT (*B.A.N.* 227) and FERWERDA (*B.A.N.* 231).

The co-ordinates of the variables were determined by comparison with stars of the *C. P. D.* or *A. G.* catalogues.

For each variable a diagram of the surroundings is given. The size of these diagrams is indicated in the right hand bottom corner.

A set of comparison stars was chosen round each variable as indicated on the diagrams.

On each plate the brightness of the variable star relative to the two comparison stars between which it was intermediate in brightness was estimated in steps, unless the variable was equal to one of the comparison stars.

The brightness of the brightest star was taken to be 0^s.

The brightness of the other comparison stars was derived from the estimates themselves (Table 1).

In the region $19^h - 19°$ 3 or 4 exposures were made on each of 6 nights, on the other nights only two. Consequently the determination of the period was sometimes difficult.

The epochs used for the computation of the provisional period are the maxima of the cluster variables or δ Cephei variables *a, g, i, l, p, t, v* and *z*, the minima of the eclipsing variables *e, f, h* and *g*, and points with a given brightness on the rising branch for the variables *h* and *s*.

For those stars of which the period has been derived by least squares Table 2 contains in column 1 the J. D. Hel. Grw. Astr. mean time of the epochs used, in column 2 the number of periods elapsed after the earliest epoch and in column 3 the residuals *O—C*.

In some cases (variables *d, m, r, u, w, x, y*) the period found from the maxima could be corrected graphically. Each estimate made on the rising branch of the lightcurve corresponds to an epoch, at which a certain fixed brightness is attained, assuming a given slope of the rising branch. From the epochs thus obtained a corrected period was computed.

The phases have been computed by the formula phase = reciprocal period × (J. D. H. Gr. A. M. T. — 2420000).

All estimates have been arranged according to phase and divided into groups. Table 3 gives for each group in column 1 the number of estimates, in column 2 the mean value of phase, in column 3 the mean value of brightness.

The accompanying diagrams give the corresponding lightcurves. In order to show better the form of the lightcurve of some cluster variables with a steep rising branch some of the points given in Table 3 were split up into means of 5 estimates. These are indicated on the diagrams by open circles.

The total number of estimates used in the present paper is 4830.

To obtain the magnitudes of the comparison stars, all these stars were estimated in an absolute scale of steps, taking the plate fog as zero point.

For a number of these comparison stars the magnitude was determined by star counts in a square cm round the comparison star. The number of stars brighter than the comparison star was counted and this number was reduced to a square degree and compared with the tables for $\log N_{m,\beta,\lambda}$ in *Gron. Publ.* 43.

The results are given in the following tables.

From these tables I conclude that the limiting magnitude of the best plates will be about $15^m.5$.

This is about 1^m less than the value found by Dr. H. VAN GENT viz.: $16^m.4$.

variable	comparison star	brightness steps	number of stars counted brighter than comparison star	the same, reduced to one square degree $= N_{m,\beta,\lambda}$	galactic longitude	galactic latitude	$\log N_{m,\beta,\lambda}$	magnitude
				region $12^h - 45°$				
d	a	9	27	108	256°	+ 23°	2·03	^{m} 13·3
	d	1	79	316			2·50	14·5
c	c	5	44	176	257	+ 19	2·25	13·7
a	b	15	17	68	255	+ 21	1·83	12·7
	a [1])	20						12·2
				region $19^h - 19°$				
q	a	8	73	292	347	— 7	2·47	13·8
	d	1	251	1004			3·00	15·0
s	a	16	25	100	343	— 9	2·00	12·8
	b	13	32	128			2·11	13·0
x	b	4	187	748	344	— 11	2·87	14·7
m	A	11	52	208	340	— 5	2·32	13·5

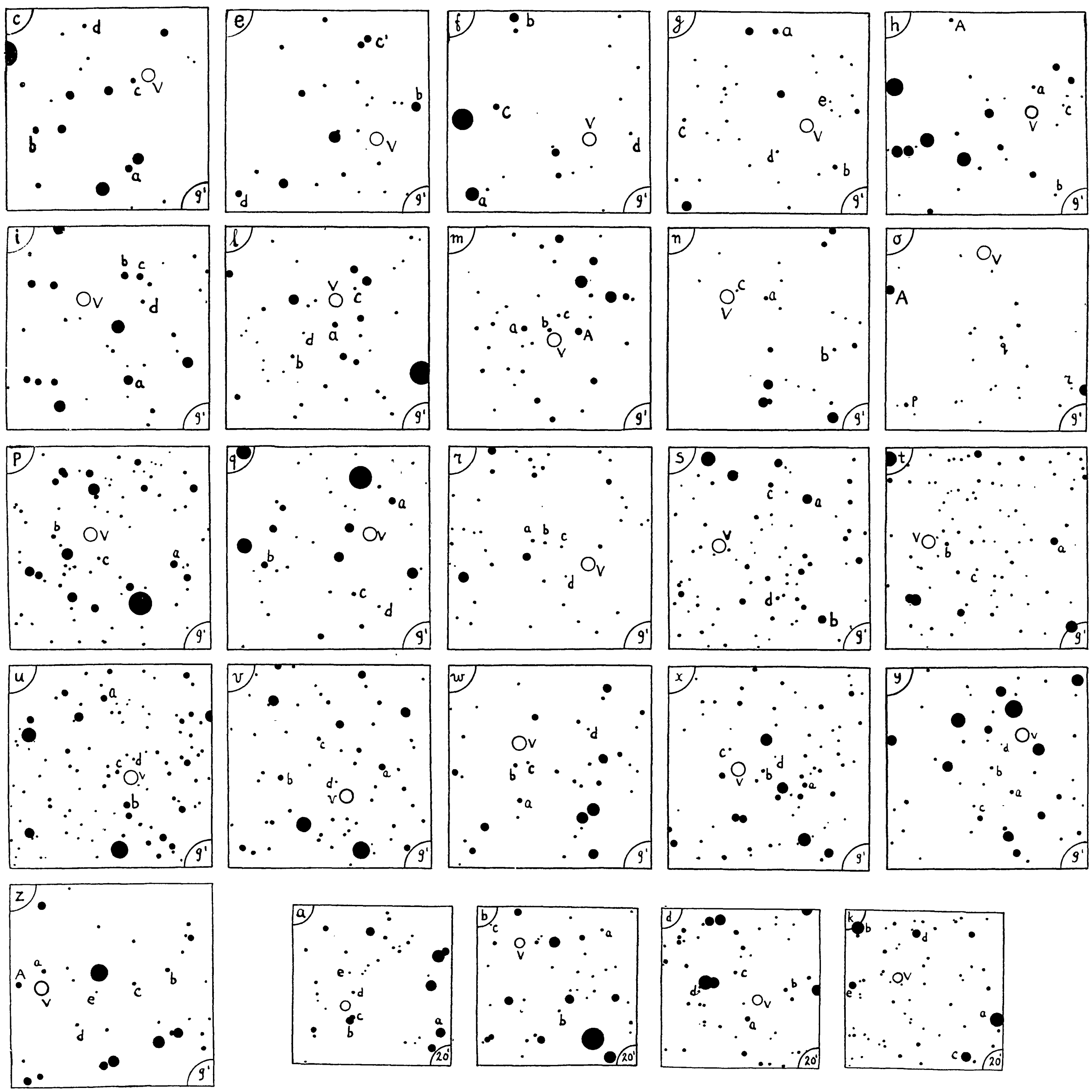
[1]) *C. P. D.* — 40° 5366.

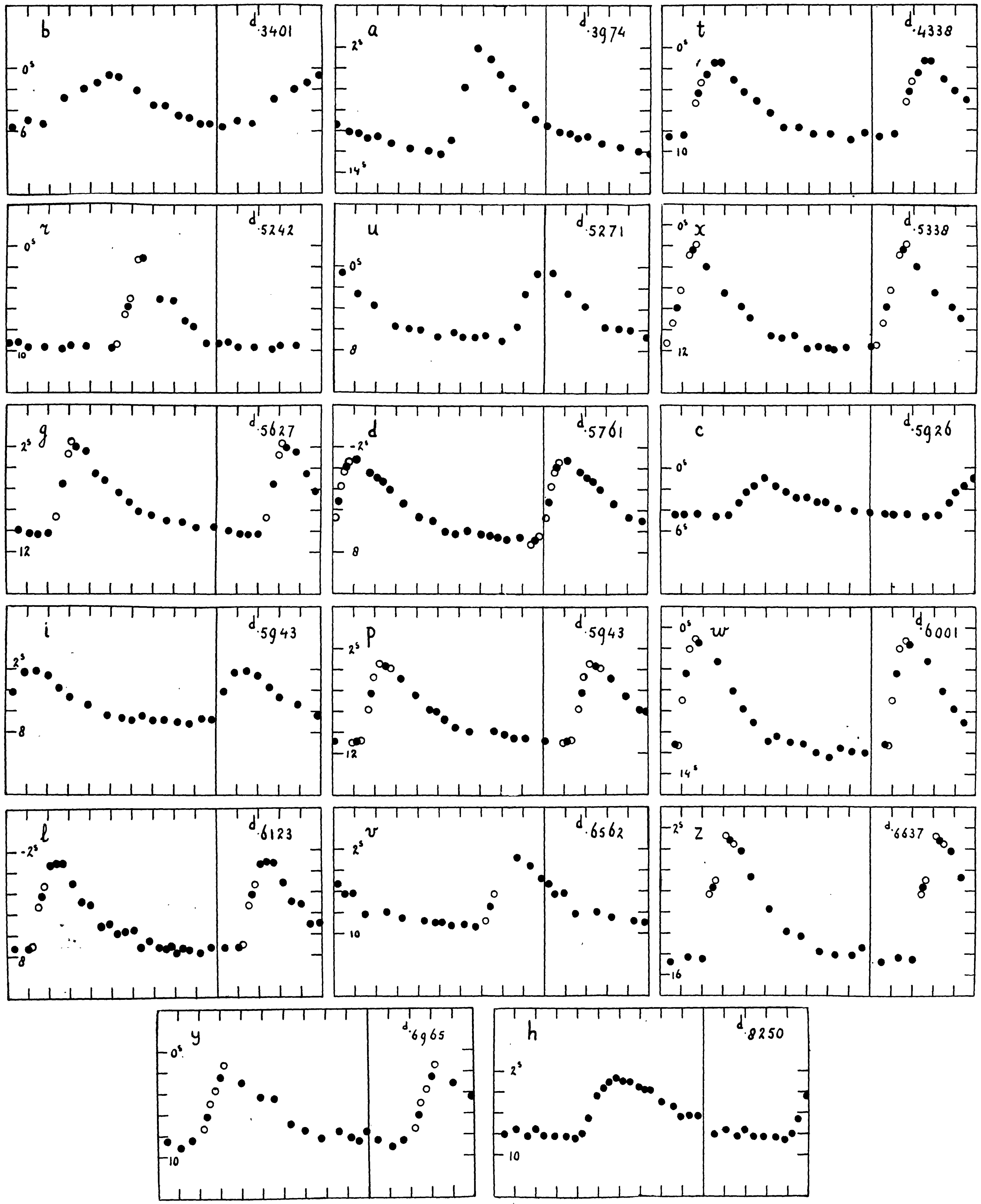
With these tables a smooth curve was drawn in a magnitude-step diagram for each of the two regions.

With these curves the magnitudes given in Table I were derived from the absolute estimates mentioned above.

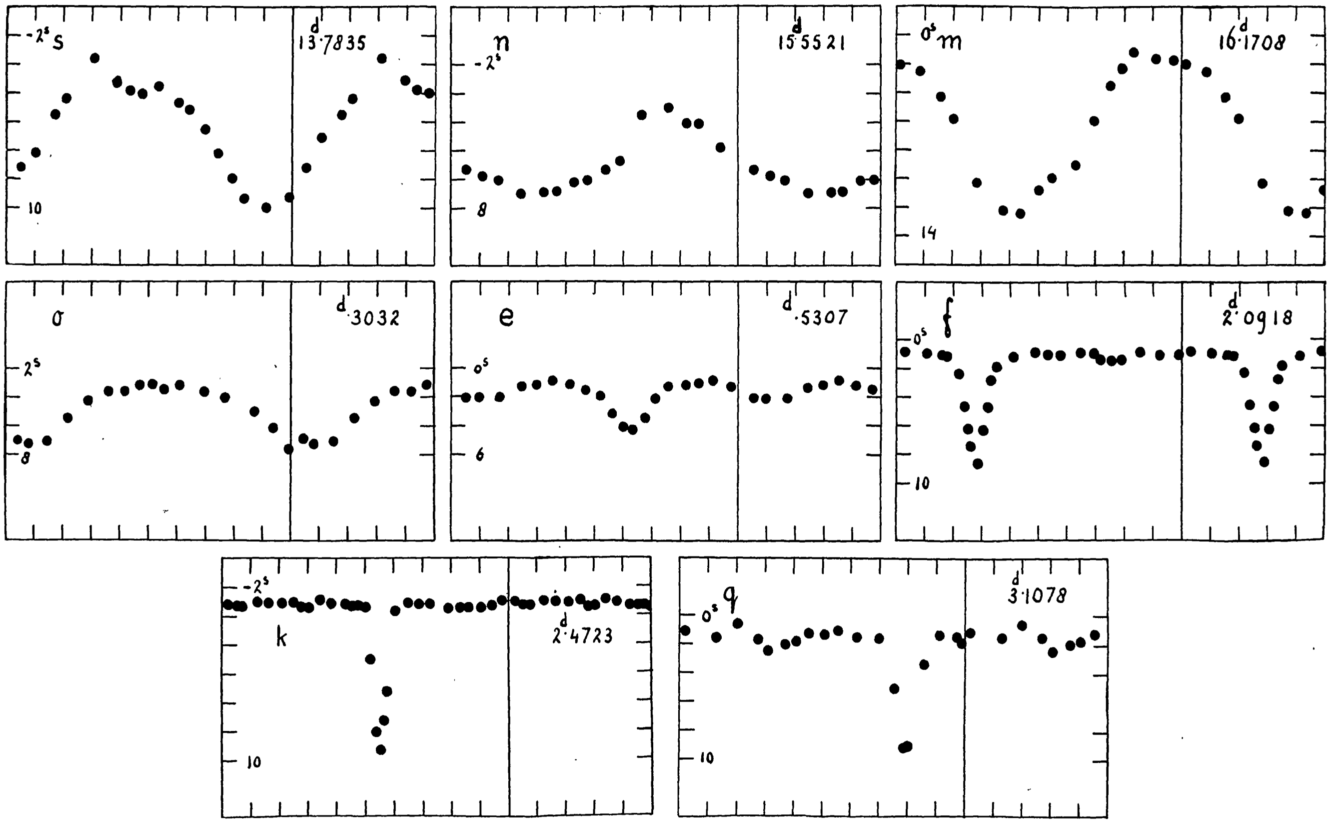
All the comparison stars of the variable *k* were *C. P. D.* stars:

comparison star	magnitude C. P. D.	magnitude International scale
	m	m
a = C. P. D. — 41°5834	9·6	10·6
b = — 40°5663	9·6	10·6
c = — 41°5835	9·8	10·9
d = — 40°5661	10·2	11·4
e = — 41°5845	10·4	11·6





b
d.3401
a
d.3974
t
d.4338
r
d.5242
u
d.5271
x
d.5338
g
d.5627
d
d.5761
c
d.5926
i
d.5943
p
d.5943
w
d.6001
l
d.6123
v
d.6562
z
d.6637
y
d.6965
h
d.8250



Variable k = C. P. D. — 41° 5839 *C. P. D.* magnitude (in maximum) $9^{m}\cdot 2$ = International scale $10^{m}\cdot 0$.

The *C. P. D.* magnitudes were reduced to the International scale by the aid of *H. A.* Vol. 80, no. 13.

Finally, Table 4 gives a summary of the various results.

Column 4 gives the total number of estimates used.

Column 5 gives the period of variation and the mean error in the unit defined by the last decimal of the period.

Column 6 gives the reciprocal period with which the phases have actually been computed.

Column 7 gives for the cluster and δ Cephei variables the phase of a point on the rising branch ΔP (column 8) distant from the point of the same brightness on the descending branch.

For the eclipsing variables the phase of the minimum is given.

The corresponding mean epochs are given in column 9.

Column 10 gives the time in fractions of the period or day between the point defined by column 7 and the maximum.

Column 12 gives the mean error of a single estimate computed in the usual way.

Column 14 gives the difference in brightness of the variable star on the two plates by comparison of which the variability was found.

Remarks on a few individual variables:

m. The lightcurve of this variable resembles that of W Virginis, which has about the same period.

e. This star originally was a comparison star for the bright star to the left of it, which is the variable with a period of $1^{d}\cdot 52$ discussed in *B. A. N.* 232.

The lightcurve of the eclipsing variable *e* shows a flat secondary minimum.

f. The lightcurve shows a slight indication of a secondary minimum.

i. The brightness at maximum seems to be variable. The elements given in Table 4 do not represent the observations near maximum satisfactorily.

On J. D. 2426515 the brightness rose from 7^{s} at phase ·00 to — 1^{s} at phase ·11.

On J. D. 2426499 the brightness rose from 9^{s} at phase ·99 to 3^{s} at phase ·26, the brightness at phase ·10 being only $4^{s}\cdot 5$.

The phase of a point with given brightness on the rising branch seems to oscillate over a range of about ·1 period.

o. Probably the period given in Table 4 is only half the period, the lightcurve showing two equally deep minima.

I wish to thank prof. HERTZSPRUNG for his help and advice during the preparation of this paper.

TABLE 1.

	s	m
a		
a	·0	12·2
b	3·7	12·7
c	7·1	13·2
d	10·5	13·7
e	13·6	14·5
b		
a	·0	13·9
b	2·3	14·3
c	6·0	14·7
c		
a	·0	13·1
b	1·6	13·4
c	3·5	13·7
d	5·3	14·0
d		
a	·0	13·3
b	1·7	13·6
c	4·0	14·0
d	7·5	14·5
e		
b	·0	12·9
c′	1·5	13·2
d	4·9	13·5
f		
a	·0	12·8
b	1·9	13·2
c	5·3	14·0
d	9·1	14·5
g		
a	·0	13·1
b	3·2	13·5
c	6·6	13·9
d	9·7	14·3
e	12·4	14·7
h		
A	·0	13·7
a	4·3	14·0
b	6·6	14·3
c	9·9	14·7
i		
a	·0	13·1
b	2·8	13·5
c	5·4	14·0
d	8·9	14·5
k		
a	·0	10·6
b	3·2	10·6
c	6·6	10·9
d	9·7	11·4
e	12·4	11·6
l		
a	·0	13·7
b	3·4	14·0
c	6·7	14·5
d	9·6	14·7
m		
A	·0	13·4
a	3·4	14·0
b	7·6	14·6
c	11·5	14·9
n		
a	·0	14·6
b	3·0	14·9
c	6·3	15·2
o		
A	·0	14·0
p	4·6	14·6
q	7·8	14·9
r	11·3	15·0
p		
a	·0	14·3
b	4·8	14·8
c	9·0	15·0
q		
a	·0	13·9
b	2·3	14·3
c	5·4	14·8
d	8·9	15·0
r		
a	·0	14·4
b	3·9	14·8
c	7·0	14·9
d	9·5	15·0
s		
a	·0	12·7
b	2·7	13·1
c	7·5	13·7
d	11·3	14·3
t		
a	·0	13·4
b	4·6	14·3
c	9·1	14·9
u		
a	—3·0	14·0
b	·0	14·4
c	3·3	14·8
d	6·8	15·0
v		
a	·0	13·9
b	3·5	14·4
c	7·6	14·8
d	10·5	15·0
w		
a	·0	14·0
b	4·0	14·6
c	7·8	14·9
d	10·3	15·0
x		
a	·0	14·3
b	4·0	14·6
c	8·2	14·9
d	12·6	15·2
y		
a	·0	14·4
b	2·8	14·8
c	6·0	14·9
d	8·6	15·0
z		
A	·0	14·0
a	4·0	14·4
b	7·2	14·8
c	10·7	14·9
d	13·1	15·0
e	15·7	15·2

TABLE 2.

d	t	*O—C* d
a		
2425348·335	0	—·012
5377·348	73	— 11
5650·389	760	+ 3
5654·364	770	+ 4
5655·554	773	+ 2
5685·372	848	+ 13
5687·351	853	+ 5
5737·431	979	+ 10
6065·275	1804	— 17
6125·318	1955	+ 16
6129·273	1965	— 3
6154·312	2028	— 2
6337·515	2489	— 9
e		
2425350·375	0	+·013
5351·420	2	— 3
5678·303	618	— 34
5704·352	667	+ 10
5713·352	684	— 12
5738·320	731	+ 13
5739·359	733	— 8
5764·325	780	+ 13
6009·510	1242	+ 13
6101·304	1415	— 5
6428·231	2031	+ 8
6499·321	2165	— 16
6515·267	2195	+ 8
f		
2425351·374	0	+·004
5357·631	3	— 14
5650·509	143	+ 8
5713·276	173	+ 20
5719·534	176	+ 2
5738·365	185	+ 7
5761·377	196	+ 9
6125·274	370	— 72
6420·330	511	+ 36
g		
2425348·335	0	+·017
2425353·376	9	— 7
5362·377	25	— 9
5406·278	103	— 1
5649·388	535	— 13
5650·478	537	+ 22
5655·544	546	— 21
5685·372	599	— 17
5706·241	636	+ 30
5720·245	661	— 33
5738·298	693	+ 13
5765·327	741	+ 31
6009·521	1175	+ 3
6013·455	1182	— 2
6039·347	1228	+ 5
6323·537	1733	+ 19
6328·567	1742	— 15
6500·235	2047	+ 22
6514·265	2072	— 16
6572·226	2175	— 15
h		
2425357·397	0	+·010
62·365	6	+ 28
5678·310	389	— 18
5706·361	423	— 18
39·359	463	— 22
6499·267	1384	+ 25
6513·260	1401	— 8
i		
2425350·349	0	—·057
5353·376	5	— 2
5357·543	12	+ 4
5362·352	20	+ 59
5406·253	94	— 22
5649·388	503	+ 24
5655·350	513	+ 43
5803·277	762	— 23
5837·200	819	+ 22
6009·510	1109	— 39
6012·502	1114	— 8
6102·231	1265	— 26
6125·436	1304	— 1
6508·237	1948	+ 40
2426515·310	1960	— 19
6540·265	2002	— 27
6571·229	2054	+ 31
k		
2425351·442	0	—·036
5356·433	2	+ 10
5361·384	4	+ 17
5655·565	123	— 10
5685·272	135	+ 30
5764·311	167	— 46
5826·195	192	+ 30
6093·199	300	+ 22
6125·318	313	+ 1
6130·254	315	— 8
6476·398	455	+ 10
6513·445	470	— 28
6528·312	476	+ 5
l		
2425350·349	0	—·014
5361·402	18	+ 18
5615·495	433	+ 9
5650·367	490	— 20
5685·282	547	— 5
5704·249	578	— 19
5745·311	645	+ 19
5791·251	720	+ 37
6013·466	1083	— 11
6102·231	1228	— 28
6143·288	1295	+ 5
6154·301	1313	— 3
6362·474	1653	— 10
6476·377	1839	+ 6
6500·257	1878	+ 6
6508·237	1891	+ 27
6514·326	1901	— 7
6560·247	1976	— 8
p		
2425720·607	0	+·023
5792·478	121	— 12
5794·308	124	+ 35
2425808·498	148	— 37
5851·289	220	— 34
6067·607	584	— 29
6129·488	688	+ 48
6161·538	742	+ 7
6213·274	829	+ 42
6242·330	878	— 21
6480·636	1279	— 14
6507·407	1324	+ 12
6529·364	1361	— 19
q		
2425795·374	0	+·016
5851·289	18	— 8
6090·615	95	+ 18
6118·534	104	— 33
6572·310	250	+ 7
s		
2425791·0	0	+·22
5832·2	3	+·08
5859·9	5	+·17
5886·8	7	—·46
6093·6	22	—·41
6121·5	24	—·08
6176·6	28	—·09
6246·3	33	+·67
6507·4	52	—·22
t		
2425713·615	0	—·011
5790·435	177	+ 22
5794·308	186	— 10
5797·353	193	— 2
5825·546	258	— 8
6094·564	878	+ 37
6103·613	899	— 25
6214·270	1154	+ 7
6480·625	1768	— 9
6571·302	1977	— 1
v		
2425707·618	0	—·079

TABLE 2 (*continued*).

d	t	O−C d	d	t	O−C d	d	t	O−C d	d	t	O−C d
2425713·593	9	— 11	2426093·572	588	+ 16				2426090·615	347	— 29
5790·435	126	+ 54	6118·523	626	+ 31	*z*			6163·612	457	— 35
5794·308	132	— 10	6179·477	719	— 44				6237·327	568	+ 14
5797·580	137	— 19	6214·270	772	— 30	2425860·358	0	+ ·004	6239·311	571	+ 8
5836·384	196	+ 67	6567·333	1310	— 14	5864·324	6	— 12	6507·396	975	— 28
5849·461	216	+ 20	6571·302	1316	+ 18	5886·275	39	+ 39	6529·364	1008	+ 39

TABLE 3

n	phase	brightness
	a	
15	·004	9·4
15	·065	10·1
15	·111	10·2
15	·152	10·7
15	·198	10·6
15	·267	11·2
17	·353	11·6
17	·444	12·0
15	·498	12·2
15	·550	10·9
10	·612	5·9
15	·678	2·1
15	·736	3·2
15	·784	4·6
15	·840	5·9
15	·900	7·4
15	·951	8·9
	b	
15	·065	2·0
16	·129	1·4
15	·186	·7
16	·234	·8
15	·321	2·2
16	·398	3·5
15	·457	3·6
16	·518	4·6
15	·570	4·7
16	·620	5·3
16	·668	5·2
15	·724	5·6
16	·798	5·0
15	·871	5·3
16	·973	2·9
	c	
15	·070	4·4
19	·113	4·5
7	·177	4·4
10	·265	4·6
15	·323	4·5
10	·374	3·4
10	·407	2·3
9	·444	1·7
12	·494	1·0
18	·547	1·8
15	·596	2·3
12	·643	2·9
17	·699	2·8
13	·746	3·3
18	·787	3·3
17	·844	3·9
20	·925	4·1
15	·998	4·2
	d	
10	·025	3·2
10	·065	— ·1
10	·112	— ·8
10	·174	·4
10	·207	·9
10	·237	1·3
10	·271	2·1
10	·336	3·3
10	·409	4·7
10	·473	5·0
10	·532	6·1
10	·583	6·3
10	·634	6·0
10	·703	6·3
10	·745	6·5
10	·783	6·6
10	·825	6·8
10	·890	6·6
10	·960	6·9
	e	
15	·053	2·1
15	·098	2·1
15	·171	2·1
15	·245	1·4
15	·298	1·2
15	·353	1·0
15	·414	1·2
15	·470	1·6
10	·520	2·0
10	·564	3·3
10	·598	4·2
10	·633	4·3
10	·676	3·5
10	·712	2·1
15	·759	1·3
15	·817	1·2
15	·859	1·1
15	·911	·9
15	·978	1·3
	f	
8	·031	·8
12	·107	1·0
8	·160	1·1
9	·182	1·2
9	·219	2·4
3	·239	4·6
3	·253	6·2
3	·263	7·4
2	·286	8·6
5	·305	6·3
3	·322	4·7
3	·333	2·8
3	·351	1·9
10	·412	1·2
12	·487	·9
10	·531	1·0
13	·576	1·0
12	·647	·9
10	·693	1·0
6	·714	1·4
7	·753	1·5
10	·790	1·4
5	·854	·9
16	·921	1·1
12	·989	1·0
	g	
15	·058	10·0
15	·115	10·3
15	·154	10·4
15	·202	10·3
15	·273	5·6
15	·332	2·1
15	·381	2·5
15	·428	4·6
15	·472	5·2
15	·539	6·4
15	·590	7·4
15	·633	8·2
15	·695	8·5
15	·767	9·0
15	·844	9·2
14	·907	9·7
15	·991	9·6
	h	
10	·054	8·1
10	·107	7·7
10	·162	8·3
10	·198	7·6
10	·239	8·3
10	·289	8·3
10	·346	8·3
10	·388	8·5
10	·424	8·0
10	·454	6·6
10	·492	4·4
10	·523	3·6
10	·550	3·1
10	·583	2·7
10	·617	3·0
10	·651	3·1
10	·694	3·6
10	·721	3·9
10	·750	3·9
10	·802	5·0
10	·860	5·4
10	·895	6·4
10	·932	6·3
10	·976	6·4
	i	
15	·034	4·2
15	·087	2·3
15	·146	2·2
15	·198	2·6
15	·252	3·8
15	·302	4·6
15	·389	5·4
15	·484	6·4
15	·552	6·7
15	·599	6·9
15	·649	6·4
15	·700	7·0
15	·754	6·9
15	·818	7·0
15	·873	7·2
16	·930	6·7
17	·978	6·8
	k	
10	·021	— ·9
10	·050	— ·7
10	·073	— ·7
10	·123	—1·0
10	·162	— ·9
10	·211	— ·9
10	·252	—1·0
10	·279	— ·6
10	·301	— ·6
10	·340	—1·1
10	·378	— ·9
10	·427	— ·8
10	·454	— ·7
10	·477	— ·7
5	·498	— ·6
5	·517	3·0
5	·539	8·0
5	·552	9·4
5	·564	7·3
5	·574	5·3
5	·604	— ·3
10	·648	— ·9
10	·684	— ·8
10	·726	— ·8
10	·789	— ·5
10	·829	— ·6
10	·860	— ·5
10	·902	— ·6
10	·941	— ·7
9	·974	—1·0
	l	
10	·036	7·3
10	·104	7·3
10	·168	2·3
10	·209	— ·6
10	·240	— ·9
10	·272	— ·8
10	·315	1·1
10	·357	2·9
10	·398	3·1
10	·447	5·2
10	·488	5·0
10	·526	5·9
10	·566	5·7
10	·607	5·6
10	·638	7·2
10	·678	6·6
16	·722	7·2
10	·757	7·4
10	·782	7·2
10	·808	7·8
10	·838	7·3
10	·868	7·5
10	·918	7·8
11	·970	7·2
	m	
10	·014	2·1
10	·085	2·6
10	·153	4·3
10	·200	5·9
10	·283	10·4
10	·376	12·2
10	·437	12·4
10	·498	10·8
10	·546	10·0
10	·629	9·1
10	·692	6·0
10	·749	3·6
10	·790	2·3
9	·834	1·2
9	·911	1·7
9	·969	1·8
	n	
10	·053	5·3
11	·112	5·8
10	·165	6·1
11	·245	7·0
10	·325	6·9
11	·368	6·9
11	·427	6·2
10	·477	6·1
11	·540	5·4
11	·587	4·8
11	·665	1·6
10	·756	1·0
11	·819	2·1
11	·863	2·2
11	·941	3·8
	o	
9	·041	7·0
10	·081	7·3
10	·147	7·1
10	·219	5·4
10	·288	4·3
10	·360	3·6
10	·420	3·6
10	·468	3·2
10	·513	3·1
10	·556	3·5
10	·607	3·2
10	·695	3·6
10	·770	4·0
10	·871	5·1
10	·937	6·2
9	·989	7·6
	p	
9	·007	10·9
10	·113	10·9
10	·180	6·3
10	·250	3·7
9	·323	4·9
10	·394	6·5
9	·461	7·9
10	·492	8·0
10	·530	8·8
9	·582	9·6
10	·647	10·0
10	·766	9·9
9	·815	10·3
10	·859	10·6
9	·914	10·7
	q	
10	·018	1·2
10	·130	1·6
10	·202	·6
10	·272	1·6
10	·308	2·5
10	·371	2·0
10	·405	1·8
10	·453	1·2
10	·507	1·3
10	·554	1·1
10	·619	1·5
10	·700	1·6
5	·753	5·1
5	·786	9·2
5	·801	9·1
5	·856	3·4
10	·911	1·4
10	·969	1·4
9	·987	1·9
	r	
10	·502	9·7
10	·579	5·9
10	·650	1·3
10	·730	5·1
10	·797	5·3
11	·852	7·2
10	·893	7·7
10	·948	9·4
11	·011	9·4
10	·056	9·2
10	·104	9·7
11	·181	9·7
10	·265	9·9
10	·305	9·5
11	·381	9·6
	s	
10	·049	7·2
10	·104	6·1
10	·171	3·5
10	·210	2·5
10	·310	— ·4
10	·390	1·1
10	·433	1·8
10	·476	2·0
10	·534	1·5
10	·606	2·7
10	·640	3·2
10	·696	4·6
10	·743	6·2
10	·788	8·0
10	·835	9·4
10	·911	10·0
9	·992	9·3
	t	
11	·033	8·6
10	·102	8·4
10	·176	4·4
10	·217	2·5
10	·249	1·4
10	·284	1·4
10	·342	3·1
10	·392	4·3
10	·448	5·1
10	·517	6·2
10	·581	7·6
10	·650	7·6
11	·717	8·3
11	·803	8·3
11	·897	9·0
11	·964	8·4
	u	
10	·042	·6
10	·113	2·5
11	·193	3·8
10	·293	5·7
10	·356	5·9
11	·412	6·0
10	·492	6·7
10	·571	6·3
11	·613	6·7
10	·669	6·7
10	·718	6·6
11	·796	7·0
10	·870	5·7
10	·911	2·6
10	·966	·6
	v	
10	·020	5·4
10	·053	6·3
10	·093	6·2
10	·148	8·2
10	·249	8·0
10	·323	8·5
10	·428	8·8
10	·479	9·0
10	·508	9·0
11	·553	9·3
11	·616	9·2
11	·671	9·4
10	·741	7·5
10	·871	2·9
10	·935	3·6
10	·986	4·8
	w	
10	·066	11·2
10	·119	4·5
10	·182	1·5
10	·266	3·3
10	·343	6·1
10	·392	7·8
10	·441	9·1
10	·511	11·0

TABLE 3 (*continued*).

n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness	n	phase	brightness
10	·552	10·4				10	·422	8·9	9	·877	11·7	10	·237	6·2	9	·862	7·7	10	·133	14·3	10	·670	12·3
10	·614	11·0		*x*		10	·519	10·6	10	·996	11·6	10	·299	2·5	9	·916	8·3	10	·199	14·5	10	·756	13·8
10	·682	11·2				10	·574	10·8				10	·400	3·1	9	·955	8·6	10	·248	7·7	10	·831	14·1
10	·740	12·0	10	·072	7·9	10	·632	10·6		*y*		10	·491	4·4	9	·993	7·7	10	·330	3·2	11	·911	14·1
10	·801	12·4	10	·147	2·4	10	·694	11·8				10	·554	4·6				10	·384	4·2	11	·963	13·4
10	·856	11·5	10	·211	4·0	10	·748	11·6	10	·046	8·6	10	·630	6·9		*z*		10	·430	6·7			
10	·911	11·9	10	·297	6·5	9	·797	11·7	10	·108	9·2	10	·700	7·6				10	·520	9·8			
9	·970	12·0	10	·380	7·8	9	·822	11·9	10	·164	8·5	10	·777	8·3	10	·049	14·8	10	·599	11·9			

TABLE 4.

1	2		3	4	5		6	7	8	9	10		11			12	13			14
var.	α (1875)	δ (1875)	type	number of estimates	period	m. e. of last decimals	reciprocal period	phase of rising branch or minimum	ΔP	J. D. of phase given in column 7	point on rising branch to maximum		steps max.	steps min.	steps range	m. e. of single estimate	magnitudes max.	magnitudes min.	magnitudes range	ΔS
	h m s	° ′			d		d^{-1}			2420000+	P	d	s	s	s	±	s	s	s	s
a	11 40 57	—40 50·1	Cl	252	·397420	± 4	2·516233	·616	·20	5995·317	·062	·025	2·1	12·3	10·2	·84	12·5	14·2	1·7	9·2
b	11 46 3	—39 47·5	Cl	233	·340109		2·940233	·983	·40	5995·097	·20	·068	·7	5·6	4·9	1·04	14·0	14·7	·7	4·0
c	11 48 49	—43 49·9	Cl	252	·592629		1·687565	·409	·20	5995·271	·08	·047	1·0	4·6	3·6	·66	13·3	13·9	·6	3·4
d	11 52 52	—39 32·5	Cl	190	·576153		1·735651	·033	·25	5782·2875	·062	·036	— ·8	6·9	7·7	·64	13·4	14·4	1·0	8·5
e	11 55 21	—45 35·0	A	255	·530705	± 6	1.884287	·621		5995·170			·9	4·3	3·4		13·1	13·5	·4	
f	12 8 29	—39 25·7	A	194	2·091827	± 22	·4780593	·279		5782·2934			·8	8·6	7·8		13·0	14·4	1·4	4·3
g	12 9 21	—44 25·9	Cl	254	·562723	± 6	1·777072	·273	·25	5995·409	.042	·024	1·6	10·4	8·8	·72	13·3	14·4	1·1	4·5
h	12 10 21	—47 16·9	Cl	240	·825040	± 16	1·2120623	·488	·30	5995·144	·102	·084	2·7	8·5	5·8	·97	13·9	14·5	·6	5·6
i	12 10 31	—46 32·0	Cl	258	·594348	± 11	1·682515	·045	·20	5995·2185	·070	·042	2·2	7·2	5·0	1·12	13·4	14·3	·9	3·5
k	12 15 40	—41 4·6	A	264	2·472329	± 43	·404477	·550		5994·2848			— 1·1	9·4	10·5		10·0	11·4	1·4	8·6
l	12 15 42	—46 16·0	Cl	241	·612294	± 6	1·633203	·163	·25	5995·068	·067	·041	— ·9	7·8	8·7	1·04	13·6	14·6	1·0	8·2
m	18 40 45	—20 15·7	δ	157	16·17076		·06184	·695	·50	6075·28			1·2	12·4	11·2	·93	13·6	15·0	1·4	6·6
n	18 45 2	—14 49·3	δ?	160	15·5521		·06430	·617	·30	6074·91	·140	2·18	1·0	7·0	6·0	1·02	14·7	15·3	·6	6·3
o	18 45 5	—14 37·6	A	158	·303159		3·2986	·766		6071·293			3·1	7·6	4·5	·90	14·4	14·9	·5	4·4
p	18 53 23	—19 46·6	Cl	144	·594268	± 18	1·6827414	·175	·25	6071·150	·05	·030	3·5	10·9	7·4	·96	14·6	15·1	·5	4·1
q	18 54 20	—14 44·1	A	179	3·10778	± 12	·3217732	·795		6071·963			·6	9·2	8·6		14·0	15·0	1·0	7·7
r	18 56 0	—22 26·8	Cl	154	·52416		1·907813	·570	·25	6071·124	·08	·042	1·3	9·9	8·6	·94	14·5	15·0	·5	3·3
s	18 58 45	—18 35·3	δ	169	13·7835	± 77	·0725505	·093	·65	6079·81	·219	3·02	— ·4	10·0	10·4	·87	12·6	14·1	1·5	9·8
t	19 0 4	—17 53·5	Cl	165	·433828	± 9	2·3050626	·170	·25	6071·058	·090	·039	1·4	9·0	7·6	1·06	13·7	14·9	1·2	4·6
u	19 0 46	—17 48·6	Cl	154	·527144		1·8970143	·902	·25	6071·595	·11	·058	·6	7·1	6·5	1·09	14·5	15·0	·5	6·8
v	19 1 17	—19 41·7	Cl	163	·656221	± 26	1·52389	·775	·25	6071·813	·08	·052	2·9	9·5	6·6	·78	14·3	14·9	·6	5·1
w	19 7 46	—22 18·9	Cl	159	·600136		1·6662886	·105	·25	6071·040	·06	·036	1·1	12·4	11·3	1·00	14·2	15·1	·9	8·9
x	19 8 32	—19 0·3	Cl	147	·533850		1·873186	·080	·25	6071·517	·080	·043	1·9	11·9	10·0	1·13	14·4	15·1	·7	7·3
y	19 10 23	—15 51·6	Cl	146	·696466		1·43582	·262	·25	6071·278	·c68	·047	1·3	9·2	7·9	1·02	14·6	15·1	·5	8·2
z	19 16 22	—15 32·2	Cl	142	·663662	± 27	1·506792	·250	·20	6071·342	·060	·040	2·9	14·8	11·9	1·31	14·3	15·1	·8	8·4

ERRATA in *B. A. N.* 232.

Page 210, column 2, line 5: for: ascending, read: descending.

Column 2, diagrams:

A. The letter *a* should be put at the faint star to the left of the star below which *a* is printed (this latter is *C. P. D.* — 40°5417).

B. The letter *d* must be added to the faint star nearest to the left side of the diagram (compare diagram *e* in this paper).