BULLETIN OF THE ASTRONOMICAL INSTITUTES OF THE NETHERLANDS

1943 March 9 — Volume IX — No. 354

COMMUNICATION FROM THE OBSERVATORY AT LEIDEN

Discussion of 121, mostly new, faint variable stars within 6° of τ Sagittarii,

by *J. G. Ferwerda*.

1. The variable stars discussed in the present paper have been studied on Franklin-Adams plates. Particulars about these plates are to be found in *B.A.N.* VI, No. 231, of which this paper is a continuation.

The series consists of 422 plates, distributed over the years of observation as shown in Figure 1. This diagram gives the number of plates taken in each time-interval between two successive full moons. The plates of the years 1928 till 1935 have all been taken by Dr H. VAN GENT, those of 1938 by Dr A. DE SITTER. The time of exposure was usually 30^m. In addition to these plates we have a series of 8 plates taken in one night at Mount Wilson by Dr P. TH. OOSTERHOFF on Imperial Eclipse (backed). The centre of these plates is $19^h\!\cdot\!0$, $-20°$, the field $10° \times 12\frac{1}{2}°$, time of exposure 30^m; the scale is nearly that of the Franklin-Adams plates. The two fields have a strip of $3\frac{1}{2}°$ in common.

FIGURE 1.

The open area in the year 1934 refers to the Mount Wilson plates.

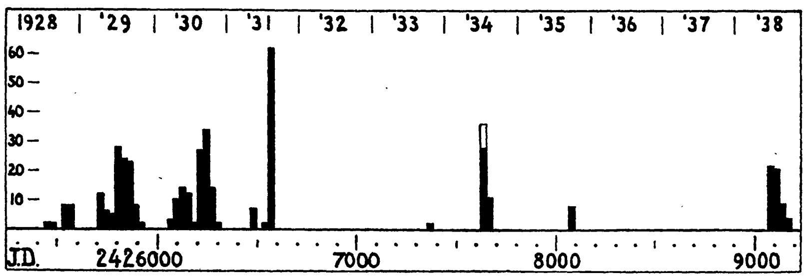


TABLE 1.

pairs of blink-plates			numbers of new objects		numbers of old variables		total
name	J.D. Hel. M.A.T. Grw. — 2420000		discoveries	rediscoveries	found	found again	
	d	d					
A	6123·4131	6129·4656	19	—	2	—	21
B	6120·5890	6125·5549	12	1	3	0	16
C	6118·5888	6125·5770	11	0	3	0	14
D	6120·5669	6123·6146	9	4	2	0	15
E	6118·5666	6123·5928	14	1	0	1	16
F	6156·3460	6161·5159	18	4	0	1	23
G	6155·6157	6156·2995	14	0	1	1	16
H	6153·5422	6155·5939	9	5	1	1	16
I	6210·2931	6212·2654	3	5	0	0	8
J	6122·5698	6129·4438	7	3	0	1	11
K	6093·5276	6103·5684	14	1	3	2	20
L	6569·4069	6570·3175	8	2	0	0	10
M	6561·5043	6568·2708	12	3	0	0	15
N	6559·3129	6570·4893	6	2	1	2	11
O	6565·4942	6571·2587	6	3	2	2	13
P	6570·4249	6573·4449	2	6	1	0	9
Q	6569·2338	6573·4878	3	4	0	1	8
R	6568·2923	6569·4928	2	1	1	0	4
S	6211·2845	6212·2872	5	6	0	2	13
T	6236·2900	6241·3129	7	2	0	1	10
U	5853·3275	5862·2866	2	4	0	3	9
V	5860·2362	5862·2648	1	4	2	1	8
W	5885·2982	5886·2417	4	2	0	1	7
X	5826·4535	5835·3921	0	1	1	1	3
Y	5823·4774	5830·2720	7	4	0	2	13
Z	5797·3076	5799·5077	5	2	0	2	9
		total	200	70	23	25	318

2. Most of the variables discussed in this paper have been discovered by Dr H. VAN GENT with the aid of the blink-microscope at Groningen (cf. *B.A.N.* No. 243, p. 21) on 1933 January 16 – 27. He blinked 26 pairs of plates. We list the results in Table 1. This table shows that 200 new and 23 old variable objects have been found. In order of detection they received the current numbers from 1 to 223, which have been used throughout this paper.

Of the 23 old variables 18 have already been studied on these Franklin-Adams plates before. Thus 205 objects remain for further examination. During this examination three objects in addition have been discovered by the author. These have been indicated by the numbers 224, 225 and 227.

3. For particulars about the treatment of the plate material see *B.A.N.* No. 231, 1932 e.g.

All variables have been estimated in 1933 and 1934 on all plates (349) available in 1934. The principal computations followed soon. The plates taken after 1934 are as yet not sufficient in number to justify supplementary estimates and repetition of computations for all variables. So these plates have only been used for a few stars to examine a certain particularity. These particularities are described in the last section of this paper: individual stars. In Table 10, column 4, the J.D. for each variable, up to which the observations are complete, is given. The number of estimates for each star is found in column 5. The total number of estimates made for this investigation is 41441, of which 31260 have been used for the computation.

4. Table 2 gives the number of stars of each type of variability occurring among the 223 objects indicated by VAN GENT.

Of the three variables discovered during examination two turned out to be long-period variables, whereas the third is an eclipsing variable.

TABLE 2.

type of variability	number of new variables	number of old variables found again
novae	1	
long-period	3	5
irregular	4	
δ Cep	2	1
cluster	95	15
a- and *b*-type	88	15
c-type	6	0
ultra-short	1	0
eclipsing	18	2
too faint	4	
asteroids	4	
not or little variable	69	
total	200	23

The table shows that a relatively large number of objects appears to be not or little variable. The meaning of "little variable" is that the observable changes of brightness can be ascribed to errors of the plate and to errors of estimation.

The objects denoted by "too faint" are really variable but not bright enough to be estimated.

The most striking feature in the table is the relatively large number of cluster variables. This is in good agreement with the results of other studies in these surroundings [1]. Moreover a former investigation of the present field suggested already the preponderance of cluster variables [2].

[1]) H. VAN GENT, *B.A.N.* No. 227, 1932; *B.A.N.* No. 243, 1933; W. CHR. MARTIN, *B.A.N.* No. 235, 1932.

[2]) *B.A.N.* No. 231, 1932.

Of course Table 2 does not give a true image of the real proportions of the numbers of each type, the chance of discovery being not the same for each of them.

5. The epochs used for the determination of the preliminary period were the observations of maximal or minimal brightness of the variable, the observations of minimum when they are less frequent than those of maximum and the latter in the reverse case. The most probable value of the period of nearly all variables was determined by least squares. For this computation all observations of brightness below or above a certain magnitude have been used rigorously. This critical brightness was chosen for each star in such a way that about 20 epochs were selected. These epochs as well as the counting of the periods and the residuals (O—C) are given in Table 11. For the Algol stars the observations of minimum are given in full (Table 12), because for these stars as a rule the preliminary period has been corrected in a graphical way.

Also among the periods determined with least squares a few appeared to need a small correction. These corrections were determined graphically.

Table 10, column 7, gives the periods definitively adopted and columns 9, 10 and 12 respectively the number of epochs used, the mean error of one epoch and the mean epoch with its mean error. The graphically corrected periods are recognizable because no mean error has been given for them.

6. The determination of the period generally produced no difficulties because VAN GENT took the plates in small and large hour-angles (up to $5\frac{1}{2}$ hours east and west), during all phases of the moon between last and first quarter [1]) and till $3\frac{1}{2}$ months before and after opposition.

Thanks to this favourable distribution of the plates over the time spurious periods are not to be feared. Most valuable for the determination of the period are five long series of plates (each taken during one night). Each series consists of 14 to 21 plates taken in direct succession, thus registering the behaviour of the stars during 7 to 11 hours continuously.

The series of 8 plates taken at Mount Wilson midway between two Johannesburg nights appeared to be of great importance for checking the computed periods of the stars.

By its distribution, outlined above, the material is very suitable for the investigation of variables of short period. On the other hand it is less suitable for the study of long-period stars on account of the small number of years of observation and the irregular yearly distribution of the plates. For this reason the

[1]) Because of the large relative aperture of the Franklin-Adams instrument (f : 4·4) practically no plates could be obtained between first and last quarter of the moon.

long-period variables have not been examined. VAN GENT has already taken into account this circumstance in the choice of the pairs of blink-plates, taking small intervals of time between them, thus suppressing the chance of discovery of long-period stars. Moreover discovery of short-period variables has been stimulated by taking the intervals not nearly equal and the plates of each pair in very different hour-angles. In this manner stars having periods very near to 1 day, ½ day etc. were prevented to be missed. This is of particular importance because galactic cluster variables are known to prefer periods of about half a day.

7. Of all observations phases have been computed with the formula

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

The estimated brightnesses have been reduced to a scale of steps in the usual manner (see *B.A.N.* No. 231 e.g.).

Phase and brightness of all single estimates have been plotted in a diagram, discriminating between observations of different years by dots of various colours. For uncertain estimates a special sign was used. These diagrams are of very great utility, a wrong period as well as changes in period or in shape of the light curve immediately being noticed.

In the case of star No. 221 a change of period is shown and changes in the light curves in the cases of Nos. 64, 74, 100, 163 and 189.

After complete examination of the diagram of estimates the observations have been classed in order of phase and means have been computed of generally ten consecutive observations. Occasionally uncertain estimates have been omitted (see remarks No. 3 to Table 10). The computed means as well as the number of estimates in each group are given in Table 13. They correspond to the mean light curves given at the end of this paper. Of all stars 1½ period has been drawn, to begin with phase ·0.

At the same time the mean error of a single estimate has been computed by first taking the difference in brightness Δs between every two estimates following each other in phase and then using the formula

$$\text{m.e. of a single estimate} = \pm \sqrt{\frac{\Sigma (\Delta s)^2}{2n}},$$

where n means the number of estimates used.

The results are tabulated in Table 10, column 16.

8. The positions of the variables in the sky have been obtained by computations according to the principle of the method of dependencies (see *B.A.N.* No. 231) with the aid of photographic enlargements of the surroundings of the variables. The resulting co-ordinates have been checked by reading them directly on the "Maps of the sky south of −19°" edited by the Union Observatory. The differences between the two determinations were always very small (mean deviation $\pm 2^s$ in α and $\pm$ ′·4 in δ), whereas it may be expected that they have mainly been caused by the errors in the readings on the map. The co-ordinates are found in Table 10, column 2.

The enlargements mentioned above served also to draw the maps of the surroundings (Figure 13) indicating the position of the variable (open circle) and its comparison stars with respect to the neighbouring stars. The current number of the variable is shown in the left-hand upper corner, the right-hand bottom corner indicating the size of each dimension of the square in minutes of arc (usually 10′). In case of absence of a map the description of individual stars is to be consulted (section 13).

9. The magnitudes of all comparison stars have been determined by direct comparison with a sequence of stars of Selected Area No. 159, which is within the field of the plates. As the quality of the images is not constant over the plate, there are generally great differences in appearance between the images to be compared. Therefore the individual determinations of the magnitude of the comparison stars may be expected to possess rather large errors (up to ^{m}·5).

In order to get some idea of the accuracy the magnitudes of a number of comparison stars were also determined by means of star counts. For this purpose one of the plates was placed against a plate of glass bearing a photographic reseau (side of each square = 2·210 mm, 80·11 squares = one square degree). The comparison star was placed in the centre of a square and then the number of stars brighter than the comparison star was counted. The counts were extended to a number of squares which formed a rectangle with the comparison star in its centre and this figure was expanded until a number of about hundred stars was counted.

The counted numbers were reduced to numbers per square degree and from these numbers the magnitudes of the comparison stars were deduced by the aid of the table of log $N_{m,\beta,\lambda}$, occurring in *Groningen Publications* No. 43. As the counted number was always about hundred the mean error of one determination may be estimated to be about ^{m}·1.

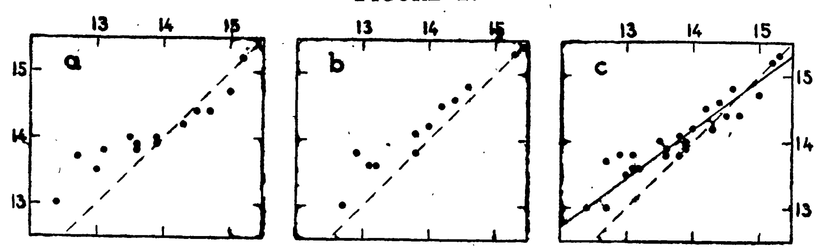
At first these counts have been executed for 14 comparison stars chosen at random. The results are given in Table 3, upper part. When the magnitudes found were compared with the values obtained by direct estimates, considerable systematic differences appeared to exist. This is illustrated in Figure 2*a*. For the 14 stars the estimated magnitudes (abscissae) have been plotted against the magnitudes from star counts (ordinates). The broken line gives the theoretical relation. Apart from the systematic deviation the agreement is not worse than could be expected.

For further examination of the deviation found counts have also been executed for all comparison stars of the three variables situated nearest to the Selected Area. The results (Table 3, bottom part) are compared with the estimated magnitudes in Figure 2*b*. The scale deviation appears to be a little smaller than in the case of stars chosen at random.

TABLE 3.

variable	name comp. star	number units of area	counted number n	$N_{m,\beta,\lambda}$	$\log N_{m,\beta,\lambda}$	λ	β	m_{counted}	$m_{\text{estimated}}$
33	a	5 × 5	122	392	2·59	333°	− 16°	13·8	13·6
	c	3 × 3	83	740	2·87	333	− 16	14·4	14·7
59	a	3 × 5	111	594	2·77	333	− 16	14·2	14·3
74	b	3 × 5	81	433	2·64	335	− 15	13·9	13·9
95	b	5 × 7	67	154	2·19	329	− 11	13·0	12·4
	e	3 × 5	95	509	2·71	329	− 11	14·0	13·9
116	a	5 × 5	145	466	2·67	333	− 16	14·0	13·5
	c	3 × 3	139	847	2·93	333	− 16	14·7	15·0
132	b	5 × 7	95	218	2·34	336	− 9	13·5	13·0
	c	5 × 5	98	314	2·50	336	− 9	13·9	13·6
152	d	3 × 3	186	1660	3·22	333	− 13	15·2	15·2
155	c	3 × 3	91	811	2·91	333	− 10	14·4	14·5
189	a	5 × 5	118	379	2·58	329	− 13	13·8	13·1
205	A	5 × 5	89	286	2·46	337	− 15	13·7	12·7
105	a	5 × 7	114	261	2·42	335	− 17	13·6	13·1
	b	5 × 5	115	369	2·57			13·8	13·8
	c	3 × 5	141	754	2·88			14·5	14·2
121	a	6 × 7	78	149	2·17	336	− 17	13·0	12·7
	b	5 × 5	90	289	2·46			13·6	13·2
	c	5 × 5	170	545	2·74			14·2	14·0
	d	3 × 3	119	1060	3·03			14·8	14·6
50	a	5 × 5	101	323	2·51	336	− 16	13·8	12·9
	b	5 × 5	169	542	2·73			14·1	13·8
	c	3 × 3	89	793	2·90			14·6	14·4
	d	3 × 3	196	1746	3·24			15·3	15·3

FIGURE 2.



A priori there are two possible explanations for the deviations:

1st. A difference in scale between the magnitudes of the Selected Area and those obtained by star counts.

2nd. Errors arising from comparison of star images in consequence of:

a) their difference in size.

b) apart from *a*), the unknown field correction.

The second explanation seemed the most probable. Therefore it was decided to adopt the system of the star counts and to apply corrections to the estimated magnitudes in order to reduce them to the scale of the counts.

In Figure 2*c*, where the dots of Figures 2*a* and 2*b* are repeated the relation adopted between estimated and definitive magnitudes is shown by the full line. It is defined by the dots with a rather large uncertainty and therefore an additional correction depending on the position of the star on the plate would be without significance. The magnitudes of the comparison stars obtained in this way are listed in Table 14.

The light curves have now been reduced to the magnitude scale of the star counts and consequently the results derived from them are directly comparable with those obtained by VAN GENT in the Corona Australis region [1]), VAN GENT having used the same scale as a base for the magnitudes of his variable stars. Nevertheless there will appear to exist a con-

---

[1]) *B.A.N.* No. 227, 1932; *B.A.N.* No. 243, 1933.

siderable difference between the two scales (see section 11).

Table 10, column 14, gives the maximum, the minimum and the range for all variables, expressed in magnitudes. Next, column 15 gives the value of one step in magnitudes for each star. This value appears to be occasionally very different from one star to another.

10. To determine the limiting magnitude of the plates, 12 small square fields have been chosen situated on the diagonals of the plate at three different distances from their point of intersection. Each of the fields has a size equal to four squares of the glass plate with reseau mentioned in the former section. The numbers of stars visible in each of the fields were counted. In this way the numbers of Table 4 have been found. It is evident from this that the limiting magnitude depends on the distance from the centre of the plate, as could be expected.

The values found for the limiting magnitude are in good agreement with VAN GENT's value ($16^{m}\cdot4$) [1], but differ considerably from MARTIN's ($15^{m}\cdot5$) [2].

TABLE 4.

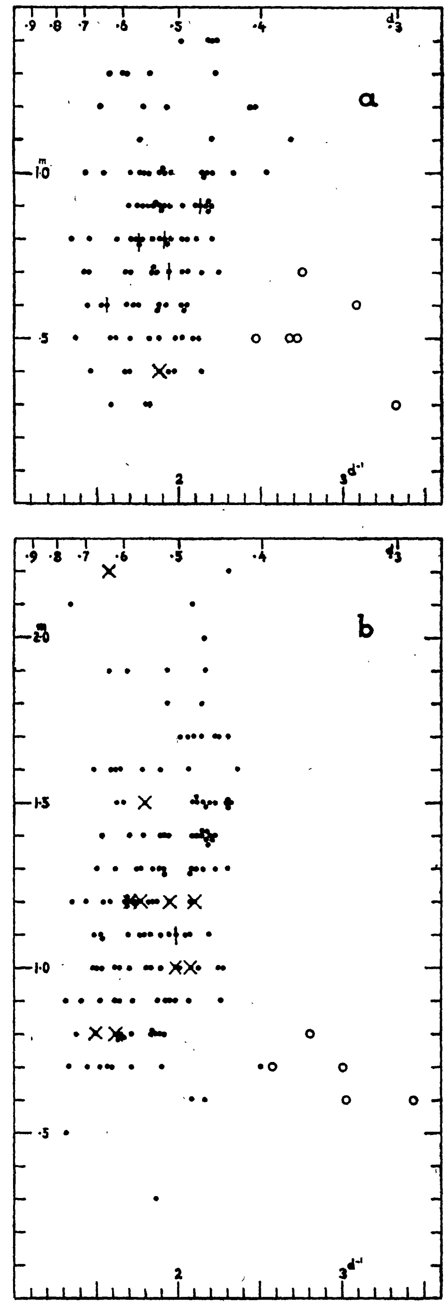
distance from centre of plate	counted number of stars on 4 areas together	number $\mathcal{N}$ per square degree	log $\mathcal{N}$	limiting magnitude
10·6 cm	508	2540	3·40	$15^{m}\cdot8$
6·4	810	4050	3·61	16·2
1·3	1204	6020	3·78	16·5

Whatever the right value may be, it is beyond doubt that the practical limit is given by a smaller number than $16^{m}\cdot4$; in our investigation the estimates never surpass $15^{m}\cdot4$.

For estimating the total number of stars registered on a plate the surface of a plate has been divided in three areas by two circles concentric with the plates and having radii of 4 and 9 cm respectively. Each of these areas was supposed to have a star density equal to that of the four fields inclosed. In this way the total number of stars on a plate was found to be 380000.

11. In Figure 3 the range of the cluster variables (except of ultra-short periods) has been plotted against the reciprocal period. The upper part of the figure refers to the variables of this paper completed with the variables published before [3]). The bottom part gives for comparison the equivalent diagram of the variables of the Corona Australis field [4]). Stars with light curves of BAILEY's *c*-type are indicated by open circles. The figures give rise to the following remarks:

FIGURE 3.

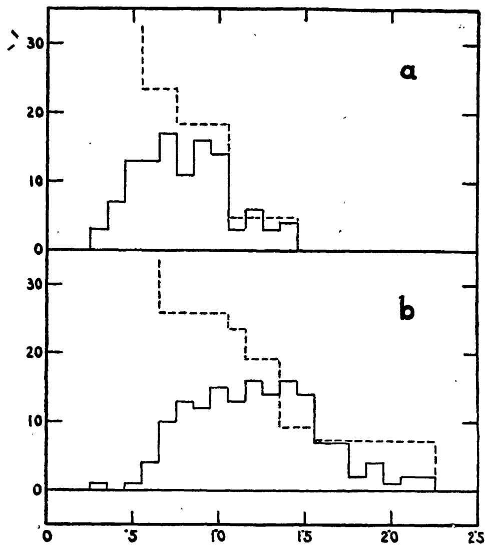


1st. In the field of τ Sgr the stars examined have ranges from $^{m}\cdot3$ up to $1^{m}\cdot4$; in the CrA field from $^{m}\cdot5$ to $2^{m}\cdot2$. This difference is still more striking, when the frequency curves of the ranges in the two fields are compared (see Figure 4, full line). It is very improbable that this difference between the two neighbouring fields should be real. The explanation has to be found in an error in at least one of the magnitude scales.

VAN GENT has found ranges which are excep-

[1]) *B.A.N.* No. 227, 1932; *B.A.N.* No. 243, 1933.
[2]) *B.A.N.* No. 235, 1932.
[3]) *B.A.N.* No. 231, 1932.
[4]) *B.A.N.* No. 227, 1932; *B.A.N.* No. 243, 1933.

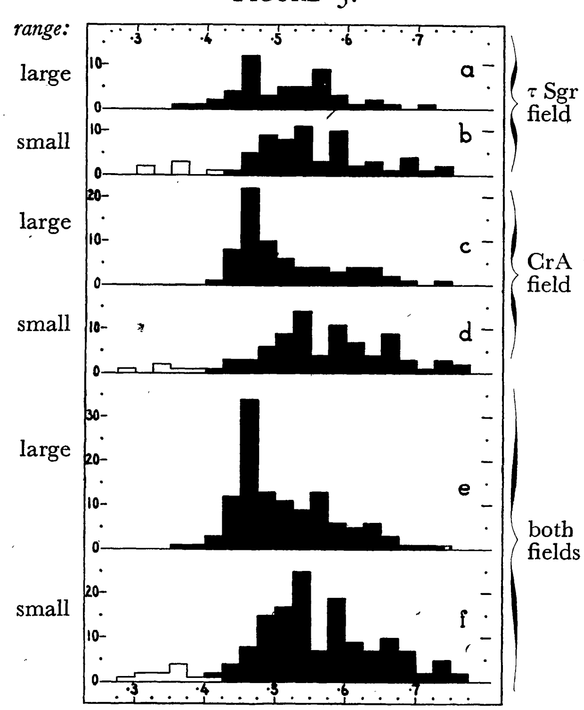
FIGURE 4.



tionally high for cluster variables. E.g. MARTIN [1]) in his investigation of 135 cluster variables in ω Centauri has found no ranges above $1^{m}\cdot4$, the scale being fixed by a grating. This is an indication that VAN GENT's scale is too large. The ratio between the present scale and that of VAN GENT is 2 to 3.

2nd. The variables with changing periods (indicated by crosses) appear to prefer neither a definite range nor a definite period; the stars with variable light curves (indicated by vertical dashes) also have

FIGURE 5.



1) *Ann. Leiden* XVII, 2e stuk, 1938.

no preference for a distinct period, whereas they may prefer a mean range ($^{m}\cdot8$).

3rd. The stars with large ranges appear to prefer a period of about $^{d}\cdot46$, longer periods occurring also, but shorter being rare; the small ranges on the other hand have their maximum frequency at a longer period. These particularities appear more clearly in Figure 5, which shows the frequencies of the periods separately firstly for the two fields and secondly for large and small ranges. The separation between large and small range is taken at $^{m}\cdot85$ for the τ Sgr field and at $1^{m}\cdot25$ for the CrA field. Stars of BAILEY's subclass *c* are indicated by open areas.

The difference between the two frequency distributions in the τ Sgr field is not so obvious that it could be taken as real. However, the two diagrams show such a great similarity with the corresponding ones in the CrA field, that the observations in the two fields confirm each other and corroborate the conclusion. This is shown in Figures 5e and 5f, being respectively found from the frequency curves a, c and b, d by addition. In the small range curve there is no trace of the preference for periods of $^{d}\cdot46$, which is so obvious in the large range curve.

It may be of interest to compare this result with that of an other investigation. In his study of the variables in ω Cen MARTIN [1]) also gives a diagram where ranges are plotted against periods. This diagram also shows a slight decrease of the period of preference for increasing range. His period of preference for large ranges however appears to be $^{d}\cdot60$ and differs considerably from $^{d}\cdot46$, the value mentioned above. This period of $^{d}\cdot46$ is even avoided in ω Cen: whereas the number of cluster variables in this globular cluster is 135, only four of them have a period between $^{d}\cdot43$ and $^{d}\cdot49$ and three of these are of BAILEY's subclass *c*.

P. TH. OOSTERHOFF [2]) and O. HACHENBERG [3]) independently compared frequency distributions of periods of cluster variables in various globular clusters and in parts of the Milky Way. They concluded that these may be very different for various fields investigated.

12. For the computation of the most probable number of cluster variables in the present field which have not been discovered, the method of VAN GENT has been used [4]). We denote by:

N the number of cluster variables, discovered or not, present in this field,

A the number of cluster variables, discovered in this field,

1) L.c.
2) *The Observatory* **62**, p. 104, 1939.
3) *Zs. f. Ap.* **18**, p. 49, 1939.
4) *B.A.N.* No. 243, 1933.

a_k the number of cluster variables, which have been discovered k times,

α the chance of discovery of a cluster variable by comparing one pair of plates,

n the number of plate pairs compared,

G the mean number of times that a variable has been discovered, the undiscovered ones not included.

Between these quantities there are the following relations. The total number of discoveries is $Nn\alpha$, consequently

$$G = \frac{Nn\alpha}{A} \tag{1}$$

The number of cluster variables not discovered is equal to $N-A$. On the other hand it is equal to $N\ (1-\alpha)$, therefore:

$$N - A = N\ (1-\alpha)^n \tag{2}$$

G can be expressed in α by means of (1) and (2):

$$G = \frac{n\alpha}{1-(1-\alpha)^n} \tag{3}$$

G being a known quantity, to be found from

$$G = \frac{\Sigma\, k a_k}{A},$$

we may compute α from (3). This is performed by reading a table giving G as a function of α. Finally N is determined from (1), consequently $N = \frac{AG}{n\alpha}$.

In this computation α is supposed to be the same for all cluster variables, which is not true, the chance of discovery for example being dependent on range and on brightness. The dependence on brightness has been neglected, because this may be supposed to be much smaller than the influence of range, the material being too small to divide it according to both range and brightness. Therefore the cluster variables have been divided into 4 groups according to range, with the assumption that all stars in one group have equal chances of discovery.

In the computations those stars discovered by VAN GENT have also been inserted, which have further not been mentioned in the present paper, because they have been published before (see section 2). The results are tabulated in Table 5.

TABLE 5.

range	$^{\rm m}.3-^{\rm m}.55$		$^{\rm m}.55-^{\rm m}.75$				$^{\rm m}.75-^{\rm m}1.05$				$^{\rm m}1.05-^{\rm m}1.45$				
k	1	2	1	2	3	4	1	2	3	4	1	2	3	4	5
a_k	22	1	18	8	2	2	16	19	4	2	5	4	3	3	1
A	**23**		**30**				**41**				**16**				
$\Sigma\, ka_k$	24		48				74				39				
G	1.04		1.60				1.80				2.44				
α	0.004		0.041				0.052				0.087				
N	**230**		**45**				**55**				**17.2**				

This table shows that the computed number of cluster variables with a range larger than $^{\rm m}.55$ is 117, whereas the number really discovered is 87. Of the group of smallest range only one tenth of the computed number has been discovered. This number of 230 however is very uncertain.

The results are represented graphically in Figure 4*a*. The full line gives the numbers of cluster variables really observed, whereas the dotted line gives the computed numbers per $^{\rm m}.1$ interval in range. These numbers have been obtained from the values N of Table 5 supposing the stars in each group to be equally distributed over the ranges. Figure 4*b* shows the corresponding frequencies in the CrA field. The discordance between the distributions for large ranges is caused by the fact that VAN GENT has divided his material both according to range and to median magnitude, thus being obliged to bring together stars of very different range in some groups. Therefore in Figure 5*b* for ranges greater than $1^{\rm m}.3$ the full line may be supposed to represent the real number of stars better than the dotted line.

If we suppose the magnitude scales to be in the ratio of 2 to 3 the computed number of 117 cluster variables with a range greater than $^{\rm m}.55$ may be compared with the corresponding result in CrA. The resulting number is 189.

13. Individual variables give rise to the following remarks (compare also the remarks to Table 10).

Var. 1. The light curve of this eclipsing variable shows a secondary minimum.

Var. 2. This cluster variable, having a large number of observations on the rising branch, seemed to be a favourable case for determining the period from these observations. For comparison the period has also been determined as usually from the maxima. The results are:

rising branch: $P = {}^{\rm d}.5316468 \pm {}^{\rm d}.0000014$ (m.e.) $n = 22$,
maxima: $P = {}^{\rm d}.5316426 \pm {}^{\rm d}.0000059$ (m.e.) $n = 18$.

Phases and mean light curves have been computed from the former value (reciprocal $1^{d-1} \cdot 880948$).

Var. 5. The shape of the light curve differs from the usual shape for variables of this period.

Var. 6. The variable is situated near to a star which is a little fainter than the variable in its minimum. Their apparent distance is so small that their images overlap on most of the plates, making estimates of brightness difficult. Determination of a period from the estimates on plates until J. D. 7664 appeared to be impossible. This was considered to be the result of the inaccurate estimates. The plate material being extended until J.D. 9165 and some precautions being taken, a new attempt was made to determine the period. The choice of the comparison stars was improved by replacing star c by another star c′, situated nearer to the variable.

During estimation distinction has now been made between the case that the variable and its component were visible separately and the case of overlapping images. This occurred 104 and 264 times respectively. The impression having been established during the first series of estimates that also the component showed variability, now the brightness of this component was also estimated in the series of comparison stars adopted when both stars were visible separately.

From the observations of maximum it proved to be possible to determine the period of light variation. The most probable value was determined from the estimates on the rising branch for plates of good quality. A mean light curve was also computed with weights of 4 and 3 respectively assigned to certain and uncertain estimates (numbers respectively 64 and 40). These weights have been adopted after determining the mean error of a single observation for each group separately; they amounted to $\pm$ $1^{s} \cdot 27$ and $\pm$ $1^{s} \cdot 46$ respectively.

TABLE 6.

name	period	references
CY Aqr	^{d} ·0610	e.g. HOFFMEISTER and JENSCH, *A.N.* **253**, No. 6051, 1934; A. J. WESSELINK, *B.A.N.* No. 341, 1941.
BAILEY 65 in ω Cen	·0627	E. HERTZSPRUNG, *B.A.N.* No. 247, 1933.
VV Pup	·0697	H. VAN GENT, *B.A.N.* No. 214, 1931.
DY Peg	·0729	A. SOLOVIEV, *Tadjik Circular* No. 37, 1938.
KU Cen	·0800	W. CHR. MARTIN, *B.A.N.* No. 232, 1932.
RV Ari	·0852	H. GURIEV, *Tadjik Circular* No. 38, 1938.
V494 Sgr	·1076	H. VAN GENT, *B.A.N.* No. 243, 1933.
BP Peg	·1094	*)
AI Vel	·1116	E. HERTZSPRUNG, *B.A.N.* No. 224, 1931.

*) In the "Katalog und Ephemeriden Veränderlicher Sterne" by H. SCHNELLER this star does not occur among the eclipsing variables for the first time in the edition for 1941.

The light curve obtained in this way is shown by the dots in Figure 14a. Every dot has a weight corresponding to about 10 certain estimates. Open circles are means derived from observations of the combined images of variable and component. These points have to be considered as less certain and systematically in error. They have been obtained as follows.

The observations of the first series of estimates have been reduced to the scale of the second; the means have been taken of both estimates made on each plate. Of the values for combined blackness arrived at in this manner, means have been taken in the ordinary way (in groups of 12). The internal mean error of one (mean) observation of the combined blackness of variable and component proved to be $\pm$ $1^{s} \cdot 51$.

Finally an attempt has been made to prove the variability of the component by establishing a period in its light variation. For that purpose the difference has been taken of all observations of combined blackness with the mean light curve (of the single variable) at the same phase. The largest differences have been considered as the maxima of the component. However neither in these differences, nor in the direct estimates of the component any period could be found. The greatest brightness observed is $8^{s} \cdot 6$, corresponding to $14^{m} \cdot 5$.

Var. 14. This star belongs to the group of cluster variables with ultra-short periods. The only stars of this type known to have shorter periods are listed in Table 6.

The determination of the period did not produce any difficulty, owing to the nights with long series of observations. The estimates from these nights together with the mean light curve repeated periodically are given in Figure 6 (open circles are uncertain estimates).

Var. 17. Single observations show a large spread caused by the fact that immediately north of the variable (about ·04 mm on the plate) a faint star is situated, which is only visible on plates of good quality when the variable is also faint.

To check the period supplementary estimates have been made on the plates after J.D. 7664. The new observations proved to be in accordance with the originals. They have not been used further.

Var. 20. This Algol star shows a deep minimum (Figure 14e) and a secondary minimum is not indicated with certainty. The period has been determined graphically from the branches. Open circles in the mean light curve are means of 4 to 8 observations; dots of 10, as usual.

Var. 23. This eclipsing variable has two minima of nearly equal depth (Figure 14e). The least squares solution is related to the period of light variation,

FIGURE 6.

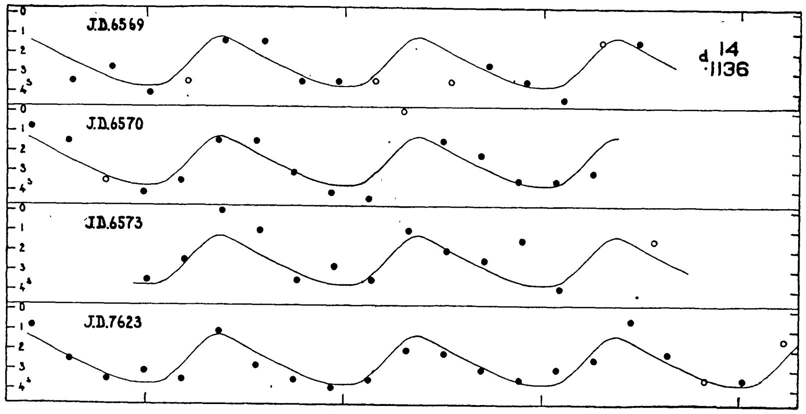
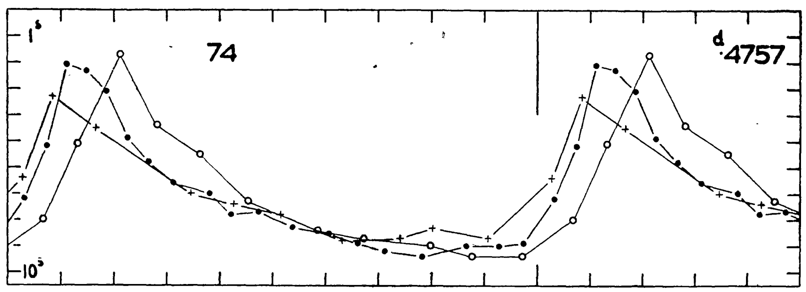


FIGURE 7.



which is half the period of rotation, given in Table 10.

Var. 31 and 36. These irregular variables (V729 and V730 Sgr) have already been published before[1]. The values of the magnitude, given in Table 10, column 14, as well as those of the comparison stars (Table 14) differ slightly from the values in that publication, because they have been determined anew according to the method mentioned in section 9.

Var. 45. Upon an indication of variability of the light curve of this star, the plates until J.D. 9165 have been estimated in addition. The presumption was not confirmed.

Var. 58. The light curve of this Algol variable (Figure 14e) shows an indication of a secondary minimum. The open circles are means of 6 observations (dots of 10).

Var. 61. The light curve of this Algol variable (Figure 14e) shows a secondary minimum.

Var. 64. The diagram of single estimates shows a large spread, suggesting a false period or a variable light curve. To obtain further information the plates until J.D. 9165 have been estimated in addition. Checking of the period showed the counting to be correct without doubt. A small correction could be applied with the aid of the new observations. The diagram of single estimates shows:

1) *B.A.N.* No. 256, 1934.

1st. Some maxima are extra high.

2nd. After correction of the period two observations of minimum occur at the time of maximum.

3rd. The observations in 1934 are shifted systematically $^{P}\cdot 1$ in phase with regard to the others.

Consequently there are indications that this star deviates now and then from its mean light curve. The new observations have not been used further.

Var. 70. This bright Algol star (V 523 Sgr = C.P.D. – 29°5846) has two minima of nearly equal depth with a difference in phase of $^{P}\cdot 414$ (Figure 14e) indicating an orbital eccentricity of at least ·14[1]. In connection with the brightness of the variable and its comparison stars and also with their rather large mutual distance the estimates have been executed with the naked eye. For further information reference is made to the publication concerned[2], which is based on observations until J.D. 6573. The star has also been estimated on all plates after that date, but appeared in minimum on two plates only (Table 12). These observations occurred at the expected phase, so they did not alter the original value of the period. For the computation of the mean light curve the new observations have not been used.

1) J. UITTERDIJK, "A method of deriving limits for the eccentricity of the orbit and for the longitude of periastron of an eclipsing binary." *B.A.N.* No. 237, 1932.
2) *B.A.N.* No. 256, 1934.

Miss JONES [1]) studied this star more fully on 1650 Harvard plates dating down to 1889, and demonstrated the rotation of the line of apsides. Her observations have been discussed anew by RUSSELL [2]) and DE KORT [3]). Both concluded to an orbital eccentricity of at least ·17 and a period of apsidal revolution of at least 200 years.

Var. 74. The diagram of single estimates showed the light curve to be variable. For some time the observations satisfy a certain light curve, whereas during the next interval of time the star has an other light curve. To get further information the star was estimated on all plates available. From the beginning of the series of plates (compare Figure 1) until J.D. 5805 the star proved to satisfy the light curve indicated by crosses (means of 5 or 6 observations) in Figure 7. After this date there are 12 nights without observations and the plates taken since show the star to have the light curve indicated by open circles (means of 9 or 10 observations) in the same figure. The observations fit this curve until J.D. 6214. Then, after an interval of 3 nights without observations, to begin with J.D. 6218 the star has the light curve indicated by black dots [4]) (means of 10 observations). The straight lines connecting consecutive points give only a rough approximation of the light curves; they have been drawn to bring out the principal characteristics of the figure.

These observations show the behaviour of the star to change with jumps. The changes concern the magnitude of maximum and minimum and the phase of the rising branch, but not the period, for this fits all three light curves very well. As the rising branches first advance and then recede, they cannot be made to coincide by correcting the period. A representation of the observations by a uniformly variable period is also impossible, the phases changing abruptly.

The computation of the mean error has been carried out separately for each of the three light curves. Moreover every curve has been divided into a part where the three curves coincide practically (phase ·0 to ·5) and a part where they are different (phase ·5 to ·0).

The results are given in Table 7 (between parentheses: numbers of observations). A remarkable feature is the difference in spread between the variable and the constant part of the light curve, the spread in the former part in two of the three curves being considerably larger than in the latter. This suggests the two changes occurring with an interval of about a year to be not the only changes the light curve has undergone during the years of observation. Whether the remaining variations occurred also with jumps or had the character of a continuous change cannot be settled with the material available. Anyway the observations are well represented by the three light curves mentioned.

TABLE 7.

curve	J.D. – 2420000	mean error of a single estimate		
		phase ·0—·5	phase ·5—·0	whole period
+ + + + + +	5442–5808	$\pm$ ·76^s (27)	$\pm$ ·88^s (23)	
○ ○ ○ ○ ○	5821–6214	$\pm$1·10 (58)	$\pm$ ·69 (47)	
● ● ● ● ●	6218–9165	$\pm$1·28 (108)	$\pm$ ·70 (80)	
all three		$\pm$1·16 (193)	$\pm$ ·73 (150)	$\pm$1·00 (433)
mean curve	5442–9165	$\pm$1·62 (193)	$\pm$ ·74 (150)	

[1]) *Harvard Bulletin* No. 909, 1938.
[2]) *Ap. J.* **90**, p. 641, 1939.
[3]) *B.A.N.* No. 348, 273, 1942.
[4]) The light curve in Figure 14a is also based on the observations after J.D. 6218 only.

Var. 76. This star is at the border of the platefield and situated close to a star of magnitude $15^m{\cdot}2$, which disturbs the image, both circumstances making estimation difficult.

Var. 80. The diagram of single estimates shows a large spread of individual observations about the mean light curve.

Var. 83. The light curve of this Algol star shows no trace of a secondary minimum. Open circles in the mean light curve (Figure 14e) are means of 5 single observations.

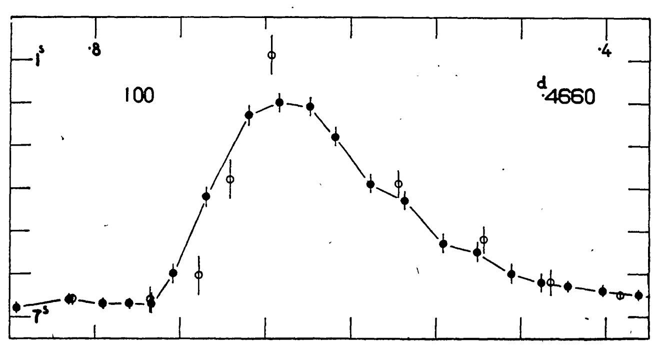
Var. 86. The period of this star is $47^d{\cdot}50$. The light curve proves to be strongly and irregularly variable (minima not equally deep). The star has not further been examined on account of the unsuitability of the plate material for this type of variables. Min. J.D. 5808, max. J.D. 5834.

Var. 88. The light curve (Figure 14c) is rather uncertain in minimum because the number of observations is too small as a consequence of the star's faintness.

Var. 96. The light curve of this Algol star shows no indication of a secondary minimum. Open circles in the diagram (Figure 14e) are means of 5 observations; dots of 10, as usual.

Var. 100. From observations till J.D. 7664 a good

FIGURE 8.



light curve resulted, but two of the latest observations showed a remarkable deviation. For further information also the plates till J.D. 9165 have been estimated. The light curve, to begin with the observations of 1933 or 1934 [1]) proved to have a shape differing from that before. Therefore separate light curves have been constructed from plates before and after J.D. 7000 (see Figure 8). The dots are those of Figure 14a; they represent 10 observations before J.D. 7000 each. Open circles are means of 10 observations (except 3 points on the rising branch, which are means of 5) after that date. The lengths of the vertical dashes through the normal points represent the mean errors. The difference between the two curves, though not large, is undoubtedly real.

The mean error of a single observation was determined separately for each of the two curves, this quantity moreover being computed for the coinciding part of the curves (phase ·35 till ·85) and for the differing part (phase ·85 till ·35)separately.

The results are given in Table 8 (between parentheses: numbers of observations). Especially in the

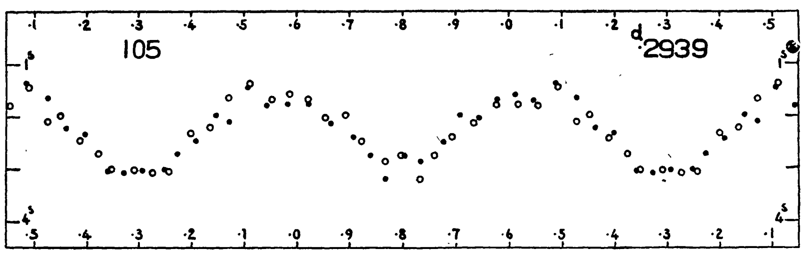
TABLE 8.

curve	J.D. — 2420000	mean error of a single estimate		
		phase ·85—·35	phase ·35—·85	whole period
• • • • •	until 7000	± ˢ·74 (134)	± ˢ·42 (114)	
○ ○ ○ ○ ○	after 7000	± 1·96 (47)	± ·33 (58)	
both		± ·84 (181)	± ·39 (172)	± ·66 (353)

curve after J.D. 7000 the mean error of the observations in the changing part is much greater than in the constant part. Therefore the changes in the light curve mentioned above are probably not the only changes which occurred during the years of observation and Figure 8 is likely to give only a rough image of the behaviour of the star.

Var. 105. This variable of short period has a very small range. Therefore the type of variability cannot be stated with certainty. If it is not a variable of the W UMa type, it must be an ultra-short period cluster variable (^{d}·1469722). However the W UMa type appears to be the most probable for the following reasons:

FIGURE 9.



1st. The minima are sharper than the maxima.

2nd. When the light curve is drawn in reverse direction together with a normal one in the same diagram, in such a way that the phases of the minima coincide (see Figure 9), the minima appear to have unequal shape. If the star were a cluster variable then the minima of Figure 9 should have equal shape. The least squares solution corresponds to the period of light variation, which is half the period of rotation, given in Table 10.

Var. 122. No secondary minimum of this Algol star has been observed. The period may have to be doubled. The variable being below the limiting magnitude of the plates on a number of minimum plates the magnitude of the minimum is uncertain. In the mean light curve (Figure 14e) means of 4 or 5 observations are indicated by open circles.

Var. 130. The light curve of this δ Cephei star with a period of 13^{d}·51 resembles very much that of FI Carinae with a period of 13^{d}·45, which has been discovered and studied by E. HERTZSPRUNG [1]). The new plates till J.D. 9165 have been estimated in addition for the purpose of detecting possible changes. The star proved to be perfectly regular. The period could be corrected graphically. The new observations have not been used further.

Var. 132. In the diagram of single estimates there are indications of inconstancy of the period (lengthening).

Var. 140. In minimum (phase ·40 till ·60) the estimates are distributed sensibly (over 2 times) thinner than in the remainder of the period. In the former part the mean light curve may be systematically too high.

Var. 144. For the map of the surroundings see var. No. 142. The corresponding comparison stars have been marked with an accent.

Var. 146. This star (V 522 Sgr) is a Nova of 1931. Particulars are to be found in a separate publication [2]).

1) From the two observations in 1933 no conclusion can be drawn.

1) *B.A.N.* No. 95, 1926.
2) *B.A.N.* No. 269, 1935.

Var. 148. The diagram of single estimates shows a gap in the observations between phase ·40 and ·50. Beyond ·50 some observations occur and the density increases a little till ·85, but in the whole interval of phase ·50 till ·85 there are only 25 observations. The cause is possibly that comparison star c is a star close to the variable. The stars are only seen separately when the variable is about equally bright as or fainter than c and only in case the images are sharp; the plates where the variable is a little fainter than b are unsuitable for estimation, the estimates becoming easier when the variable is fainter.

Var. 152. The light curve of this Algol star (Figure 14e) shows no trace of a secondary minimum. Open circles are means of 4 or 5 observations (dots of 10 as usual).

Var. 159. This variable proves to be an irregular one. It seems to be nearly periodical with a period of about 80 days. The plate material, being unsuitable for this type of variables, has not been further examined.

Var. 162. The light curve of this Algol star (Figure 14e) shows an indication of a secondary minimum at phase ·3. Open circles are means of 5 or 6 observations (dots of 10 as usual).

Var. 163. The diagram of single estimates shows the light curve to differ from year to year. For further information the plates of 1935 and 1938 have been estimated in addition. To begin with this yielded a correction to the period. Next, the observations of 1938 proved to differ very much from the older ones. For this reason a new mean light curve has not been constructed. The mean light curve covering the years 1929 till 1934, computed with the original reciprocal period 1^{d-1}·934844 is given in Figure 14b.

FIGURE 10.

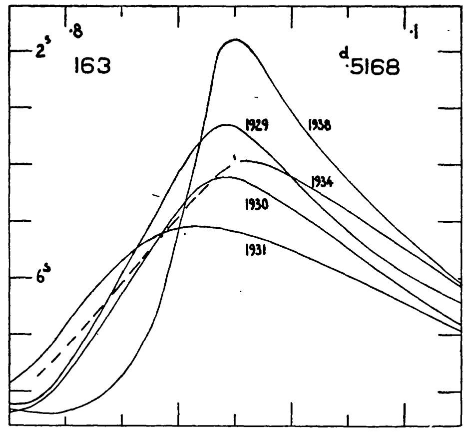
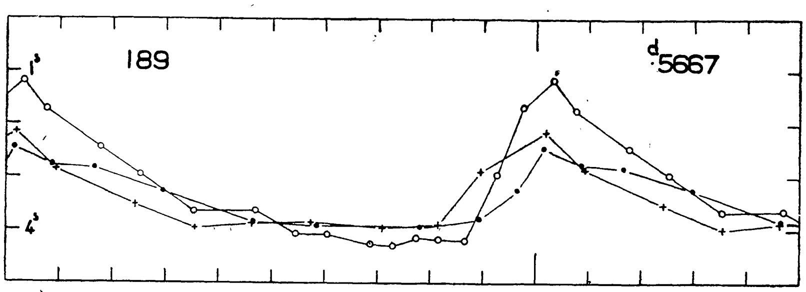


Figure 10 gives the mean light curves of the different years separately for the new reciprocal period 1^{d-1}·934833. In 1934 no observations on the rising branch were available: the broken line in the figure is a nearly straight line connecting the last observations in minimum with the first in maximum. The figure shows the greatest range to be at least twice the smallest.

Var. 169. For the map of the surroundings see var. 69. The corresponding comparison stars have been marked with an accent.

FIGURE 11.



Var. 175. In the diagram of single estimates there are some indications of a possible shortening of the period.

Var. 188. This star, having a period of 1^{d}·835, is the only δ Cep star known to have a period between that of VZ Aql (1^{d}·668) and SU Cas (1^{d}·949) according to the *Katalog und Ephemeriden* for 1941.

Var. 189. The diagram of single estimates shows the light curve to be variable. The changes are imperceptible in the course of one year of observation. The plates until J.D. 9165 have been estimated in addition. The material has been divided into three groups and a mean light curve has been computed for each group separately. The results are given in Figure 11. The curve indicated by open circles is identical with that given in Figure 14c. Straight lines of connection between consecutive points serve to emphasize the chief features of the figure.

TABLE 9.

curve	J.D. — 2420000	mean error of a single estimate	number of observations
• • • • •	5442–5926	± ·70ˢ	89
o o o o o	6067–6573	± ·45	146
+ + + + +	7367–9165	± ·60	85

Mean errors of a single estimate have been computed separately for each of the three curves. Table 9 shows the results. From this the mean value $\pm$ ^{s}·57 is found, which is also given in Table 10.

Var. 191. This eclipsing variable has two unequal minima (Figure 14e).

Var. 207. For the map of the surroundings see var. 90. The corresponding comparison stars have an accent.

Var. 219. For the map of the surroundings see var. 124. The corresponding comparison stars have an accent.

Var. 221. It proved to be impossible to derive a period satisfying all observations of this star. A period can be found however, which represents the observations of the first four years. This has been determined with least squares and came out to be ^{d}·5310747 $\pm$ ·0000135 (1^{d-1}·882974). The corresponding mean light curve for the first four years is given in Figure 14b. The phase of maximum is ·36. With this period, however, the maxima in 1934 have the phase ·96, those in 1938 ·42, whereas for the observations in 1935, containing no maximum, the phase of maximum can be estimated to be ·65 [1]). The shape of the light curve was the same in all years.

These phases of maximum being plotted in a diagram against the mean J.D. it proves to be impossible to bring them on a straight line, whatever the counting of the periods may be. Accurate examination of the observations from 1928 till 1931 showed the phase to increase first and to decrease afterwards, suggesting a shortening of the period. With least squares a parabola has been computed passing through the best determined individual maxima. For this parabola the following equation has been found:

$$ph_{max} = -674 \times 10^{-10} E^2 + ·000186\, E + 2·298$$
$$\pm 33 \qquad\qquad \pm 25 \qquad \pm 28 \text{ (m.e.)}$$

where E means the number of periods elapsed after J.D. 5470·228. From this parabola the quadratic term in the ephemeris of the maximum was found to be:

$$-358^{d} \times 10^{-10} E^2$$
$$\pm 18 \qquad \text{(m.e.)}$$

In order to collect all observations in a single light curve phases have been computed with the formula:

$$\text{phase} = (\text{J.D.Hel.M.A.T. Grw.} -2420000) \times 1^{d-1}·882974 + (\text{J.D.Hel.M.A.T. Grw.} -2426203)^2 \times 2391^{d-2}·5 \times 10^{-10}.$$

With these phases the diagram of single estimates has been drawn and a rather good light curve resulted. Two things however drew the attention:

1. in the year 1935 an observation of minimum occurs at the phase of maximum.

2. the spread of the observations in 1938 is too large. From 1, though this is based upon one observation only, it follows that the representation of the progress of the phase of maximum by a quadratic function of the time is erroneous or at least an insufficient approximation.

This becomes also evident when the phase of maximum is derived separately for each month [1]). The phases (from reciprocal period 1^{d-1}·882974) together with the parabola have been drawn in Figure 12. The diameter of the circles increases, as shown in the figure, with increasing number of observations *n*, from which the corresponding phase has been determined.

The figure shows that the parabola passes close to the circles, but also that it cannot describe the behaviour of the star with sufficient accuracy. Moreover the three circles of 1938 indicate that the parabola does not describe approximately the behaviour of the star, but probably gives an entirely wrong representation of it. The situation namely of the three circles mentioned indicates an increase of the phase of maximum (connected with an increasing period), whereas according to the parabola the phase (and also the period) ought to decrease. Consequently the counting of the periods probably is wrong, some points in the figure having to rise or to descend by a whole number of periods.

Some possibilities for the maxima in 1934, 1935 and 1938 are shown in the figure. The problem is how to determine how the phase of maximum varies with the time. The dotted line gives one of the possibilities, supposing the period to vary gradually. Other solutions are possible.

If it is supposed that the period could vary with a leap, it becomes fully impossible to determine its behaviour. Frequent observation will be necessary.

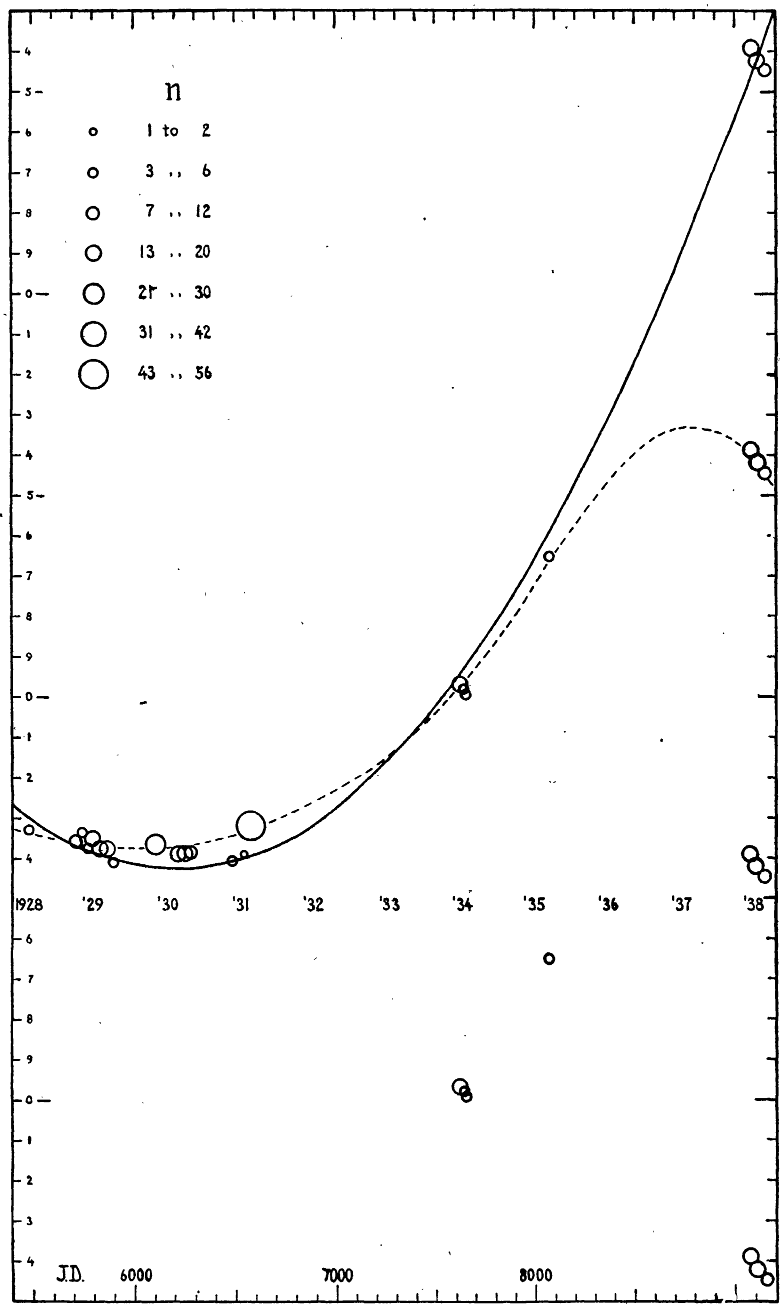
Var. 224. This variable has been discovered during examination of var. 83 and is indicated on its map. The type being long-period it has not been further examined.

Var. 225. This variable (C.P.D. — 30°5669, CPD magn. 8^{m}·8) was discovered during examination

1) See note in the next column.

1) This has been done by plotting the observations against phase in a diagram and shifting the mean light curve of the first four years, drawn on a piece of transparent paper, until it coincides as closely as possible with the observed points. By this method it is possible to obtain a rather good value of the phase of maximum even from a few observations.

FIGURE 12.



of var. 109. The type of variation is Algol, the provisionally determined period being $4^{d}\cdot15$. The examination of this star has not been finished as yet.

Var. 227. This variable has been discovered during examination of var. 162 and is indicated on its map. The type being long-period it has not been studied further.

For much help in preparing this paper I am indebted to the computers of the Observatory, especially to Messrs DE HAAS and DE ROOY.

FIGURE 13a.

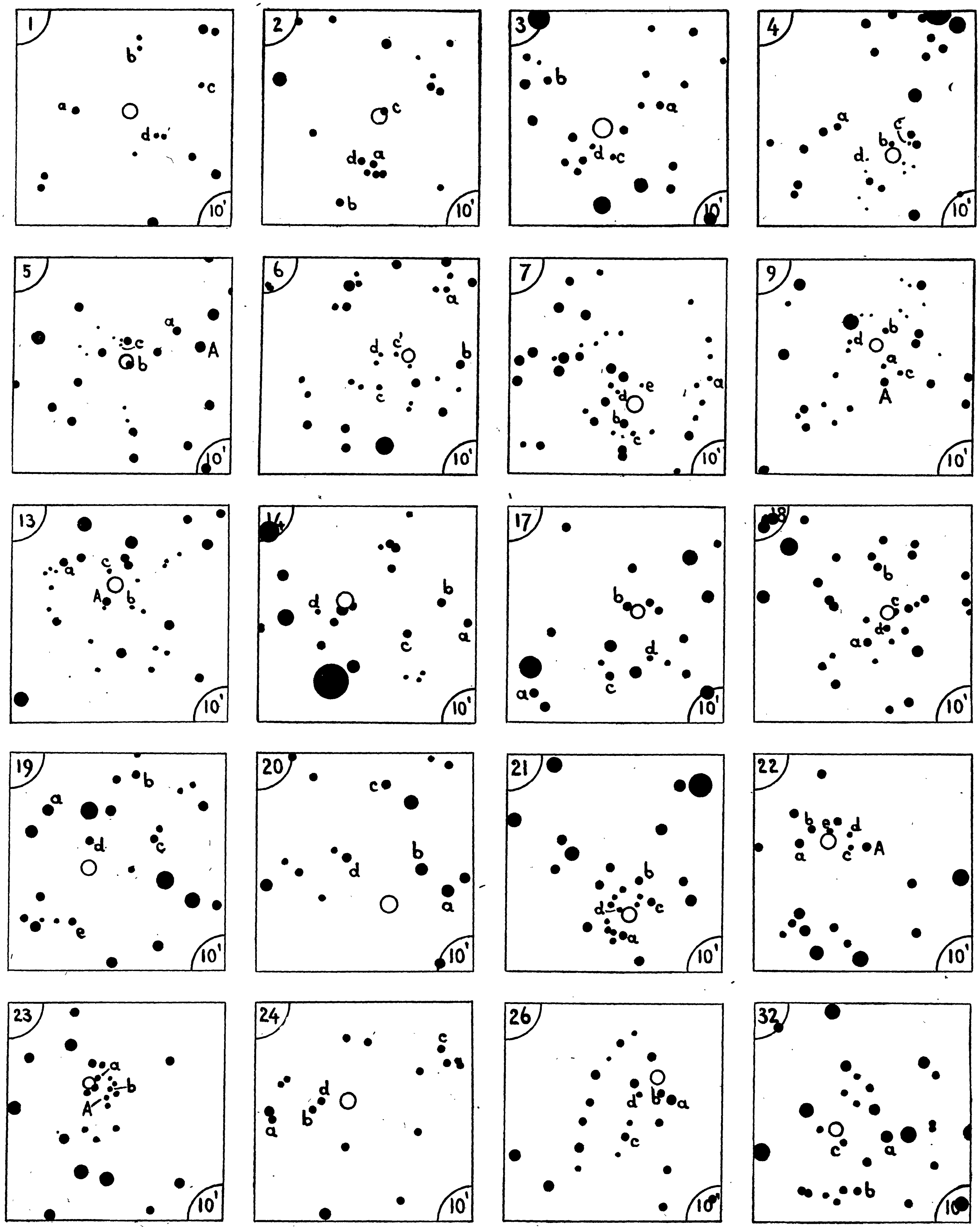


FIGURE 13b.

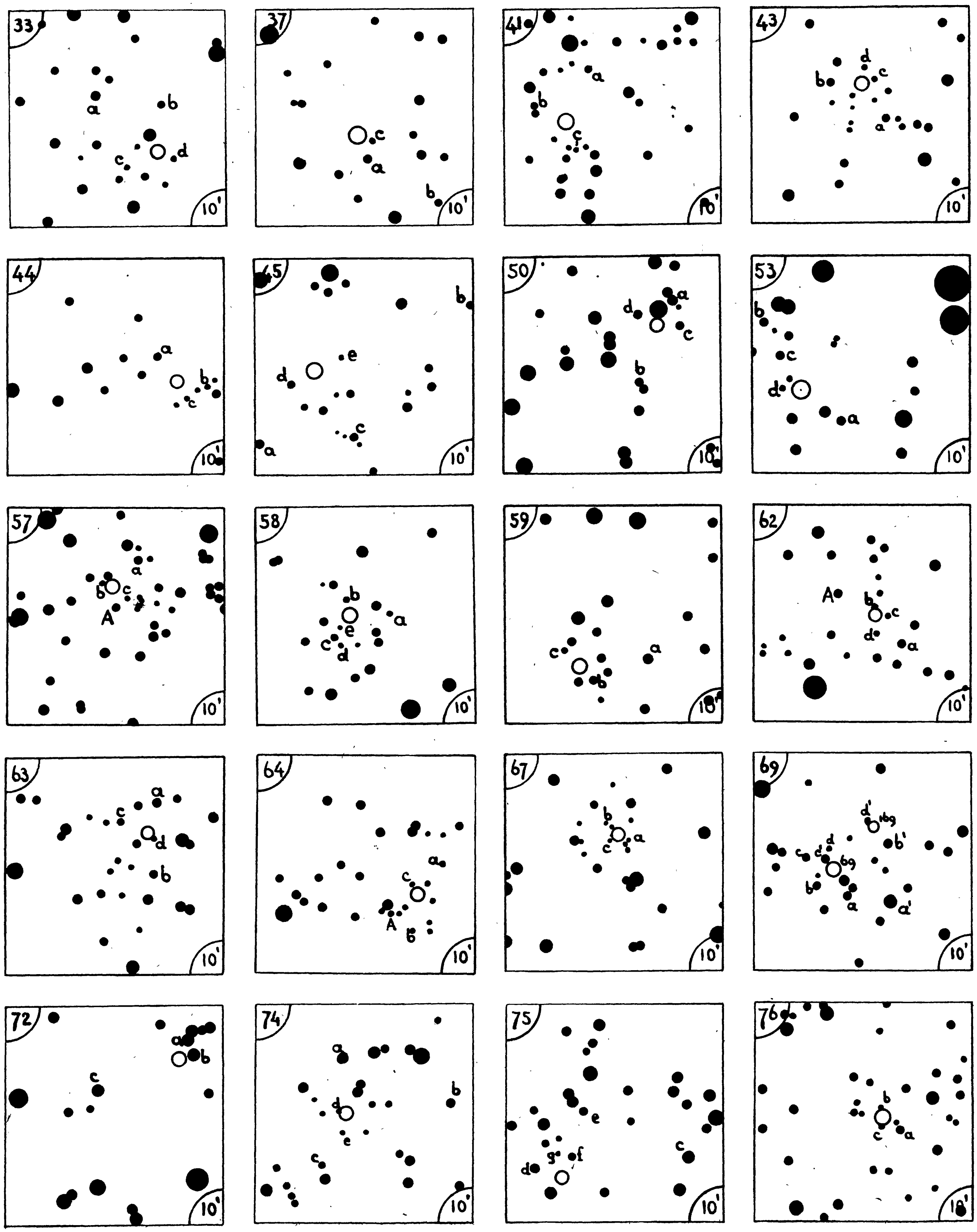


FIGURE 13c.

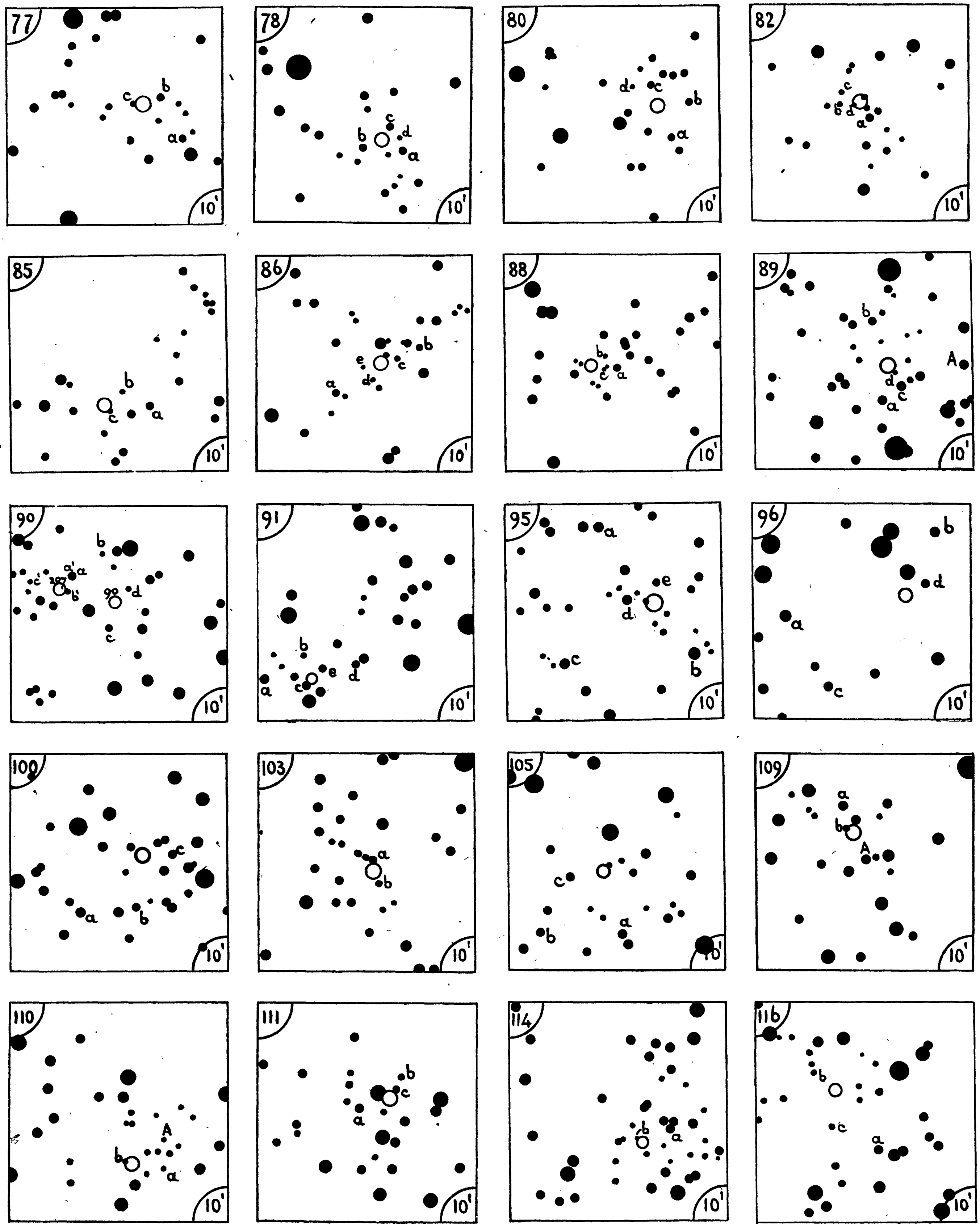

77
78
80
82
85
86
88
89
90
91
95
96
100
103
105
109
110
111
114
116
10'

FIGURE 13d.

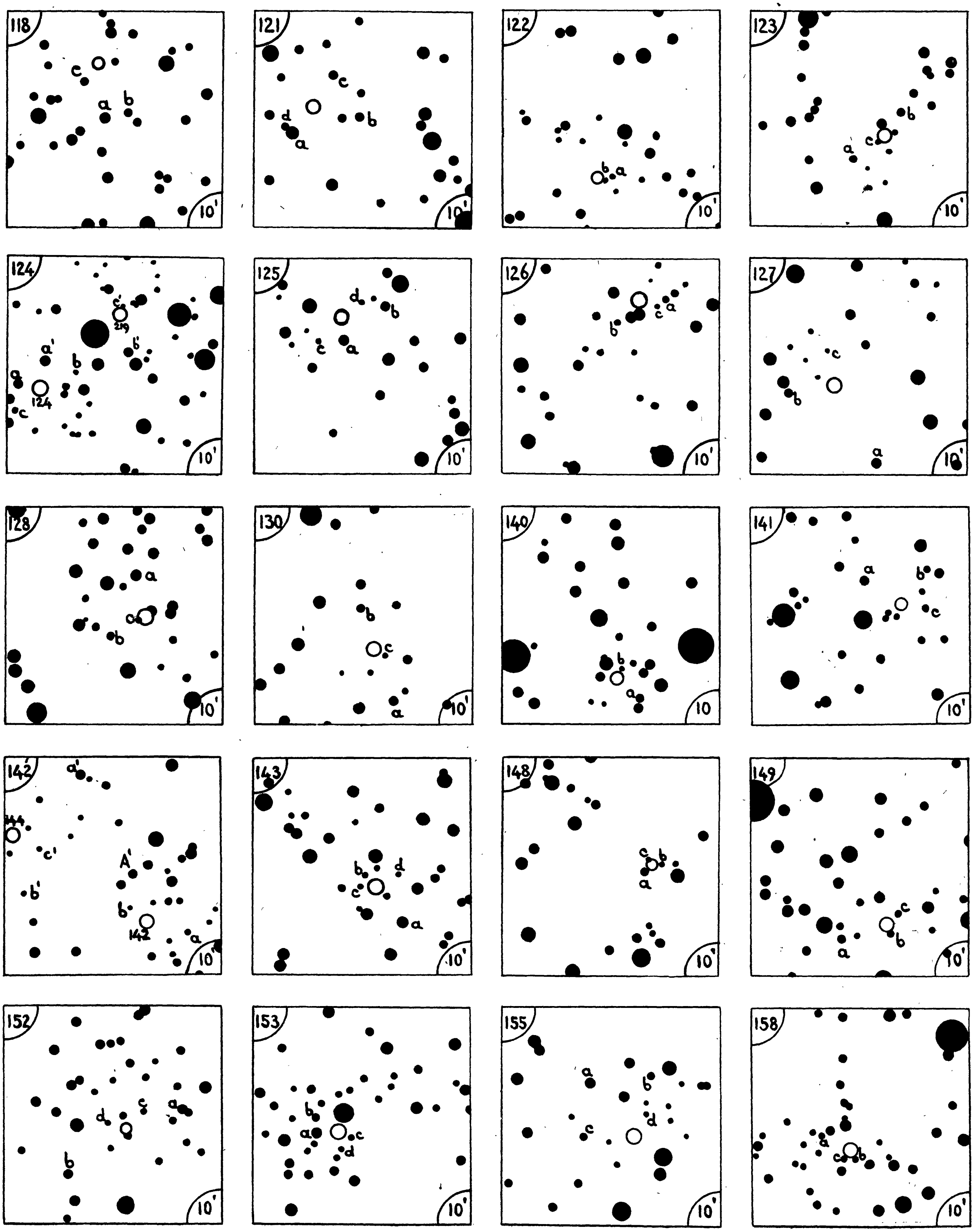

118
121
122
123
124
125
126
127
128
130
140
141
142
143
148
149
152
153
155
158
10'

FIGURE 13e.

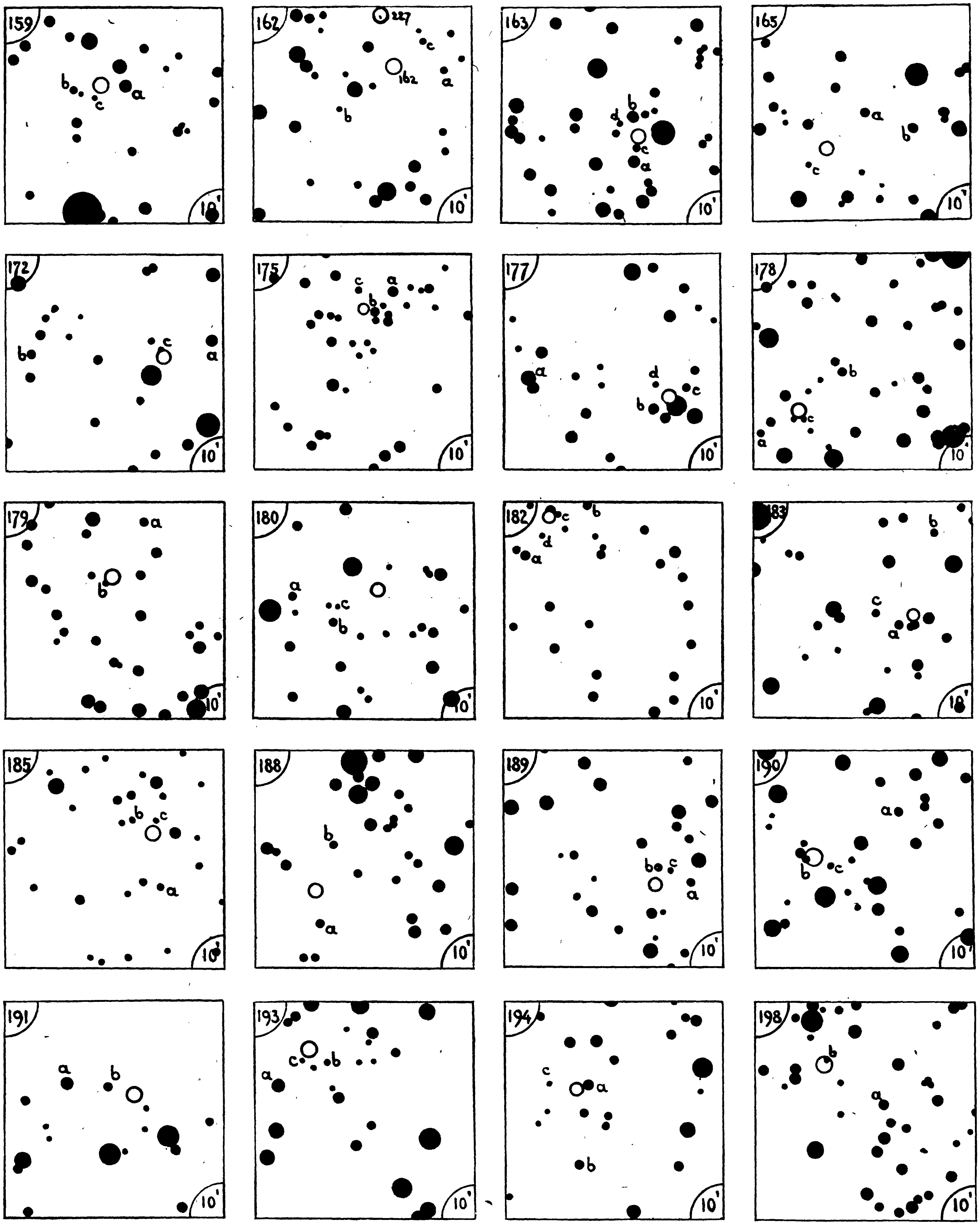

159
162
163
165
172
175
177
178
179
180
182
183
185
188
189
190
191
193
194
198

FIGURE 13f.

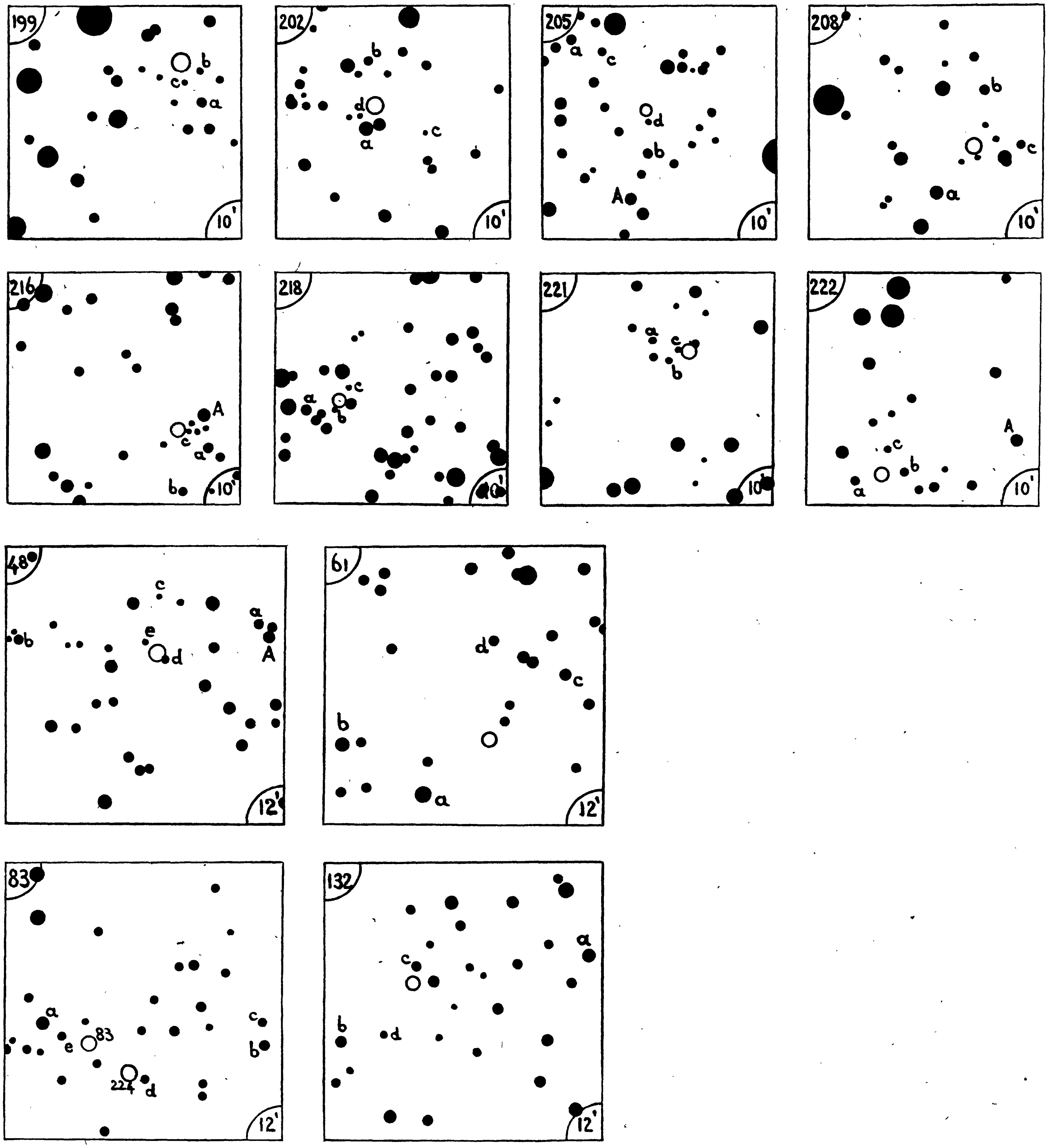


FIGURE 14a.

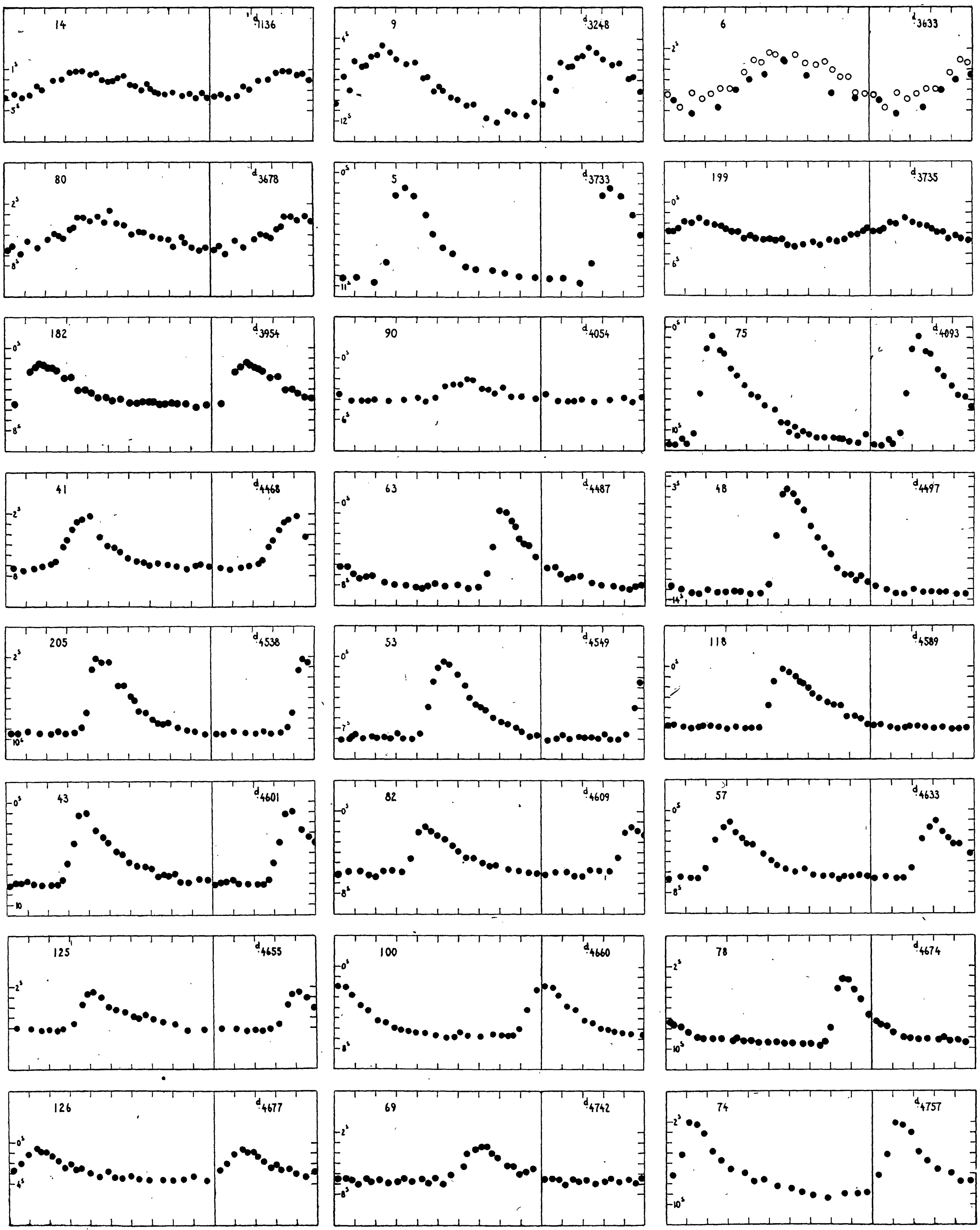

14
d1136
9
d3248
6
d3633
80
d3678
5
d3733
199
d3735
182
d3954
90
d4054
75
d4093
41
d4468
63
d4487
48
d4497
205
d4538
53
d4549
118
d4589
43
d4601
82
d4609
57
d4633
125
d4655
100
d4660
78
d4674
126
d4677
69
d4742
74
d4757

FIGURE 14b.

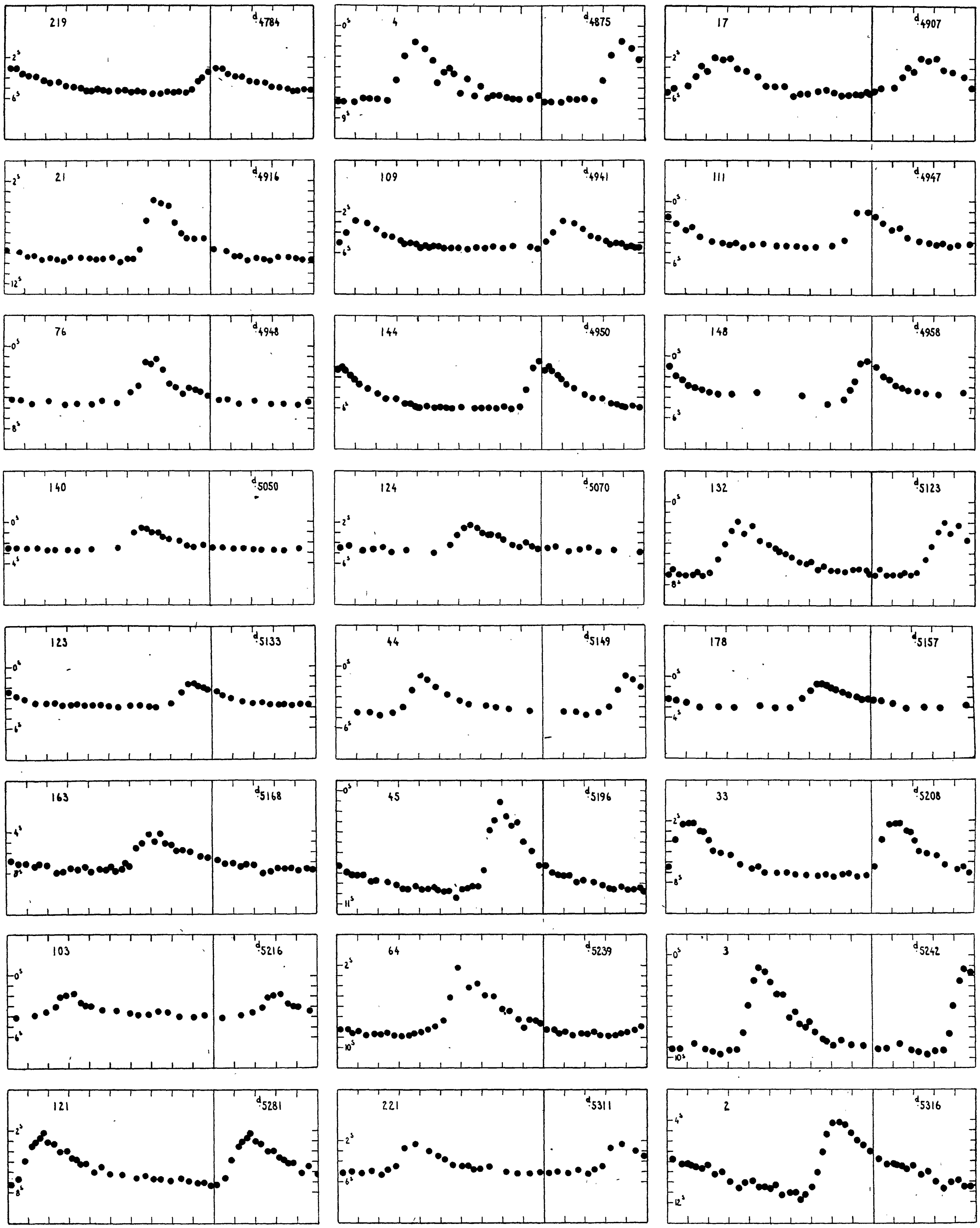

219
d4784
4
d4875
17
d4907
21
d4916
109
d4941
111
d4947
76
d4948
144
d4950
148
d4958
140
d5050
124
d5070
132
d5123
123
d5133
44
d5149
178
d5157
163
d5168
45
d5196
33
d5208
103
d5216
64
d5239
3
d5242
121
d5281
221
d5311
2
d5316

FIGURE 14c.

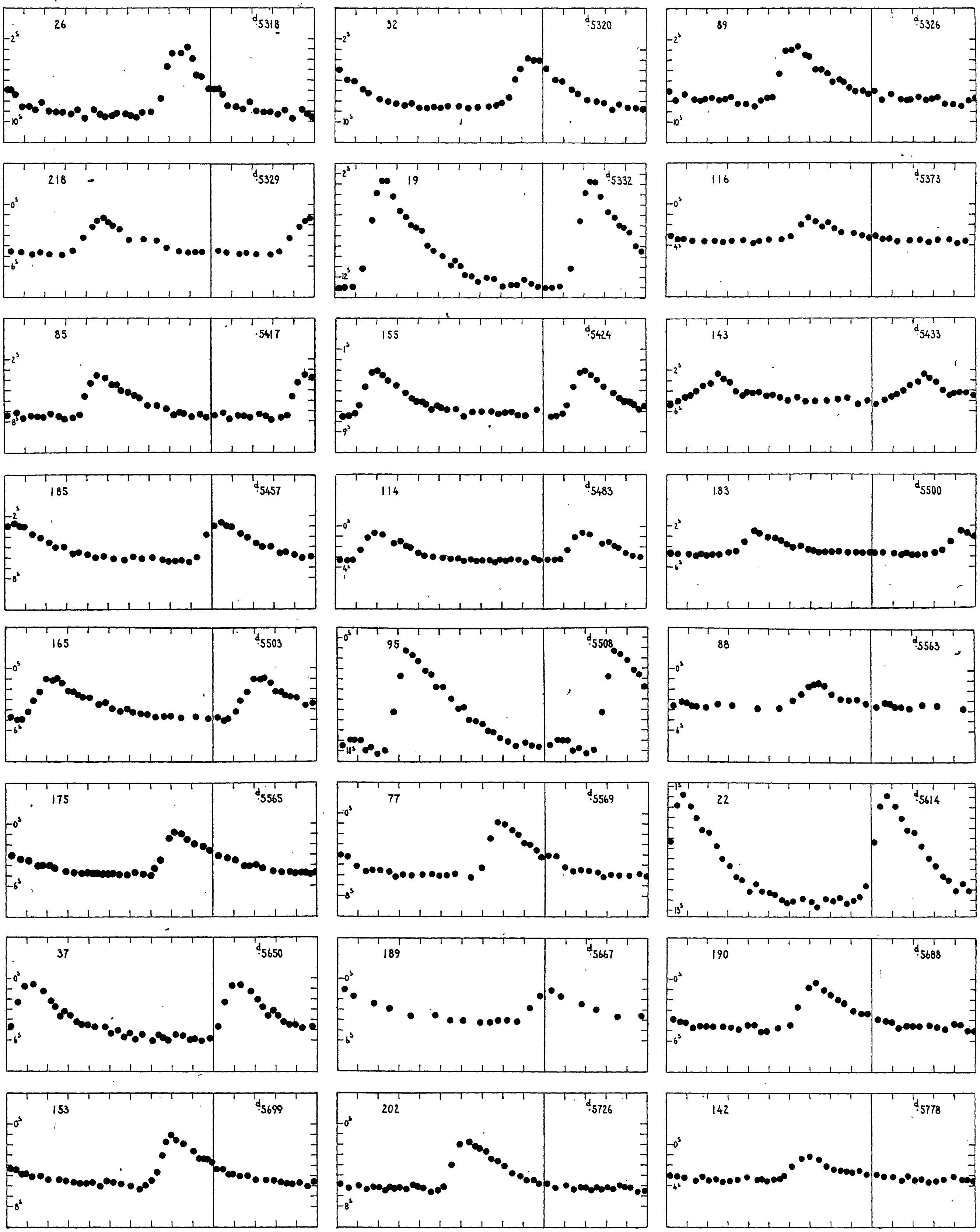

26
d5318
32
d5320
89
d5326
218
d5329
19
d5332
116
d5373
85
5417
155
d5424
143
d5433
185
d5457
114
d5483
183
d5500
165
d5503
95
d5508
88
d5563
175
d5565
77
d5569
22
d5614
37
d5650
189
d5667
190
d5688
153
d5699
202
d5726
142
d5778

FIGURE 14d.

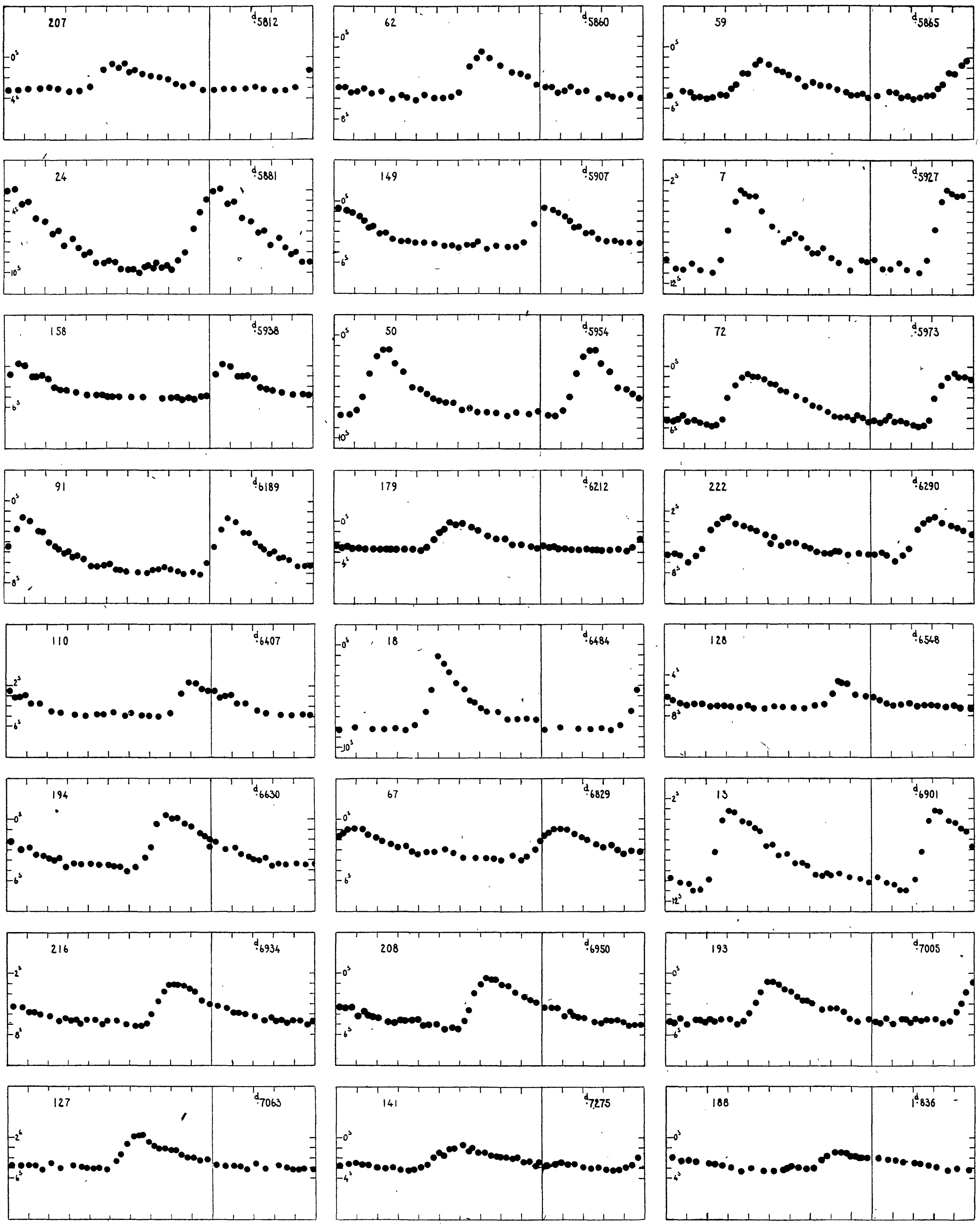
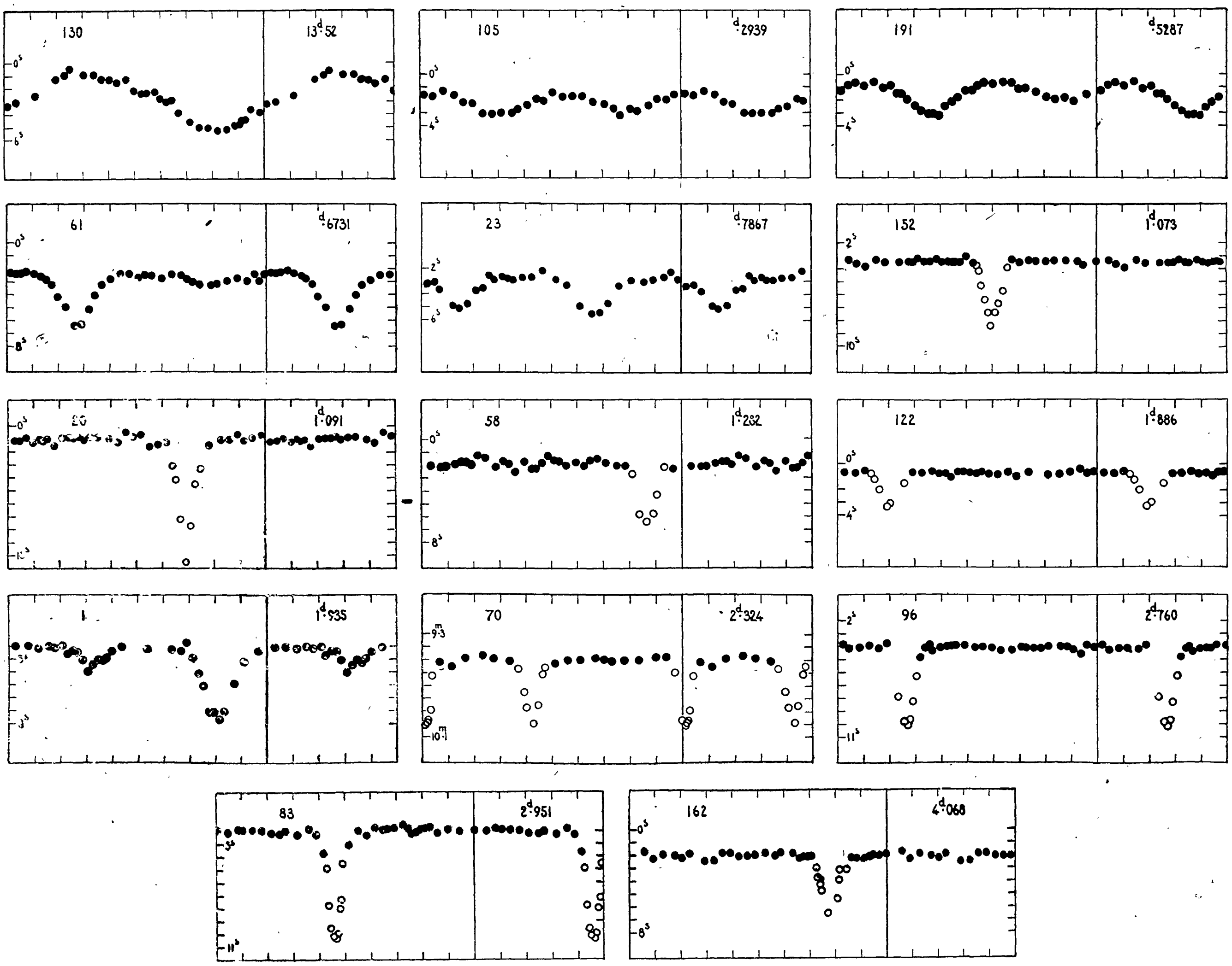

207
d.5812
62
d.5860
59
d.5865
24
d.5881
149
d.5907
7
d.5927
158
d.5938
50
d.5954
72
d.5973
91
d.6189
179
d.6212
222
d.6290
110
d.6407
18
d.6484
128
d.6548
194
d.6630
67
d.6829
13
d.6901
216
d.6934
208
d.6950
193
d.7005
127
d.7063
141
d.7275
188
1d.836

FIGURE 14e.



TABLE

1	2		3	4	5	6	7		8
No. var.	α (1875)	δ (1875)	discovered on blink-pairs	plates estimated until JD 242	number of estimates used	type	period	10^7 × m.e. ±	reciprocal period
	h m s	° ′					d	d	d^{-1}
109	18 36 53	−30 34·4	H	7664	271	cl	·4941035	55	2·023868
225 1)	38 04	−30 36·9	*)			ecl 1)			
190	38 37	−28 59·3	S	7664	255	cl	·5687622	40	1·758204
76	38 38	−28 15·4	F	7664	218	cl	·4948335	46	2·020882
22	39 38	−29 12·9	BLX	7664	301	cl	·5613666 7)	40	1·78367 7)
146	40 18	−25 30·2	LO	7664	35	nova *)			
1	40 52	−27 09·9	A	7664	312	ecl	1·934850		·516836
130	40 56	−26 17·2	KY	9165	313	δ *)	13·5135 4) 7)		·074000 7)
122	40 59	−27 34·1	J	8079	278	ecl	1·885874		·530258
123	41 08	−27 57·0	J	7664	246 3)	cl	·5132710	38	1·948289
110	41 40	−28 53·5	H	7664	238 3)	cl	·6406812	68	1·560839
62	41 56	−31 13·3	E	7664	254	cl	·5859507	75	1·706628
37	42 00	−26 37·2	CI	7664	310	cl	·5650292 4)		1·769820
111	42 05	−28 21·3	H	7664	213	cl	·4947376 6)	37	2·021274 6)
77	42 20	−27 21·3	F	7664	260	cl	·5569029	48	1·795645
155	42 33	−27 48·0	MP	7664	304	cl	·5424195	29	1·843592
219	42 37	−30 23·0	Z	7664	307	cl	·4784034	37	2·090286
124	42 53	−30 25·4	J	7664	227	cl	·5069735	76	1·972490
78	43 19	−27 21·2	F	7664	278 3)	cl	·4673535	24	2·139708
95	43 41	−31 52·9	GHIN	7664	315 3)	cl	·5507782	27	1·815613
63	44 18	−30 37·5	EHP	7664	273	cl	·4487108	20	2·228607
185	44 43	−28 31·9	QT	7664	264	cl	·5456616	42	1·832638
125	45 07	−24 48·4	JY	7664	222 3)	cl	·4655084	42	2·148189
64	45 21	−28 51·9	E	9165	288	cl	·523751 4) 7)		1·908852 7)
2	46 12	−27 37·9	AU	7664	328	cl	·5316468	14 *)	1·880948
132	46 18	−26 00·8	K	7664	320	cl	·5123466 *)	52	1·951804
67	46 52	−28 16·0	E	7664	270	cl	·6828666	109	1·464415
53	46 52	−22 56·2 2)	DF	7664	301	cl	·4548698	24	2·198431
80	46 54	−23 34·0	F	7664	315	cl	·3678216	33	2·718709
41	46 55	−29 25·8	CJKW	7664	269 3)	cl	·4467935 5)	29	2·238170 5)
23	47 20	−27 50·5	B	7664	285	ecl	·7867419	57	1·271065
158	47 50	−29 27·5	M	7664	265	cl	·5937966	61	1·684078
4	48 16	−28 23·9	A	7664	283	cl	·4874996 7)	38	2·051284 7)
96	48 36	−29 35·5	GT	8079	340	ecl	2·760319		·362277
6	49 22	−30 16·9	A	9165	368	cl	·3633023 7)	28	2·752529 7)
5	49 29	−26 12·1	A	7664	171	cl	·3732583 7)	39	2·679110 7)
182	49 53	−29 31·6	PQ	7664	286	cl	·3954471	17	2·528783
3	50 01	−23 18·5	A	7664	280	cl	·5241802	32	1·907741
148	50 05	−25 24·0	L	7664	172	cl	·4958414	26	2·016774
24	50 16	−27 28·4	B	7664	326	cl	·5880825	54	1·700442
7	50 37	−29 25·7	AS	7664	283	cl	·5927139	42	1·687155
149	50 49	−25 23·8	L	7664	273	cl	·5906682 4)		1·692998
159	51 12	−25 12·6	M	6573		irr	80		
202	51 33	−24 56·4	U	7664	313	cl	·5726207	37	1·746357
169 1)	51 50	−30 01·9	N			ecl 1)			
175	51 52	−29 01·7	OQ	7664	301	cl	·5565165	30	1·796892
69	51 59	−30 03·9	E	7664	279	cl	·4741555	53	2·109012
188	52 04	−23 31·8	R	7664	277 3)	δ	1·835347 *)		·544856
82	52 05	−28 24·8	F	7664	255 3)	cl	·4608651	23	2·169832
189	52 15	−31 53·6	R	9165	319	cl	·5666805	65	1·764663
9	52 24	−27 07·6	A	7664	278 3)	cl	·3247891	61	3·078921
221	52 29	−26 44·9	Z	9165	223	cl	·5310747 *)	135	1·882974
191	53 12	−23 24·9	S	7664	330	ecl	·5287385	23	1·891294
26	53 25	−26 55·2	B	7664	315	cl	·5318327	102	1·880291
43	53 53	−27 06·3	CE	7664	296	cl	·4600653	27	2·173604
44	54 34	−28 28·8	C	7664	162 3)	cl	·5149085 7)	36	1·942093 7)
83	54 35	−31 18·2	F	8079	344	ecl	2·95061		·338913

0.

9	10	11	12		13	14			15	16	17	18
number of epochs	m.e. of single epoch ±	phase of epochs	mean epoch JD 242	m.e. ±	range	max	min	range	value of one step	m.e. of single estimate ±	remarks	No. var.
	d		d	d	s	m	m	m	m	s		
17	·024	·10	6248·001	·006	2·8	13·9	14·5	·6	·21	·50	*	109
											*, 1	225 1)
13	·016	·72	6238·017	·004	4·7	13·5	14·6	1·1	·23	·62		190
17	·017	·72	6329·775	·004	4·4	14·4	15·1	·7	·16	1·00	*	76
14	·018	·07	6408·599	·005	10·7	13·5	14·7	1·2	·11	1·15	7	22
											*	146
		·815	5928·022	-	5·4	13·9	15·0	1·1	·20	·96	*	1
		·01 8)	6311·07		4·7	13·4	14·6	1·2	·26	·51	*, 4, 7, 8	130
		·195	6385·948		2·6 11)	14·3	14·8 11)	·5	·19	·40	*, 11	122
12	·013	·90	6215·148	·004	2·4	14·2	15·0	·8	·33	·36 3)	3	123
24	·032	·90	6203·026	·006	3·3	14·1	14·7	·6	·18	·56 3)	3	110
23	·024	·73	6150·563	·005	4·7	13·9	14·7	·8	·17	·79		62
		·10	6274·141		5·5	13·8	14·6	·8	·15	·72	4	37
24	·021	·93	6404·358	·004	3·5	14·0	14·8	·8	·23	·47	6	111
22	·024	·78	6309·045	·005	5·4	13·8	14·8	1·0	·19	·83		77
21	·013	·18	6349·125	·003	4·5	13·9	14·7	·8	·18	·62		155
22	·022	·03	6568·022	·005	2·5	13·7	14·2	·5	·20	·46		219
18	·040	·64	6385·677	·009	2·6	14·5	14·9	·4	·15	·48		124
20	·013	·87	6363·427	·003	6·6	13·9	14·9	1·0	·15	·86 3)	3	78
19	·012	·34	6282·374	·003	10·0	12·7	14·0	1·3	·13	·76 3)	3	95
22	·012	·81	6290·844	·003	7·6	13·6	15·0	1·4	·18	·84		63
16	·020	·05	6378·264	·005	3·7	13·9	14·8	·9	·24	·52		185
22	·018	·41	6244·989	·004	3·8 11)	14·1	15·1 11)	1·0	·26	·53 3)	3, 11	125
		·40	5993·338		6·7	14·0	14·8	·8	·11	1·03	*, 4, 7	64
22	·0038 *)	·740 10)	6081·370	·001 *)	7·6	13·5	14·5	1·0	·13	·68	*, 10	2
21	·020	·36	6088·405	·004	5·0	13·4	14·4	1·0	·20	·73	*	132
22	·040	·09	6438·810	·008	3·1	14·6	15·0	·4	·13	·71		67
23	·016	·53	6268·808	·003	7·6	13·0	14·4	1·4	·18	·61	2	53
22	·026	·45	6282·185	·005	3·4	14·0	14·5	·5	·15	1·34	*	80
25	·020	·37	6574·736	·004	5·1	14·2	14·9	·7	·14	·98 3)	3, 5	41
30	·029	·66 8)	6523·396	·005	3·2	14·3	14·9	·6	·19	1·00	*, 8	23
24	·026	·06	6269·358	·005	3·5	14·3	14·9	·6	·17	·43		158
17	·022	·20	6405·355	·005	5·9	14·3	15·0	·7	·12	1·18	7	4
		·267	6382·594		6·1	13·5	14·5	1·0	·16	·42	*	96
18	·029	·27 10)	6326·280	·007	4·5	13·6	14·3	·7	·16	1·27	*, 7, 10	6
22	·021	·43	6199·979	·004	9·2	13·8	14·9	1·1	·12	1·18	*, 7	5
23	·012	·17	6261·577	·003	4·1	13·7	14·7	1·0	·24	·49		182
22	·015	·46	6336·007	·003	8·7	14·0	15·0	1·0	·11	1·23		3
19	·014	·97	6377·001	·003	4·2	14·2	14·7	·5	·12	·59	*	148
20	·031	·03	6353·075	·007	7·9	13·5	14·2	·7	·09	1·25		24
21	·018	·39	6387·903	·004	7·8	14·2	15·1	·9	·12	1·38		7
		·03	6178·407		3·9	14·2	14·9	·7	·18	·59	4	149
						13·9	14·5	·6			*	159
20	·020	·62	6414·856	·005	4·8	13·3	14·2	·9	·19	·47		202
											1	169 1)
20	·015	·82	6277·962	·003	4·2	13·6	14·6	1·0	·24	·47	*	175
19	·020	·71	6293·332	·004	3·8	14·6	15·1	·5	·13	·75		69
		·83 9)	6170·126		1·8	14·2	14·6	·4	·22	·43 3)	*, 3, 9	188
24	·014	·44	6273·043	·003	5·0	14·1	15·0	·9	·18	·56 3)	3	82
20	·020	·01	6390·466	·004	3·1	13·7	14·5	·8	·26	·57	*	189
17	·035	·24	6197·055	·008	6·8	14·5	15·1	·6	·09	1·75 3)	3	9
14	·033	·36	6007·189	·009	2·8	14·2	14·6	·4	·14	·59	*	221
13	·012	·37 8)	6498·926	·003	2·5	13·4	13·7	·3	·12	·53	*, 8	191
17	·025	·84	6118·132	·006	6·5	14·1	14·6	·5	·08	1·26		26
18	·012	·37	6209·675	·003	7·0	14·0	14·9	·9	·13	·74		43
19	·021	·41	6549·337	·005	3·9 12)	14·7	15·1 12)	·4	·10	·76 3)	3, 7, 12	44
		·461	6289·110		8·5	12·9	13·6	·7	·08	·62	*	83

TABLE 10

1 No. var.	2 α (1875)	δ (1875)	3 discovered on blink-pairs	4 plates estimated until JD 242	5 number of estimates used	6 type	7 period	$10^7 \times$ m.e. ±	8 reciprocal period
	h m s	° ′					d	d	d^{-1}
70	18 55 01	−29 19·1	E	9165	306	ecl *)	2·323802	370	·430329
45	57 02	−30 35·1	CQ	9165	326	cl	·5196097	74	1·924521
85	57 26	−30 59·6	FI	7664	296	cl	·5417421	59	1·845897
140	57 38	−24 52·7	K	7664	204 [3]	cl	·5049887	20	1·980242
141	18 58 50	−30 07·8	K	7664	329	cl	·7275312	105	1·374512
86	19 00 03	−25 13·8	F	6573		irr *)	47·50		·02105
88	00 14	−29 22·8	F	7664	214 [3]	cl	·5563080	31	1·797565
89	01 44	−27 28·2	FJ	7664	318	cl	·5325551	34	1·877740
13	01 50	−29 39·9	ANP	7664	294	cl	·6900761	98	1·449115
152	01 52	−29 51·8	L	8079	332	ecl	1·072605		·932310
100	01 58	−24 36·1	GH	9165	353	cl	·4659810 [4]		2·146011
198 [1]	02 05	−26 25·7	T			ecl [1]			
183	02 47	−28 48·8	PS	7664	288	cl	·5499901	54	1·818215
153	02 55	−29 30·0	LMV	7664	316	cl	·5698756	42	1·754769
177 [1]	03 20	−23 40·1	O			ecl [1]			
103	03 31	−25 05·1	GL	7664	202	cl	·5216189	30	1·917108
178	03 50	−25 58·9	O	7664	209	cl	·5156861	28	1·939164
57	03 58	−27 03·1	D	7664	264	cl	·4632683	78	2·158576
14	04 26	−23 52·9	A	7664	325	cl *)	·11359409 [7]	3·9	8·803275 [7]
72	04 31	−27 07·4	E	7664	336	cl	·5973433	59	1·674079
90	05 06	−28 43·9	F	7664	222 [3]	cl	·4053721	68	2·466870
207	05 18	−28 43·3	W	7664	233	cl	·5812065 [4]		1·720559
114	05 29	−28 25·7	H	7664	298	cl	·5483316	48	1·823714
48	06 11	−25 39·5	CF	7664	279	cl	·4496928	18	2·223740
208	06 20	−31 04·9	W	7664	329	cl	·6950270 [4]		1·438793
199	06 30	−31 19·6	T	7664	308	cl	·3735253	37	2·677195
142	06 40	−25 14·2	K	7664	276	cl	·5778171	72	1·730652
143	06 52	−23 54·8	KU	7664	265	cl	·5433479	67	1·840441
144	07 06	−25 10·1	KR	7664	295	cl	·4950461	27	2·020014
126	07 13	−28 30·8	J	7664	254	cl	·4677259	31	2·138004
91	07 58	−29 01·2	FO	7664	324	cl	·6189279	52	1·615697
179	08 00	−26 00·4	O	7664	301	cl	·6212388 [5]	54	1·609687 [5]
17	08 57	−23 23·6	A	9165	268	cl	·4906629	56	2·038059
222	09 02	−22 58·0 [2]	Z	7664	303	cl	·6289945	74	1·589839
31	09 22	−26 27·6	BF	6573		irr			
116	09 41	−31 26·2	H	7664	244 [3]	cl	·5373436	134	1·861007
58	09 58	−30 30·1	DY	7664	326	ecl	1·28246		·77975
162	10 06	−24 12·0	M	8079	326	ecl	4·06848		·245792
163	10 47	−28 34·6	MV	9165	312	cl	·5168271 [4] [7]		1·934883 [7]
18	10 57	−25 32·4	ABDH	7664	226	cl	·6484454	69	1·542150
193	10 57	−23 45·1	SW	7664	319	cl	·7005342 [4]		1·427482
216	11 02	−24 35·8	Y	7664	308	cl	·6934490	94	1·442067
32	11 26	−31 35·4	BJ	7664	269 [3]	cl	·5319859 [7]	28	1·879749 [7]
74	11 29	−29 21·9	EH	9165	343	cl	·4757204		2·102075
19	11 35	−31 46·3	AI	7664	313	cl	·5331563	20	1·875623
33	12 09	−30 59·9	BDU	7664	256	cl	·5207599	31	1·920271
59	12 09	−30 36·3	D	7664	298 [3]	cl	·5865256	129	1·704955
172 [1]	12 09	−30 01·0	NP			ecl [1]			
127	12 23	−24 41·4	JMS	7664	305	cl	·7062917	34	1·415846
21	12 33	−26 12·8	AO	7664	271	cl	·4916242 [4]		2·034074
205	12 49	−26 38·4	V	7664	275	cl	·4537734 [4]		2·203743
20	12 57	−31 16·6	A	7664	340	ecl	1·091379		·916272
218	13 15	−28 34·7	Y	7664	218	cl	·5329164	36	1·876467
165	13 45	−30 06·6	M	7664	286	cl	·5502785	36	1·817262
118	14 18	−27 48·3	HIMV	7664	304	cl	·4589226	16	2·179017
36	15 11	−28 43·6	BDEP	6573		irr			
75	15 45	−28 24·6	ESUYZ	7664	319	cl	·4092612 [7]	27	2·443427 [7]

(continued).

9	10	11	12		13	14			15	16	17	18
number of epochs	m.e. of single epoch ±	phase of epochs	mean epoch JD 242	m.e. ±	range	max	min	range	value of one step	m.e. of single estimate ±	remarks	No. var.
	d		d	d	s	m	m	m	m	s		
18	·037	·011	6051·210	·009	2·1	9·47	10·02	·55	·26	·29	*	70
21	·018	·79	6344·332	·004	9·0	13·3	14·5	1·2	·13	1·10	*	45
17	·023	·44	6444·279	·006	4·2	14·1	14·8	·7	·17	·71		85
22	·019	·68	6225·346	·004	2·2	14·5	15·0	·5	·23	·44 [3]	*, 3	140
20	·040	·60	6292·856	·009	2·4	13·7	14·2	·5	·21	·48		141
					6·9	13·5	14·5	1·0	·14		*	86
19	·015	·72	6374·029	·003	2·4	14·8	15·1	·3	·12	·72 [3]	*, 3	88
26	·018	·63	6279·697	·003	5·6	13·9	14·8	·9	·16	·77		89
20	·035	·30	6255·772	·008	7·7	14·0	14·8	·8	·10	·84		13
		·596	6414·815		4·9	13·9	14·8	·9	·18	·54	*	152
		·01	6320·110		4·8	13·8	14·5	·7	·15	·66	*, 4	100
											1	198 [1]
22	·028	·44	6508·289	·006	2·2	14·3	14·8	·5	·23	·39		183
18	·020	·79	6360·273	·005	5·3	14·0	14·9	·9	·17	·66		153
											1	177 [1]
15	·014	·30	6478·137	·004	2·4 [11]	14·3	14·9 [11]	·6	·25	·54	11	103
18	·016	·75	6436·157	·004	2·3	14·3	15·0	·7	·30	·43		178
16	·020	·30	6063·870	·005	5·7	14·0	14·9	·9	·16	·82		57
16	·008	·38	6268·732	·002	2·5	13·9	14·5	·6	·24	·63	*, 7	14
20	·030	·42	6356·592	·007	5·1	13·0	13·4	·4	·08	·62		72
20	·034	·63	6129·819	·008	2·2	14·6	15·1	·5	·23	·83 [3]	3	90
		·53	6265·714		2·5	14·5	15·1	·6	·24	·69	4	207
26	·031	·19	6352·540	·006	2·7	14·2	14·5	·3	·11	·37		114
22	·012	·60	6277·984	·002	10·2	13·3	14·6	1·3	·13	·82		48
		·74	6421·861		5·0	13·1	13·7	·6	·12	·47	4	208
17	·024	·18	6244·291	·006	2·7	13·8	14·3	·5	·19	·54		199
19	·030	·69	6465·018	·007	2·4	14·1	14·9	·8	·33	·48		142
19	·028	·24	6116·595	·006	2·9	14·1	14·8	·7	·24	·73		143
21	·017	·99	6544·014	·004	4·7	13·6	14·5	·9	·19	·48		144
23	·020	·13	6462·639	·004	3·0	14·7	15·1	·4	·13	·58		126
18	·025	·11	6433·206	·006	5·5	14·0	14·8	·8	·15	·72		91
18	·028	·59	6492·309	·007	2·6	14·2	14·7	·5	·19	·48	5	179
26	·038	·27	6464·122	·008	3·6	14·3	14·9	·6	·17	1·10	*	17
20	·030	·30	6149·876	·007	4·3	13·9	14·4	·5	·12	·65	2	222
					7·0	13·6	14·7	1·1	·16		*	31
12	·024	·70	6093·319	·007	2·4	14·2	14·9	·7	·29	·46 [3]	3	116
		·87	6140·263		5·0	14·0	14·9	·9	·18	·96	*	58
		·778	6716·158		4·5 [11]	14·0	15·1 [11]	1·1	·24	·50	*, 11	162
		·97	6322·330		6·6	13·7	14·9	1·2	·18	·60	*, 4, 7	163
16	·018	·50	6168·999	·005	7·0 [11]	14·0	15·0 [11]	1·0	·14	·93	11	18
		·51	6086·599		4·1	13·3	14·3	1·0	·24	·58	4	193
19	·027	·81	6070·337	·006	4·0	13·9	14·6	·7	·18	·50		216
16	·017	·94	6348·700	·004	4·9	14·2	14·8	·6	·12	·76 [3]	3, 7	32
		·15	6591·178		7·1	13·9	14·8	·9	·13	1·00	*	74
20	·011	·24	6431·059	·002	10·2	13·7	14·6	·9	·09	1·12		19
19	·018	·11	6429·363	·004	5·3	14·2	15·1	·9	·17	·72		33
19	·042	·48	6102·498	·010	3·9	14·3	14·7	·4	·10	·89 [3]	3	59
											1	172 [1]
18	·014	·65	6215·113	·003	3·3	14·0	14·7	·7	·21	·47		127
		·74	6271·522		6·0	14·3	14·9	·6	·10	·85	4	21
		·45	6558·596		7·3	13·5	14·6	1·1	·15	·59	4	205
		·691	5962·957		9·6	12·6	13·5	·9	·09	·85	*	20
23	·018	·47	6249·768	·004	3·5	14·3	15·1	·8	·23	·53		218
25	·016	·22	6187·456	·003	4·1	13·7	14·6	·9	·22	·57		165
22	·011	·57	6557·812	·002	5·8	13·3	14·7	1·4	·24	·45		118
					8·2	13·3	14·7	1·4	·17		*	36
18	·012	·20	6281·023	·003	10·8	13·4	14·6	1·2	·11	·94	7	75

TABLE 10

1	2		3	4	5	6	7		8
No. var.	α (1875)	δ (1875)	discovered on blink-pairs	plates estimated until JD 242	number of estimates used	type	period	10^7 × m.e. ±	reciprocal period
	h m s	° ′					d	d	d^{-1}
180 [1])	19 15 50	−25 01·4	OS			ecl [1])			
50	17 09	−28 41·9	CFQ	7664	262	cl	·5954149	58	1·679501
105	17 23	−29 23·5	G	7664	279 [3])	ecl *)	·2939444	19	3·402004
61	17 59	−27 37·5	D	8079	347	ecl	·6730857		1·485695
121	20 17	−28 57·6	IPSV	7664	290	cl	·5281197	22	1·893510
128	20 39	−26 59·8	J	7664	262	cl	·6547620	69	1·527272
194	20 49	−25 01·9	S	7664	286	cl	·6630479 [5])	94	1·508187 [5])

EXPLANATION OF THE COLUMNS:

Column 6 — cl = cluster variable, δ = δ Cep variable, ecl = eclipsing variable, irr = irregular.

Column 7 — The value of the period definitively adopted. When a mean error has been given the period has been determined with least squares, otherwise graphically.

Column 8 — Always the reciprocal value of column 7. As a rule the value used for computing phases. In exceptional cases remark 7 indicates which value has been used instead.

Columns 9 and 10 — Relate to the determination of the period with least squares.

Column 11 — Phase of the epoch corresponding to the value of column 8. The epoch is normally the maximum for cluster variables and the minimum for eclipsing variables. Otherwise reference has been made to a remark.

Column 12 — The mean epoch is the epoch which differs least from the mean value of the epochs used for the least squares solution or for the graphical correction.

continued).

9	10	11	12		13	14			15	16	17	18
number of epochs	m.e. of single epoch ±	phase of epochs	mean epoch JD 242	m.e. ±	range	max	min	range	value of one step	m.e. of single estimate ±	remarks	No. var.
	d		d	d	s	m	m	m	m	s		
											1	180 1)
22	·022	·24	6305·587	·005	6·7	13·6	14·9	1·3	·19	·79		50
28	·015	·30 8)	6273·155	·003	1·3	13·8	14·3	·3	·23	·49 3)	*, 3, 8	105
		·280	6369·598		4·4	13·0	13·4	·4	·09	·57	*	61
16	·011	·17	6457·932	·003	5·1	13·6	14·6	1·0	·20	·69		121
19	·019	·86	6088·544	·004	2·7	14·3	14·9	·6	·22	·59		128
12	·024	·78	6378·386	·007	5·6	13·3	14·5	1·2	·22	·53	5	194

REMARKS.

*) Refers to section 13: discussion of individual variables.

1) The examination of this eclipsing variable has not been finished as yet (nos. 169, 172, 177, 180, 198 and 225).

2) This star being situated north of $\delta = -23°$ the co-ordinates are given for 1855 conventionally (nos. 53 and 222).

3) Uncertain estimates omitted (nos. 9, 32, 41, 44, 59, 78, 82, 88, 90, 95, 105, 110, 116, 123, 125, 140 and 188).

4) The period of this star has been obtained by graphical correction of the least squares solution:

var. no.	period from least squares solution	$10^7 \times$ m.e. ±
21	·4916146	38
37	·5650360	60
64	·5238648	134
100	·4659780	31
130	13·5221	26000
149	·5906966	76
163	·5168375	37
193	·7005146	96
205	·4537767	18
207	·5811861	64
208	·6950375	35

5) The following reciprocal period may satisfy the observations somewhat better: no. 41: $2^{d^{-1}}$·238151; no. 179: $1^{d^{-1}}$·609659; no. 194: $1^{d^{-1}}$·508169.

6) The period of this star may be slightly too large (no. 111).

7) Phases and light curves of this star have been computed with the provisional reciprocal period:

var. no.	provisional reciprocal period
	d^{-1}
4	2·051314
5	2·67910
6	2·74255
14	8·803283
22	1·781368
32	1·879746
44	1·942096
64	1·908890
75	2·443431
130	·07397
163	1·934844

8) The epochs of this star are the minima (nos. 23, 105, 130, 191).

9) The epochs of this star are the maxima (no. 188).

10) For this star the epochs where the rising branch passes a certain brightness have been used (no. 2: 8^s·5; no. 6: 5^s·5).

11) This star is invisible on many plates of minimum (nos. 18, 103, 122, 125, 162). Thus the minima may be systematically in error.

12) This star is very faint in minimum (no. 44).

TABLE II.

2

from maxima

d	t	d
2425442·385	0	·000
5706·588	497	− 24
39·587	559	+ 13
97·535	668	+ 12
5803·351	679	− 20
21·456	713	+ 9
36·339	741	+ 6
53·328	773	− 17
6123·413	1281	− 7
25·555	1285	+ 9
·577	1285	+ 31
6214·331	1452	+ 1
46·235	1512	+ 6
6486·520	1964	− 11
6569·450	2120	− 18
·471	2120	+ 3
·493	2120	+ 25
70·511	2122	− 20

from rising branches

d	t	d
2425525·274	0	+ ·007
5706·559	341	0
64·509	450	+ 1
94·279	506	− 2
95·341	508	− 2
5823·514	561	− 7
61·269	632	+ 1
63·393	636	− 2
86·255	679	0
6067·550	1020	+ 3
76·587	1037	+ 2
6118·580	1116	− 5
23·366	1125	− 4
56·329	1187	− 3
6213·215	1294	− 3
39·270	1343	+ 1
40·339	1345	+ 7
73·301	1407	+ 7
6559·320	1945	0
67·293	1960	− 2
69·421	1964	0
70·486	1966	+ 1

3

d	t	d
2425740·530	0	− ·008
·552	0	+ 14
92·434	99	+ 2
·456	99	+ 24
5832·258	175	− 12
34·355	179	− 12
86·242	278	− 19
6120·567	725	− 2
29·466	742	− 14
6213·342	902	− 7
65·269	1001	+ 26
66·305	1003	+ 14
6540·430	1526	− 8
·452	1526	+ 14
59·313	1562	+ 5
69·256	1581	− 11
·277	1581	+ 10
70·296	1583	− 20
·339	1583	+ 23
73·445	1589	− 16
7623·399	3592	+ 5
64·272	3670	− 8

4

d	t	d
2425713·571	0	− ·022
2425825·248	229	+ ·017
58·350	297	− 31
61·286	303	− 20
62·265	305	− 16
64·280	309	+ 49
6067·540	726	+ 22
6103·590	800	− 3
23·593	841	+ 13
29·444	853	+ 14
6212·287	1023	− 18
35·228	1070	+ 10
6475·540	1563	− 15
7623·592	3918	− 25
·614	3918	− 3
56·281	3985	+ 2
·303	3985	+ 24

5

d	t	d
2425740·530	0	+ ·032
75·566	94	− 18
95·351	147	− 16
98·328	155	− 25
99·486	158	+ 14
5822·257	219	+ 16
32·356	246	+ 37
85·298	388	− 24
6156·300	1114	− 7
·346	1114	+ 39
61·516	1128	− 17
76·444	1168	− 19
6212·287	1264	− 9
13·409	1267	− 7
37·294	1331	− 10
40·313	1339	+ 23
6476·576	1972	+ 13
6567·267	2215	+ 2
69·493	2221	− 11
70·232	2223	− 19
73·230	2231	− 7
7636·289	5079	+ 12

6

d	t	d
2425716·607	0	− ·052
19·524	8	− 41
92·643	209	+ 54
99·478	228	− 14
5823·467	294	− 3
34·371	324	+ 2
·348	324	− 21
50·371	368	+ 17
58·358	390	+ 11
61·277	398	+ 24
·257	398	+ 4
6123·540	1120	− 17
6266·366	1513	+ 31
6569·292	2347	− 37
70·454	2350	+ 35
7623·288	5248	+ 19
56·334	5339	+ 4
9109·521	9339	− 18

7

d	t	d
2425797·556	0	− ·004
5850·315	89	− 7
·337	89	+ 15
63·349	111	− 13
85·298	148	+ 6
6094·520	501	0
·542	501	+ 22
6129·466	560	− 24
6161·516	614	+ 19
2426212·464	700	− ·006
14·237	703	− 11
40·313	747	− 15
43·290	752	− 1
46·235	757	− 20
6570·489	1304	+ 20
72·277	1307	+ 29
73·402	1309	− 31
·466	1309	+ 33
7656·303	3136	− 18
·317	3136	− 4
·332	3136	+ 11

9

d	t	d
2425745·570	0	− ·028
99·508	166	− 5
5803·351	178	− 60
25·225	245	+ 54
·509	246	+ 13
58·350	347	+ 50
86·220	433	− 12
6103·568	1102	+ 52
6213·320	1440	+ 26
14·237	1443	− 32
39·289	1520	+ 11
40·246	1523	− 6
63·301	1594	− 11
6568·271	2533	− 18
70·232	2539	− 6
·511	2540	− 51
7623·227	5781	+ 23

13

d	t	d
2425524·263	0	− ·028
·285	0	− 6
5764·516	348	+ 78
97·535	396	− 26
·556	396	− 5
5825·248	436	+ 83
6122·570	867	− 17
·592	867	+ 5
29·466	877	− 22
60·524	922	− 18
6210·226	994	− 1
12·287	997	− 10
14·353	1000	− 14
43·311	1042	− 40
6476·576	1380	− 20
6561·526	1503	+ 50
70·425	1516	− 22
·446	1516	− 1
7623·485	3042	− 18
64·251	3101	+ 34

14

d	t	d
2425526·288	0	+ ·007
5797·308	2386	− 9
·535	2388	− 9
5808·450	2484	+ 1
61·264	2949	− 6
5926·262	3521	+ 16
6129·466	5310	0
53·542	5522	− 6
6210·226	6021	− 5
13·409	6049	− 3
40·224	6285	+ 4
46·257	6338	+ 16
6570·210	9190	− 1
73·273	9217	− 5
7623·227	18460	− 1
·571	18463	+ 2

17

d	t	d
2425706·566	0	+ ·028
65·430	120	+ 13
90·412	171	− 29
5849·413	291	+ 92
50·315	293	+ 13
6122·570	848	− 50
·592	848	− 28
53·542	911	+ 10
6212·442	1031	+ 31
13·409	1033	+ 16
18·345	1043	+ 46
40·335	1088	− 44
41·313	1090	− 47
42·285	1092	− 57
·307	1092	− 35
43·290	1094	− 33
46·235	1100	− 32
·257	1100	− 10
48·254	1104	+ 24
73·313	1155	+ 60
7623·571	3907	+ 13
·592	3907	+ 34
35·361	3931	+ 27
36·311	3933	− 4
58·366	3978	− 29
64·272	3990	− 11

18

d	t	d
2425745·548	0	− ·016
·570	0	+ 6
92·247	72	− 5
5821·434	117	+ 2
36·339	140	− 7
6090·550	532	+ 13
6123·593	583	− 15
25·577	586	+ 24
29·444	592	0
60·546	640	− 23
6218·323	729	+ 42
40·313	763	− 15
·335	763	+ 7
42·285	766	+ 12
6570·360	1272	− 27
7623·463	2896	+ 1

19

d	t	d
2425526·288	0	− ·005
5707·550	340	− 16
16·636	357	+ 6
5826·479	563	+ 19
64·302	634	− 12
6123·413	1120	− 15
25·555	1124	− 6
6212·464	1287	− 1
18·323	1298	− 7
·345	1298	+ 15
65·247	1386	− 1
66·327	1388	+ 13
6486·520	1801	+ 12
6570·210	1958	− 3
71·280	1960	0
73·423	1964	+ 11
7367·288	3453	+ 6
7657·322	3997	+ 3
58·366	3999	− 19
64·251	4010	+ 1

21

d	t	d
2425524·263	0	− ·016
2425713·549	385	− ·002
39·587	438	− 20
·609	438	+ 2
5823·208	608	+ 27
·230	608	+ 49
6093·549	1158	− 20
94·542	1160	− 10
6120·589	1213	− 19
22·592	1217	+ 18
29·444	1231	− 13
·466	1231	+ 9
53·542	1280	− 4
6475·540	1935	− 14
80·493	1945	+ 29
6540·430	2067	− 17
70·425	2128	− 10
·446	2128	+ 11
73·380	2134	− 5
7623·485	4270	+ 11
64·272	4353	− 6

22

d	t	d
2425740·552	0	− ·021
5825·362	151	+ 22
26·454	153	− 8
·479	153	+ 17
61·264	215	− 3
6213·237	842	− 7
14·353	844	− 14
41·291	892	− 21
63·213	931	+ 8
68·284	940	+ 26
6570·275	1478	+ 2
7622·248	3352	− 26
23·399	3354	+ 2
·420	3354	+ 23

23

d	t	d
2425442·385	0	− ·028
5707·572	674	+ 27
92·587	890	+ 74
5823·208	968	+ 12
30·272	986	− 5
·294	986	+ 17
35·370	999	− 21
·392	999	+ 1
61·286	1065	− 67
6120·567	1724	− 18
·589	1724	+ 4
6155·616	1813	+ 21
6210·293	1952	+ 20
12·222	1957	− 18
13·409	1960	− 11
43·311	2036	− 5
6480·493	2639	− 26
6561·526	2845	− 27
68·271	2862	+ 30
·292	2862	+ 51
69·407	2865	− 14
73·338	2875	− 17
7623·270	5544	+ 8
·292	5544	+ 30
·635	5545	− 20
52·339	5618	− 32
56·281	5628	− 24
·303	5628	− 2
·317	5628	+ 12
·332	5628	+ 27

24

d	t	d
2425745·548	0	− ·038

TABLE 11 (*continued*).

d	t	d
2425745·570	0	−·016
75·566	51	− 12
91·485	78	+ 28
93·251	81	+ 30
·273	81	+ 52
97·329	88	− 8
5808·472	107	− 39
21·434	129	− 15
30·272	144	+ 2
34·377	151	− 10
6122·570	641	+ 23
·592	641	+ 45
6476·576	1243	+ 3
86·520	1260	− 50
7623·292	3193	− 41
·313	3193	− 20
·334	3193	+ 1
·356	3193	+ 23
·377	3193	+ 44

26

d	t	d
2425527·273	0	+·007
5794·263	502	+ 17
5860·236	626	+ 43
61·242	628	− 15
·264	628	+ 7
63·349	632	− 35
·371	632	− 13
6067·562	1016	− 46
6125·577	1125	0
6211·216	1286	+ 14
13·342	1290	+ 12
37·294	1335	+ 32
38·298	1337	− 28
6570·210	1961	+ 20
71·259	1963	+ 6
73·359	1967	− 22
·380	1967	− 1

32

d	t	d
2425526·265	0	+·015
27·295	2	− 19
5706·588	339	− 5
92·247	500	+ 4
97·556	510	− 6
5825·225	562	− 1
35·370	581	+ 37
6122·592	1121	− 14
53·474	1179	+ 13
6218·345	1301	− 18
42·285	1346	− 18
·307	1346	+ 4
7623·356	3942	+ 18
56·303	4004	− 18
·317	4004	− 4
·332	4004	+ 11

33

d	t	d
2425790·390	0	−·001
92·456	4	− 18
5823·208	63	+ 9
50·315	115	+ 36
51·311	117	− 5
86·220	184	+ 9
88·277	188	− 17
6094·542	584	+ 27
6212·222	810	+ 15
13·237	812	− 11
39·267	862	− 19
40·313	864	− 15
6569·450	1496	+ 2
2426570·468	1498	−·022
·489	1498	− 1
7623·442	3520	− 24
·485	3520	+ 19
56·281	3583	+ 7
58·366	3587	+ 9

37

d	t	d
2425442·428	0	−·004
5739·609	526	− 32
64·494	570	− 9
·516	570	+ 13
97·308	628	+ 33
5823·230	674	− 37
25·509	678	− 18
63·371	745	− 13
88·277	789	+ 31
6125·555	1209	− 6
6210·293	1359	− 23
14·237	1366	− 35
36·290	1405	− 18
40·246	1412	− 17
48·254	1426	+ 80
66·305	1458	+ 50
6570·232	1996	− 12
·253	1996	+ 9
·275	1996	+ 31
7623·442	3860	− 29
·463	3860	− 8
·485	3860	+ 14

41

d	t	d
2425740·552	0	−·021
5821·434	181	− 9
86·220	326	− 8
·242	326	+ 14
6118·567	846	+ 7
·589	846	+ 29
22·570	855	− 12
·592	855	+ 10
60·524	940	− 35
6213·320	1058	+ 39
38·298	1114	− 3
42·307	1123	− 15
6475·540	1645	− 8
6569·364	1855	− 11
·385	1855	+ 10
70·253	1857	− 16
·275	1857	+ 6
73·402	1864	+ 6
·423	1864	+ 27
7623·356	4214	− 5
·377	4214	+ 16
·399	4214	+ 38
36·289	4243	− 29
·311	4243	− 7
57·294	4290	− 23

43

d	t	d
2425791·462	0	−·014
·485	0	+ 9
94·263	6	+ 27
5823·208	69	− 12
·230	69	+ 10
25·509	74	− 11
26·454	76	+ 13
86·242	206	− 7
6153·542	787	− 5
56·300	793	− 7
6212·442	915	+ 7
37·272	969	− 7
2426559·313	1669	−·012
·335	1669	+ 10
69·450	1691	+ 4
70·360	1693	− 6
71·280	1695	− 6
7623·463	3982	+ 7

44

d	t	d
2425745·570	0	+·005
97·556	101	− 15
5822·257	149	− 30
25·362	155	− 14
93·364	287	+ 20
6125·555	738	− 13
·577	738	+ 9
6235·228	951	− 15
·250	951	+ 7
6303·249	1038	+ 38
6486·520	1439	+ 1
6569·407	1600	− 12
·428	1600	+ 9
·450	1600	+ 31
7623·399	3647	− 38
·420	3647	− 17
·442	3647	+ 5
·463	3647	+ 26
36·311	3672	+ 2

45

d	t	d
2425716·615	0	−·028
·636	0	− 7
5893·341	340	+ 30
6125·577	787	+ 1
6235·228	998	+ 14
36·290	1000	+ 37
37·272	1002	− 20
·294	1002	+ 2
63·279	1052	+ 6
6303·271	1129	− 12
6561·526	1626	− 3
67·267	1637	+ 23
68·271	1639	− 13
·292	1639	+ 8
69·299	1641	− 24
·321	1641	− 2
·342	1641	+ 19
70·339	1643	− 23
·360	1643	− 2
73·466	1649	− 14
·488	1649	+ 8

48

d	t	d
2425745·548	0	·000
·570	0	+ 22
94·564	109	− 1
99·508	120	− 3
5826·479	180	− 14
49·413	231	− 14
50·315	233	− 12
·337	233	+ 10
60·214	255	− 6
6067·540	716	+ 12
6120·589	834	− 3
25·555	845	+ 16
61·516	925	+ 2
6213·216	1040	− 13
·237	1040	+ 8
35·250	1089	− 14
6570·296	1834	+ 11
73·423	1841	− 10
·445	1841	+ 12
2427623·463	4176	−·002
56·281	4249	− 12
·303	4249	+ 10

50

d	t	d
2425706·588	0	−·012
40·530	57	− 8
99·508	156	+ 24
5857·217	253	− 23
60·214	258	− 3
6161·516	764	+ 19
6210·293	846	− 28
13·320	851	+ 22
·342	851	+ 44
14·472	853	− 17
19·260	861	+ 8
38·298	893	− 7
41·291	898	+ 9
63·279	935	− 34
·301	935	− 12
66·305	940	+ 15
·327	940	+ 37
6569·321	1449	− 35
·364	1449	+ 8
70·532	1451	− 15
7623·248	3219	+ 8
58·366	3278	− 4

53

d	t	d
2425478·239	0	−·005
5706·588	502	− 1
16·615	524	+ 19
92·587	691	+ 28
97·556	702	− 7
5808·472	726	− 8
23·499	759	+ 8
30·294	774	− 20
49·413	816	− 5
50·315	818	− 13
·337	818	+ 9
6160·546	1500	− 3
76·466	1535	− 4
6214·215	1618	− 9
18·323	1627	+ 5
19·260	1629	+ 33
6569·471	2399	− 6
70·382	2401	− 5
71·280	2403	− 17
7367·288	4153	− 31
·310	4153	− 9
7623·420	4716	+ 9
·442	4716	+ 31

57

d	t	d
2425478·288	0	−·011
5739·587	564	+ 4
40·530	566	+ 21
·552	566	+ 43
45·570	577	− 35
5888·277	885	− 15
6067·562	1272	− 15
6123·615	1393	− 17
76·444	1507	− 1
·466	1507	+ 21
6241·291	1647	− 11
42·221	1649	− 8
48·254	1662	+ 3
73·291	1716	+ 23
6570·210	2357	− 13
·232	2357	+ 9

59

d	t	d
2425524·285	0	+·101
5719·518	333	+ 21
92·247	457	+ 20
94·542	461	− 31
·564	461	− 9
5803·351	476	− 20
30·272	522	− 79
50·337	556	+ 44
6123·593	1022	− 21
·615	1022	+ 1
29·466	1032	− 13
53·474	1073	− 52
60·524	1085	− 41
6213·342	1175	− 10
40·313	1221	− 19
43·290	1226	+ 25
·311	1226	+ 46
6573·488	1789	+ 9
7636·289	3601	+ 26

62

d	t	d
2425707·572	0	−·012
75·566	116	+ 12
94·263	148	− 41
·286	148	− 18
5832·377	213	− 14
35·392	218	+ 71
49·391	242	+ 7
93·341	317	+ 11
6123·593	710	− 16
·615	710	+ 6
29·444	720	− 24
·466	720	− 2
53·474	761	− 18
60·524	773	+ 1
·546	773	+ 23
6237·272	904	− 11
·294	904	+ 11
40·224	909	+ 11
·246	909	+ 33
68·306	957	− 32
6569·514	1471	− 3
71·280	1474	+ 5
7635·361	3290	0

63

d	t	d
2425764·494	0	−·012
·516	0	+ 10
94·564	67	− 6
99·486	78	− 20
·508	78	+ 2
5808·472	98	− 8
32·258	151	− 3
35·392	158	− 10
6122·570	798	− 7
·592	798	+ 15
53·542	867	+ 4
6239·267	1058	+ 25
42·397	1065	+ 14
43·290	1067	+ 9
48·232	1078	+ 16
65·269	1116	+ 2
6569·493	1794	0
70·382	1796	− 9
71·280	1798	− 8
7367·288	3572	− 13
7623·506	4143	− 8
7656·281	4216	+ 10

TABLE II (*continued*).

64

d	t	d
2425713·549	0	−·045
·571	0	− 23
45·548	61	− 2
65·430	99	− 27
94·263	154	− 6
·286	154	+ 17
95·351	156	+ 34
99·486	164	− 22
5825·225	213	+ 48
50·315	261	− 8
·337	261	+ 14
52·418	265	0
6076·600	693	− 32
6118·567	773	+ 25
56·300	845	+ 40
61·516	855	+ 17
6211·284	950	+ 18
13·342	954	− 19
·409	954	+ 48
44·249	1013	− 20
6480·493	1464	− 39
·515	1464	− 17

67

d	t	d
2425739·609	0	+·054
97·556	85	− 43
5858·328	174	− 46
6103·568	533	+ 45
18·567	555	+ 21
20·589	558	− 6
29·444	571	− 28
·466	571	− 6
61·516	618	− 51
6218·323	701	+ 78
46·235	742	− 7
·257	742	+ 15
6480·493	1085	+ 27
6569·299	1215	+ 61
70·532	1217	− 72
71·280	1218	− 7
73·295	1221	− 40
·316	1221	− 19
·359	1221	+ 24
7622·227	2757	+ 8
23·571	2759	− 13
·592	2759	+ 8

69

d	t	d
2425524·263	0	+·011
5792·609	566	− 15
97·329	576	− 37
5853·328	694	+ 12
6123·593	1264	+ 8
53·474	1327	+ 18
56·300	1333	− 1
61·516	1344	− 1
6212·287	1451	+ 35
13·216	1453	+ 16
39·289	1508	+ 10
6559·335	2183	+ 1
65·494	2196	− 3
69·256	2204	− 35
·277	2204	− 14
70·210	2206	− 29
·232	2206	− 7
·253	2206	+ 14
7367·310	3887	+ 15

70

see *B.A.N.* No. 256

72

d	t	d
2425526·288	0	+·003
5745·570	367	+ 60
5836·339	519	+ 33
49·391	541	− 57
52·418	546	− 17
·440	546	+ 5
57·217	554	+ 4
85·298	601	+ 10
6123·593	1000	− 35
·615	1000	− 13
53·474	1050	− 22
6214·472	1152	+ 47
38·298	1192	− 20
41·291	1197	− 14
6570·425	1748	− 16
72·255	1751	+ 22
7623·528	3511	− 29
·549	3511	− 8
·571	3511	+ 14
·592	3511	+ 35

74

d	t	d
2425720·584	0	−·046
5852·418	277	+ 16
63·349	300	+ 6
64·280	302	− 15
·302	302	+ 7
93·341	363	+ 28
6103·590	805	+ 13
53·542	910	+ 15
6213·476	1036	+ 10
36·290	1084	− 11
·312	1084	+ 11
37·272	1086	+ 20
46·257	1105	− 33
6486·520	1610	− 4
6570·232	1786	− 17
7623·463	4000	− 10
·485	4000	+ 12
35·361	4025	− 4
·383	4025	+ 18
36·311	4027	− 6
56·281	4096	− 16
·303	4096	+ 6

75

d	t	d
2425716·636	0	−·016
19·518	7	+ 2
5821·434	256	+ 11
25·509	266	− 6
6161·516	1087	− 3
6210·226	1206	+ 5
12·265	1211	− 2
39·267	1277	− 11
·289	1277	+ 11
41·313	1282	− 12
46·235	1294	− 1
·257	1294	+ 21
66·305	1343	+ 16
6569·536	2084	− 16
70·360	2086	− 11
73·230	2093	− 5
·252	2093	+ 17
7623·399	4659	− 1

76

d	t	d
2425790·412	0	+·006
97·308	14	− 26
·329	14	− 5
2425851·311	123	+·040
6123·413	673	− 16
55·594	738	+ 1
60·524	748	− 18
·546	748	+ 4
61·538	750	+ 7
6567·288	1570	− 7
68·292	1572	+ 8
69·256	1574	− 18
·277	1574	+ 3
·299	1574	+ 25
70·253	1576	− 11
71·259	1578	+ 6
7623·270	3704	0

77

d	t	d
2425775·566	0	+·034
92·247	30	+ 8
99·486	43	+ 7
·508	43	+ 29
5803·372	50	− 5
32·356	102	+ 20
61·264	154	− 31
6103·568	589	+ 20
18·567	616	− 17
·589	616	+ 5
23·593	625	− 4
76·466	720	− 36
6233·216	786	− 42
38·298	831	− 21
42·221	838	+ 4
43·311	840	− 20
6475·540	1257	− 19
6570·253	1427	+ 20
·275	1427	+ 42
7622·227	3316	+ 5
57·294	3379	− 13
·322	3379	+ 15

78

d	t	d
2425478·239	0	−·020
5745·570	572	− 15
5826·454	745	+ 17
34·377	762	− 5
64·302	826	+ 9
6103·568	1338	− 10
·590	1338	+ 12
6212·464	1571	− 7
13·409	1573	+ 3
14·331	1575	− 10
·353	1575	+ 12
36·312	1622	+ 6
6569·536	2335	+ 7
70·468	2337	+ 4
73·252	2343	− 16
·273	2343	+ 5
·295	2343	+ 27
7367·288	4042	− 14
·310	4042	+ 8
7623·399	4590	− 12

80

d	t	d
2425745·570	0	+·037
65·430	54	+ 35
90·390	122	− 17
91·485	125	− 25
92·247	127	+ 1
·269	127	+ 23
5832·377	236	+ 39
50·337	285	− 25
85·274	380	− 31
2425885·298	380	−·007
6153·474	1109	+ 27
61·516	1131	− 23
·538	1131	− 1
6237·294	1337	− 16
40·246	1345	− 7
6540·430	2161	+ 35
70·532	2243	− 25
71·259	2245	− 33
·280	2245	− 12
7623·248	5105	− 14
·270	5105	+ 8
·292	5105	+ 30

82

d	t	d
2425707·550	0	−·012
·572	0	+ 10
13·549	13	− 4
19·540	26	− 4
91·462	182	+ 23
93·273	186	− 10
5823·230	251	− 9
26·454	258	− 11
64·280	340	+ 24
6090·550	831	+ 9
6125·555	907	− 12
·577	907	+ 10
61·516	985	+ 2
6211·284	1093	− 4
35·250	1145	− 3
40·313	1156	− 9
·335	1156	+ 13
6561·526	1853	− 19
69·364	1870	− 16
71·259	1874	+ 36
73·509	1879	− 19
7623·377	4157	− 1
35·361	4183	0
36·289	4185	+ 6

85

d	t	d
2425740·530	0	−·026
5803·372	116	− 26
93·364	282	+ 37
6123·593	707	+ 25
·615	707	+ 47
6210·226	867	− 20
18·345	882	− 28
43·290	928	− 3
6486·520	1377	− 15
6567·267	1526	+ 13
69·407	1530	− 14
·428	1530	+ 7
70·489	1532	− 16
·511	1532	+ 6
73·230	1537	+ 16
7623·659	3476	+ 7
64·272	3551	− 10

88

d	t	d
2425707·550	0	−·022
·572	0	0
65·430	104	+ 2
5857·217	269	− 2
·239	269	+ 20
58·350	271	+ 19
6122·570	746	− 8
·592	746	+ 14
61·516	816	− 3
6213·237	909	− 19
38·299	954	+ 9
2426273·313	1017	−·024
6561·526	1535	+ 21
69·277	1549	− 16
·299	1549	+ 6
70·403	1551	− 3
7636·311	3467	+ 19
56·303	3503	− 16
·317	3503	− 2

89

d	t	d
2425745·548	0	+·004
·570	0	+ 26
94·542	92	+ 3
5826·479	152	− 14
32·356	163	+ 5
49·391	195	− 2
·413	195	+ 20
64·280	223	− 24
·302	223	− 2
88·277	268	+ 8
6122·592	708	− 1
53·474	766	− 8
55·594	770	− 18
·616	770	+ 4
6240·313	929	+ 25
42·397	933	− 21
48·254	944	− 22
73·291	991	− 16
·313	991	+ 6
6570·446	1549	− 26
·468	1549	− 4
·489	1549	+ 17
·511	1549	+ 39
7623·313	3526	− 21
·334	3526	0
·356	3526	+ 22

90

d	t	d
2425524·263	0	+·007
5745·548	546	− 41
99·508	679	+ 4
5808·450	701	+ 28
30·294	755	− 18
32·258	760	− 81
·356	760	+ 17
34·377	765	+ 11
49·391	802	+ 26
·413	802	+ 48
6090·571	1397	+ 10
6129·444	1493	− 33
61·516	1572	+ 15
6235·250	1754	− 29
63·301	1823	+ 51
6480·493	2359	− 36
6567·267	2573	− 12
69·299	2578	− 7
73·402	2588	+ 43
7623·270	5178	− 3

91

d	t	d
2425745·570	0	−·007
65·430	32	+ 48
92·587	76	− 28
·609	76	− 6
97·556	84	− 11
5861·286	187	− 30
6125·577	614	− 21
61·516	672	+ 20
6241·313	801	− 25
67·328	843	− 5
·350	843	+ 17

Table 11 (*continued*).

d	t	d
2426303·271	901	+·040
6569·364	1331	− 6
71·259	1334	+ 32
7623·377	3034	− 27
·399	3034	− 5
·420	3034	+ 16
64·251	3100	− 2

95

d	t	d
2425478·239	0	+·001
5527·273	89	+ 16
5720·584	440	+ 4
93·273	572	− 10
5825·225	630	− 3
32·377	643	− 11
6067·562	1070	− 9
94·542	1119	− 17
6210·226	1329	+ 4
38·298	1380	− 14
43·290	1389	+ 21
48·232	1398	+ 6
6565·472	1974	− 2
·494	1974	+ 20
69·321	1981	− 8
·342	1981	+ 13
70·425	1983	− 6
7623·506	3895	− 13
·528	3895	+ 9

100

d	t	d
2425745·548	0	−·011
·570	0	+ 11
5803·351	124	+ 11
08·450	135	− 16
25·248	171	+ 7
51·311	227	− 25
6067·540	691	− 10
·562	691	+ 12
88·540	736	+ 21
·562	736	+ 43
6155·594	880	− 26
·616	880	− 4
6570·339	1770	− 1
71·259	1772	− 13
7623·442	4030	− 8
·463	4030	+ 13
52·339	4092	− 2

103

d	t	d
2425794·286	0	−·008
95·351	2	+ 13
5821·434	52	+ 15
32·377	73	+ 4
6156·300	694	+ 2
61·516	704	+ 2
6214·215	805	+ 17
41·313	857	− 9
6569·385	1486	− 35
·407	1486	− 13
70·446	1488	− 17
·468	1488	+ 5
7623·614	3507	+ 2
·635	3507	+ 23
29·869	3519	− 2

105

d	t	d
2425707·572	0	−·035
40·530	224	+ 1
5822·257	780	+ 12
36·339	876	− 16
57·217	1018	− 8
2425857·239	1018	+·014
64·280	1066	+ 1
6088·562	2592	+ 3
6118·567	2796	+ 26
23·413	2829	+ 22
25·577	2844	− 19
55·594	3048	+ 16
56·300	3053	− 13
6212·464	3435	+ 8
14·237	3447	+ 17
40·224	3624	− 10
42·307	3638	+ 15
63·301	3781	− 8
68·306	3815	0
73·291	3849	− 12
6476·554	5232	− 11
·576	5232	+ 11
6569·299	5863	− 6
·450	5864	− 2
70·210	5869	+ 23
73·252	5890	− 21
7623·248	13034	+ 5
·377	13035	− 13

109

d	t	d
2425739·587	0	+·019
40·530	2	− 27
·552	2	− 5
5835·392	194	− 32
6118·567	767	+ 21
20·567	771	+ 45
29·444	789	+ 28
55·594	842	− 9
60·525	852	− 20
·546	852	+ 1
61·516	854	− 17
·538	854	+ 5
6212·464	957	+ 39
63·301	1060	− 17
65·269	1064	− 25
7623·571	3813	− 14
·592	3813	+ 7

110

d	t	d
2425706·566	0	+·068
13·549	11	+ 4
·571	11	+ 26
20·563	22	− 30
45·548	61	− 31
·570	61	− 9
65·430	92	− 10
90·390	131	− 37
·412	131	− 15
94·263	137	− 8
·286	137	+ 15
5849·413	223	+ 44
60·236	240	− 25
6155·616	701	+ 1
6213·237	791	− 39
·342	791	+ 66
38·298	830	+ 35
6476·554	1202	− 42
6569·471	1347	− 24
·493	1347	− 2
73·338	1353	− 1
7623·399	2992	− 17
·420	2992	+ 4
·442	2992	+ 26

111

d	t	d
2425775·566	0	+·019
2425790·390	30	·000
97·308	44	− 8
5826·479	103	− 26
35·392	121	− 19
6103·568	663	+ 10
53·542	764	+ 15
6212·375	883	− 26
13·409	885	+ 19
14·353	887	− 27
18·323	895	− 14
·345	895	+ 8
66·327	992	0
67·328	994	+ 11
68·284	996	− 22
·306	996	0
73·291	1006	+ 38
6476·576	1417	− 14
86·520	1437	+ 35
6540·430	1546	+ 18
7623·356	3735	− 36
·377	3735	− 15
·399	3735	+ 7
·420	3735	+ 28

114

d	t	d
2425442·385	0	+·075
5527·273	155	− 28
·295	155	− 6
5706·566	482	− 40
·588	482	− 18
5834·355	715	− 12
·377	715	+ 10
61·242	764	+ 7
·264	764	+ 29
6120·567	1237	− 29
·589	1237	− 7
25·555	1246	+ 24
6213·237	1406	− 27
14·331	1408	− 30
·353	1408	− 8
36·290	1448	− 4
42·307	1459	− 18
6559·313	2037	+ 52
61·504	2041	+ 50
70·210	2057	− 18
·232	2057	+ 4
7623·528	3978	− 45
·549	3978	− 24
·571	3978	− 2
·592	3978	+ 19
·614	3978	+ 41

116

d	t	d
2425716·636	0	−·005
5821·434	195	+ 11
25·225	202	+ 40
35·370	221	− 24
·392	221	− 2
6118·567	748	− 7
61·538	828	− 24
6214·215	926	− 7
·237	926	+ 15
66·327	1023	− 17
6540·430	1533	+ 41
69·385	1587	− 21

118

d	t	d
2425716·615	0	+·008
5825·362	237	− 10
32·258	252	+ 2
52·440	296	− 8
2425860·236	313	−·014
6176·444	1002	− 4
6212·244	1080	0
·265	1080	+ 21
40·224	1141	− 14
·246	1141	+ 8
6476·576	1656	− 7
6561·504	1841	+ 20
69·277	1858	− 8
·299	1858	+ 14
70·210	1860	+ 7
73·402	1867	− 14
·423	1867	+ 7
7623·420	4155	− 11
35·361	4181	− 2
36·289	4183	+ 9
52·339	4218	− 4
64·272	4244	− 3

121

d	t	d
2425478·288	0	+·018
5764·494	542	− 17
·516	542	+ 5
5825·248	657	+ 3
6103·568	1184	+ 4
76·444	1322	− 1
6213·409	1392	− 4
14·472	1394	+ 3
6567·267	2062	+ 14
68·292	2064	− 18
69·364	2066	− 2
70·403	2068	− 19
·425	2068	+ 3
7623·506	4062	+ 13
57·294	4126	+ 2
58·345	4128	− 3

123

d	t	d
2425525·294	0	−·018
5764·516	466	+ 20
93·251	522	+ 12
5832·258	598	+ 10
6129·444	1177	+ 12
53·542	1224	− 14
55·594	1228	− 15
6219·260	1352	+ 6
39·267	1391	− 5
6569·299	2034	− 6
73·402	2042	− 9
7623·571	4088	+ 7

124

d	t	d
2425791·485	0	−·019
94·542	6	− 4
97·556	12	− 31
5849·413	114	+ 114
85·274	185	− 20
93·364	201	− 41
6088·562	586	− 28
6212·265	830	− 27
·287	830	− 5
43·290	891	+ 73
46·235	897	− 24
·257	897	− 2
6570·210	1536	− 5
72·277	1540	+ 34
73·252	1542	− 5
7635·361	3637	− 5
64·251	3694	− 13
·272	3694	+ 8

125

d	t	d
2425478·288	0	−·009
5716·636	512	− 1
99·486	690	− 11
·508	690	+ 11
5826·479	748	− 18
30·272	756	+ 51
6088·562	1311	− 16
6155·616	1455	+ 5
6213·320	1579	− 14
·342	1579	+ 8
35·228	1626	+ 15
40·313	1637	− 21
·335	1637	+ 1
48·232	1654	− 16
67·328	1695	− 5
6561·526	2327	− 9
69·428	2344	− 20
·450	2344	+ 2
70·382	2346	+ 3
72·255	2350	+ 14
73·209	2352	+ 37
7623·356	4608	− 3

126

d	t	d
2425716·615	0	−·001
75·566	126	+ 17
91·485	160	+ 33
97·535	173	+ 3
5823·230	228	− 27
51·311	288	− 10
88·277	367	+ 6
6153·474	934	+ 2
6242·307	1124	− 33
43·290	1126	+ 15
65·247	1173	− 11
6569·256	1823	− 24
·277	1823	− 3
·299	1823	+ 19
70·210	1825	− 5
·232	1825	+ 17
73·466	1832	− 24
·488	1832	− 2
·509	1832	+ 19
7623·506	4077	− 28
·528	4077	− 6
·571	4077	+ 37
56·281	4147	+ 6

127

d	t	d
2425442·428	0	−·002
5706·566	374	− 18
·588	374	+ 4
5803·351	511	+ 5
·372	511	+ 26
25·248	542	+ 7
61·242	593	− 19
63·373	596	− 9
85·274	627	− 1
·298	627	+ 23
5926·239	685	− 1
6212·287	1090	− 1
36·290	1124	− 12
65·247	1165	− 13
6568·271	1594	+ 12
7623·442	3088	− 17
·463	3088	+ 4
29·830	3097	+ 14

TABLE 11 (*continued*).

128

d	t	d
2425478·288	0	−·018
5720·563	370	− 5
39·587	399	+ 31
75·566	454	− 2
92·587	480	− 5
94·542	483	− 14
·564	483	+ 8
5886·220	623	− 3
·242	623	+ 19
6088·562	932	+ 18
6122·570	984	− 22
60·546	1042	− 22
6212·265	1121	− 29
35·228	1156	+ 17
42·397	1167	− 16
67·328	1205	+ 34
6559·313	1651	− 5
·335	1651	+ 17
7367·288	2885	− 6

130

d	t	d
2425527·27	0	+ ·74
5716·61	14	+ ·77
·64	14	+ ·80
97·31	20	+ ·33
·33	20	+ ·35
·53	20	+ ·55
98·33	20	+1·35
5823·23	22	− ·79
25·22	22	+1·20
·25	22	+1·23
·36	22	+1·34
36·34	23	−1·20
50·31	24	− ·75
51·31	24	+ ·25
64·28	25	− ·33
·30	25	− ·29
6067·54	40	+ ·12
·56	40	+ ·14
93·53	42	− ·93
·55	42	− ·91
94·52	42	+ ·06
·54	42	+ ·08
6120·57	44	− ·94
61·54	47	− ·53
6214·47	51	−1·69
42·29	53	− ·92
·31	53	− ·90
6540·43	75	− ·26
67·27	77	− ·47
·29	77	− ·45
7622·23	155	− ·23
·25	155	− ·21
23·23	155	+ ·77
·31	155	+ ·85
·61	155	+1·15
35·36	156	− ·62
36·31	156	+ ·33

132

d	t	d
2425719·518	0	+·003
·540	0	+ 25
20·563	2	+ 23
40·530	41	+ 9
92·247	142	− 21
·268	142	0
94·286	146	− 31
5821·456	199	− 16
23·499	203	− 22
58·350	271	− 11

d	t	d
2426076·600	697	−·020
93·549	730	+ 21
94·542	732	− 11
6212·375	962	− 17
13·409	964	− 8
14·472	966	+ 30
46·235	1028	+ 28
48·254	1032	− 3
6486·520	1497	+ 22
6569·514	1659	+ 16
7623·377	3716	− 18

140

d	t	d
2425740·530	0	−·027
·552	0	− 5
5825·362	168	− 33
57·239	231	+ 30
60·236	237	− 3
61·264	239	+ 15
64·302	245	+ 23
6093·528	699	− 16
·549	699	+ 5
6210·226	930	+ 30
13·216	936	− 10
·237	936	+ 11
73·313	1055	− 7
6540·452	1584	− 7
69·234	1641	− 9
70·232	1643	− 21
71·259	1645	− 4
·280	1645	+ 17
72·255	1647	− 18
·277	1647	+ 4
73·273	1649	− 10
·316	1649	+ 33

141

d	t	d
2425525·272	0	−·039
5716·636	263	− 15
19·540	267	− 22
94·564	370	+ 67
5821·456	407	+ 40
93·364	506	− 77
6093·528	781	+ 15
·549	781	+ 36
6125·555	825	+ 31
76·444	895	− 7
·466	895	+ 15
6214·215	947	− 68
·331	947	+ 48
38·298	980	+ 7
65·247	1017	+ 37
67·350	1020	− 43
6569·299	1435	− 19
7623·485	2884	− 26
64·251	2940	− 1
·272	2940	+ 20

142

d	t	d
2425825·362	0	−·012
36·317	19	− 35
58·328	57	+ 19
6090·571	459	− 21
6210·226	666	+ 26
14·215	673	− 29
·237	673	− 7
18·323	680	+ 34
40·224	718	− 22
·246	718	0
66·327	763	+ 79
6476·554	1127	− 19

d	t	d
2426561·504	1274	−·009
67·267	1284	− 24
·288	1284	− 3
70·210	1289	+ 30
7623·506	3112	− 34
29·895	3123	− 1
·924	3123	+ 28

143

d	t	d
2425716·636	0	−·055
64·494	88	− 12
·516	88	+ 10
92·268	139	+ 51
5830·272	209	+ 21
32·377	213	− 47
50·337	246	− 18
61·242	266	+ 20
62·287	268	− 21
63·371	270	− 24
86·220	312	+ 4
6103·568	712	+ 13
22·570	747	− 2
·592	747	+ 20
56·300	809	+ 40
6212·222	912	− 2
·244	912	+ 20
7629·830	3521	+ 11
36·311	3533	− 28

144

d	t	d
2425740·552	0	−·002
94·542	109	+ 28
5823·208	167	− 19
52·418	226	− 16
64·302	250	− 13
6088·562	703	− 9
90·550	707	− 1
94·520	715	+ 8
6213·320	955	− 3
14·331	957	+ 18
6567·267	1670	− 14
68·271	1672	0
70·253	1676	+ 2
·275	1676	+ 24
71·259	1678	+ 18
73·209	1682	− 12
7622·248	3801	+ 24
23·227	3803	+ 13
58·345	3874	− 17
·366	3874	+ 4
64·272	3886	− 31

148

d	t	d
2425713·549	0	−·016
·571	0	+ 6
19·518	12	+ 3
·540	12	+ 25
90·412	155	− 9
5852·418	280	+ 17
58·350	292	− 1
6123·615	827	− 11
56·346	893	− 5
6218·323	1018	− 9
6569·385	1726	− 2
·407	1726	+ 20
70·360	1728	− 19
·382	1728	+ 3
73·338	1734	− 16
·359	1734	+ 5
7623·528	3852	− 18
·549	3852	+ 3

d	t	d
2427623·571	3852	+·025

149

d	t	d
2425442·428	0	+·020
5713·549	459	+ 11
·571	459	+ 33
91·485	591	− 24
5849·391	689	− 7
·413	689	+ 15
6094·520	1104	− 17
·542	1104	+ 5
6236·290	1344	− 14
·312	1344	+ 8
42·221	1354	+ 10
65·247	1393	− 1
·269	1393	+ 21
6475·509	1749	− 27
6569·407	1908	− 50
·428	1908	− 29
7629·802	3703	+ 45

153

d	t	d
2425524·285	0	+·020
5775·566	441	− 14
90·390	467	− 7
93·273	472	+ 27
99·508	483	− 7
5830·294	537	+ 6
63·349	595	+ 8
6129·466	1062	− 7
6238·298	1253	− 21
42·307	1260	− 1
6568·271	1832	− 6
·292	1832	+ 15
69·407	1834	− 10
72·255	1839	− 11
73·380	1841	− 26
7367·288	3234	+ 46
7623·659	3684	− 28
57·322	3743	+ 13

155

d	t	d
2425526·265	0	−·010
·288	0	+ 13
5740·530	395	0
5834·355	568	− 14
6118·589	1092	− 8
29·444	1112	− 1
6212·442	1265	+ 7
·464	1265	+ 29
35·228	1307	+ 11
36·290	1309	− 12
·312	1309	+ 10
68·306	1368	+ 2
6475·509	1750	0
76·576	1752	− 17
6568·271	1921	+ 9
69·321	1923	− 26
·342	1923	− 5
70·425	1925	− 7
·446	1925	+ 14
7623·270	3866	+ 2
36·289	3890	+ 3

158

d	t	d
2425713·549	0	−·015
·571	0	+ 7
19·518	10	+ 16
97·308	141	+ 19
5822·257	183	+ 28

d	t	d
2425832·377	200	+·054
51·311	232	− 14
57·217	242	− 46
60·214	247	− 18
·236	247	+ 4
6153·542	741	− 25
6211·216	838	+ 50
12·353	840	0
40·246	887	− 16
6476·554	1285	− 39
·576	1285	− 17
6561·504	1428	− 2
69·212	1441	− 13
·234	1441	+ 9
70·382	1443	− 31
·403	1443	− 10
·446	1443	+ 33
7623·227	3216	+ 13
36·289	3238	+ 11

163

d	t	d
2425792·587	0	+·015
·609	0	+ 37
5830·272	73	− 29
·294	73	− 7
32·356	77	− 13
·377	77	+ 8
49·413	110	− 11
61·286	133	− 26
63·349	137	− 30
·371	137	− 8
93·341	195	− 15
·364	195	+ 8
6067·540	532	+ 10
·562	532	+ 32
6160·546	712	− 15
6212·222	812	− 22
14·331	816	+ 19
6303·271	988	+ 63
7623·227	3542	+ 16
56·281	3606	− 7
·303	3606	+ 15
57·294	3608	− 28
58·345	3610	− 11

165

d	t	d
2425442·385	0	+·006
5745·570	551	− 12
94·542	640	− 15
97·308	645	− 1
·329	645	+ 20
99·486	649	− 24
·508	649	− 2
5803·351	656	− 11
·372	656	+ 10
26·454	698	− 19
·479	698	+ 6
62·265	763	+ 24
6176·466	1334	+ 15
6212·222	1399	+ 3
13·320	1401	+ 1
6565·472	2041	− 25
·494	2041	− 3
69·342	2048	− 7
·364	2048	+ 15
70·425	2050	− 25
·446	2050	− 4
·468	2050	+ 18
73·209	2055	+ 8
·230	2055	+ 29
7658·345	4027	− 6

TABLE 11 (*continued*).

175

d	t	d
2425478·239	0	−·009
5825·509	624	− 5
53·328	674	− 12
57·217	681	− 19
·239	681	+ 3
58·328	683	− 21
·350	683	+ 1
62·265	690	+ 20
63·349	692	− 9
·371	692	+ 13
6160·546	1226	+ 9
6213·409	1321	+ 3
46·235	1380	− 6
66·305	1416	+ 30
6475·540	1792	+ 14
6573·466	1968	− 9
·488	1968	+ 13
7623·592	3855	− 27
·614	3855	− 5
·635	3855	+ 16

178

d	t	d
2425775·566	0	+·003
5821·456	89	− 2
35·370	116	− 12
50·337	145	0
52·418	149	+ 18
64·280	172	+ 19
6088·562	607	− 22
6120·567	669	+ 10
53·542	733	− 18
55·616	737	− 7
6240·224	901	+ 28
6480·493	1367	− 12
·515	1367	+ 10
6570·210	1541	− 25
7622·227	3581	− 7
·248	3581	+ 14
56·281	3647	+ 11
57·294	3649	− 7

179

d	t	d
2425442·385	0	−·030
5745·548	488	− 32
·570	488	− 10
5803·351	581	− 4
21·434	610	+ 63
52·418	660	− 15
6088·540	1040	+ 36
6160·546	1156	− 21
6213·409	1241	+ 36
41·313	1286	− 15
6480·493	1671	− 12
6569·342	1814	0
·364	1814	+ 22
7623·549	3511	− 36
·571	3511	− 14
·592	3511	+ 7
·614	3511	+ 29
35·383	3530	− 5

182

d	t	d
2425707·550	0	−·006
16·636	23	− 15
39·587	81	0
75·566	172	− 6
92·587	215	+ 10
95·351	222	+ 6
5821·434	288	− 10
2425822·257	290	+·022
63·371	394	+ 9
5926·239	553	+ 1
6155·594	1133	− 3
61·538	1148	+ 9
6213·342	1279	+ 30
19·260	1294	− 4
40·224	1347	+ 1
66·305	1413	− 17
68·284	1418	− 16
6475·509	1942	− 5
6570·403	2182	− 18
·425	2182	+ 4
7623·506	4845	+ 9
35·361	4875	+ 1
56·317	4928	− 2

183

d	t	d
2425713·549	0	−·004
5825·225	203	+ 24
49·413	247	+ 13
86·220	314	− 29
·242	314	− 7
6120·589	740	+ 44
56·300	805	+ 5
6211·284	905	− 10
12·375	907	− 19
13·476	909	− 18
6565·472	1549	− 15
68·271	1554	+ 34
69·299	1556	− 38
·321	1556	− 16
·385	1556	+ 48
70·403	1558	− 34
·425	1558	− 12
·468	1558	+ 31
7623·659	3473	− 9
36·289	3496	− 29
·311	3496	− 7
58·366	3536	+ 48

185

d	t	d
2425524·285	0	−·019
5706·566	334	+ 11
5825·509	552	− 1
64·280	623	+ 28
88·277	667	+ 16
6094·520	1045	− 1
6129·444	1109	+ 1
6213·476	1263	+ 1
41·291	1314	− 13
·313	1314	+ 9
42·397	1316	+ 2
6569·234	1915	− 12
70·296	1917	− 42
7623·506	3847	+ 42
57·294	3909	− 2
58·366	3911	− 21

188

d	t	d
2425707·550	0	−·041
40·552	18	− 79
64·494	31	0
·516	31	+ 22
75·566	37	+ 59
5821·456	62	+ 60
32·377	68	− 33
6076·600	201	+ 59
6120·567	225	− 28
55·594	244	+ 123
6212·222	275	− 152
2426212·353	275	−·021
14·237	276	+ 28
6568·292	469	− 183
70·253	470	− 58
·275	470	− 36
·339	470	+ 28
·360	470	+ 49
·403	470	+ 92
72·255	471	+ 109

189

d	t	d
2425745·570	0	−·014
5803·372	102	− 14
08·472	111	− 14
6093·549	614	+ 23
6161·538	734	+ 10
6235·228	864	+ 32
36·312	866	− 18
44·249	880	− 14
65·247	917	+ 17
6476·576	1290	− 26
6559·313	1436	− 24
·335	1436	− 2
67·267	1450	− 4
·288	1450	+ 17
69·536	1454	− 6
71·259	1457	+ 21
·280	1457	+ 42
73·488	1461	− 16
·509	1461	+ 5
7623·549	3314	− 14

190

d	t	d
2425790·412	0	+·011
98·328	14	− 35
99·486	16	− 15
·508	16	+ 7
5822·257	56	+ 6
93·341	181	− 6
6093·549	533	− 2
6118·589	577	+ 12
6212·442	742	+ 20
48·254	805	0
73·291	849	+ 11
7623·506	3223	− 15
·528	3223	+ 7

191

d	t	d
2425791·485	0	+·011
98·328	13	− 19
5823·208	60	+ 10
35·370	83	+ 11
60·214	130	+ 4
63·371	136	− 11
6156·300	690	− 3
6212·353	796	+ 4
6573·466	1479	− 12
7623·571	3465	+ 18
29·895	3477	− 2
56·317	3527	− 17
64·272	3542	+ 7

193

d	t	d
2425719·518	0	−·022
·540	0	0
40·530	30	− 25
·552	30	− 3
75·556	80	− 15
92·434	104	+ 41
·456	104	+ 63
2425797·308	111	+·011
5823·208	148	− 8
25·362	151	+ 45
53·328	191	− 10
86·220	238	− 42
·242	238	− 20
6161·538	631	− 26
6211·284	702	− 17
13·409	705	+ 7
18·345	712	+ 39
39·289	742	− 32
65·269	779	+ 28
6569·234	1213	− 30
·256	1213	− 8
·277	1213	+ 13
7623·549	2718	+ 11

194

d	t	d
2425716·636	0	−·028
92·268	114	+ 16
97·535	122	− 21
6156·300	663	+ 35
6211·284	746	− 14
6480·493	1152	− 2
·515	1152	+ 20
6569·321	1286	− 23
·342	1286	− 2
·385	1286	+ 41
73·316	1292	− 6
7622·248	2874	− 16

199

d	t	d
2425713·549	0	+·037
19·518	16	+ 29
20·584	19	− 25
97·556	225	0
98·328	227	+ 25
5821·434	289	− 27
·456	289	− 5
6094·520	1020	+ 12
6219·260	1354	− 6
41·291	1413	− 13
·313	1413	+ 9
42·397	1416	− 27
6303·271	1579	− 38
6569·256	2291	− 3
·277	2291	+ 18
7623·377	5113	+ 30
57·322	5204	− 16

202

d	t	d
2425527·273	0	−·021
·295	0	+ 1
5792·434	463	+ 16
97·556	472	− 15
5808·472	491	+ 21
35·370	538	+ 6
62·265	585	− 12
·287	585	+ 10
6123·391	1041	− 2
6240·246	1245	+ 39
6475·540	1656	− 14
6569·450	1820	− 14
·471	1820	+ 7
·493	1820	+ 29
73·423	1827	− 49
·466	1827	− 6
7623·659	3661	0
56·281	3718	− 17
·303	3718	+ 5
·317	3718	+ 19

205

d	t	d
2425764·494	0	+·007
92·609	62	− 12
5834·377	154	+ 8
60·236	211	+ 2
93·364	284	+ 4
6161·538	875	− 4
6212·353	987	− 12
·375	987	+ 10
42·307	1053	− 7
48·232	1066	+ 19
6540·430	1710	− 16
70·382	1776	− 13
·403	1776	+ 8
7622·248	4094	− 1
23·592	4097	− 19
·614	4097	+ 3
·635	4097	+ 24
56·281	4169	− 2

207

d	t	d
2425478·239	0	+·012
·288	0	+ 61
5524·294	81	− 9
5745·570	460	− 3
91·462	539	− 24
·485	539	− 1
5823·477	594	+ 25
25·248	597	+ 53
86·220	702	0
·242	702	+ 22
6213·409	1265	− 18
48·254	1325	− 45
66·305	1356	− 10
73·291	1368	+ 1
·313	1368	+ 23
6475·509	1716	− 33
6561·504	1864	− 54
·526	1864	− 32
70·232	1879	− 44
·253	1879	− 23
7622·248	3689	+ 25
23·399	3691	+ 14
·442	3691	+ 57

208

d	t	d
2425525·272	0	−·004
5720·584	281	+ 2
91·462	383	− 14
·485	383	+ 9
94·263	387	+ 7
·286	387	+ 30
5885·298	518	− 8
6094·520	819	+ 8
6160·524	914	− 16
6236·290	1023	− 10
68·284	1069	+ 13
6486·520	1383	+ 7
6569·212	1502	− 10
71·280	1505	− 28
73·380	1508	− 13
·402	1508	+ 9
7623·571	3019	− 23
56·281	3066	+ 20
58·345	3069	− 1
·366	3069	+ 20

216

d	t	d
2425525·272	0	−·014
5764·494	345	− 31

TABLE 11 (*continued*).

d	t	d
2425764·516	345	−·009
92·247	385	− 16
·268	385	+ 5
5803·351	401	− 8
·372	401	+ 13
21·434	427	+ 46
·456	427	+ 68
60·214	483	− 7
6067·540	782	− 23
6156·300	910	− 24
76·466	939	+ 32
6240·224	1031	− 7
·246	1031	+ 15
42·285	1034	− 27
·307	1034	− 5
6570·296	1507	− 17
7658·345	3076	+ 10

218

d	t	d
2425442·385	0	−·015
5719·518	520	+ 1
20·563	522	− 20
·584	522	+ 1

d	t	d
2425791·462	655	+·001
97·308	666	− 15
·329	666	+ 6
5823·477	715	+ 41
61·242	786	− 31
85·274	831	+ 20
6076·600	1190	+ 29
6212·442	1445	− 22
42·307	1501	− 1
66·305	1546	+ 16
67·350	1548	− 5
6480·515	1948	− 6
6561·504	2100	− 21
·526	2100	+ 1
69·514	2115	− 4
73·273	2122	+ 24
7367·288	3612	− 6
·310	3612	+ 16
7635·339	4115	− 12

219

d	t	d
2425797·308	0	−·006
·329	0	+ 15

d	t	d
2425864·280	140	−·010
6090·550	613	− 25
6123·593	682	+ 8
25·555	686	+ 56
55·616	749	− 22
6218·323	880	+ 14
63·279	974	0
73·291	995	− 34
·313	995	− 12
6480·493	1428	+ 19
6569·428	1614	− 29
·450	1614	− 7
·471	1614	+ 14
70·403	1616	− 11
·446	1616	+ 32
7623·377	3817	− 3
35·361	3842	+ 21
36·289	3844	− 8
·311	3844	+ 14
57·322	3888	− 25

221

d	t	d
2425478·239	0	·000

d	t	d
2425706·566	430	−·035
·588	430	− 13
64·494	539	+ 5
92·609	592	− 27
95·351	597	+ 60
99·508	605	− 31
5823·477	650	+ 39
6090·550	1153	− 18
6214·331	1386	+ 22
39·289	1433	+ 20
6540·430	2000	+ 41
73·273	2062	− 42
·295	2062	− 20

epochs not used:
7623·549
·592
36·311
9079·454
·476
·498
9104·480
06·538
·560

222

d	t	d
2425525·272	0	−·012
·294	0	+ 10
5792·587	425	− 20
·609	425	+ 2
94·542	428	+ 48
99·486	436	− 40
·508	436	− 18
5832·258	488	+ 24
35·370	493	− 9
·392	493	+ 13
64·302	539	− 10
6160·546	1010	− 23
6237·294	1132	− 12
42·307	1140	− 31
44·249	1143	+ 24
66·327	1178	+ 87
6569·407	1660	− 8
71·280	1663	− 22
7656·303	3388	− 15
·332	3388	+ 14

TABLE 12.

1

J.D. (d)	brightness (s)
2425442·3847	7·0
·4276	6·3
5707·5497	3·9
·5719	3·9
40·5302	6·0
65·4302	8·0
92·4344	2·5
·4555	5·2
·5868	8·0:
·6089	6·3
94·5422	8·0
·5642	6·7
98·3281	7·0
5821·4345	3·9
·4563	5·2
23·4774	7·5
·4992	8·0
52·4176	3·9
·4397	3·4
58·3280	7·5
·3498	7·5
60·2143	7·5
·2362	7·5
62·2648	7·5
·2866	6·0:
64·2796	5·2:
·3021	2·5:
85·2740	3·9
·2982	4·3
93·3414	2·5
6088·5405	7·5:
·5623	5·2:
90·5496	8·5
·5713	7·5
94·5200	6·3
·5418	4·7
6123·3913	6·7
·4131	8·0
·5928	4·3
·6146	2·0
28·5549	2·0
·5770	2·0

J.D. (d)	brightness (s)
2426129·4438	1·7
56·2995	8·0
·3460	7·0
6210·2931	2·1
12·2217	1·2
·2435	4·1
·2654	3·4
·2872	5·2:
·3533	6·3
·3751	7·5
·4420	8·0
·4636	7·5:
14·2154	4·1
·2373	5·2
·3311	7·5
·3533	7·5:
·4724	3·4
41·2911	5·2
·3129	2·5
43·2896	6·3:
·3114	7·0
6475·5094	7·5
·5395	7·5
6568·2708	2·5
·2932	4·3
6570·2102	3·4
·2317	3·4
·2531	4·3
·2746	3·4
·2961	5·2
·3175	6·7
·3390	6·7
·3605	7·5
·3819	7·5
·4034	7·5
·4249	7·5
·4464	7·5
·4678	5·2
·4893	6·7
·5108	6·7
·5322	6·3
72·2552	3·9:
·2766	6·7

J.D. (d)	brightness (s)
2427636·2894	2·5
·3107	2·5

20

J.D. (d)	brightness (s)
2425442·3847	8·3
·4276	4·9
78·2876	·4
5524·2627	5·4
·2848	3·3
25·2723	4·5
·2945	6·1
5706·5663	2·9
07·5497	6·9
·5719	11·1
19·5181	2·4
·5401	4·9
20·5844	2·0
65·4302	8·3
·4455	4·9
92·6089	·0
5822·2574	·4
23·2084	3·3
·2302	7·0
25·3621	2·4
·5089	2·0
26·4535	1·2
·4790	3·3
36·3171	4·9
·3391	7·9
49·3914	2·9
·4132	4·1
6088·5405	1·2
·5623	·0
90·5496	1·2
·5713	2·4
6123·3913	11·1
·4131	7·4
25·5549	7·9
·5770	10·2
60·5245	6·8
·5464	3·3
61·5159	1·0

J.D. (d)	brightness (s)
2426161·5377	2·4
6218·3233	7·4
·3451	9·7
40·2239	3·3
·2461	2·0
41·2911	4·9
·3129	3·3
42·2851	2·4
·3073	4·5
·3973	4·1
65·2467	7·4
·2686	10·2
66·3052	4·1
·3270	6·6
6565·4721	2·9
·4942	1·0
7652·3391	1·2

58

J.D. (d)	brightness (s)
2425527·2729	5·0:
5764·4943	6·4:
·5165	6·4:
91·4624	6·4
·4846	4·5
5822·2574	4·5
23·4774	5·7
·4992	6·4:
36·3171	5·0:
·3391	[5·0
6123·5928	8·4
·6146	6·4
55·6157	6·4
6213·3197	5·5
·3419	5·9
·4090	5·0
40·2461	6·4
·3128	5·3
·3347	5·7
67·3495	5·0:
6486·5199	6·4
6540·4296	5·0

61

J.D. (d)	brightness (s)
2425524·2627	2·5
·2848	2·9
26·2653	4·1
·2882	3·8
5706·5663	4·7
·5882	6·1
16·6365	2·5
39·5871	5·3
·6091	6·4
64·4943	4·7
·5165	4·7
91·4624	4·0
·4846	2·5
97·5347	2·5
99·4857	6·4
·5077	6·1
5826·4535	4·3
·4790	3·6
51·3110	7·0
53·3275	7·0
63·3711	4·7
88·2772	4·0
6118·5666	4·7
·5888	4·7
20·5669	7·6
·5890	4·7
22·5698	7·6
·5916	6·6
53·4740	4·0
·5422	7·0
55·5939	4·7
·6157	4·7
56·2995	2·5
61·5377	2·5
76·4437	7·0
·4658	4·3:
6213·4090	5·3
·4762	4·7
36·2900	4·7
·3118	6·1
38·2767	2·5
·2985	4·7

J.D. (d)	brightness (s)
2426240·3128	3·8
·3347	4·3
42·3073	2·5
·3973	5·7
63·2127	4·7
·2786	5·7
·3010	2·5
65·2467	6·4
·2686	6·4
67·2251	3·6
·3276	4·7
·3495	2·5
73·2913	4·3
·3130	4·7
6476·5544	2·5
·5760	4·7
6559·3347	2·5
65·4721	7·0
·4942	5·1
69·4284	3·6
·4498	4·7
·4713	5·7
·4928	6·9
·5143	6·4
·5357	4·7
70·2102	4·7
·2317	4·3
·2531	4·1
72·2552	2·5
·2766	3·8
73·4664	3·2
·4878	4·0
·5093	5·3
7622·2267	4·3
·2485	3·9
23·4632	3·2
·4847	3·4
·5062	4·1
·5276	5·3
·5491	6·1
·5706	6·4
·5920	4·0
·6135	3·8

TABLE 12 (*continued*).

J.D.	bright-ness	J.D.	bright-ness	J.D.	bright-ness	J.D.	bright-ness	J.D.	bright-ness	J.D.	bright-ness
d	s	d	s	d	s	d	s	d	s	d	s
2427623·6350	2·1	2426088·5623	3·6	2425808·4502	9·4:	2425886·2417	[1·8	2426303·2710	8·0:	2426240·2461	F
36·2894	4·3	6153·4740	3·5	·4720	10·1:	6129·4438	3·8	6569·2338	6·0	·3347	3·5
·3107	5·3	56·2995	9·6	22·2574	10·1	·4656	3·8	·2559	7·4	48·2325	[4·6
57·2941	4·0	·3460	10·5	6153·4740	10·1	61·5159	F	·2774	7·7	·2543	[4·6
		6212·2435	3·8	·5422	8·6	·5377	3·3	·2989	6·4	6561·5043	F
70		·2654	4·1	56·2995	8·7	6212·4420	F	·3210	5·1	·5259	F
See *B.A.N.* No. 256		·2872	5·3	·3460	7·2	·4636	[1·8	70·3175	6·7	65·4721	4·0
additional minima:		·3533	10·1	6214·2154	10·6	14·3311	[1·8	·3390	7·9	·4942	4·6
2429082·4125	3·6	·3751	10·3	·2373	9·5	·3533	[1·8	·3605	7·4	69·4928	3·5
·4343	3·8	·4420	8·4	36·2900	10·1	48·2325	[1·8:	·3819	6·4	·5357	4·6
		·4636	6·3	·3118	10·1	63·3010	2·8	73·5093	5·0	7367·2882	4·0
83		18·3233	10·1	6476·5544	5·5	65·2467	[1·8	7367·2882	8·3	7623·2271	3·8
		·3451	8·8	6559·3129	8·5	·2686	2·3	·3100	7·0	·2485	3·7
2425442·3847	4·1	6569·2774	3·6	·3347	7·6	7636·2894	3·8	7623·6135	6·3	·2700	4·1
5716·6147	7·5	·2989	5·5	70·2102	8·4	·3107	F	·6350	8·3	·2915	4·6
·6365	10·6	·3210	5·6	·2317	9·6	8064·3317	F	·6592	6·3:	·3129	5·6
19·5181	4·6	·3425	7·0	·2531	9·2	·3531	2·8			·3344	6·6
·5401	5·8	·3640	8·6	·2746	10·1			162		·3559	6·6
75·5660	3·6	·3854	9·8	·2961	10·6	F = invisible on				·3774	F
90·3896	8·6	·4069	10·5	·3175	10·1	good plate		2425524·2627	3·8	·3988	6·6
·4116	10·5	·4284	10·5	·3390	8·6			·2848	4·0	·4203	F
93·2513	3·6	·4498	9·9	·3605	8·4	152		5719·5181	5·1	·4418	F
5849·3914	7·2	·4713	7·5	·3819	7·1			39·5871	4·6	·4632	6·1
·4132	8·0	·4928	6·3	·4034	6·7	2425745·5484	5·1	·6091	4·6	·4847	6·6
52·4176	11·1	·5143	4·6	·4249	5·5	75·5660	6·6	92·4344	3·5	·5062	F
·4397	10·5	72·2766	4·6	73·2087	5·5:	5830·2720	7·0	·4555	4·1	·5276	5·6
58·3280	10·5	7652·3391	9·0	·2302	5·7	·2938	5·9	·5868	F	·5491	5·6
·3498	9·0	·3529	7·3	7652·3391	10·1	32·3555	5·9	5825·2250	F	·5706	5·6
61·2420	10·5	58·3446	4·1			·3773	7·4	·2482	F	·5920	4·6
·2642	9·5:			122		60·2362	5·1	49·3914	3·7	64·2510	4·6
·2860	10·3	96				6129·4656	5·5	·4132	4·6	·2725	3·8
64·2796	7·5			2425797·5347	2·8	56·2995	7·4	86·2199	F	8079·3395	4·6
·3021	4·6	2425794·5422	6·7	·5565	2·8	·3460	6·6	·2417	F		
5926·2392	6·3	·5642	9·1	99·4857	[1·8	6213·2155	6·1	6093·5276	4·1	F = invisible on	
·2624	8·0	97·3076	7·6	5850·3148	[1·8	14·2154	6·7	·5493	4·6	good plate	
6076·5998	8·6	·3294	7·6	·3368	[1·8	·2373	9·1	6236·2900	3·1		
88·5405	6·6	·5347	5·7	86·2199	[1·8	6303·2491	7·4	40·2239	F		

TABLE 13.

n	phase	bright-ness	*n*	phase	bright-ness	*n*	phase	bright-ness	*n*	phase	bright-ness
	1				s			s			s
		s	10	·834	7·1	10	·668	11·3	10	·504	2·6
10	·026	2·1	10	·870	4·8	10	·701	10·6	10	·535	3·8
10	·072	2·0	11	·910	3·2	10	·727	9·2	10	·569	3·9
10	·112	2·2	11	·966	2·4	10	·752	7·2	10	·597	6·2
10	·153	2·0				10	·775	5·4	10	·624	5·6
10	·178	2·2		2		10	·802	4·3	10	·644	6·8
10	·209	2·0				10	·839	4·2	10	·672	7·1
10	·224	2·6	10	·025	7·8	10	·864	4·5	10	·692	6·5
10	·245	2·4	10	·069	8·3	10	·894	5·2	10	·720	7·6
10	·269	2·4	10	·100	8·3	10	·922	6·0	10	·751	8·2
10	·285	3·1	10	·114	8·4	9	·951	6·5	10	·778	8·4
10	·304	4·0	10	·139	8·5	9	·983	7·1	10	·806	8·8
10	·322	3·5	10	·165	8·7				10	·845	8·4
10	·343	3·1	10	·196	8·4		3		10	·899	8·8
10	·362	3·2	10	·231	9·3				10	·955	8·9
10	·377	2·9	10	·266	9·1	10	·023	9·2			
10	·400	2·4	10	·303	10·0	10	·068	9·2		4	
10	·437	2·1	10	·344	10·6	10	·132	8·6			
10	·538	2·2	10	·375	10·1	10	·189	9·2	10	·015	7·3
10	·628	2·3	10	·414	9·9	10	·224	9·4	10	·045	7·4
10	·667	2·4	10	·448	10·5	10	·261	9·7	10	·096	7·4
10	·690	1·8	10	·474	10·5	10	·301	9·3	10	·133	7·1
10	·713	2·8	10	·500	10·7	10	·342	9·3	10	·170	7·2
10	·732	4·0	10	·526	10·3	10	·371	7·6	10	·207	7·1
10	·754	5·0	10	·555	11·3	10	·397	4·9	10	·256	7·2
10	·779	7·1	10	·593	11·1	10	·425	2·5	10	·297	5·3
10	·792	7·1	10	·621	11·1	10	·449	1·3	10	·334	2·9
10	·812	7·6	10	·647	11·8	10	·478	1·7	10	·385	1·5

n	phase	bright-ness	*n*	phase	bright-ness	*n*	phase	bright-ness	*n*	phase	bright-ness
		s			s	variable +					s
10	·436	2·2	10	·446	4·1	component			10	·059	10·6
10	·473	3·3	10	·480	5·9			s	10	·098	10·6
10	·498	5·4	10	·525	7·3	12	·020	6·5	10	·135	10·0
10	·524	4·5	10	·574	7·8	12	·076	7·7	10	·180	10·7
10	·551	4·1	10	·636	9·1	12	·135	6·3	10	·238	11·0
10	·577	4·6	10	·689	9·3	12	·185	6·9	10	·278	9·7
10	·605	6·5	10	·765	9·4	12	·229	6·4	10	·312	6·8
10	·638	5·2	10	·825	9·7	12	·273	5·9	10	·345	4·1
10	·674	6·7	10	·895	10·1	12	·322	5·9	10	·373	3·0
10	·705	5·8	11	·971	10·2	12	·392	4·3	10	·394	3·3
10	·732	7·0				12	·440	3·1	10	·418	3·5
10	·766	6·7		6		12	·474	3·4	10	·444	3·5
10	·796	6·7				12	·510	2·4	10	·475	4·9
10	·832	6·9	single variable			12	·545	2·6	10	·528	6·4
10	·863	7·0	weight			12	·588	3·3	10	·580	7·9
11	·897	7·1	39	·048	7·0	12	·636	2·6	10	·608	7·7
11	·944	7·0	37	·132	8·3	12	·689	3·4	10	·636	7·1
11	·988	6·8	38	·263	7·7	12	·736	3·6	10	·663	7·5
			39	·348	5·9	12	·782	3·3	10	·694	8·4
	5		37	·415	5·0	12	·820	4·1	10	·719	9·0
			36	·490	4·5	12	·859	4·7	10	·745	9·0
10	·042	10·2	36	·580	3·1	12	·898	4·7	10	·769	8·5
10	·108	10·2	37	·695	4·6	12	·932	6·3	10	·808	9·5
10	·192	10·7	39	·814	6·3	12	·978	6·4	10	·847	9·9
10	·249	8·8	38	·930	6·8				11	·903	10·6
10	·300	2·2					7		11	·957	9·7
10	·337	1·5							11	·988	9·8
10	·389	2·2				10	·017	9·7			

TABLE 13 (*continued*).

n	phase	brightness (s)
	9	
10	·008	10·4
10	·049	7·7
10	·072	9·1
10	·098	6·3
10	·134	6·8
10	·153	6·6
10	·174	5·8
10	·207	5·6
10	·230	4·9
10	·271	5·3
10	·302	6·0
10	·348	6·5
10	·391	6·4
10	·428	7·9
10	·450	7·8
10	·482	9·2
10	·506	8·7
10	·528	9·1
10	·565	9·7
10	·599	10·0
10	·640	10·5
10	·685	10·4
10	·738	11·7
10	·791	12·2
10	·833	11·0
10	·879	11·3
9	·929	11·5
9	·968	10·2
	13	
10	·028	9·7
10	·072	10·2
10	·113	10·4
10	·140	10·9
10	·170	10·9
10	·214	10·0
10	·244	7·2
10	·279	4·2
10	·308	3·2
10	·336	3·4
10	·375	4·2
10	·408	4·4
10	·434	5·0
10	·459	5·3
10	·490	6·7
10	·516	6·5
10	·551	7·6
10	·590	7·4
10	·628	8·3
10	·662	8·4
10	·691	8·6
10	·724	9·5
10	·760	9·6
10	·782	9·3
10	·811	9·6
11	·843	9·4
11	·890	9·8
11	·945	9·9
11	·985	10·2
	14	
10	·020	3·7
10	·051	3·5
10	·087	3·8
10	·127	3·6
10	·160	2·7
10	·188	3·0
10	·239	2·1
10	·282	2·0
10	·320	1·3
10	·352	1·2
10	·383	1·2
10	·421	1·5
10	·448	1·4
10	·480	2·0
10	·505	2·2
10	·526	2·1
10	·553	1·8
10	·585	1·6
10	·613	2·5
10	·639	2·6
10	·671	3·0
10	·696	2·5
10	·714	2·9
10	·731	3·2
10	·750	3·3
10	·781	3·4
10	·821	3·2
11	·864	3·6
11	·901	3·4
11	·932	3·8
11	·959	3·3
11	·985	3·8
	17	
10	·009	5·3
10	·042	5·0
10	·109	4·8
10	·149	3·9
10	·176	2·9
10	·202	3·4
10	·238	2·0
10	·277	2·3
10	·312	2·1
10	·347	3·1
10	·391	3·4
10	·447	3·8
10	·484	4·8
10	·529	4·8
10	·576	4·8
10	·614	5·8
10	·650	5·5
10	·688	5·5
10	·739	5·2
10	·779	5·1
10	·815	5·4
10	·854	5·7
10	·889	5·6
10	·923	5·5
10	·949	5·5
9	·970	5·3
9	·989	5·5
	18	
10	·018	8·3
10	·095	8·0
10	·180	8·2
10	·235	8·2
10	·291	8·2
10	·339	8·3
10	·386	7·9
10	·438	6·5
10	·469	4·4
10	·498	1·1
10	·525	1·8
10	·551	2·7
10	·589	3·7
10	·624	4·4
10	·652	5·5
10	·677	5·5
10	·707	6·2
10	·738	6·5
10	·791	6·6
9	·839	7·2
9	·882	7·3
9	·926	7·3
9	·974	7·3
	19	
10	·017	13·0
10	·047	13·0
10	·084	12·9
10	·133	11·2
10	·179	6·5
10	·204	3·8
10	·229	2·8
10	·253	2·8
10	·282	4·2
10	·313	5·6
10	·344	6·2
10	·369	7·0
10	·392	7·2
10	·420	7·6
10	·450	9·0
10	·478	9·5
10	·520	10·0
10	·558	10·9
10	·582	10·4
10	·606	10·9
10	·630	11·7
10	·658	11·9
10	·692	12·4
10	·728	12·1
10	·772	12·2
10	·812	12·9
10	·849	12·8
10	·880	12·8
11	·912	12·3
11	·948	12·6
11	·983	12·9
	20	
10	·020	1·2
10	·043	1·2
10	·066	1·0
10	·095	1·3
10	·117	1·1
10	·131	1·2
10	·149	1·1
10	·175	1·6
10	·204	1·0
10	·231	1·0
10	·252	1·0
10	·271	·9
10	·292	1·1
10	·316	·9
10	·345	·9
10	·390	1·1
10	·423	1·3
10	·454	·5
10	·483	·8
10	·514	·7
10	·548	1·6
10	·579	1·5
10	·612	1·3
6	·637	3·1
6	·652	4·2
8	·670	7·2
5	·692	10·5
4	·709	7·7
5	·727	4·5
6	·748	3·3
10	·780	1·5
10	·826	1·1
10	·861	1·1
10	·892	·7
10	·915	1·2
10	·945	1·0
10	·984	·7
	21	
10	·016	8·7
10	·072	8·9
10	·114	9·3
10	·143	9·3
10	·182	9·8
10	·224	9·5
10	·258	9·6
10	·290	9·8
10	·324	9·4
10	·374	9·5
10	·417	9·6
10	·448	9·6
10	·483	9·7
10	·522	9·5
10	·566	9·9
10	·600	9·6
10	·625	9·6
10	·661	8·7
10	·693	5·9
10	·726	3·9
10	·761	4·2
10	·798	4·4
10	·828	6·0
10	·859	7·1
10	·890	7·5
10	·930	7·7
11	·970	7·6
	22	
10	·015	6·4
10	·042	2·8
10	·077	1·8
10	·117	2·9
10	·145	4·0
10	·170	5·2
10	·203	5·5
10	·243	6·8
10	·275	8·0
10	·310	8·7
10	·341	9·8
10	·370	10·2
10	·405	11·2
10	·436	10·5
10	·468	11·2
10	·502	11·3
10	·533	11·5
10	·562	12·1
10	·589	12·4
10	·620	12·1
10	·667	11·9
10	·707	12·2
10	·737	12·6
10	·777	11·9
10	·819	12·1
10	·849	11·8
10	·879	12·4
10	·914	12·0
10	·946	11·7
11	·977	10·6
	23	
10	·016	3·4
10	·048	3·3
10	·076	3·8
10	·116	4·9
10	·144	5·2
10	·173	4·9
10	·207	3·7
10	·236	3·6
10	·259	2·6
10	·279	2·9
10	·308	2·8
10	·329	2·9
10	·352	3·0
10	·389	2·7
10	·422	2·8
10	·465	2·2
10	·519	2·9
10	·555	3·4
10	·608	4·9
10	·657	5·5
10	·687	5·5
10	·720	4·7
10	·762	3·4
10	·805	3·0
9	·855	3·1
9	·894	2·9
9	·931	2·7
9	·959	2·4
9	·986	2·9
	24	
10	·012	2·1
10	·048	1·9
10	·082	3·4
10	·117	3·0
10	·151	4·7
10	·199	5·1
10	·234	6·2
10	·261	6·0
10	·292	7·4
10	·333	6·6
10	·362	7·6
10	·392	8·3
10	·417	8·0
10	·446	9·1
10	·483	9·1
10	·509	8·9
10	·536	9·0
10	·563	9·7
10	·601	9·7
10	·630	9·6
10	·657	10·0
10	·683	9·5
10	·698	9·4
10	·722	9·7
10	·739	9·1
10	·762	9·6
10	·789	9·4
10	·813	9·8
10	·845	8·8
9	·879	8·0
9	·920	5·8
9	·952	4·2
9	·982	2·8
	26	
10	·014	6·9
10	·033	6·9
10	·055	7·4
10	·088	8·6
10	·122	8·6
10	·152	8·9
10	·186	8·2
10	·219	9·0
10	·253	9·1
10	·287	9·1
10	·322	9·3
10	·355	8·9
10	·393	9·8
10	·436	8·9
10	·466	9·3
10	·488	9·6
10	·521	9·5
10	·544	9·3
10	·583	9·3
10	·617	9·5
10	·644	9·6
10	·670	9·1
10	·708	9·2
10	·757	7·8
10	·787	4·7
10	·819	3·3
10	·855	3·4
9	·885	2·9
9	·909	4·0
9	·930	5·5
9	·952	5·7
9	·989	6·8
	32	
10	·014	4·9
10	·054	6·0
10	·094	6·1
10	·133	6·9
10	·168	7·3
10	·215	7·8
10	·258	8·0
10	·295	8·2
10	·336	8·4
10	·369	8·3
10	·405	8·7
10	·445	8·7
10	·473	8·6
10	·500	8·7
10	·540	8·6
10	·598	8·5
10	·643	8·6
10	·689	8·7
10	·740	8·6
10	·776	8·4
10	·799	8·3
10	·834	7·7
10	·861	5·9
10	·894	4·9
10	·925	3·8
9	·956	4·1
9	·981	4·1
	33	
10	·012	6·4
10	·049	3·9
10	·081	2·4
10	·112	2·3
10	·136	2·3
10	·164	3·0
10	·187	3·2
10	·206	3·9
10	·230	5·0
10	·264	5·2
10	·316	5·4
10	·358	6·3
10	·414	6·7
10	·445	6·5
10	·479	7·0
10	·538	7·1
10	·581	7·1
10	·625	7·3
10	·682	7·3
10	·731	7·4
10	·773	7·3
10	·812	7·4
9	·856	7·3
9	·883	7·2
9	·925	7·5
9	·977	7·3
	37	
10	·020	4·7
10	·052	2·4
10	·088	·7
10	·129	·6
10	·178	1·3
10	·211	2·2
10	·234	2·8
10	·258	3·7
10	·282	3·2
10	·312	3·6
10	·339	4·2
10	·364	4·5
10	·391	4·5
10	·426	4·8
10	·474	4·7
10	·504	5·4
10	·537	5·1
10	·567	5·7
10	·594	5·4
10	·623	6·0
10	·654	5·4
10	·704	6·1
10	·734	5·6
10	·756	5·8
10	·779	6·1
10	·817	5·4
10	·850	5·7
10	·883	6·0
10	·908	5·9
10	·940	6·1
10	·980	5·9
	41	
10	·034	7·3
10	·088	7·5
10	·138	7·3
10	·178	7·1
10	·220	7·0
10	·242	6·6
10	·279	5·2
10	·300	4·6
10	·323	3·6
10	·347	2·8
10	·370	2·6
10	·410	2·2
10	·455	4·3
10	·495	5·1
10	·526	5·3
10	·556	5·7
10	·592	6·3
10	·637	6·7
10	·671	6·7
10	·699	7·0
10	·737	6·9
10	·781	7·0
10	·830	7·1
10	·873	7·4
10	·918	7·1
10	·941	6·9
9	·982	7·1
	43	
10	·013	8·2
10	·039	7·9
10	·066	7·9
10	·098	7·8
10	·128	8·0
10	·170	8·1
10	·216	8·1
10	·250	8·1
10	·270	7·7
10	·298	6·0
10	·323	4·0
10	·353	1·3
10	·386	1·1
10	·431	2·9
10	·469	3·5
10	·496	4·0
10	·532	4·9
10	·565	5·2
10	·594	5·9
10	·633	6·2
10	·672	6·3
10	·702	6·6
10	·734	7·3
10	·761	7·1
10	·786	7·2
10	·813	7·1
9	·842	7·8
9	·883	7·9
9	·932	7·6
9	·973	7·7
	44	
10	·102	4·4
10	·163	4·6
10	·209	4·9
10	·271	4·6
10	·323	4·0
10	·368	2·4
10	·407	1·0
10	·444	1·4
10	·480	2·1
10	·534	2·8
10	·596	3·5
10	·641	3·6
10	·724	3·9
10	·776	4·1
11	·837	4·2
11	·935	4·4
	45	
10	·012	7·3
10	·046	8·0
10	·073	8·2
10	·099	8·2
10	·129	8·2

TABLE 13 (*continued*).

n	phase	brightness
		s
10	·163	8·9
10	·193	8·7
10	·246	8·9
10	·289	9·2
10	·319	9·5
10	·344	9·6
10	·381	9·3
10	·410	9·6
10	·441	9·6
10	·471	9·4
10	·491	9·7
10	·518	9·8
10	·542	9·7
10	·577	10·4
10	·606	9·6
10	·632	9·5
10	·656	9·2
10	·682	9·3
10	·711	7·8
10	·741	3·8
10	·765	2·9
10	·793	1·2
10	·821	2·6
10	·846	3·4
9	·874	3·1
9	·901	5·0
9	·947	5·9
9	·982	7·2
	48	
10	·021	12·7
10	·074	13·1
10	·124	13·4
10	·162	13·4
10	·205	13·1
10	·253	13·3
10	·296	13·3
10	·336	13·3
10	·365	13·4
10	·416	13·5
10	·463	13·4
10	·505	12·6
10	·544	7·8
10	·572	3·8
10	·596	3·3
10	·625	3·7
10	·644	4·6
10	·677	5·4
10	·700	6·9
10	·740	8·0
10	·776	9·0
10	·805	9·6
10	·840	11·0
10	·871	11·6
10	·901	11·6
10	·929	12·2
10	·952	11·7
9	·981	12·4
	50	
10	·036	7·8
10	·076	7·8
10	·106	7·3
10	·137	6·0
10	·171	3·8
10	·206	2·0
10	·234	1·4
10	·267	1·4
10	·294	2·7
10	·333	3·6
10	·376	5·1
10	·418	5·2
10	·449	5·7
10	·479	6·2
10	·505	6·4
10	·539	6·5
10	·574	6·6
10	·618	7·3
10	·658	7·1
10	·694	7·5
10	·740	7·5
10	·785	7·6
10	·840	7·8
10	·882	7·5
11	·940	7·7
11	·988	7·4
	53	
10	·031	8·1
10	·073	8·0
10	·103	7·6
10	·140	8·0
10	·181	7·8
10	·208	7·9
10	·242	7·8
10	·274	8·0
10	·304	7·6
10	·334	8·0
10	·376	8·1
10	·414	7·6
10	·451	5·0
10	·480	2·6
10	·504	1·1
10	·530	·6
10	·557	·8
10	·597	1·8
10	·633	2·8
10	·656	4·1
10	·684	4·7
10	·707	5·0
10	·735	5·2
10	·767	6·0
10	·805	6·4
10	·839	6·6
10	·878	7·0
10	·906	7·3
10	·943	7·8
11	·978	7·7
	57	
10	·016	6·7
10	·071	6·5
10	·120	6·6
10	·157	6·6
10	·196	5·6
10	·245	2·9
10	·284	1·6
10	·312	1·1
10	·344	2·1
10	·371	2·7
10	·397	3·3
10	·426	3·3
10	·473	4·2
10	·510	4·9
10	·544	5·4
10	·582	5·8
10	·629	6·1
10	·679	5·8
10	·720	6·3
10	·766	6·5
10	·807	6·4
10	·844	6·6
11	·870	6·5
11	·904	6·4
11	·943	6·3
11	·983	6·4
	58	
10	·032	2·1
10	·074	2·2
10	·096	2·1
10	·124	1·9
10	·153	1·8
10	·170	1·8
10	·190	2·0
10	·217	1·3
10	·248	1·4
10	·286	2·2
10	·314	1·7
10	·337	1·9
10	·363	2·5
10	·400	1·8
10	·426	2·2
10	·443	2·2
10	·460	1·9
10	·487	1·3
10	·511	1·6
10	·531	1·7
10	·556	2·0
10	·599	1·8
10	·630	2·1
10	·653	1·6
10	·678	1·4
10	·707	1·8
10	·747	2·2
10	·785	2·1
6	·809	2·8
6	·838	5·8
6	·866	6·4
6	·890	5·8
6	·907	4·4
6	·936	2·2
10	·968	2·2
	59	
10	·032	4·8
10	·094	4·4
10	·129	4·4
10	·150	4·9
10	·178	4·9
10	·209	5·1
10	·238	4·9
10	·275	4·7
10	·302	4·7
10	·328	4·1
10	·350	3·7
10	·382	2·6
10	·409	2·6
10	·441	1·8
10	·468	1·4
10	·508	1·8
10	·545	2·2
10	·573	2·5
10	·605	2·7
10	·649	3·2
10	·685	3·8
10	·722	3·4
10	·760	3·7
10	·798	3·8
10	·844	4·1
10	·885	4·4
10	·909	4·7
10	·939	4·6
9	·963	4·5
9	·990	5·0
	61	
10	·011	2·4
10	·037	2·4
10	·052	2·4
10	·074	2·2
10	·105	2·4
10	·131	2·6
10	·152	2·8
10	·175	3·3
10	·200	4·2
10	·229	5·0
10	·262	6·5
10	·293	6·4
10	·319	5·2
10	·342	4·1
10	·370	3·3
10	·401	2·9
10	·439	2·5
10	·476	2·5
10	·508	2·7
10	·535	2·6
10	·561	2·6
10	·599	2·8
10	·636	2·5
10	·672	2·6
10	·696	2·9
10	·717	3·2
10	·745	3·3
10	·784	3·4
10	·811	3·2
10	·848	3·0
10	·893	2·8
10	·923	3·0
10	·950	2·5
10	·975	3·0
7	·993	2·5
	62	
10	·022	5·0
10	·055	4·9
10	·085	5·5
10	·118	5·3
10	·149	5·0
10	·186	5·5
10	·228	5·3
10	·284	6·0
10	·324	5·7
10	·352	5·9
10	·396	6·2
10	·440	5·7
10	·486	6·0
10	·528	6·0
10	·565	5·9
10	·600	5·4
10	·653	2·9
10	·691	2·1
10	·719	1·4
10	·751	2·0
10	·808	2·8
11	·864	3·5
11	·901	3·6
11	·940	4·0
11	·982	4·7
	63	
10	·030	6·2
10	·064	6·2
10	·093	6·9
10	·122	7·3
10	·149	7·2
10	·187	7·1
10	·243	7·8
10	·293	8·0
10	·348	8·1
10	·392	8·2
10	·424	8·3
10	·450	8·1
10	·486	7·9
10	·534	8·1
10	·600	7·9
10	·648	8·4
10	·694	8·1
10	·739	6·8
10	·764	4·3
10	·797	·8
10	·828	·9
10	·853	1·8
10	·875	2·3
10	·895	3·4
11	·917	4·0
11	·940	4·1
11	·976	5·2
	64	
10	·018	8·3
10	·051	8·3
10	·074	8·6
10	·104	8·4
10	·142	8·8
10	·183	8·7
10	·212	8·7
10	·243	8·5
10	·274	8·8
10	·311	8·9
10	·349	8·8
10	·374	8·6
10	·407	8·5
10	·442	8·3
10	·477	8·0
10	·516	7·4
10	·548	5·1
10	·588	2·3
10	·637	4·2
10	·678	3·8
10	·716	4·9
10	·756	5·0
10	·796	6·3
10	·834	6·5
10	·877	7·3
10	·906	8·1
10	·932	7·3
9	·961	7·4
9	·987	7·6
	67	
10	·012	1·7
10	·032	1·4
10	·056	1·0
10	·090	·9
10	·124	1·0
10	·156	1·5
10	·192	1·8
10	·220	2·2
10	·263	2·5
10	·300	2·7
10	·336	2·6
10	·367	3·1
10	·396	3·4
10	·435	3·2
10	·478	3·2
10	·522	3·0
10	·568	3·4
10	·615	3·8
10	·677	3·9
10	·729	3·9
10	·766	3·9
10	·800	4·1
10	·857	3·6
10	·896	4·0
10	·927	3·7
10	·965	3·1
10	·988	2·2
	69	
10	·012	6·5
10	·054	6·5
10	·086	6·6
10	·115	7·1
10	·151	6·6
10	·180	6·8
10	·216	6·6
10	·260	7·0
10	·301	6·9
10	·336	6·5
10	·379	6·8
10	·420	6·6
10	·455	6·9
10	·483	6·5
10	·524	7·1
10	·562	6·2
10	·603	5·4
10	·643	4·1
10	·680	3·6
10	·712	3·5
10	·739	3·4
10	·761	4·1
10	·790	4·5
10	·833	5·2
10	·867	5·3
10	·900	6·0
10	·925	5·9
9	·962	5·5
	70	
	see *B.A.N.* No. 256	
	72	
10	·015	5·3
10	·047	5·5
10	·072	5·2
10	·093	4·8
10	·119	5·4
10	·147	5·3
10	·178	5·5
10	·208	5·7
10	·233	5·9
10	·259	5·7
10	·282	5·2
10	·309	3·1
10	·346	1·8
10	·376	1·1
10	·407	·8
10	·429	1·0
10	·456	1·0
10	·489	1·3
10	·516	1·8
10	·535	1·8
10	·561	2·4
10	·588	2·4
10	·641	2·9
10	·684	3·3
10	·715	3·8
10	·750	4·0
10	·792	4·4
10	·824	4·9
10	·853	5·0
10	·883	5·0
9	·911	5·2
9	·935	4·8
9	·964	5·0
9	·990	5·5
	74	
	mean curve	
10	·023	9·0
10	·069	9·0
10	·104	8·8
10	·150	9·5
10	·193	9·0
10	·233	8·4
10	·274	8·9
10	·303	7·0
10	·333	5·6
10	·359	6·4
10	·387	4·2
10	·416	2·2
10	·446	2·9
10	·472	1·9
10	·503	4·1
10	·530	4·5
10	·557	5·9
10	·593	6·0
10	·628	6·3
10	·655	6·8
10	·681	7·1
10	·704	8·0
10	·741	7·4
10	·781	8·0
10	·824	8·4
10	·862	8·3
10	·900	8·5
11	·933	9·0
11	·978	9·0
	J.D. 2425442 — 5808	
5	·029	6·4
5	·085	3·3
5	·166	4·5
5	·346	7·0
5	·426	7·4
5	·516	7·8
5	·634	8·8
5	·741	8·7
5	·803	8·3
6	·907	8·7
	J.D. 2425821 — 6214	
9	·067	8·0
9	·131	5·1
9	·212	1·7
10	·282	4·4
10	·364	5·5
10	·454	7·3
10	·588	8·4
10	·674	8·7
10	·799	9·0
9	·877	9·4
9	·972	9·4
	J.D. 2426218 — 9165	
10	·031	7·2
10	·075	5·2
10	·111	2·1
10	·149	2·3
10	·186	3·1
10	·226	4·9
10	·268	5·8
10	·314	6·6
10	·382	7·0
10	·424	7·8
10	·474	7·7
10	·540	8·3
10	·608	8·5
10	·661	8·9
10	·712	9·2
10	·784	9·4
10	·866	9·0
10	·928	9·0
7	·975	8·9
	75	
10	·019	11·4
10	·051	11·5
10	·083	11·0
10	·108	11·4
10	·142	10·3
10	·173	6·4
10	·203	2·1
10	·234	·8
10	·269	2·3
10	·291	2·6
10	·325	4·1
10	·353	4·8
10	·391	5·7
10	·422	6·6
10	·455	6·8
10	·490	7·7
10	·533	8·1
10	·563	9·4
10	·591	9·5
10	·609	10·2
10	·633	9·8
10	·649	10·6
10	·676	10·2
10	·704	10·4
10	·737	10·8
10	·778	10·8
10	·818	10·8
10	·844	10·8
10	·868	10·9
10	·898	11·1
10	·938	11·3
9	·978	10·4
	76	
10	·039	5·3
10	·080	5·2
10	·134	5·7
10	·213	5·4

TABLE 13 (*continued*).

n	phase	brightness
		s
10	·295	5·7
10	·354	5·6
10	·422	5·7
10	·473	5·4
10	·548	5·6
10	·614	4·5
10	·650	3·9
10	·682	1·6
10	·713	1·7
10	·738	1·3
10	·770	2·3
10	·802	3·7
10	·832	4·0
10	·866	4·6
10	·897	4·1
10	·929	4·3
9	·951	4·4
9	·985	4·8
	77	
10	·013	4·1
10	·051	4·2
10	·093	5·2
10	·136	5·6
10	·171	5·5
10	·209	5·6
10	·254	5·7
10	·284	6·2
10	·316	6·0
10	·359	6·0
10	·409	6·0
10	·455	5·9
10	·488	6·1
10	·527	6·1
10	·569	5·9
10	·642	6·2
10	·693	5·3
10	·737	2·5
10	·771	·9
10	·806	1·1
10	·842	1·7
10	·871	2·1
10	·899	2·9
10	·927	3·0
10	·957	3·6
10	·983	4·3
	78	
10	·021	7·4
10	·040	7·7
10	·072	7·8
10	·102	8·5
10	·151	8·9
10	·188	9·0
10	·226	9·1
10	·268	9·2
10	·322	9·2
10	·343	9·0
10	·377	9·3
10	·413	9·3
10	·450	9·5
10	·498	9·4
10	·533	9·4
10	·574	9·5
10	·616	9·5
10	·665	9·6
10	·706	9·5
10	·745	9·8
10	·770	9·4
10	·800	8·0

n	phase	brightness
		s
10	·835	4·2
10	·855	3·3
10	·888	3·3
10	·912	4·3
9	·945	5·3
9	·986	6·8
	80	
10	·014	6·6
10	·038	6·2
10	·078	6·9
10	·111	5·7
10	·159	6·3
10	·210	5·5
10	·241	5·0
10	·267	5·2
10	·290	5·3
10	·316	4·6
10	·335	4·2
10	·355	3·3
10	·384	3·3
10	·416	3·6
10	·455	3·2
10	·487	3·7
10	·512	2·7
10	·542	4·0
10	·582	4·1
10	·616	5·0
10	·653	4·8
10	·679	4·8
10	·717	5·2
10	·759	5·4
10	·796	5·6
10	·820	6·2
11	·857	5·3
11	·873	5·9
11	·908	6·2
11	·943	6·6
11	·975	6·2
	82	
10	·018	6·2
10	·066	5·9
10	·125	5·9
10	·162	6·3
10	·196	6·4
10	·236	5·8
10	·280	5·8
10	·326	5·9
10	·370	4·6
10	·408	2·0
10	·437	1·5
10	·468	1·9
10	·499	2·4
10	·538	2·7
10	·571	3·4
10	·597	3·9
10	·634	4·5
10	·674	4·5
10	·716	5·1
10	·752	5·4
11	·780	5·3
11	·841	5·7
11	·894	5·8
11	·944	6·0
11	·981	6·1
	83	
10	·044	2·0

n	phase	brightness
		s
10	·081	1·8
10	·103	1·9
10	·138	2·0
10	·178	2·0
10	·212	2·2
10	·245	2·3
10	·267	2·1
10	·318	2·3
10	·357	1·9
10	·390	2·3
9	·413	3·7
5	·426	4·9
5	·437	7·8
5	·444	9·6
5	·453	10·1
5	·463	10·4
5	·470	10·0
5	·478	8·0
5	·484	7·1
5	·491	4·5
10	·512	3·1
10	·547	2·0
10	·582	2·4
10	·615	1·8
10	·643	1·9
10	·664	1·8
10	·687	1·8
10	·725	1·5
10	·743	1·8
10	·756	2·2
10	·776	2·1
10	·791	1·9
10	·810	1·8
10	·829	1·8
10	·853	2·2
10	·900	1·9
10	·940	2·0
10	·000	2·0
	85	
10	·013	7·4
10	·056	7·2
10	·087	7·7
10	·125	7·5
10	·156	7·6
10	·186	7·6
10	·232	7·3
10	·262	7·5
10	·291	7·8
10	·331	7·6
10	·363	7·4
10	·391	5·6
10	·417	4·3
10	·449	3·6
10	·488	3·8
10	·518	4·4
10	·544	4·5
10	·567	5·0
10	·596	5·3
10	·624	5·6
10	·652	5·8
10	·688	6·5
10	·735	6·5
10	·780	6·8
10	·816	7·4
10	·848	7·2
9	·867	7·3
9	·902	7·5
9	·945	7·4
9	·979	7·6

n	phase	brightness
	88	
		s
10	·025	3·6
10	·064	3·2
10	·090	3·3
10	·115	3·6
10	·142	3·6
10	·187	3·8
10	·246	3·4
10	·318	3·6
10	·443	3·8
10	·548	3·8
10	·615	3·1
10	·659	2·4
10	·692	1·6
10	·717	1·4
10	·740	1·4
10	·768	1·6
10	·807	2·4
11	·850	2·9
11	·890	2·9
11	·930	2·9
11	·973	3·3
	89	
10	·013	7·0
10	·045	7·9
10	·092	7·4
10	·137	7·8
10	·168	7·9
10	·187	7·8
10	·222	7·7
10	·259	7·9
10	·288	7·8
10	·316	7·6
10	·350	8·3
10	·389	8·3
10	·430	8·5
10	·463	8·0
10	·496	7·7
10	·520	7·6
10	·554	5·4
10	·583	3·1
10	·610	3·0
10	·642	2·8
10	·675	3·5
10	·695	3·7
10	·725	5·0
10	·756	4·9
10	·785	5·3
10	·808	6·2
10	·840	6·0
10	·861	6·2
10	·890	6·7
10	·919	7·0
9	·955	7·1
9	·981	7·3
	90	
10	·023	3·5
10	·081	4·2
10	·130	4·2
10	·164	4·2
10	·199	4·0
10	·262	4·2
10	·335	4·0
10	·401	3·8
10	·441	4·2
10	·488	3·8
10	·534	2·7
10	·576	2·6

n	phase	brightness
		s
10	·608	2·5
10	·643	2·0
10	·674	2·0
10	·714	2·9
10	·747	3·0
10	·777	3·4
10	·819	2·8
10	·856	3·8
11	·914	3·8
11	·975	4·0
	91	
10	·021	4·5
10	·057	2·8
10	·089	1·6
10	·126	2·0
10	·161	3·0
10	·186	3·1
10	·217	4·1
10	·246	4·4
10	·267	4·7
10	·291	5·2
10	·313	4·9
10	·332	5·5
10	·353	5·4
10	·384	5·7
10	·423	6·4
10	·456	6·3
10	·486	6·3
10	·516	6·2
10	·543	6·7
10	·564	6·8
10	·595	6·9
10	·660	6·9
10	·694	7·0
10	·720	6·7
10	·751	6·7
10	·780	6·5
10	·812	6·6
10	·844	6·9
11	·873	7·2
11	·916	6·9
11	·953	7·1
11	·987	6·0
	95	
10	·025	10·5
10	·063	10·0
10	·086	10·0
10	·112	9·9
10	·135	11·0
10	·162	10·8
10	·198	11·3
10	·236	10·9
10	·278	7·2
10	·307	3·8
10	·339	1·2
10	·366	1·6
10	·397	2·2
10	·431	3·2
10	·457	3·5
10	·480	4·8
10	·510	4·8
10	·552	5·9
10	·587	6·9
10	·614	6·8
10	·643	8·0
10	·678	8·2
10	·701	8·4
10	·729	9·1

n	phase	brightness
		s
10	·753	9·2
10	·785	9·8
11	·822	10·1
11	·865	10·5
11	·907	10·2
11	·940	10·5
11	·976	10·6
	96	
10	·017	3·8
10	·041	4·2
10	·080	4·1
10	·120	4·0
10	·158	4·2
10	·189	3·8
5	·234	7·9
5	·256	9·8
5	·268	10·2
5	·276	9·7
5	·289	8·3
5	·305	6·3
10	·318	4·8
10	·337	4·1
10	·350	3·9
10	·363	4·3
10	·392	4·1
10	·415	4·1
10	·437	4·0
10	·454	3·9
10	·490	3·9
10	·526	4·1
10	·557	4·1
10	·594	4·1
10	·627	4·2
10	·671	4·1
10	·704	4·0
10	·729	4·0
10	·754	4·1
10	·780	4·1
10	·814	3·9
10	·856	3·9
10	·883	3·9
10	·909	4·1
10	·936	4·5
10	·960	3·8
10	·987	4·0
	100 before J.D. 7000	
10	·016	2·0
10	·052	2·1
10	·082	2·8
10	·123	3·9
10	·163	4·3
10	·208	5·3
10	·248	5·5
10	·289	6·0
10	·324	6·2
10	·355	6·3
10	·396	6·4
10	·439	6·5
10	·492	6·7
10	·543	6·9
10	·581	6·9
10	·609	6·4
10	·648	6·7
10	·708	6·8
10	·769	6·6
10	·809	6·7

n	phase	brightness
		s
10	·840	6·7
10	·866	6·7
10	·892	6·0
9	·930	4·2
9	·980	2·3
	after J.D. 7000	
5	·007	·9
10	·156	3·9
10	·256	5·2
10	·335	6·2
10	·417	6·5
10	·511	6·7
10	·583	6·8
10	·664	6·8
10	·762	6·6
10	·865	6·6
5	·922	6·1
5	·958	3·8
	103	
10	·043	4·1
10	·134	3·8
10	·189	3·6
10	·234	3·1
10	·259	2·2
10	·289	1·9
10	·323	1·8
10	·355	2·7
10	·381	3·0
10	·409	3·0
10	·463	3·4
10	·531	3·4
10	·596	3·7
10	·636	3·8
10	·691	3·8
10	·733	3·6
10	·781	3·6
10	·835	4·0
11	·902	4·1
11	·955	3·9
	105	
10	·012	1·6
10	·047	1·7
10	·089	1·4
10	·129	1·6
10	·164	2·2
10	·200	2·3
10	·242	3·0
10	·273	3·1
10	·308	3·0
10	·350	3·0
10	·375	2·7
10	·410	2·5
10	·448	2·0
10	·471	2·1
10	·507	1·4
10	·544	1·8
10	·584	1·8
10	·624	1·8
10	·665	2·1
10	·706	2·4
10	·740	2·8
10	·767	3·2
10	·803	2·8
10	·834	2·9
10	·877	2·5

n	phase	brightness
		s
10	·907	2·0
10	·945	2·0
9	·978	1·7
	109	
10	·012	5·0
10	·055	4·0
10	·102	2·8
10	·157	3·1
10	·200	3·6
10	·237	4·4
10	·278	4·5
10	·311	4·9
10	·336	5·2
10	·363	5·1
10	·393	5·1
10	·414	5·4
10	·433	5·3
10	·456	5·4
10	·476	5·4
10	·500	5·4
10	·529	5·5
10	·563	5·6
10	·597	5·6
10	·638	5·6
10	·687	5·6
10	·724	5·6
10	·766	5·5
10	·810	5·6
10	·860	5·4
10	·947	5·4
11	·982	5·6
	110	
10	·016	2·5
10	·042	3·2
10	·064	3·1
10	·095	3·0
10	·121	3·8
10	·164	3·8
10	·219	4·5
10	·265	4·7
10	·332	4·8
10	·388	4·9
10	·440	4·8
10	·479	4·8
10	·520	4·7
10	·577	5·0
10	·612	4·7
10	·664	4·9
10	·697	5·0
10	·742	5·0
10	·800	4·6
10	·854	2·8
10	·889	1·7
10	·921	1·7
9	·955	2·3
9	·986	2·4
	111	
10	·016	1·5
10	·054	2·2
10	·097	2·7
10	·132	2·5
10	·166	3·5
10	·228	3·8
10	·276	4·0
10	·308	4·2
10	·340	4·1

TABLE 13 (*continued*).

n	phase	brightness (s)
10	·377	4·4
10	·414	4·3
10	·472	4·1
10	·539	4·3
10	·588	4·4
10	·637	4·4
10	·678	4·5
10	·728	4·4
10	·805	4·3
11	·866	3·8
11	·922	1·0
11	·977	1·0
	114	
10	·022	3·2
10	·055	3·3
10	·082	3·2
10	·117	2·3
10	·153	1·1
10	·187	·7
10	·226	·8
10	·284	1·7
10	·316	1·5
10	·344	1·9
10	·363	2·1
10	·399	2·6
10	·429	2·8
10	·468	3·0
10	·515	3·2
10	·554	3·2
10	·590	3·1
10	·619	3·4
10	·651	3·2
10	·678	3·4
10	·705	3·3
10	·737	3·3
10	·768	3·5
10	·792	3·2
10	·818	3·4
10	·844	3·2
10	·878	3·3
10	·916	3·4
9	·953	3·1
9	·982	3·3
	116	
10	·017	3·2
10	·053	3·4
10	·083	3·4
10	·123	3·6
10	·183	3·6
10	·233	3·6
10	·277	3·8
10	·318	3·6
10	·374	3·6
10	·414	3·8
10	·451	3·6
10	·501	3·5
10	·557	3·5
10	·605	3·2
10	·656	2·1
10	·694	1·4
10	·725	1·7
10	·757	2·2
10	·784	1·9
10	·815	2·4
11	·851	2·8
11	·908	2·9
11	·950	3·1
11	·985	3·3

n	phase	brightness (s)
	118	
10	·016	5·8
10	·048	5·7
10	·092	5·9
10	·130	6·0
10	·165	6·0
10	·189	5·8
10	·224	5·8
10	·263	5·9
10	·304	6·1
10	·349	6·0
10	·392	6·1
10	·426	6·0
10	·462	6·0
10	·505	3·8
10	·535	1·5
10	·573	·2
10	·603	·6
10	·636	1·0
10	·654	1·5
10	·674	1·7
10	·699	2·1
10	·720	2·7
10	·750	3·0
10	·789	3·5
10	·826	3·7
10	·856	3·8
11	·887	4·8
11	·924	4·9
11	·950	5·1
11	·981	5·6
	121	
10	·014	7·2
10	·052	6·7
10	·087	5·0
10	·117	3·6
10	·136	3·1
10	·158	2·8
10	·175	2·3
10	·197	3·1
10	·225	3·4
10	·257	4·1
10	·287	4·0
10	·310	4·7
10	·334	4·9
10	·356	5·3
10	·380	5·2
10	·418	6·1
10	·453	5·5
10	·499	6·3
10	·557	6·4
10	·627	6·6
10	·670	6·4
10	·705	6·8
10	·741	6·8
10	·790	6·9
10	·838	6·7
10	·879	7·0
10	·920	7·1
10	·953	7·1
10	·985	7·4
	122	
10	·024	·7
10	·069	·8
10	·105	·6
5	·129	·9
5	·144	1·2
5	·162	2·0

n	phase	brightness (s)
4	·190	3·3
4	·205	3·0
5	·255	1·5
10	·291	·7
10	·325	·7
10	·363	·6
10	·392	·8
10	·418	·8
10	·443	1·0
10	·468	·6
10	·487	·6
10	·512	·7
10	·538	·8
10	·558	·6
10	·585	·8
10	·618	·8
10	·661	·7
10	·691	1·0
10	·737	·7
10	·814	·8
10	·857	·8
10	·897	·6
10	·933	·4
10	·965	·7
10	·987	·6
	123	
10	·015	2·4
10	·050	2·9
10	·093	3·2
10	·149	3·6
10	·199	3·7
10	·242	3·6
10	·280	3·8
10	·320	3·8
10	·349	3·7
10	·384	3·8
10	·428	3·8
10	·466	3·8
10	·504	3·8
10	·548	4·0
10	·607	3·8
10	·656	3·8
10	·696	4·0
10	·732	4·0
10	·805	3·6
10	·855	2·6
10	·886	1·7
9	·916	1·7
9	·934	1·9
9	·961	2·1
9	·980	2·3
	124	
10	·026	4·5
10	·070	4·3
10	·137	4·8
10	·183	4·6
10	·229	4·5
10	·274	4·9
10	·347	4·7
10	·478	5·0
10	·556	4·2
10	·590	3·2
10	·621	2·6
10	·656	2·2
10	·688	2·6
10	·713	3·1
10	·741	3·2
10	·757	3·2

n	phase	brightness (s)
10	·789	3·4
10	·821	3·6
10	·857	4·2
10	·891	4·4
9	·922	4·0
9	·952	4·3
9	·985	4·6
	125	
10	·034	6·1
10	·110	6·1
10	·162	6·3
10	·200	6·2
10	·237	6·3
10	·273	6·1
10	·318	5·6
10	·361	3·8
10	·385	2·8
10	·416	2·5
10	·453	3·1
10	·490	4·0
10	·524	4·3
10	·570	4·5
10	·609	5·0
10	·637	5·1
10	·670	4·8
10	·708	5·2
10	·754	5·5
10	·812	5·7
11	·873	6·2
11	·951	6·2
	126	
10	·022	2·7
10	·057	2·1
10	·097	1·2
10	·135	·7
10	·159	·9
10	·183	1·0
10	·207	1·4
10	·238	1·8
10	·273	2·4
10	·303	2·2
10	·325	2·6
10	·364	2·6
10	·398	3·0
10	·443	3·4
10	·483	2·8
10	·516	3·5
10	·556	3·5
10	·596	3·4
10	·635	3·6
10	·688	3·7
10	·750	3·7
11	·802	3·7
11	·848	3·6
11	·900	3·3
11	·966	3·8
	127	
10	·019	4·8
10	·061	4·8
10	·102	4·8
10	·134	4·9
10	·169	5·2
10	·210	4·6
10	·256	5·0
10	·320	4·8
10	·360	5·0

n	phase	brightness (s)
10	·388	5·1
10	·417	5·1
10	·446	5·0
10	·489	5·2
10	·530	4·4
10	·553	3·7
10	·586	2·7
10	·620	1·9
10	·642	1·8
10	·661	1·8
10	·690	2·4
10	·718	2·8
10	·740	3·1
10	·770	3·1
10	·800	3·2
10	·820	3·3
11	·845	3·7
11	·876	4·0
11	·904	4·0
11	·939	4·2
11	·978	4·2
	128	
10	·010	6·3
10	·041	6·6
10	·076	6·9
10	·108	7·0
10	·143	7·0
10	·186	6·9
10	·220	7·1
10	·257	7·1
10	·291	7·0
10	·322	7·2
10	·362	7·2
10	·401	7·1
10	·434	7·3
10	·486	7·4
10	·530	7·2
10	·573	7·2
10	·625	7·2
10	·676	7·3
10	·729	7·0
10	·775	6·9
10	·813	6·0
10	·839	4·7
10	·859	4·8
10	·886	4·9
11	·924	6·0
11	·972	6·2
	130	
10	·009	3·2
10	·042	3·1
10	·113	2·6
10	·195	1·3
10	·227	·9
10	·248	·6
10	·303	·9
10	·341	1·0
10	·372	1·3
10	·401	1·3
10	·429	1·6
10	·466	1·3
10	·498	2·2
10	·522	2·4
10	·546	2·4
10	·576	2·3
10	·597	2·8
10	·620	3·0
10	·637	3·0

n	phase	brightness (s)
10	·669	3·9
10	·708	4·6
10	·747	5·1
10	·782	5·1
10	·817	5·4
10	·851	5·2
10	·887	4·8
10	·900	4·8
10	·911	4·5
10	·929	4·4
10	·945	3·7
13	·985	3·8
	132	
10	·018	7·0
10	·044	6·6
10	·072	7·0
10	·103	7·0
10	·135	7·1
10	·158	6·9
10	·190	7·1
10	·219	6·9
10	·258	5·6
10	·291	4·1
10	·322	2·8
10	·350	1·9
10	·383	3·0
10	·421	2·3
10	·462	3·8
10	·503	4·2
10	·533	4·5
10	·552	4·8
10	·583	5·0
10	·613	5·2
10	·650	5·8
10	·684	6·0
10	·708	5·7
10	·743	6·5
10	·767	6·2
10	·801	6·7
10	·833	6·7
10	·872	6·8
10	·910	6·5
10	·940	6·6
10	·972	6·6
10	·991	7·0
	140	
10	·016	2·6
10	·059	2·5
10	·111	2·6
10	·162	2·6
10	·207	2·8
10	·249	2·8
10	·306	2·8
10	·357	2·8
10	·428	2·6
10	·556	2·5
10	·631	1·1
10	·668	·6
10	·694	·8
10	·718	1·0
10	·748	1·1
9	·773	1·6
9	·811	1·7
9	·854	1·9
9	·886	2·4
9	·919	2·5
9	·966	2·3

n	phase	brightness (s)
	141	
10	·018	2·8
10	·059	2·6
10	·093	2·5
10	·121	2·7
10	·155	2·7
10	·197	3·0
10	·237	3·0
10	·273	3·0
10	·309	3·2
10	·345	3·2
10	·375	3·2
10	·406	2·9
10	·440	2·7
10	·468	2·0
10	·497	1·5
10	·519	1·8
10	·545	1·2
10	·568	1·0
10	·608	·8
10	·643	1·3
10	·668	1·0
10	·689	1·4
10	·714	1·5
10	·752	1·7
10	·778	1·9
10	·797	1·9
10	·821	2·0
10	·853	2·0
10	·878	2·0
10	·907	2·4
10	·939	2·4
10	·965	2·8
9	·985	2·4
	142	
10	·014	3·0
10	·052	3·2
10	·098	3·3
10	·142	3·5
10	·174	3·2
10	·204	3·5
10	·239	3·4
10	·272	3·6
10	·310	3·6
10	·346	3·4
10	·400	3·2
10	·432	3·4
10	·461	3·4
10	·490	3·6
10	·522	3·4
10	·551	3·4
10	·578	3·1
10	·608	2·2
10	·655	1·4
10	·698	1·2
10	·744	1·4
10	·780	2·1
10	·814	2·4
10	·848	2·5
9	·874	2·7
9	·901	2·8
9	·935	2·6
9	·972	3·0
	143	
10	·018	5·4
10	·055	5·0
10	·090	4·7
10	·116	4·5

n	phase	brightness (s)
10	·147	4·1
10	·177	3·6
10	·218	3·2
10	·251	2·5
10	·279	2·9
10	·306	3·2
10	·338	4·1
10	·370	4·5
10	·393	4·2
10	·419	4·3
10	·450	4·2
10	·484	4·6
10	·515	4·5
10	·553	4·7
10	·593	5·0
10	·632	4·7
10	·673	5·1
10	·724	5·0
9	·776	5·1
9	·832	4·9
9	·879	4·8
9	·929	5·4
9	·978	5·0
	144	
10	·011	2·3
10	·033	2·0
10	·047	2·4
10	·075	2·8
10	·094	3·2
10	·120	3·7
10	·156	4·1
10	·203	4·7
10	·246	5·1
10	·296	5·2
10	·336	5·6
10	·366	5·6
10	·386	5·9
10	·406	5·9
10	·441	5·8
10	·478	6·0
10	·505	6·0
10	·534	6·0
10	·563	6·1
10	·614	5·9
10	·677	6·0
10	·708	6·0
10	·741	6·0
10	·781	6·1
10	·816	5·9
9	·854	6·1
9	·892	5·9
9	·923	4·2
9	·958	2·1
9	·988	1·4
	148	
10	·020	1·1
10	·053	2·0
10	·083	2·3
10	·113	2·9
10	·148	3·1
10	·180	3·3
10	·216	3·5
10	·259	3·6
10	·322	3·7
10	·445	3·5
10	·657	3·9
10	·785	4·7
10	·861	4·3

TABLE 13 (*continued*).

n	phase	brightness
		s
10	·897	3·4
10	·914	2·4
11	·942	·7
11	·976	·4
	149	
10	·018	·7
10	·060	·9
10	·087	1·2
10	·118	1·5
10	·141	2·0
10	·162	2·6
10	·184	2·5
10	·219	3·2
10	·249	3·1
10	·280	3·7
10	·321	3·9
10	·356	3·9
10	·391	4·1
10	·433	4·0
10	·486	4·2
10	·531	4·4
10	·570	4·4
10	·603	4·4
10	·641	4·3
10	·674	4·3
10	·699	4·0
10	·739	4·6
10	·785	4·4
10	·839	4·6
11	·883	4·5
11	·919	4·0
11	·964	2·2
	152	
10	·046	3·3
10	·074	3·6
10	·109	3·8
10	·151	3·3
10	·184	3·5
10	·242	3·5
10	·277	3·5
10	·292	3·6
10	·311	3·3
10	·334	3·5
10	·357	3·5
10	·382	3·3
10	·405	3·5
10	·428	3·5
10	·446	3·5
10	·458	3·6
10	·473	3·5
10	·499	3·0
10	·524	3·6
4	·540	3·8
4	·546	4·2
4	·558	5·3
4	·570	6·4
4	·582	7·4
4	·594	8·4
4	·608	7·4
5	·620	6·7
5	·639	5·7
4	·655	3·9
10	·674	3·3
10	·701	3·5
10	·737	3·4
10	·767	3·4
10	·805	3·4
10	·838	3·4

n	phase	brightness
		s
10	·880	3·3
10	·921	3·5
10	·950	3·6
10	·998	3·4
	153	
10	·017	4·4
10	·044	4·4
10	·072	4·9
10	·091	4·9
10	·123	5·1
10	·162	5·1
10	·210	5·4
10	·252	5·4
10	·287	5·6
10	·322	5·7
10	·352	5·8
10	·382	5·8
10	·415	5·7
10	·452	6·0
10	·485	5·6
10	·516	5·7
10	·551	5·9
10	·598	6·1
10	·643	6·4
10	·673	6·0
10	·703	5·5
10	·727	4·7
10	·752	3·1
10	·770	1·7
10	·794	1·1
10	·819	1·6
10	·855	1·9
10	·903	2·6
9	·931	3·3
9	·954	3·4
9	·970	3·5
9	·990	3·8
	155	
10	·032	7·6
10	·062	7·5
10	·092	7·2
10	·114	6·5
10	·145	4·6
10	·175	3·3
10	·202	3·1
10	·227	3·6
10	·254	4·0
10	·292	4·6
10	·335	5·3
10	·368	5·8
10	·390	6·1
10	·415	6·1
10	·436	6·4
10	·462	6·8
10	·489	6·5
10	·509	6·7
10	·537	6·8
10	·579	6·8
10	·620	7·4
10	·656	7·1
10	·703	7·1
10	·748	7·1
10	·785	7·3
10	·817	7·1
11	·847	7·1
11	·878	7·4
11	·918	7·4
11	·968	6·9

n	phase	brightness
	158	
		s
10	·026	2·9
10	·066	1·8
10	·100	2·0
10	·133	3·1
10	·155	3·0
10	·181	2·9
10	·210	3·3
10	·242	4·1
10	·270	4·3
10	·303	4·4
10	·347	4·6
10	·401	4·9
10	·447	4·8
10	·477	4·9
10	·504	5·0
10	·527	5·0
10	·558	5·1
10	·620	5·1
10	·679	5·0
10	·772	5·2
10	·812	5·2
10	·841	5·1
9	·870	5·3
9	·897	5·1
9	·924	5·2
9	·957	5·0
9	·985	5·0
	162	
10	·060	1·8
10	·091	2·3
10	·129	2·0
10	·174	2·1
10	·202	2·2
10	·230	1·9
10	·291	2·4
10	·326	2·4
10	·357	1·9
10	·392	1·9
10	·422	2·1
10	·454	2·1
10	·483	2·0
10	·525	2·0
10	·559	2·1
10	·586	1·8
10	·633	1·9
10	·660	2·2
10	·676	2·1
10	·693	2·2
10	·707	2·1
5	·726	3·1
5	·736	3·8
5	·741	4·3
5	·747	4·8
5	·773	6·5
5	·809	5·3
5	·819	3·9
5	·825	3·2
6	·835	3·2
10	·861	2·2
10	·883	2·2
10	·914	2·2
10	·933	2·1
10	·948	2·0
10	·971	2·0
10	·999	1·9
	163	
10	·020	6·9

n	phase	brightness
		s
10	·056	7·1
10	·096	7·2
10	·132	7·4
10	·159	7·3
10	·196	7·3
10	·241	8·0
10	·274	7·9
10	·310	7·6
10	·346	7·7
10	·377	7·5
10	·410	7·8
10	·450	7·7
10	·481	7·8
10	·505	7·5
10	·527	7·9
10	·554	7·7
10	·574	7·1
10	·595	7·3
10	·624	5·6
10	·660	5·1
10	·693	4·3
10	·719	4·9
10	·745	4·2
10	·770	5·2
10	·799	5·3
10	·822	5·9
10	·852	5·8
10	·887	6·0
11	·934	6·4
11	·978	6·6
	165	
10	·020	4·8
10	·053	5·1
10	·077	5·0
10	·107	4·2
10	·133	3·2
10	·165	2·3
10	·197	1·0
10	·223	1·1
10	·248	1·0
10	·274	1·4
10	·304	2·3
10	·325	2·3
10	·349	2·6
10	·373	2·8
10	·403	2·9
10	·448	3·6
10	·480	3·4
10	·515	4·0
10	·552	4·2
10	·586	4·0
10	·616	4·3
10	·651	4·4
10	·688	4·5
10	·726	4·8
10	·764	4·7
9	·799	4·7
9	·847	4·8
9	·913	4·8
9	·978	4·9
	175	
10	·022	3·1
10	·068	3·4
10	·109	3·6
10	·151	4·0
10	·179	4·0
10	·207	4·1
10	·237	4·2

n	phase	brightness
		s
10	·286	4·6
10	·328	4·8
10	·366	4·7
10	·396	4·8
10	·422	4·8
10	·444	4·8
10	·469	4·8
10	·492	4·9
10	·516	4·8
10	·552	4·8
10	·587	4·9
10	·623	4·8
10	·664	4·8
10	·699	5·0
10	·716	4·4
10	·747	3·6
10	·786	1·4
10	·814	·8
10	·844	1·0
10	·874	1·5
10	·909	2·0
10	·949	2·2
11	·982	2·6
	178	
10	·013	2·3
10	·053	2·4
10	·108	2·6
10	·171	3·0
10	·262	3·0
10	·334	3·1
10	·463	2·8
10	·538	3·0
10	·609	3·1
10	·668	2·2
10	·708	1·4
10	·736	·7
10	·763	·8
10	·783	·9
10	·808	1·1
10	·829	1·3
10	·862	1·5
10	·894	1·8
10	·931	2·0
10	·956	2·2
9	·990	2·2
	179	
10	·012	2·4
10	·037	2·6
10	·064	2·4
10	·089	2·6
10	·117	2·6
10	·149	2·7
10	·184	2·8
10	·222	2·8
10	·252	2·8
10	·273	2·8
10	·298	2·7
10	·336	2·7
10	·377	2·7
10	·419	2·8
10	·447	2·6
10	·481	1·8
10	·507	1·1
10	·534	·8
10	·558	·2
10	·584	·4
10	·619	·2
10	·663	·6

n	phase	brightness
		s
10	·700	·9
10	·740	1·4
10	·784	1·5
10	·829	1·6
10	·861	2·2
10	·904	2·2
10	·954	2·4
11	·982	2·6
	182	
10	·048	5·4
10	·117	2·3
10	·145	1·8
10	·169	1·5
10	·188	1·6
10	·206	2·0
10	·226	2·0
10	·249	2·2
10	·283	3·0
10	·320	2·8
10	·356	4·1
10	·388	4·1
10	·419	4·4
10	·452	4·7
10	·486	4·8
10	·519	5·1
10	·556	5·0
10	·605	5·3
10	·640	5·3
10	·666	5·2
10	·699	5·2
10	·716	5·3
10	·747	5·5
10	·775	5·4
10	·806	5·3
9	·833	5·4
9	·878	5·4
9	·927	5·7
9	·974	5·6
	183	
10	·013	4·8
10	·052	4·7
10	·107	4·8
10	·140	4·9
10	·165	4·8
10	·195	4·9
10	·221	4·9
10	·255	4·8
10	·301	4·7
10	·338	4·5
10	·379	4·0
10	·426	2·6
10	·461	2·7
10	·500	3·0
10	·531	3·2
10	·558	3·5
10	·584	3·8
10	·616	4·1
10	·653	4·0
10	·690	4·3
10	·716	4·4
10	·744	4·6
10	·772	4·6
10	·804	4·6
10	·842	4·5
10	·881	4·7
10	·922	4·6
9	·957	4·7
9	·989	4·7

n	phase	brightness
	185	
		s
10	·013	3·0
10	·045	2·7
10	·073	3·0
10	·096	3·0
10	·135	3·8
10	·177	4·1
10	·216	4·6
10	·246	5·0
10	·287	5·0
10	·326	5·6
10	·358	5·6
10	·401	5·8
10	·439	6·0
10	·480	6·0
10	·529	6·1
10	·580	6·3
10	·622	6·0
10	·664	6·2
10	·712	6·1
10	·762	6·3
10	·792	6·4
10	·822	6·4
11	·856	6·3
11	·889	6·4
11	·926	6·1
11	·974	3·8
	188	
10	·030	2·0
10	·078	2·2
10	·114	2·2
10	·149	2·4
10	·207	2·5
10	·237	2·6
10	·276	2·8
10	·316	3·0
10	·369	3·3
10	·412	3·0
10	·468	3·3
10	·523	3·3
10	·567	3·2
10	·588	3·0
10	·606	2·8
10	·642	3·0
10	·678	3·1
10	·716	3·0
10	·753	2·2
10	·784	1·7
10	·819	1·5
10	·848	1·5
10	·877	1·6
10	·895	1·8
10	·920	1·8
9	·936	2·0
9	·950	1·9
9	·977	2·0
	189	
	before J.D. 6000	
10	·014	2·4
10	·088	2·8
10	·166	2·8
10	·299	3·2
10	·464	3·8
9	·583	3·9
10	·780	3·9
10	·894	3·8

n	phase	brightness
		s
10	·964	3·2
	from J.D. 6000 to 7000	
10	·032	1·1
10	·077	1·7
10	·179	2·5
10	·252	3·0
10	·356	3·6
10	·470	3·6
10	·545	4·1
9	·605	4·1
9	·687	4·3
9	·730	4·3
9	·773	4·1
10	·815	4·2
10	·868	4·2
10	·925	3·0
10	·978	1·7
	after J.D. 7000	
9	·019	2·1
9	·094	2·9
9	·241	3·5
10	·356	4·0
10	·463	3·9
10	·574	3·8
9	·708	4·0
9	·812	3·9
9	·895	2·9
	190	
10	·024	3·9
10	·067	4·1
10	·095	4·2
10	·127	4·8
10	·165	4·6
10	·196	4·6
10	·229	4·6
10	·277	4·6
10	·313	4·7
10	·352	4·9
10	·397	4·5
10	·428	4·5
10	·460	5·1
10	·492	5·1
10	·546	4·8
10	·604	4·5
10	·639	2·7
10	·692	·8
10	·725	·4
10	·764	1·1
10	·799	1·6
9	·832	2·0
9	·866	2·3
9	·907	3·1
9	·949	3·4
9	·980	3·4
	191	
10	·016	1·3
10	·046	·9
10	·075	·7
10	·109	1·0
10	·147	·6
10	·182	1·1
10	·210	1·0

TABLE 13 (*continued*).

n	phase	brightness
		s
10	·232	1·5
10	·252	1·6
10	·275	2·0
10	·301	2·5
10	·328	2·9
10	·357	3·2
10	·374	3·1
10	·396	3·3
10	·417	2·6
10	·444	2·2
10	·469	1·8
10	·498	1·4
10	·520	1·3
10	·542	1·0
10	·569	·7
10	·601	·8
10	·643	·6
10	·674	·7
10	·700	1·2
10	·729	1·2
10	·769	1·4
10	·807	1·8
10	·842	2·0
10	·881	1·9
10	·916	2·1
10	·962	1·6
193		
10	·017	4·7
10	·040	4·9
10	·068	4·4
10	·104	5·0
10	·147	4·5
10	·168	4·6
10	·189	4·8
10	·213	4·4
10	·238	4·7
10	·270	4·5
10	·309	4·5
10	·344	5·0
10	·378	4·8
10	·407	3·9
10	·435	2·9
10	·460	1·9
10	·492	·9
10	·520	·8
10	·546	1·1
10	·579	1·6
10	·607	1·8
10	·638	2·3
10	·665	2·6
10	·684	2·7
10	·708	2·9
10	·755	3·5
10	·794	3·5
10	·826	3·4
10	·858	3·8
10	·891	4·4
10	·924	4·7
9	·983	4·5
194		
10	·018	2·2
10	·067	3·0
10	·112	2·8
10	·144	3·5
10	·181	3·7
10	·206	3·9
10	·232	4·1
10	·262	3·8
10	·293	4·6
10	·329	4·4
10	·366	4·4
10	·411	4·4
10	·456	4·5
10	·499	4·5
10	·526	4·6
10	·555	4·7
10	·588	5·2
10	·632	4·7
10	·680	3·8
10	·705	2·8
10	·735	·5
10	·776	·4
10	·806	·0
10	·835	·1
10	·868	·4
9	·902	·8
9	·942	1·4
9	·970	1·7
9	·987	2·0
199		
10	·017	2·8
10	·045	2·8
10	·065	2·6
10	·098	2·0
10	·127	2·1
10	·170	1·5
10	·205	2·0
10	·245	2·2
10	·276	2·3
10	·302	2·6
10	·328	2·8
10	·354	2·9
10	·385	3·5
10	·418	3·2
10	·443	3·5
10	·481	3·7
10	·510	3·6
10	·542	3·8
10	·572	3·6
10	·598	4·2
10	·631	4·3
10	·673	4·2
10	·720	3·9
10	·756	4·2
10	·796	3·7
10	·835	3·8
10	·875	3·5
10	·906	3·1
10	·939	3·1
9	·966	2·8
9	·989	2·5
202		
10	·013	5·8
10	·055	6·2
10	·103	6·0
10	·144	6·4
10	·178	6·2
10	·202	6·2
10	·228	6·4
10	·253	6·2
10	·280	6·3
10	·305	6·2
10	·336	6·3
10	·365	6·0
10	·391	6·1
10	·419	6·2
10	·455	6·6
10	·487	6·6
10	·517	6·2
10	·552	4·0
10	·593	2·1
10	·635	1·8
10	·664	2·3
10	·689	2·4
10	·714	2·8
10	·744	3·4
10	·775	3·6
10	·807	4·2
10	·845	4·9
10	·882	5·1
11	·914	5·5
11	·948	5·5
11	·977	5·8
205		
10	·022	9·5
10	·059	9·6
10	·105	9·4
10	·167	9·4
10	·216	9·5
10	·252	9·3
10	·292	9·5
10	·335	9·4
10	·370	9·0
10	·395	7·5
10	·421	3·3
10	·441	2·2
10	·470	2·6
10	·504	2·6
10	·548	4·9
10	·576	4·8
10	·605	5·9
10	·623	6·4
10	·648	7·4
10	·680	7·5
10	·711	8·2
10	·741	8·6
10	·766	8·6
9	·793	8·5
9	·833	9·0
9	·879	9·3
9	·920	9·3
9	·972	9·6
207		
10	·020	3·2
10	·072	3·2
10	·116	3·1
10	·173	3·2
10	·221	3·0
10	·262	3·2
10	·318	3·4
10	·368	3·3
10	·416	3·0
10	·482	1·4
10	·524	·7
10	·556	1·1
10	·588	·7
10	·608	1·5
10	·638	1·3
10	·672	1·7
10	·714	1·9
10	·755	2·0
10	·799	2·2
10	·837	2·7
11	·872	2·9
11	·916	2·6
11	·970	3·2
208		
10	·014	3·3
10	·047	3·4
10	·077	3·4
10	·109	4·2
10	·136	3·8
10	·153	4·1
10	·176	4·3
10	·204	4·4
10	·251	4·7
10	·283	4·8
10	·312	4·6
10	·335	4·6
10	·367	4·6
10	·397	4·7
10	·422	5·1
10	·451	5·0
10	·486	5·0
10	·527	5·5
10	·563	5·4
10	·590	5·4
10	·620	4·7
10	·646	3·5
10	·672	2·0
10	·703	1·1
10	·728	·4
10	·753	·6
10	·778	·6
10	·806	1·1
10	·835	1·3
10	·869	1·9
10	·913	2·4
10	·942	2·6
9	·974	2·8
216		
10	·028	5·2
10	·072	5·4
10	·105	5·8
10	·132	5·8
10	·161	6·0
10	·210	6·2
10	·255	6·7
10	·283	6·4
10	·312	6·7
10	·338	6·6
10	·363	6·9
10	·392	6·6
10	·430	6·6
10	·463	7·0
10	·492	6·7
10	·534	6·7
10	·581	7·0
10	·626	7·2
10	·656	7·2
10	·682	6·9
10	·708	6·0
10	·737	4·8
10	·769	3·9
10	·792	3·2
10	·816	3·1
10	·839	3·2
10	·863	3·2
10	·888	3·6
10	·917	3·8
9	·952	4·7
9	·989	5·0
218		
10	·034	4·5
10	·086	4·6
10	·140	4·8
10	·177	4·7
10	·221	4·8
10	·288	4·9
10	·331	4·6
10	·384	3·3
10	·427	2·2
10	·456	1·6
10	·481	1·4
10	·503	1·8
10	·529	2·1
10	·561	2·4
10	·604	3·4
10	·674	3·4
10	·740	3·6
10	·784	4·2
10	·849	4·5
10	·897	4·6
9	·927	4·5
9	·966	4·5
219		
10	·023	3·1
10	·057	3·2
10	·082	3·6
10	·117	3·9
10	·151	3·9
10	·188	4·3
10	·219	4·5
10	·261	4·5
10	·295	4·9
10	·334	5·0
10	·368	5·1
10	·399	5·3
10	·420	5·3
10	·452	5·2
10	·483	5·2
10	·516	5·4
10	·553	5·3
10	·583	5·3
10	·612	5·4
10	·646	5·3
10	·674	5·4
10	·719	5·6
10	·756	5·6
10	·791	5·4
10	·822	5·4
10	·848	5·4
10	·878	5·5
10	·906	5·2
9	·936	4·3
9	·958	4·0
9	·988	3·5
221 from J.D. 5400—6600 only		
10	·022	5·2
10	·066	5·0
10	·116	5·2
10	·166	4·9
10	·212	5·3
10	·246	4·8
10	·283	4·5
10	·324	2·8
10	·377	2·4
10	·445	3·0
10	·486	3·5
10	·519	3·8
10	·560	4·4
10	·603	4·5
10	·635	4·5
10	·660	4·8
10	·693	4·8
10	·735	4·6
10	·819	5·0
11	·870	5·2
11	·933	5·2
11	·983	5·1
222		
10	·018	6·2
10	·050	6·2
10	·078	6·4
10	·115	6·9
10	·152	6·4
10	·186	5·7
10	·226	3·8
10	·257	3·2
10	·283	2·8
10	·310	2·6
10	·346	3·3
10	·389	3·5
10	·420	3·7
10	·448	3·9
10	·490	4·3
10	·513	5·1
10	·534	4·5
10	·564	5·4
10	·599	5·1
10	·636	5·1
10	·671	5·4
10	·703	5·6
10	·737	6·0
10	·778	6·1
10	·803	6·2
10	·823	6·0
10	·842	6·0
11	·887	6·2
11	·942	6·2
11	·988	6·2

TABLE 14.

		s	m
1			
	a	·0	13·7
	b	2·5	13·9
	c	5·2	14·2
	d	7·5	14·9
2			
	a	·0	13·2
	b	4·0	13·4
	c	8·5	14·1
	d	12·1	14·5
3			
	a	1·0	14·0
	b	4·7	14·5
	c	8·1	14·7
	d	10·9	15·1
4			
	a	1·0	14·3
	b	4·1	14·5
	c	7·2	14·9
	d	9·7	15·2
5			
	A	1·0	13·8
	a	4·5	14·0
	b	7·3	14·4
	c	10·5	14·9
6			
	a	1·0	13·7
	b	4·4	13·9
	c′	8·6	14·5
	d	10·8	14·8
7			
	a	·0	13·8
	b	3·8	14·3
	c	6·1	14·6
	d	9·9	15·0
	e	12·6	15·2
9			
	A	·0	14·2
	a	3·2	14·3
	b	7·0	14·8
	c	10·8	15·0
	d	14·2	15·2
13			
	A	·0	13·7
	a	4·4	14·0
	b	8·3	14·5
	c	11·9	14·9
14			
	a	·0	13·6
	b	1·5	14·1
	c	3·5	14·3
	d	5·3	14·7
17			
	a	·0	14·0
	b	1·8	14·2
	c	4·0	14·6
	d	6·1	15·0
18			
	a	·0	14·0
	b	3·9	14·3
	c	6·4	14·7
	d	9·0	15·2
19			
	a	−3·0	13·1
	b	1·2	13·6
	c	6·8	14·0
	d	10·2	14·2
	e	13·5	14·8
20			
	a	·0	12·5
	b	4·9	12·9
	c	7·4	13·1
	d	12·0	13·6
21			
	a	·0	14·0
	b	3·4	14·3
	c	7·0	14·6
	d	9·7	14·9
22			
	A	·0	13·5
	a	3·2	13·7
	b	6·6	13·8
	c	9·3	14·2
	d	11·6	14·7
	e	13·8	14·9
23			
	A	·0	14·1
	a	2·7	14·6
	b	5·6	14·9
24			
	a	·5	13·4
	b	4·6	13·7
	c	8·4	14·1
	d	10·4	14·2
26			
	a	·5	13·9
	b	4·6	14·1
	c	7·5	14·4
	d	10·7	14·7

TABLE 14 (*continued*).

No.		s	m
31	a	1·0	13·7
	b	5·0	14·3
	c	8·0	14·6
	d	10·6	15·2
32	a	·0	13·7
	b	4·1	14·2
	c	9·0	14·9
33	a	·0	13·9
	b	3·0	14·3
	c	5·2	14·7
	d	7·6	15·2
36	a	·0	13·1
	b	4·2	13·3
	c	7·2	14·0
	d	9·9	14·6
37	a	·5	13·8
	b	4·6	14·3
	c	6·4	14·7
41	a	·5	14·0
	b	4·4	14·5
	c	7·1	14·8
43	a	·5	13·9
	b	4·0	14·3
	c	6·2	14·6
	d	8·5	15·0
44	a	1·0	14·7
	b	3·6	15·0
	c	5·4	15·2
45	a	·5	13·2
	b	3·6	13·5
	c	5·6	13·7
	d	9·2	14·3
	e	10·9	14·7
48	A	·0	13·1
	a	4·2	13·4
	b	6·1	13·6
	c	9·7	14·0
	d	13·1	14·5
	e	15·0	14·8
50	a	·0	13·4
	b	3·3	14·0
	c	6·4	14·5
	d	8·6	15·2
53	a	·5	13·1
	b	2·6	13·4
	c	6·1	14·0
	d	8·5	14·6
57	A	·5	14·0
	a	2·5	14·1
	b	5·2	14·6
	c	6·7	15·0
58	a	·0	13·7
	b	2·5	14·2
	c	5·0	14·6
	d	6·4	14·9
	e	8·9	15·2
59	a	1·0	14·4
	b	3·2	14·5
	c	5·4	14·8
61	a	·0	12·7
	b	2·5	13·0
	c	4·7	13·2
	d	7·6	13·5
62	A	·5	13·7
	a	1·9	14·0
	b	3·6	14·3
	c	5·1	14·6
	d	6·6	14·8
63	a	·5	13·6
	b	3·0	13·9
	c	5·9	14·6
	d	8·3	14·9
64	A	—3·0	13·7
	a	1·0	13·8
	b	5·5	14·5
	c	8·9	14·7
67	a	·0	14·5
	b	3·0	14·8
	c	4·4	15·1
69	a	·0	14·0
	b	2·9	14·6
	c	5·0	14·9
	d	7·2	15·1
70	see *B.A.N.* No. 256		
72	a	·0	13·0
	b	3·1	13·2
	c	6·0	13·4
74	a	·0	13·7
	b	2·8	14·1
	c	5·0	14·3
	d	7·5	14·5
	e	10·0	15·1
75	c	·0	13·3
	d	4·3	13·6
	e	8·0	14·2
	f	10·7	14·6
	g	13·4	14·8
76	a	1·0	14·3
	b	3·1	14·4
	c	5·7	15·2
77	a	·0	13·6
	b	3·6	14·3
	c	6·4	14·9
78	a	·0	13·6
	b	3·4	13·9
	c	6·5	14·3
	d	9·2	14·9
80	a	·0	13·6
	b	2·5	13·7
	c	5·0	14·3
	d	7·7	14·7
82	a	·0	13·8
	b	2·9	14·4
	c	5·7	14·9
	d	7·4	15·1
83	a	·0	12·8
	b	2·0	13·0
	c	4·6	13·1
	d	8·0	13·3
	e	11·1	13·8
85	a	·0	13·5
	b	4·9	14·3
	c	7·4	14·8
86	a	·0	13·4
	b	2·9	13·7
	c	5·1	14·0
	d	7·0	14·5
	e	8·8	14·7
88	a	·5	14·6
	b	3·3	15·1
	c	4·7	15·2
89	A	·0	13·6
	a	3·0	13·9
	b	5·3	14·3
	c	7·0	14·5
	d	8·8	15·0
90	a	·0	14·4
	b	2·6	14·7
	c	4·3	15·1
	d	5·4	15·2
91	a	·0	13·9
	b	4·0	14·3
	c	5·5	14·5
	d	7·1	14·8
	e	8·3	15·0
95	a	·0	12·7
	b	4·0	13·0
	c	6·1	13·3
	d	9·2	13·7
	e	12·1	14·1
96	a	·0	13·1
	b	4·3	13·5
	c	6·7	13·7
	d	10·1	14·7
100	a	·0	13·6
	b	3·9	14·1
	c	6·8	14·5
103	a	·0	13·8
	b	2·8	14·6
105	a	·0	13·5
	b	2·2	14·0
	c	4·5	14·3
109	A	·0	13·4
	a	2·0	13·6
	b	5·3	14·5
110	A	·0	13·7
	a	2·9	14·3
	b	5·1	14·7
111	a	1·0	14·0
	b	2·0	14·1
	c	4·3	14·8
114	a	1·0	14·2
	b	3·2	14·5
116	a	·0	13·8
	b	1·8	14·2
	c	3·3	14·9
118	a	·5	13·4
	b	3·1	13·8
	c	6·7	14·9
121	a	·0	13·2
	b	2·7	13·6
	c	5·2	14·2
	d	7·6	14·6
122	a	·0	14·1
	b	1·8	14·5
123	a	·0	13·7
	b	1·9	14·2
	c	3·6	15·0
124	a	·5	14·2
	b	2·8	14·5
	c	4·8	14·9
125	a	·0	13·5
	b	2·7	14·1
	c	4·9	14·7
	d	6·5	15·1
126	a	1·0	14·7
	b	2·6	14·9
	c	4·0	15·1
127	a	·0	13·6
	b	3·0	14·3
	c	5·3	14·7
128	a	·0	13·4
	b	4·4	14·3
	c	7·1	14·8
130	a	·0	13·2
	b	2·8	14·0
	c	5·3	14·6
132	a	·0	13·1
	b	3·0	13·4
	c	4·9	13·9
	d	7·2	14·5
140	a	·5	14·5
	b	2·5	15·0
141	a	·0	13·5
	b	2·1	13·9
	c	4·1	14·5
142	a	1·0	14·1
	b	3·2	14·8
143	a	·0	13·6
	b	2·7	14·1
	c	4·7	14·7
	d	5·9	14·9
144	A′	·0	13·4
	a′	2·3	13·6
	b′	3·9	14·0
	c′	6·0	14·6
146	see *B.A.N.* No. 269		
148	a	·0	14·2
	b	3·7	14·6
	c	5·6	14·8
149	a	·0	14·1
	b	1·4	14·5
	c	4·1	14·8
152	a	·0	13·4
	b	4·0	14·0
	c	7·4	14·5
	d	9·1	15·1
153	a	·0	13·9
	b	3·0	14·1
	c	5·3	14·7
	d	6·5	14·9
155	a	·0	13·5
	b	4·2	14·0
	c	6·6	14·6
	d	8·1	14·8
158	a	·0	14·0
	b	2·8	14·5
	c	5·0	14·9
159	a		13·2
	b		14·2
	c		14·7
162	a	·0	13·5
	b	2·4	14·1
	c	4·6	14·6
163	a	·0	13·6
	b	3·8	13·8
	c	6·6	14·6
	d	8·3	14·8
165	a	·5	13·6
	b	3·3	14·2
	c	5·7	14·8
169	a′	·0	13·2
	b′	3·0	13·7
	c′	5·6	13·7
	d′	7·6	14·5
172	a	1·0	13·3
	b	3·7	13·6
	c	6·1	14·7
175	a	·0	13·4
	b	2·7	14·0
	c	5·5	14·8
177	a	·5	13·4
	b	2·5	13·7
	c	4·3	14·1
	d	6·3	14·7
178	a	·5	14·3
	b	2·3	14·6
	c	3·6	15·2
179	a	·5	14·3
	b	2·8	14·7
180	a		14·0
	b		14·4
	c		14·7
182	a	·0	13·4
	b	2·7	14·0
	c	5·1	14·7
	d	6·4	14·9
183	a	·0	13·9
	b	2·5	14·2
	c	4·5	14·8
185	a	·0	13·4
	b	3·9	14·1
	c	6·6	14·9
188	a	·0	13·8
	b	2·6	14·4
189	a	·0	13·5
	b	2·5	14·0
	c	4·7	14·7
190	a	1·0	13·7
	b	4·0	14·2
	c	5·4	14·8
191	a	·0	13·3
	b	3·0	13·7
193	a	·5	13·3
	b	3·8	13·9
	c	6·1	14·6
194	a	·0	13·3
	b	2·8	14·0
	c	5·3	14·6
198	a		13·7
	b		14·7
199	a	·0	13·5
	b	3·4	14·0
	c	5·6	14·7
202	a	·0	13·1
	b	3·2	13·5
	c	6·0	13·9
	d	8·5	14·6
205	A	·0	13·2
	a	2·8	13·5
	b	4·8	13·8
	c	7·2	14·3
	d	9·5	14·7
207	a′	·0	14·4
	b′	1·3	14·6
	c′	3·3	15·1
208	a	·0	13·1
	b	3·2	13·4
	c	6·1	13·8
216	A	·0	13·3
	a	2·8	14·0
	b	5·6	14·3
	c	7·5	14·6
218	a	·0	14·0
	b	2·5	14·6
	c	4·9	15·1
219	a′	·0	13·2
	b′	3·8	13·7
	c′	6·0	14·3
221	a	·0	13·9
	b	2·9	14·3
	c	5·1	14·6
222	A	·0	13·7
	a	3·6	14·0
	b	5·9	14·2
	c	8·1	14·6