III.—*The Rutherford Photographic Measures of Sixty-five Stars near 61 Cygni.*

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Read May, 1897.

1. It was but natural that MR. RUTHERFURD, in developing the art of astronomical photography, should try his skill upon that star which has attracted the attention of so many investigators ever since BESSEL proved by it the possibility of determining stellar parallax.

Of these photographs of *61 Cygni* and its surrounding stars taken by MR. RUTHERFURD, nineteen, exposed between 1871, Nov. 9, and 1874, June 13, were measured by Miss Ida Martin more than twenty years ago, but have remained unreduced until recently placed in my hands for that purpose by Professor J. K. REES, Director of the Observatory. The present paper contains the results of measures of position of stars surrounding *61 Cygni*, and will be followed by a second paper containing the results of an investigation of the *Parallax of 61 Cygni*. The methods of reduction used so far as measures of distance are concerned are those presented by Dr. HAROLD JACOBY in earlier *Contributions* from this Observatory.

2. In Table I are given the general data of exposure of the plates, including the computed values of the zenith-distance, parallactic angle and refraction factor.

3. Table II contains the *means* of the refractions computed for the Eastern and Western impressions from the data of Table I by the formulæ

$$\begin{aligned} \kappa \frac{\sigma - s}{s} &= \kappa [\tan^2 \zeta \cos^2 (p - q) + 1] \\ \pi - p &= -\frac{1}{2} \kappa \operatorname{cosec} 1'' \tan^2 \zeta \sin 2(p - q). \end{aligned}$$

The argument for entering this table is p .

4. Table III.—The corrections to the position-angle due to precession, nutation and aberration will be found in column two. These were computed by the formulæ

$$\begin{aligned}
 a' &= 20''.06 \sin a \sec \delta & \gamma' &= \cos a \tan \delta \\
 \beta' &= \cos a \sec \delta & \delta' &= \sin a \tan \delta \\
 \Delta p &= (T-t) a' - Aa' - B\beta' - C\gamma' - D\delta'.
 \end{aligned}$$

The epoch $T=1873.0$ has been selected to which to reduce all the observations. The substitution of the coördinates of 61¹ Cygni for this epoch gives:

$$\begin{aligned}
 \Delta p_{11} &= -36'' + [1.254] A + [9.956_n] B + [9.746_n] C + [9.742] D. \\
 \Delta p_{12} &= -18 + [1.254] A + [9.956_n] B + [9.746_n] C + [9.742] D. \\
 \Delta p_{13} &= 0 + [1.254] A + [9.956_n] B + [9.746_n] C + [9.742] D. \\
 \Delta p_{14} &= +18 + [1.254] A + [9.956_n] B + [9.746_n] C + [9.742] D.
 \end{aligned}$$

Where Δp_{71} denotes the correction to be applied to the position-angle for the plates made in 1871, and so on in the other years as denoted by the subscripts.

5. Precession and nutation have no effect upon the distances; but aberration does have, and its amount is given by:

$$\begin{aligned}
 \gamma'' &= (\tan \varepsilon \sin \delta + \sin a \cos \delta) \sin 1'' \\
 \delta'' &= -\cos a \cos \delta \sin 1'' \\
 \Delta s &= (C\gamma'' + D\delta'') s
 \end{aligned}$$

For 61¹ Cygni this becomes

$$\Delta s = [4.141_n] C + [4.433_n] D \{s \quad \text{for all years,}$$

and is additive to the distances to reduce them to 1873.0. This factor of s is given in column three of Table III.

6. The logarithms of the Besselian day-numbers, taken from the *American Ephemeris*, are:

Plates.	log A.	log B.	log C.	log D.
1,	9.692	0.035 _n	1.104	1.178
2, 3,	9.699	0.022 _n	1.077	1.198
4,	9.774	0.583 _n	0.840	1.279
5, 6,	9.816	0.580 _n	0.244	1.309
7,	9.821	0.582 _n	0.038	1.310
8, 9,	9.788	0.807 _n	1.043	1.218
10,	9.800	0.802 _n	0.985	1.244
11, 12, 13,	9.805	0.801 _n	0.958	1.253
15,	9.336	0.857 _n	0.776 _n	1.287 _n
16, 17,	9.411	0.854 _n	0.418 _n	1.306 _n
18, 19, 20.	9.417	0.854 _n	0.364 _n	1.307 _n

7. In the second portion of Table III. is given the mean of the

East and West zero-corrections computed for each by the formula *

$$v = \frac{1}{2} k z \tan \delta - y + x$$

in which v is the zero-correction to be added to all observed position angles of each plate.

In the next column are the special corrections † required by the position-angles of the Western impressions in consequence of using the same zero-point in measuring both Eastern and Western impressions.‡ The sum of these two columns is then given in column six, which, therefore, contains the final correction as actually applied in the reductions.

8. In Table IV. is given the tangent correction. This is always negative and its unit is .0001 divisions of the micrometer. It has been computed by the formula :

$$\text{Correction} = -\frac{1}{2} s^2 d^2 \sin^2 1'' = [1.7887_n] s^2$$

where s denotes the distance in divisions of the glass scale and d is the value of one division of the scale in seconds of arc.

TABLE V.—Measures of Distance.

9. The first column contains the numbers of the stars in order of right ascension and also in parentheses, for convenience of reference to the original measures and plates, are the numbers as assigned by RUTHERFURD. The number of the plate is given in column two, after which follows the *observed* distances for the Eastern and Western impressions. The numbers set down are the fractional part of the measured distance expressed in divisions of the glass scale, the whole number of divisions being ordinarily the same as that given in the *final corrected distance*. Where there is a change of .8 or .9 in the observed distance, it is an indication of a change of a unit in the whole number of divisions in passing from the observed distance to the corrected mean. In columns five, six and seven are placed the corrections as applied for refraction, § aberration || and scale ¶ respectively; these, with addition of

* Annals N. Y. Acad. of Sci., Vol. VI., p. 272.

† Ibid., p. 278.

‡ Ibid., p. 240.

§ Table II and Paragraph 2.

|| Table III and Paragraph 4.

¶ *Pleiades*, pp. 242-251.

the tangent correction only—which may be obtained directly from Table IV, being practically constant for each star—present all the corrections which have been applied to the observed *mean* distance of the East and West impressions to get the *corrected mean* of column eight.

10. It is noticeable that among these corrected means the distances belonging to some of the plates are always larger than the average and to other plates always smaller. To get rid of this variation of scale value, whatever may be its cause, I have selected the following four stars as standards:

No.	Distance.	sin p.	cos p.
5	77.2926	−0.998	+0.054
23	89.2118	−0.068	+0.998
32	77.0019	+0.127	−0.992
48	50.7333	+0.962	−0.274
Sums	294.2396	+0.02	−0.21

Now, if $s_5, s_{23}, s_{32}, s_{48}$ represent the distances of stars 5, 23, 32 and 48 from 61¹ Cygni on any given plate and Σs , the sum of the standard distances, there must be added to every distance on that plate for any other star its proportional part of the difference between the mean of the sums of the distances of the standard stars and their separate sums for that particular plate, or:

$$\text{Scale variation} = \frac{\Sigma s_s - (s_5 + s_{23} + s_{32} + s_{48})}{\Sigma s_s} s$$

The following table gives the value of this coefficient of s for each plate. The individual values of *scale variation* are given in column nine of Table V.

Plate.	Scale Variation Factor $\times 10^2$.
1	+ .1948
2	+ .2275
3	+ .1666
4	— .0027
5	+ .0439
6	+ .0894
7	+ .0928
8	— .1272
9	— .0442
10	— .0408
11	— .0714
12	— .0598
13	— .0129
15	— .1047
16	— .0670
17	— .0714
18	— .0537
19	— .0326
20	— .1241

11. The measures of distance are next to be corrected for the proper motion of the central star. For this purpose let :

t = date of the plate.

$\tau = t - 1873.0$

ρ = annual motion on great circle

χ = position-angle of that great circle

$S_1 = \cos(\chi - p)$

$S_2 = -\frac{1}{2s} \sin^2(\chi - p)$

$P_1 = \tau\rho$

$P_2 = \tau^2\rho^2$

The correction for proper motion, additive to observed distances, will then be:

$$\Delta s = S_1 P_1 + S_2 P_2$$

I have adopted AUWERS's values of

$$\mu = +0.3444,$$

$$\mu' = +3.230,$$

as given in the *Fundamental Catalog*. Corresponding to these are:

$$\rho = 5''.1904 = 0.18528,$$

$$\chi = 51^\circ 30' 56''$$

The values of p used in the above formulæ were the means after correction for "zero" and refraction, as explained in paragraph 7; and the values of s were after correction for scale variation.

The figures at the tops of the columns are the numbers of the plates to which the columns are applicable as determined by their values of P_2 . Selecting, therefore, the proper column and using S_2 as the argument in the body of the table (where it is expressed in units of the fourth decimal place), one will find in the first column the desired value of $S_2 P_3$, expressed in divisions of the scale. Column ten of Table V gives the total proper motion correction.

14. A correction for parallax of the principal star was next applied. Using AUWERS's values of the coördinates of δI^1 Cygni reduced to 1873.0

$$\alpha = 21^{\text{h}} 01^{\text{m}} 12.329^{\text{s}}$$

$$\delta = 38^{\circ} 07' 33.40''$$

and the almanac values of r and $\odot$, the radius vector and longitude of the sun respectively, the values of S_3 , S_4 , P_3 and P_4 were computed by the formulæ

$$\begin{array}{ll} g \sin G = \sin \delta \cos \alpha & h \sin H = \sin \delta \sin \alpha \\ g \cos G = \sin \alpha & h \cos H = -\cos \delta \end{array}$$

$$\begin{array}{l} f \sin F = h \sin (H + \epsilon) \\ f \cos F = -\cos \alpha \cos \epsilon \end{array}$$

$$S_3 = f \sin (p + F)$$

$$S_4 = g \sin (p + G)$$

$$P_3 = -r \sin \odot$$

$$P_4 = -r \cos \odot$$

The value of p used here was the mean of the position-angles after correction for proper motion and orientation variation, as described in paragraphs 17 and 19. The values of P_3 and P_4 are:

Plates.	For Parallax.	
	P_3	P_4
1	+ 0.727	+ 0.672
2	+ 0.761	+ 0.632
3	+ 0.761	+ 0.632
4	+ 0.915	+ 0.366
5	+ 0.979	+ 0.096
6	+ 0.979	+ 0.095
7	+ 0.982	+ 0.061
8	+ 0.798	+ 0.583
9	+ 0.798	+ 0.583
10	+ 0.845	+ 0.511
11	+ 0.862	+ 0.481
12	+ 0.862	+ 0.480
13	+ 0.862	+ 0.480
15	— 0.962	— 0.322
16	— 1.006	— 0.142
17	— 1.006	— 0.142
18	— 1.008	— 0.125
19	— 1.008	— 0.125
20	— 1.008	— 0.125

In Table VIII, columns two and three, will be found S_3 and S_4 . The coefficient of the parallax, as printed in column eleven of Table V is

$$S_3P_3 + S_4P_4$$

and the correction, additive to the distances, is

$$(S_3P_3 + S_4P_4) \frac{\Pi}{28''.0124}$$

where Π is the parallax expressed in seconds of arc. Table XI gives values of this quantity corresponding to limiting values of the coefficient. The method of using this table is the same as described in paragraph 13. In its construction I used*

$$\Pi = + 0''.3597$$

15. The distances thus corrected for all known disturbances affecting the central star, 61¹ Cygni, are given in column twelve of Table V. In this column are also the means of the distances.

TABLE VI.—Measures of Position-angle.

16. This table has been put on pages opposite the correspond-

*The Parallax of 61¹ Cygni as deduced from Rutherford Photographic Measures, by Herman S. Davis. *Contribution No. 13.*

ANNALS N. Y. ACAD. SCI., X, August, 1897.—5.

ing measures of distance in Table V. The first column is a repetition of the number of the plate. In columns two and three are given the *observed* angles for the eastern and western impressions. The number of degrees for the *west* column are the same as printed in the *east* column, except where there is an obvious change of $\pm 1^\circ$ indicated by a difference of nearly $60'$ in the minutes of the two columns.

In column four are placed the zero-corrections of paragraph 7 plus the special corrections due to the precession, etc., mentioned in the same paragraph. This quantity is taken from the last column of Table III. The correction for refraction from Table II is in column five. The mean of the east and west impressions thus corrected is placed in column six.

17. In column seven of Table VI is the correction due to proper motion of the central star. This has been computed from the following formulæ : *

Let t , τ , S_1 , P_1 , P_2 , ρ and χ have the same meaning as in paragraph 11; also let

$$\begin{aligned} S_3 &= \sin (\chi - p) \\ S_6 &= \frac{1}{\sigma} \\ S_7 &= S_6 S_6 \\ P_5 &= \tau \rho \operatorname{cosec} 1'' \\ K &= - \left\{ P_1 \sin \chi \tan \delta + \frac{1}{2} P_2 \sin 1'' \sin \chi \cos \chi (1 + 2 \tan^2 \delta) \right\} \end{aligned}$$

Then will the correction for proper motion, additive to observed angles, be

$$\Delta p = S_7 P_5 (1 + S_1 P_1 \cdot S_6) + K.$$

Throughout these formulæ ρ and σ are to be expressed in divisions of the scale, whereas K and Δp are in seconds of arc. The convenience of expressing Δp in this form is more noticeable when it is remembered that $S_1 P_1$ has already been computed for use in correcting the distances; see paragraph 11. Here σ is to represent the value of s after being corrected for scale variation and proper motion.

18. As K is obviously a constant for all stars on the same plate, being only that part of the variation in $(\chi - p)$ due to the

* Handbuch der Vermessungskunde von Dr. W. Jordan, Bd. III. S. 359. Vierte Auflage.

effect of meridian-convergence upon the value of χ at different dates, we have for 61¹ Cygni:

$$K = -17.2094 P_1$$

the term in P_2 being neglected, as its maximum value in the present research is only ± 0.00015 .

The following table gives K for the various plates, and also the values of P_6 ; while in columns four, five and six of Table VII will be found S_5 , S_6 and S_7 .

Plate.	For Proper Motion.	
	K	P_6
1	+ 3.6	- 43644.
2	+ 3.6	- 43338.
3	+ 3.6	- 43338.
4	+ 0.3	- 3248.
5	+ 0.1	- 1567.
6	+ 0.1	- 1567.
7	+ 0.1	- 1376.
8	- 2.8	+ 33478.
9	- 2.8	+ 33478.
10	- 2.8	+ 34013.
11	- 2.8	+ 34204.
12	- 2.8	+ 34204.
13	- 2.8	+ 34204.
15	- 4.5	+ 54191.
16	- 4.6	+ 55338.
17	- 4.6	+ 55338.
18	- 4.6	+ 55452.
19	- 4.6	+ 55452.
20	- 4.6	+ 55452.

19. Orientation Variation.—When the angles have been corrected as described above, observation of the *corrected mean plus proper motion* in Table VI reveals a variation of measures on some of the plates from the mean of all that is erratic, and in some cases very considerable in magnitude. This is undoubtedly due to the method which RUTHERFURD used for the orientation of his plates.

It was his custom in making the exposures to take two impressions of the stars on each plate. After the second, or western impression, the telescope clock was stopped, and the stars were allowed to trail across the plate for a distance of sixty to eighty

scale-divisions. The clock was then again made to run long enough to permit the formation of another image of the central star. The line joining this last image with the central image was used as the origin of the position-angles. Angles so measured were made in the present paper to conform to the custom of counting from the north point towards the east by addition of 270° to the observed readings, as seen in Table VI.

Of course the position-angle of this last impression of the principal star is not exactly 270° , however, unless there has been absolutely no shifting of the telescope in declination during the formation of the trail, or when clamping in the clock for the final image. It is *a priori* probable that such shifting did occur; but with such alterations in the balance-weights of the tube, in the pointing of the telescope, and in the other conditions of exposure of many plates during the course of several years, we may fairly assume, on the other hand, that such shifting in declination is not systematically in the same direction; that, consequently, the mean of the position-angles of a given star as determined from all the plates is its most probable value. Hence, if all the stars were found on all the plates, it would be unnecessary to apply a correction for error of orientation. But such is not the case. Furthermore it is desirable to use the individual measures separately for a determination of the parallax.

This correction may be deduced from standard stars by taking from the mean of all the angles of all the plates the angle measured on each plate separately, and regarding the residual as the orientation variation of that plate. For any particular star such residuals would not, however, be the true correction; for it would contain the effect of both the proper motion and the parallax of the central star. Several stars should, therefore, be selected as standards; and they should be so distributed in distance and angle as to eliminate both parallax and proper motion from the mean of their residuals for each plate severally. Since the probable error of measures of angle vary inversely as the distance, these means should be taken by weight proportional to the square of the distance.

Expressed symbolically these conditions are:

$$\text{A.} \quad \frac{\sum \sigma^2 S_8}{\sum \sigma^2} = 0 \quad \text{and} \quad \frac{\sum \sigma^2 S_9}{\sum \sigma^2} = 0$$

$$\text{B.} \quad \sum S_8 = 0.$$

The significance of S_8 and S_9 will be found in paragraph 22, and of S_7 in paragraph 17.

20. It is easily seen that both A and B cannot be satisfied at the same time, unless the direction of proper motion of the principal star coincide with the major or the minor axis of the parallactic ellipse. This fortunately is very nearly the case with 61¹ Cygni; wherefore it would have been immaterial here whether the angles of the standard stars had been corrected for proper motion or not, though as a matter of fact they were so corrected; as would ordinarily be necessary.

21. If stars can be found on all the plates which will satisfy only very closely, but not exactly, condition A , the *residuum* of the parallactic effect may be more nearly eliminated by adding to the orientation variation deduced from such stars the quantity

$$\left\{ \frac{(P_3' - P_3) \Sigma \sigma^2 S_8}{\Sigma \sigma^4} + \frac{(P_4' - P_4) \Sigma \sigma^2 S_9}{\Sigma \sigma^4} \right\} \Pi'$$

where the primed P_3' and P_4' are the means of the values of P_3 and P_4 for all the plates, and where Π' is an approximate value of the parallax, or a value deduced from the measures of distance.

In this paper the following six stars were selected as the standards:

Star	$\sigma^2 S_8$	$\sigma^2 S_9$	S_7	σ^2
5	-423898.2	+227748.4	+0.008388	5962.
6	-90170.0	+550938.7	-.000240	9017.
13	-611921.1	-381846.5	+ .009566	9667.
23	-459811.3	-441482.6	+ .009229	7969.
32	+418587.4	+364040.6	-.011118	5929.
48	+322758.0	-85914.0	-.016022	2580.

These give:

$$\frac{\Sigma \sigma^2 S_8}{\Sigma \sigma^4} = -20.5 \quad \frac{\Sigma \sigma^2 S_9}{\Sigma \sigma^4} = +5.7 \quad \Sigma S_7 = -.000003$$

which shows that they are admirably adapted to the present purpose. From these stars, therefore, and with $\Pi' = +0.''40$ have been deduced the following corrections, additive to observed position-angles.

Plate.	Orientation Variation.
1	+ 0 13
2	+ 1 0
3	+ 0 6
4	- 0 35
5	- 0 8
6	+ 0 17
7	+ 3 21
8	- 0 12
9	- 0 30
10	- 0 21
11	- 0 31
12	+ 0 11
13	+ 0 24
15	- 0 19
16	- 0 29
17	- 2 5
18	- 0 50
19	- 0 1
20	+ 0 14

22. In column eight of Table VI are given the parallax coefficients. They have been computed by the formulæ:

$$S_3 P_3 + S_4 P_4$$

where:

$$S_3 = \frac{f \operatorname{cosec} 1''}{28.770124} S_6 \cos (\pi + F)$$

$$S_4 = \frac{g \operatorname{cosec} 1''}{28.770124} S_6 \cos (\pi + G)$$

$$S_6 = \frac{1}{\sigma}$$

and where f, g, F, G, P_3 , and P_4 have the same meaning as in paragraph 14. The value of the position-angle used here, π , is the angle p corrected for proper motion and orientation variation. The quantities S_3, S_4 , and S_6 are in columns four and five of Table VIII and five of Table VII respectively. P_3 and P_4 are tabulated in paragraph 14.

23. After adding to the observed angle the correction

$$(S_3 P_3 + S_4 P_4) \Pi$$

taken from Table XI with the parallax coefficient of column eight, Table VI, as the argument we have the final corrected angle given in the last column of Table VI.

24. Table IX.—Column three contains the mean of the final position-angles of Table VI, and column two the mean of the distances, converted to seconds of arc by the scale value $28''.0124$. These are followed in columns four and five by the differences of right ascension and of declination derived by aid of the formulæ:

Logarithms for Plates of
61st Cygni only.

$$n = \sigma \sin \pi$$

$$m = \sigma \cos \pi$$

$$P = \sec \delta$$

$$P = \sec \delta = [0.104215]$$

$$Q = [4.685575] \tan \delta \sec \delta = [4.6846]$$

$$R = [8.89403_n] \tan^2 \delta \sec \delta = [8.7878_n]$$

$$S = [8.89403] \sec \delta (1 + 3 \tan^2 \delta) = [9.4528]$$

$$T = [4.384545] \tan \delta = [4.2793]$$

$$U = [8.59300_n] (1 + 3 \tan^2 \delta) = [9.0475_n]$$

$$V = [3.57960_u] \sec \delta \tan \delta (1 + 3 \tan^2 \delta)$$

$$W = [3.57960] \sec \delta \tan \delta (2 + 3 \tan^2 \delta)$$

$$\begin{aligned} a' - a &= Pn + Qnm + Rn^3 + Sm^2 + (Vn^3m + Wnm^3) \\ \delta' - \delta &= m + Tn^3 + Un^2m \end{aligned}$$

where σ and π are the final corrected mean distance and position-angle respectively of the star whose α' and δ' are desired. It was found also that the terms in V and W were not needed, since they are so nearly equal and have contrary signs.

In column six is the number of plates on which the image of the star was impressed; though it is proper to state that the given position is the result of at least twenty measures of distance and twelve of position-angle for *each* plate recorded in this column.

In columns seven and eight are the *Durchmusterung* number and magnitude for as many of the stars as could be identified. A few of those found in the *Durchmusterung* but not found on these plates, though of much brighter magnitude than many which are on the plates, no doubt are missing because of their color; as obviously light from reddish stars affects the plate but little, though optically it may appear quite bright.

25. Table X is on pages opposing Table IX and gives the right ascensions and declinations of each star. These were obtained by adding the $\alpha' - \alpha$, $\delta' - \delta$ of Table X to AUWERS's position of $\delta 1^{\text{st}}$ Cygni reduced to 1873.0 with the constants given in the *Fundamental Catalogue*:

$$\left. \begin{array}{rcl} a = 21^{\text{h}} 01^{\text{m}} 12.329^{\text{s}} \\ \delta = 38^{\circ} 07' 33.40'' \end{array} \right\} 1873.0$$

The other columns contain the precession constants, whereby the positions of these stars may be reduced to another epoch, T , by the formulæ :

$$\alpha_T = \alpha_{1873} + J(T - 1873) + K \frac{(T - 1873)^2}{200}.$$

$$\delta_T = \delta_{1873} + L(T - 1873) + M \frac{(T - 1873)^2}{200}.$$

TABLE I.—GENERAL DATA.—Observatory of L. M. Rutherford, New York.
 Lat. — $40^{\circ} 43' 48''$ Long. — $4^{\circ} 55' 56.62''$ W

Plate.	Date.	Sidereal Time.	Hour Angle.	Barom.	Att. Therm.	Ext. Therm.	Tel. Therm.	Focus.	Zero.	ζ	q	Log. ϵ
1	1871 Nov. 9	0 11 5	3 9 56	29.988	45	42	45	7.7	70.38	36.32	+70.57	6.4559
2	Nov. 12	23 58 5	2 56 56	30.460	38	35	38	7.8	77.08	33.91	+71.38	6.4690
3	Nov. 12	0 28 20	3 27 11	30.460	38	35	40	7.8	77.19	39.50	+69.38	6.4685
4	1872 Nov. 29	0 18 47	3 17 35	29.748	25	22	25	8.0	69.72	37.74	+70.04	6.4706
5	Dec. 15	0 14 47	3 13 35	30.150	35	34	35	7.9	63.56	37.01	+70.31	6.4654
6	Dec. 15	1 21 2	4 19 50	30.150	35	34	35	7.8	63.18	49.07	+65.33	6.4641
7	Dec. 17	0 45 52	3 44 40	30.328	33	32	33	7.9	69.44	42.71	+68.10	6.4695
8	1873 Nov. 15	0 28 20	3 27 7	29.716	35	35	35	8.0	70.05	39.50	+69.38	6.4581
9	Nov. 15	1 8 12	4 6 59	29.716	35	35	35	7.9	76.95	46.76	+66.40	6.4574
10	Nov. 20	23 26 2	2 24 49	30.070	32	30	32	7.9	71.01	27.88	+73.13	6.4882
11	Nov. 22	23 5 47	2 4 34	30.392	38	37	40	7.8	77.15	24.10	+73.95	6.4667
12	Nov. 22	23 47 2	2 45 48	30.392	38	37	40	7.8	84.37	31.82	+72.05	6.4663
13	Nov. 22	0 24 47	3 23 33	30.392	38	37	40	7.8	70.29	38.83	+69.67	6.4660
15	1874 June 1	18 12 47	21 11 30	29.984	60	55	60	7.7	68.32	32.33	+71.88	6.4442
16	June 12	16 49 32	19 48 15	29.950	71	69	70	7.64	(63.00)	47.64	+66.03	6.4303
17	June 12	17 19 22	20 18 5	29.950	71	69	70	7.64	63.18	42.20	+68.33	6.4312
18	June 13	16 59 2	19 57 45	30.300	59	57	60	7.7	(62.88)	45.90	+66.77	6.4461
19	June 13	17 29 32	20 28 15	30.300	59	57	60	7.7	63.67	40.34	+69.07	6.4466
20	June 13	18 3 2	21 1 45	30.300	59	57	60	7.7	70.22	34.14	+71.30	6.4472

TABLE II.—CORRECTIONS FOR REFRACTION.

Position Angle, p .				$\frac{\sigma-s}{s} \times 10^3$	$\pi-p$	Position Angle, p .				$\frac{\sigma-s}{s} \times 10^3$	$\pi-p$
PLATE 1.						PLATE 2.					
71°	251°	+.440		0.0		71°	251°	+.427		0.0	
81	261	.436		— 5.4		81	261	.423		— 4.7	
91	271	.422		—10.2		91	271	.411		— 8.8	
101	281	.402		—13.8		101	281	.394		—11.9	
111	291	.377		—15.7		111	291	.372		—13.5	
121	301	.350		—15.7		121	301	.349		—13.5	
131	311	.325		—13.8		131	311	.327		—11.9	
141	321	.304		—10.2		141	321	.310		— 8.8	
151	331	.291		— 5.4		151	331	.298		— 4.7	
161	341	.286		0.0		161	341	.294		0.0	
171	351	.291		+ 5.4		171	351	.298		+ 4.7	
181	1	.304		+10.2		181	1	.310		+ 8.8	
191	11	.325		+13.8		191	11	.327		+11.9	
201	21	.350		+15.7		201	21	.349		+13.5	
211	31	.377		+15.7		211	31	.372		+13.5	
221	41	.402		+13.8		221	41	.391		+11.9	
231	51	.422		+10.2		231	51	.411		+ 8.8	
241	61	.436		+ 5.4		241	61	.423		+ 4.7	
251	71	+.440		0.0		251	71	+.427		0.0	

PLATE 3.						PLATE 4.					
69°	249°	+.494		0.0		70°	250°	+.473		0.0	
79	259	.488		— 7.0		80	260	.468		— 6.3	
89	269	.471		—13.2		90	270	.453		—11.8	
99	279	.444		—17.8		100	280	.429		—15.8	
109	289	.411		—20.3		110	290	.400		—18.0	
119	299	.377		—20.3		120	300	.369		—18.0	
129	309	.344		—17.8		130	310	.340		—15.8	
139	319	.318		—13.2		140	320	.317		—11.8	
149	329	.300		— 7.0		150	330	.301		— 6.3	
159	339	.294		0.0		160	340	.296		0.0	
169	349	.300		+ 7.0		170	350	.301		+ 6.3	
179	359	.318		+13.2		180	0	.317		+11.8	
189	9	.344		+17.8		190	10	.340		+15.8	
199	19	.377		+20.3		200	20	.369		+18.0	
209	29	.411		+20.3		210	30	.400		+18.0	
219	39	.444		+17.8		220	40	.429		+15.8	
229	49	.471		+13.2		230	50	.453		+11.8	
239	59	.488		+ 7.0		240	60	.468		+ 6.3	
249	69	+.494		0.0		250	70	+.473		0.0	

TABLE II.—CORRECTIONS FOR REFRACTION. (*Continued.*)

Position Angle, <i>p</i> .	$\frac{\sigma-s}{s} \times 10^3$	$\pi-p$	Position Angle, <i>p</i> .	$\frac{\sigma-s}{s} \times 10^3$	$\pi-p$
PLATE 5.			PLATE 6.		
70° 250°	+.458	0.0	65° 245°	+.678	0.0
80 260	.453	— 5.8	75 255	.666	—13.6
90 270	.439	—11.0	85 265	.633	—25.7
100 280	.417	—14.8	95 275	.581	—34.6
110 290	.390	—16.8	105 285	.518	—39.3
120 300	.361	—16.8	115 295	.451	—39.3
130 310	.333	—14.8	125 305	.388	—34.6
140 320	.312	—11.0	135 315	.336	—25.7
150 330	.297	— 5.8	145 325	.303	—13.6
160 340	.292	0.0	155 335	.291	0.0
170 350	.297	+ 5.8	165 345	.303	+13.6
180 0	.312	+11.0	175 355	.336	+25.7
190 10	.333	+14.8	185 5	.388	+34.6
200 20	.361	+16.8	195 15	.451	+39.3
210 30	.390	+16.8	205 25	.518	+39.3
220 40	.417	+14.8	215 35	.581	+34.6
230 50	.439	+11.0	225 45	.633	+25.7
240 60	.453	+ 5.8	235 55	.666	+13.6
250 70	+.458	0.0	245 65	+.678	0.0
PLATE 7.			PLATE 8.		
68° 248°	+.546	0.0	69° 249°	+.482	0.0
78 258	.539	— 8.9	79 259	.476	— 6.9
88 268	.517	—16.7	89 269	.459	—12.9
98 278	.484	—22.4	99 279	.433	—17.4
108 288	.443	—25.5	109 289	.402	—19.8
118 298	.399	—25.5	119 299	.367	—19.8
128 308	.358	—22.4	129 309	.336	—17.4
138 318	.325	—16.7	139 319	.310	—12.9
148 328	.303	— 8.9	149 329	.293	— 6.9
158 338	.295	0.0	159 339	.287	0.0
168 348	.303	+ 8.9	169 349	.293	+ 6.9
178 358	.325	+16.7	179 359	.310	+12.9
188 8	.358	+22.4	189 9	.336	+17.4
198 18	.399	+25.5	199 19	.367	+19.8
208 28	.443	+25.5	209 29	.402	+19.8
218 38	.484	+22.4	219 39	.433	+17.4
228 48	.517	+16.7	229 49	.459	+12.9
238 58	.539	+ 8.9	239 59	.476	+ 6.9
248 68	+.546	0.0	249 69	+.482	+ 0.0

TABLE II.—CORRECTIONS FOR REFRACTION. (Continued.)

Position Angle, p		$\frac{\sigma-s}{s} \times 10^3$	$\pi-p$	Position Angle, p		$\frac{\sigma-s}{s} \times 10^3$	$\pi-p$
PLATE 9.				PLATE 10.			
66°	246°	+ .612	0.0	73°	253°	+ .376	0.0
76	256	.602	— 11.5	83	263	.374	— 2.9
86	266	.574	— 21.5	93	273	.367	— 5.5
96	276	.531	— 29.0	103	283	.356	— 7.3
106	286	.477	— 33.0	113	293	.342	— 8.4
116	296	.421	— 33.0	123	303	.328	— 8.4
126	306	.368	— 29.0	133	313	.314	— 7.3
136	316	.325	— 21.5	143	323	.304	— 5.5
146	326	.297	— 11.5	153	333	.296	— 2.9
156	336	.287	0.0	163	343	.294	0.0
166	346	.297	+ 11.5	173	353	.296	+ 2.9
176	356	.325	+ 21.5	183	3	.304	+ 5.5
186	6	.368	+ 29.0	193	13	.314	+ 7.3
196	16	.421	+ 33.0	203	23	.328	+ 8.4
206	26	.477	+ 33.0	213	33	.342	+ 8.4
216	36	.531	+ 29.0	223	43	.356	+ 7.3
226	46	.574	+ 21.5	233	53	.367	+ 5.5
236	56	.602	+ 11.5	243	63	.374	+ 2.9
246	66	+ .612	0.0	253	73	+ .376	0.0
PLATE 11.				PLATE 12.			
74°	254°	+ .352	0.0	72°	252°	+ .406	0.0
84	264	.350	— 2.1	82	262	.403	— 4.0
94	274	.345	— 3.9	92	272	.393	— 7.5
104	284	.337	— 5.2	102	282	.378	— 10.0
114	294	.327	— 6.0	112	292	.359	— 11.4
124	304	.317	— 6.0	122	302	.339	— 11.4
134	314	.308	— 5.2	132	312	.321	— 10.0
144	324	.300	— 3.9	142	322	.306	— 7.5
154	334	.295	— 2.1	152	332	.296	— 4.0
164	344	.293	0.0	162	342	.293	0.0
174	354	.295	+ 2.1	172	352	.295	+ 4.0
184	4	.300	+ 3.9	182	2	.306	+ 7.5
194	14	.308	+ 5.2	192	12	.321	+ 10.0
204	24	.317	+ 6.0	202	22	.339	+ 11.4
214	34	.327	+ 6.0	212	32	.359	+ 11.4
224	44	.337	+ 5.2	222	42	.378	+ 10.0
234	54	.345	+ 3.9	232	52	.393	+ 7.5
244	64	.350	+ 2.1	242	62	.403	+ 4.0
254	74	+ .352	0.0	252	72	+ .406	0.0

TABLE II. CORRECTIONS FOR REFRACTION. (Continued.)

Position Angle, p .	$\frac{\sigma-s}{s} \times 10^4$	$\pi-p$	Position Angle, p .	$\frac{\sigma-s}{s} \times 10^4$	$\pi-p$
PLATE 13.			PLATE 14.		
70° 250°	+.481	0.0			
80 260	.475	- 6.7			
90 270	.459	-12.5			
100 280	.434	-16.9			
110 290	.403	-19.2			
120 300	.370	-19.2			
130 310	.339	-16.9			
140 320	.314	-12.5			
150 330	.298	- 6.7			
160 340	.292	0.0			
170 350	.298	+ 6.7			
180 0	.314	+12.5			
190 10	.339	+16.9			
200 20	.370	+19.2			
210 30	.403	+19.2			
220 40	.434	+16.9			
230 50	.459	+12.5			
240 60	.475	+ 6.7			
250 70	+.481	0.0			
PLATE 15.			PLATE 16.		
288° 108°	+.389	0.0	294° 114	+.593	0.0
298 118	.386	- 3.9	304 124	.583	-11.4
308 128	.376	- 7.4	314 134	.555	-21.5
318 138	.362	-10.0	324 144	.512	-28.9
328 148	.343	-11.3	334 154	.459	-32.9
338 158	.324	-11.3	344 164	.403	-32.9
348 168	.306	-10.0	354 174	.350	-28.9
358 178	.291	- 7.4	4 184	.307	-21.5
8 188	.281	- 3.9	14 194	.279	-11.4
18 198	.278	0.0	24 204	.269	0.0
28 208	.281	+ 3.9	34 214	.279	+11.4
38 218	.291	+ 7.4	44 224	.307	+21.5
48 228	.306	+10.0	54 234	.350	+28.9
58 238	.324	+11.3	64 244	.403	+32.9
68 248	.343	+11.3	74 254	.459	+32.9
78 258	.362	+10.0	84 264	.512	+28.9
88 268	.376	+ 7.4	94 274	.555	+21.5
98 278	.386	+ 3.9	104 284	.583	+11.4
108 288	+.389	0.0	114 294	+.593	0.0

TABLE II.—CORRECTIONS FOR REFRACTIONS. (Concluded.)

Position Angle, <i>p</i> .	$\frac{\sigma-s}{s} \times 10^3$	$\pi-p$	Position Angle, <i>p</i> .	$\frac{\sigma-s}{s} \times 10^3$	$\pi-p$
PLATE 17.			PLATE 18.		
292° 112°	+ .492	0.0	293° 113°	+ .576	0.0
302 122	.485	— 7.8	303 123	.567	—10.5
312 132	.466	—14.7	313 133	.541	—19.7
322 142	.437	—19.8	323 143	.501	—26.6
332 152	.400	—22.6	333 153	.453	—30.2
342 162	.362	—22.6	343 163	.402	—30.2
352 172	.326	—19.8	353 173	.353	—26.6
2 182	.296	—14.7	3 183	.314	—19.7
12 192	.277	— 7.8	13 193	.288	—10.5
22 202	.270	0.0	23 203	.279	0.0
32 212	.277	+ 7.8	33 213	.288	+10.5
42 222	.296	+14.7	43 223	.314	+19.7
52 232	.326	+19.8	53 233	.353	+26.6
62 242	.362	+22.6	63 243	.402	+30.2
72 252	.400	+22.6	73 253	.453	+30.2
82 262	.437	+19.8	83 263	.501	+26.6
92 272	.466	+14.7	93 273	.541	+19.7
102 282	.485	+ 7.8	103 283	.567	+10.5
112 292	+ .492	0.0	113 293	+ .576	0.0
PLATE 19.			PLATE 20.		
291° 111°	+ .482	0.0	289° 109°	+ .409	0.0
301 121	.476	— 7.1	299 119	.405	— 4.5
311 131	.459	—13.4	309 129	.394	— 8.6
321 141	.432	—18.0	319 139	.377	—11.5
331 151	.399	—20.5	329 149	.356	—13.1
341 161	.363	—20.5	339 159	.333	—13.1
351 171	.331	—18.0	349 169	.312	—11.5
1 181	.304	—13.4	359 179	.295	— 8.6
11 191	.286	— 7.1	9 189	.284	— 4.5
21 201	.280	0.0	19 199	.280	0.0
31 211	.286	+ 7.1	29 209	.284	+ 4.5
41 221	.304	+13.4	39 219	.295	+ 8.6
51 231	.331	+18.0	49 229	.312	+11.5
61 241	.363	+20.5	59 239	.333	+13.1
71 251	.399	+20.5	69 249	.356	+13.1
81 261	.432	+18.0	79 259	.377	+11.5
91 271	.459	+13.4	89 269	.394	+ 8.6
101 281	.476	+ 7.1	99 279	.405	+ 4.5
111 291	+ .482	0.0	109 289	+ .409	0.0

TABLE III.—CORRECTIONS FOR PRECESSION, ETC., TO 1873 AND
ZERO CORRECTIONS.

Plate No.	Precession, etc.		Zero Correction $\frac{1}{2}$ (East + West)	Special Correction Mean.	Adopted Mean.
	Position Angle Correction.	Distance Factor $\times 10^3$			
1	-25.	-.0584	+12 29	-27	+12 2
2	-24.	-.0593	13 52	-24	13 28
3	-24.	-.0593	13 58	-24	13 34
4	+ 3.	-.0611	13 1	-22	12 39
5	+ 8.	-.0576	11 57	-19	11 38
6	+ 8.	-.0576	12 12	-34	11 38
7	+ 8.	-.0568	13 9	-17	12 52
8	+20.	-.0601	13 23	-20	13 3
9	+20.	-.0601	14 50	-20	14 30
10	+21.	-.0609	13 27	-20	13 7
11	+22.	-.0611	14 34	-21	14 13
12	+22.	-.0611	15 56	-21	15 35
13	+22.	-.0611	13 27	-19	13 8
15	+21.	+.0608	12 45	-32	12 13
16	+19.	+.0584	11 27	-29	10 58
17	+19.	+.0584	11 38	-28	11 10
18	+19.	+.0582	11 29	-26	11 3
19	+19.	+.0582	11 45	-23	11 22
20	+19.	+.0582	+13 3	-25	+12 38

TABLE IV.—TANGENT CORRECTION.

This correction is always *negative*, and is here expressed in terms of the *fourth* decimal place of the micrometer readings.

Distance.	0.	1.	2.	3.	4.	5.	6.	7.	8.	9.
20.	0	0	0	0	0	1	1	1	1	1
30.	2	2	2	2	2	3	3	3	3	3
40.	4	4	4	5	5	6	6	6	7	7
50.	8	8	8	9	9	10	10	11	11	12
60.	13	13	14	15	16	17	17	18	19	20
70.	21	22	23	24	25	26	27	28	30	31
80.	32	34	35	36	37	38	40	41	42	43
90.	45	46	48	50	52	53	55	57	59	61
100.	62	64	65	67	69	71	73	75	77	79
110.	81	83	85	87	90	93	95	98	100	103
120.	106	109	112	114	117	120	123	126	129	132
130.	-135	-138	-141	-145	-148	-151	-155	-158	-162	-165

TABLE V.—RESULTS OF MEASURES OF DISTANCE.

Star No.	Plate	Observed Dist.		Corrections for			Corrected Mean.	Scale Variation.	Proper Motion.	Parallax Co-efficient.	Final Corrected Distance.
		East.	West.	Refrac.	Aberr.	Scale.					
1 (16)	1	.5188	.5206	479	-79	4	.5452	+262	+.0502	+0.612	134.6295
	2	.4992	.5242	458	-80	4	.5349	+306	+.0499	+.582	.6229
	3	.5392	.5166	479	-80	2	.5531	+224	+.0499	+.582	.6329
	5	.5864	.6211	464	-78	12	.6285	+59	+.0018	+.157	.6382
	6	.5898	.6182	513	-78	5	.6330	+120	+.0018	+.157	.6488
	7	.6063	.6018	493	-77	10	.6316	+125	+.0016	+.129	.6474
	10	.6539	.6502	439	-82	10	.6737	-55	-.0394	+.490	.6351
	15	.6880	.7412	516	+82	5	.7599	-141	-.0629	-.343	.6785
	16	.5970	.6074	774	+79	6	.6731	-90	-.0643	-.197	.5973
	17	.6227	.6303	650	+79	6	.6851	-96	-.0643	-.197	.6087
						Mean					134.6339
2 (25)	3	.7912	.7799	532	-65	112	.8357	+181	+.2096	+0.925	109.0753
	11	.2029	.2003	384	-67	117	.2371	-78	-.1654	+.970	.0764
	12	.1825	.1745	438	-67	112	.2189	-65	-.1654	+.970	.0595
	13	.1650	.1473	517	-67	112	.2045	-14	-.1654	+.970	.0502
	15	.2923	.2717	355	+66	106	.3267	-114	-.2621	-1.011	.0402
	19	.3074	.3010	382	+63	112	.3519	-36	-.2682	-0.991	.0674
						Mean					109.0615
8 (26)	2	.0674	.0344	474	-68	105	.0930	+260	+.2100	+0.892	114.3405
	11	.4735	.4343	397	-70	123	.4897	-82	-.1658	+.950	.3279
	13	.4314	.4084	513	-70	114	.4685	-15	-.1658	+.950	.3134
	15	.5538	.5548	361	+70	105	.5987	-120	-.2626	-1.004	.3112
	18	.5716	.5540	395	+67	107	.6106	-62	-.2687	-0.997	.3229
						Mean					114.3232
4 (27)	2	.5200	.5410	451	-66	114	.5722	+252	+.2094	+0.868	110.8179
	12	.8999	.9155	435	-68	114	.9475	-66	-.1653	+.932	.7876
						Mean					110.8028
5 (19)	1	.0086	.0100	327	-45	115	.0462	+150	+.1583	+0.934	77.2315
	2	.0038	.0036	320	-46	115	.0398	+175	+.1571	+.925	.2263
	3	.0032	.0030	360	-46	115	.0432	+128	+.1571	+.925	.2250
	4	.2026	.1564	350	-47	115	.2185	-2	+.0117	+.827	.2406
	5	.1722	.1676	339	-44	115	.2080	+34	+.0057	+.670	.2257
	6	.1544	.1458	463	-44	117	.2009	+69	+.0057	+.670	.2221
	7	.1684	.1552	397	-44	115	.2058	+72	+.0050	+.646	.2263
	8	.3030	.2988	352	-46	115	.3401	-98	-.1216	+.912	.2204
	9	.2870	.2860	438	-46	115	.3343	-34	-.1216	+.912	.2210
	10	.3072	.2922	289	-47	115	.3325	-32	-.1235	+.889	.2172
	11	.3110	.3048	271	-47	115	.3389	-55	-.1242	+.877	.2205
	12	.3072	.3017	307	-47	115	.3391	-46	-.1242	+.877	.2216
	13	.3002	.2900	355	-47	115	.3345	-10	-.1242	+.877	.2206
	15	.3853	.3863	300	+47	117	.4293	-81	-.1968	-.824	.2138
	16	.3727	.3607	432	+45	116	.4231	-52	-.2010	-.720	.2077
	17	.3793	.3739	368	+45	116	.4266	-55	-.2010	-.720	.2109
	18	.3771	.3737	424	+45	116	.4310	-42	-.2014	-.709	.2163
	19	.3878	.3854	358	+45	116	.4356	-25	-.2014	-.709	.2226
	20	.3781	.3947	313	+45	116	.4309	-96	-.2014	-.709	.2108
						Mean					77.2211

TABLE VI.—RESULTS OF MEASURES OF ANGLE.

Plate.	Observed Position Angle.		Zero Correction plus precession, etc.	Refrac.	Corrected Mean. μ	Proper Motion.	Parallax Coefficient.	Final Corrected Angle.
	East.	West.						π
1	37° 37' 13"	38° 1' 12" 2"	-16	49 23	-5 11	-41	307° 44' 10"	
2	35 58	36 24	-13	49 26	-5 9	-43	45 2	
3	36 36	37 10	-18	50 9	-5 9	-43	44 51	
5	33 34	33 42	-15	45 1	-0 11	-51	44 24	
6	33 2	33 30	-32	44 22	-0 11	-51	44 10	
7	29 2	29 22	-23	41 41	-0 10	-52	44 33	
10	27 3	27 33	-8	40 17	+4 3	-46	43 42	
15	25 8	25 34	-7	37 27	+6 26	+52	43 53	
16	26 53	27 27	-18	37 50	+6 34	+54	44 14	
17	28 18	28 40	-12	39 27	+6 34	+54	44 15	
			Mean				307 44 19.4	
3	325 11 34	12 22	13 34	+10	25 42	-0 23	+21	235 25 33
11	10 54	11 18	14 13	+3	25 22	+0 18	+12	25 13
12	8 2	8 58	15 35	+6	24 11	+0 18	+12	24 44
13	11 20	11 12	13 8	+10	24 34	+0 19	+12	25 21
15	12 55	13 37	12 13	+11	25 40	+0 29	-3	25 49
19	13 8	13 48	11 22	+18	25 8	+0 30	+9	25 40
			Mean					235 25 23.3
2	319 54 34	54 28	13 28	+9	8 8	+0 13	+26	230 9 30'
11	54 45	55 27	14 13	+4	9 23	-0 10	+17	8 48
13	55 22	55 25	13 8	+13	8 45	-0 10	+17	9 5
15	57 15	58 12	12 13	+10	10 6	-0 16	-8	9 28
18	57 48	59 32	11 3	+25	10 8	-0 16	+3	9 3
			Mean					230 9 10.8
2	316 42 20	43 42	13 28	+10	56 39	+0 35	+30	226 58 25
12	42 20	43 42	15 35	+9	58 45	-0 27	+22	58 37
			Mean					226 58 31.0
1	3 0 28	1 28	12 2	-11	12 49	-6 12	-26	273 6 41
2	2 58 36	59 32	13 28	-9	12 25	-6 9	-30	7 5
3	59 6	59 40	13 34	-15	12 42	-6 9	-30	6 28
4	55 20	55 48	12 39	-13	8 0	-0 28	-51	6 39
5	55 50	56 35	11 38	-12	7 38	-0 13	-66	6 53
6	55 4	56 52	11 38	-33	7 3	-0 13	-66	6 43
7	50 38	51 27	12 52	-20	3 34	-0 12	-68	6 19
8	49 32	49 50	13 3	-15	2 29	+4 44	-35	6 48
9	48 3	48 53	14 30	-26	2 32	+4 44	-35	6 33
10	48 35	49 33	13 7	-5	2 6	+4 49	-41	6 19
11	47 56	48 22	14 13	-4	2 33	+4 50	-43	6 37
12	45 58	46 20	15 35	-8	1 36	+4 50	-43	6 22
13	48 28	49 23	13 8	-13	1 51	+4 50	-43	6 50
15	46 7	47 10	12 13	+6	58 57	+7 40	+56	6 38
16	47 32	47 38	10 58	+23	58 56	+7 49	+66	6 40
17	48 15	49 23	11 10	+13	0 12	+7 49	+66	6 20
18	46 56	47 58	11 3	+20	58 50	+7 50	+67	6 14
19	46 37	47 11	11 22	+12	58 28	+7 50	+67	6 41
20	45 18	45 46	12 38	+7	58 17	+7 50	+67	6 45
			Mean					273 6 36.6

TABLE V.—RESULTS OF MEASURES OF DISTANCE. (Continued.)

Star No.	Plate.	Observed Dist.		Corrections for			Corrected Mean.	Scale Variation.	Proper Motion.	Parallax Co-efficient.	Final Corrected Distance.
		East.	West.	Refrac.	Aberr.	Scale.					
6 (24)	1	.6858	.6818	401	—55	131	.7262	+185	+ .2115	+0.871	94.9674
	2	.6928	.6910	393	—56	130	.7333	+215	+ .2100	+ .892	.9763
	3	.6920	.6812	455	—56	130	.7342	+158	+ .2100	+ .892	.9715
	4	.8981	.8831	437	—58	134	.9365	— 3	+ .0157	+ .971	.9644
	5	.9014	.8962	423	—55	138	.9441	+ 42	+ .0076	+ .962	.9683
	6	.8773	.8578	626	—55	132	.9326	+ 85	+ .0076	+ .962	.9611
	7	.8896	.8944	503	—54	138	.9454	+ 88	+ .0067	+ .956	.9732
	8	.0688	.0660	445	—57	134	.1143	—121	— .1623	+ .916	.9517
	9	.0571	.0546	561	—57	135	.1145	— 42	— .1623	+ .916	.9598
	10	.0923	.0755	352	—58	134	.1214	— 39	— .1649	+ .942	.9647
	11	.0848	.0872	330	—58	134	.1213	— 68	— .1658	+ .950	.9609
	12	.0814	.0812	376	—58	136	.1214	— 57	— .1658	+ .950	.9621
	13	.0632	.0488	444	—58	134	.1027	— 12	— .1658	+0.950	.9479
	15	.1924	.1991	300	+58	132	.2394	—100	— .2626	—1.005	.9539
	16	.1892	.1790	322	+56	132	.2298	— 64	— .2682	—1.000	.9424
	17	.2069	.2078	323	+56	132	.2531	— 68	— .2682	—1.000	.9653
	18	.1939	.1912	328	+55	132	.2388	— 51	— .2687	—0.998	.9522
	19	.2206	.1926	319	+55	136	.2523	— 31	— .2687	— .998	.9677
	20	.2064	.2074	304	+55	132	.2506	—118	— .2687	— .998	.9573
						Mean					94.9615
7 (23)	2	.0818	.1088	341	—48	125	.1337	+185	+ .2097	+0.923	81.3738
	13	.4722	.4627	244	—50	126	.4960	— 11	— .1655	+ .969	.3418
						Mean					81.3578
8 (17)	2	.0438	.0356	213	—36	100	.0660	+139	+ .0676	+0.650	61.1558
	3	.0383	.0341	228	—36	100	.0640	+102	+ .0676	+ .650	.1501
	11	.1636	.1495	196	—37	100	.1811	— 44	— .0538	+ .541	.1298
	12	.1595	.1823	209	—37	100	.1967	— 37	— .0538	+ .541	.1461
	13	.1678	.1622	214	—37	100	.1913	— 8	— .0538	+ .541	.1436
	15	.1983	.2245	237	+37	96	.2471	— 64	— .0854	— .426	.1498
						Mean					61.1459
9 (29)	2	.4752	.4860	416	—68	115	.5178	+260	+ .1873	+0.631	114.7392
	3	.5146	.4676	458	—68	122	.5331	+191	+ .1873	+ .631	.7476
	11	.8372	.8280	371	—70	120	.8654	— 82	— .1478	+ .740	.7189
	13	.8130	.8001	449	—70	120	.8473	— 15	— .1478	+ .740	.7075
	15	.9240	.9426	327	+70	121	.9758	—120	— .2343	— .849	.7186
	18	.9489	.9477	328	+67	120	.9905	— 62	— .2398	— .912	.7328
						Mean					114.7274
10 (78)	10	.0253	.0063	300	—60	132	.0469	— 40	+ .0296	+0.097	99.0737
	12	.0295	.9887	298	—60	132	.0400	— 49	+ .0298	+ .069	.0648
	15	.9722	.9822	337	+60	128	.0236	—104	+ .0470	+ .077	.0612
	18	.9556	.9712	460	+58	132	.0223	— 53	+ .0480	+ .233	.0680
	19	.9687	.9714	404	+58	132	.0233	— 32	+ .0480	+ .233	.0711
	20	.9906	.9534	352	+58	132	.0201	—123	+ .0480	+ .233	.0588
						Mean					99.0663

TABLE VI.—RESULTS OF MEASURES OF ANGLE. (Continued.)

Plate.	Observed Position Angle.		Zero Correction plus precession, etc.	Refrac.	Corrected Mean. p	Proper Motion.	Parallax Coefficient.	Final Corrected Angle.
	East.	West.						π
1	319 59 30	59 52	12 2	+11	11 54	+ 0 14	+ 34	230 12 33
2	57 56	57 56	13 28	+ 9	11 33	+ 0 14	+ 31	12 58
3	58 5	58 24	13 34	+13	12 1	+ 0 14	+ 31	12 32
4	59 48	0 13	12 39	+12	12 52	+ 0 1	+ 13	12 23
5	320 0 48	1 28	11 38	+11	12 57	+ 0 1	- 4	12 49
6	0 18	0 34	11 38	+20	12 24	+ 0 1	- 4	12 41
7	319 55 52	56 2	12 52	+13	9 2	+ 0 0	- 6	12 21
8	59 28	59 12	13 3	+12	12 35	- 0 11	+ 28	12 22
9	57 45	58 38	14 30	+18	12 59	- 0 11	+ 28	12 28
10	59 27	0 13	13 7	+ 6	13 3	- 0 11	+ 23	12 39
11	58 34	59 12	14 13	+ 4	13 10	- 0 11	+ 21	12 36
12	56 38	56 58	15 35	+ 8	12 31	- 0 11	+ 21	12 39
13	58 15	59 5	13 8	+13	12 1	- 0 11	+ 21	12 22
15	320 00 40	1 35	12 13	+10	13 31	- 0 18	- 10	12 50
16	1 28	2 12	10 58	+27	13 15	- 0 18	+ 1	12 28
17	2 50	3 45	11 10	+20	14 48	- 0 18	+ 1	12 25
18	1 5	1 57	11 3	+25	12 59	- 0 18	+ 2	11 52
19	1 22	1 57	11 22	+18	13 19	- 0 18	+ 2	13 1
20	319 59 30	59 55	12 38	+12	12 32	- 0 18	+ 2	12 29
			Mean					230 12 33.1
2	325 1 15	1 43	13 28	+ 6	15 3	- 0 31	+ 29	235 15 42
13	0 15	0 59	13 8	- 3	13 42	+ 0 24	+ 16	14 36
			Mean					235 15 9.0
2	32 40 22	41 24	13 28	-13	54 7	-11 8	- 89	302 43 27
3	40 16	40 45	13 34	-19	53 46	-11 8	- 89	42 12
11	20 2	21 20	14 13	- 6	34 48	+ 8 46	-100	42 27
12	18 40	18 37	15 35	-11	34 2	+ 8 46	-100	42 23
13	21 10	21 48	13 8	-17	34 20	+ 8 46	-100	42 54
15	16 8	15 24	12 13	- 5	27 54	+13 53	+101	42 4
			Mean					302 42 34.5
2	294 17 35	18 20	13 28	+14	31 40	+ 2 55	+ 48	204 35 52
3	17 33	18 48	13 34	+20	32 4	+ 2 55	+ 48	35 22
11	23 23	24 5	14 13	+ 6	38 3	- 2 18	+ 41	35 29
13	22 47	23 22	13 8	+19	36 31	- 2 18	+ 41	34 52
15	26 32	28 41	12 13	+ 2	39 51	- 3 38	- 35	35 41
18	27 52	28 53	11 3	+ 2	39 27	- 3 43	- 26	34 45
			Mean					204 35 20.2
10	61 42 56	44 10	13 7	- 3	56 37	+ 5 35	- 73	332 1 25
12	40 24	41 48	15 35	- 4	56 37	+ 5 37	- 73	1 59
15	40 38	40 37	12 13	-11	52 40	+ 8 54	+ 75	1 42
18	41 12	42 16	11 3	-30	52 17	+ 9 6	+ 72	0 59
19	39 25	41 23	11 22	-21	51 25	+ 9 6	+ 72	0 56
20	39 43	40 13	12 38	-13	52 23	+ 9 6	+ 72	2 9
			Mean					332 1 31.7

TABLE V.—RESULTS OF MEASURES OF DISTANCE. (Continued.)

Star No.	Plate.	Observed Dist.		Corrections for			Cor- rected Mean. s	Scale Varia- tion.	Proper Motion.	Parallax Co- efficient.	Final Corrected Distance. σ
		East.	West.	Refrac.	Aberr.	Scale.					
11 (77)	11	.1390	.1408	223	—45	124	.1675	—53	+.0261	+.0.090	74.1895
	12	.1531	.1270	225	—45	124	.1679	—44	+.0261	+.0.090	.1908
	15	.1319	.1356	255	+45	123	.1736	—78	+.0412	+.0.056	.2077
						Mean					74.1960
12 (15)	11	.6700	.6604	166	—33	99	.6874	—38	—0.0056	+.0.276	53.6815
	13	.6836	.6730	172	—33	99	.7011	—7	—0.0056	+.276	.6083
	15	.6732	.6743	195	+33	96	.7053	—56	—0.0090	— .138	.6889
						Mean					53.6896
13 (14)	1	.3524	.3614	285	—57	136	.3874	+192	—0.0720	+.0.092	98.3358
	2	.3630	.3550	293	—58	136	.3901	+224	—0.0715	+.0.050	.3416
	3	.3642	.3513	295	—58	138	.3894	+164	—0.0715	+.0.050	.3349
	4	.2984	.2968	297	—60	136	.3289	—3	—0.0053	— .191	.3208
	5	.3068	.2918	293	—57	136	.3305	+43	—0.0026	— .394	.3271
	6	.2970	.2951	299	—57	136	.3278	+88	—0.0026	— .394	.3289
	7	.3014	.3063	298	—56	136	.3356	+91	—0.0023	— .419	.3370
	10	.2354	.2393	294	—60	136	.2684	—40	+0.0559	— .066	.3195
	11	.2419	.2395	294	—60	136	.2716	—70	+0.0562	— .094	.3196
	12	.2335	.2293	293	—60	136	.2624	—59	+0.0562	— .094	.3115
	13	.2352	.2496	293	—60	136	.2734	—13	+0.0562	— .094	.3271
	15	.1947	.1884	317	+60	136	.2369	—103	+0.0889	+.242	.3186
	16	.1811	.1681	413	+57	136	.2293	—66	+0.0908	+.378	.3184
	17	.1604	.1670	366	+57	136	.2137	—70	+0.0908	+.378	.3024
	18	.1569	.1686	407	+57	136	.2169	—53	+0.0910	+.390	.3076
	19	.1873	.1810	361	+57	136	.2336	—32	+0.0910	+.390	.3264
	20	.1854	.1686	329	+57	136	.2233	—122	+0.0910	+.390	.3071
						Mean					98.3226
14 (18)	2	.5585	.5620	127	—21	106	.5811	+79	+.0881	+.0.723	34.6864
	3	.5667	.5729	135	—21	105	.5914	+58	+.0881	+.723	.6946
	10	.7285	.7121	119	—21	104	.7402	—14	—0.0658	+.646	.6773
	11	.7369	.7223	115	—21	105	.7492	—25	—0.0702	+.625	.6845
	12	.7356	.7166	123	—21	105	.7465	—21	—0.0702	+.625	.6822
	13	.7191	.6993	135	—21	104	.7307	—4	—0.0702	+.625	.6681
	15	.7756	.7645	136	+21	102	.7956	—36	—0.1115	— .521	.6738
	16	.7510	.7642	208	+20	106	.7907	—23	—0.1140	— .384	.6695
	18	.7750	.7772	203	+20	108	.8089	—19	—0.1142	— .370	.6880
	19	.7717	.7725	169	+20	105	.8012	—11	—0.1142	— .370	.6811
	20	.7780	.7722	143	+20	108	.8019	—43	—0.1142	— .370	.6786
						Mean					34.6804
15 (22)	2	.9422	.9548	201	—31	106	.9753	+118	+.2018	+.0.760	52.1987
	3	.9428	.9546	227	—31	110	.9784	+87	+.2018	+.760	.1987
	10	.3307	.3272	183	—32	106	.3537	—21	—0.1584	+.835	.2039
	11	.3287	.3188	175	—32	106	.3478	—37	—0.1593	+.850	.1957
	12	.3230	.3271	194	—32	106	.3510	—31	—0.1593	+.850	.1995
	13	.3143	.3105	223	—32	110	.3416	—7	—0.1593	+.850	.1925
	15	.4327	.4583	194	+32	94	.4766	—55	—0.2523	— .938	.2068
	18	.4623	.4506	163	+31	101	.4851	—28	—0.2583	— .972	.2115
						Mean					52.2009

TABLE VI.—RESULTS OF MEASURES OF ANGLE. (Continued.)

Plate	Observed Position Angle.		Zero Correction plus precession, etc.	Refrac.	Corrected Mean, p	Proper Motion.	Parallax Coefficient.	Final Corrected Angle.
	East.	West.						"
11	60° 27' 37"	27' 48"	14' 13"	— 3"	41' 52"	+ 7' 33"	— 97	330° 48' 19"
12	25 25	25 33	15 35	— 5	40 59	+ 7 33	— 97	48 8
15	23 52	23 32	12 13	— 11	35 44	+ 11 57	+ 101	47 58
				Mean				330 48 8.3
11	49 29 30	30 22	14 13	— 4	44 5	+ 10 34	— 130	319 53 21
13	30 2	30 36	13 8	— 13	43 14	+ 10 34	— 130	53 25
15	23 57	24 5	12 13	— 10	36 4	+ 16 44	+ 137	53 18
				Mean				319 53 21.3
1	71 19 56	19 39	12 2	0	31 50	— 6 54	— 73	341 24 43
2	16 25	17 22	13 28	0	30 21	— 6 51	— 73	24 4
3	17 55	18 45	13 34	+ 1	31 55	— 6 51	— 73	24 44
4	13 42	14 30	12 39	+ 1	26 46	— 0 31	— 72	25 14
5	13 6	14 22	11 38	+ 1	25 23	— 0 15	— 66	24 36
6	12 30	13 43	11 38	+ 8	24 53	— 0 15	— 66	24 31
7	8 41	9 25	12 52	+ 3	21 58	— 0 13	— 65	24 41
10	7 2	7 11	13 7	— 1	20 12	+ 5 23	— 74	24 47
11	5 35	6 38	14 13	— 1	20 19	+ 5 25	— 74	24 46
12	3 48	3 50	15 35	— 1	19 23	+ 5 25	— 74	24 32
13	5 57	6 16	13 8	+ 1	19 15	+ 5 25	— 74	24 37
15	3 10	4 4	12 13	— 11	15 39	+ 8 34	+ 74	24 21
16	4 43	6 21	10 58	— 33	15 57	+ 8 45	+ 69	24 38
17	6 8	7 37	11 10	— 23	17 39	+ 8 45	+ 69	24 44
18	4 58	5 50	11 3	— 30	16 51	+ 8 46	+ 69	25 12
19	3 38	4 32	11 22	— 20	15 7	+ 8 46	+ 69	24 17
20	2 5	3 3	12 38	— 13	14 59	+ 8 46	+ 69	24 24
				Mean				341 24 38.4
2	26 54 6	55 10	13 28	— 14	7 52	— 18 53	— 140	296 49 9
3	54 0	56 16	13 34	— 20	8 22	— 18 53	— 140	48 45
10	19 37	21 27	13 7	— 8	33 31	+ 14 45	— 158	46 58
11	19 26	19 38	14 13	— 6	33 39	+ 14 50	— 162	47 0
12	17 28	17 46	15 35	— 11	33 1	+ 14 50	— 162	47 4
13	20 3	20 21	13 8	— 19	33 1	+ 14 50	— 162	47 17
15	12 35	11 37	12 13	— 3	24 16	+ 23 28	+ 185	48 32
16	10 30	12 42	10 58	— 3	22 31	+ 23 58	+ 196	47 10
18	11 42	11 58	11 3	— 3	22 50	+ 24 1	+ 197	47 12
19	10 10	12 35	11 22	— 4	22 40	+ 24 1	+ 197	47 51
20	10 2	9 56	12 38	— 3	22 34	+ 24 1	+ 197	48 0
				Mean				296 47 43.5
2	305 0 0	1 40	13 28	+ 13	14 31	+ 3 55	+ 87	215 19 57
3	1 54	2 42	13 34	+ 19	16 11	+ 3 55	+ 87	20 43
10	10 13	11 25	13 7	+ 8	24 4	— 3 3	+ 74	21 7
11	9 37	9 55	14 13	+ 6	24 5	— 3 4	+ 71	20 56
12	6 58	8 16	15 35	+ 11	23 23	— 3 4	+ 71	20 56
13	9 44	10 6	13 8	+ 19	23 22	— 3 5	+ 71	21 7
15	14 53	16 10	12 13	— 9	27 36	— 4 52	— 54	22 6
18	15 43	15 5	11 3	+ 18	26 45	— 4 59	— 32	20 44
				Mean				215 20 57.0

TABLE V.—RESULTS OF MEASURES OF DISTANCE. (Continued.)

Star No.	Plate.	Observed Dist.		Corrections for			Corrected Mean. s	Scale Variation.	Proper Motion.	Parallax Co-efficient.	Final Corrected Distance. σ
		East.	West.	Refract.	Aberr.	Scale.					
16 (20)	2	.0451	.0651	131	-18	107	.0769	+ 68	+.1978	+0.976	30.2940
	3	.0509	.0502	151	-18	107	.0743	+ 50	+.1978	+ .976	.2896
	10	.4275	.4128	116	-19	108	.4405	- 12	-.1554	+ .984	.2965
	11	.4162	.4188	108	-19	108	.4369	- 22	-.1563	+ .982	.2910
	13	.4499	.4011	148	-19	108	.4490	- 4	-.1563	+ .982	.3049
	15	.5196	.5287	108	+19	136	.5503	- 32	-.2475	- .984	.2870
	16	.5265	.5298	137	+18	104	.5536	- 21	-.2528	- .926	.2868
	18	.5404	.5371	137	+18	106	.5647	- 16	-.2533	- .920	.2980
						Mean					30.2935
17 (13)	2	.4616	.4644	246	-49	135	.4942	+188	-.0712	+0.052	82.4425
	10	.3210	.3434	246	-50	136	.3618	- 34	+.0555	- .064	.4131
	11	.3304	.3316	246	-50	136	.3607	- 59	+.0558	- .092	.4094
	13	.3578	.3466	246	-50	136	.3818	- 11	+.0558	- .092	.4353
	15	.2947	.2895	266	+50	136	.3338	- 86	+.0884	+ .240	.4167
	20	.2928	.2669	276	+48	135	.3223	-102	+.0904	+ .388	.4075
						Mean					82.4207
18 (12)	2	.9188	.9421	230	-41	128	.9701	+159	-.0607	+0.103	69.9266
	10	.8614	.8647	210	-43	127	.8602	- 29	+.0472	- .013	.9344
	11	.8696	.8500	209	-43	127	.8870	- 50	+.0475	- .040	.9290
	12	.8637	.8578	209	-43	128	.8881	- 42	+.0475	- .040	.9309
	13	.8604	.8524	209	-43	127	.8836	- 9	+.0475	- .040	.9297
	15	.8128	.8102	230	+42	128	.8494	- 73	+.0752	+ .188	.9197
	18	.8071	.8033	304	+41	128	.8504	- 37	+.0769	+ .339	.9280
	19	.8118	.8030	251	+41	127	.8472	- 23	+.0769	+ .339	.9262
	20	.8181	.8011	237	+41	127	.8480	- 87	+.0769	+ .339	.9206
						Mean					69.9272
19 (62)	11	.9849	.9861	397	-79	23	.0064	- 92	-.1211	+0.529	128.8829
	12	.9814	.9767	410	-79	23	.0013	- 77	-.1211	+ .529	.8793
	15	.0476	.0500	366	+78	23	.0823	-135	-.1917	- .662	.8686
	19	.0705	.0634	381	+75	23	.1016	- 42	-.1962	- .763	.8914
						Mean					128.8806
20 (11)	2	.8045	.8214	223	-44	120	.8403	+168	-.0985	-0.087	73.7575
	3	.8395	.8172	226	-44	120	.8561	+123	-.0985	- .087	.7688
	9	.6494	.6636	228	-44	120	.6844	- 33	+.0758	- .136	.7552
	10	.6614	.6699	221	-45	120	.6927	- 30	+.0770	- .203	.7641
	11	.6725	.6640	220	-45	115	.6948	- 53	+.0774	- .230	.7639
	12	.6730	.6656	221	-45	120	.6964	- 44	+.0774	- .230	.7664
	13	.6560	.6576	223	-45	120	.6841	- 10	+.0774	- .230	.7575
	15	.6116	.5942	228	+45	120	.6347	- 77	+.1225	+ .377	.7543
	16	.5856	.5666	282	+43	118	.6179	- 49	+.1251	+ .502	.7445
	18	.5646	.5910	278	+43	118	.6192	- 40	+.1253	+ .514	.7471
	19	.5870	.5912	252	+43	118	.6279	- 24	+.1253	+ .514	.7574
	20	.6028	.5880	233	+43	118	.6323	- 91	+.1253	+ .514	.7551
						Mean					73.7576

TABLE VI.—RESULTS OF MEASURES OF ANGLE. (Continued.)

Plate.	Observed Position Angle.		Zero Correction plus precession, etc.	Refrac.	Corrected Mean. p	Proper Motion.	Parallax Coefficient.	Final Corrected Angle π
	East.	West.						
2	341° 7' 47"	3' 50"	13' 28"	0"	19' 16"	- 8' 0"	+ 13	251° 12' 21"
3	7' 48"	6' 20"	13' 34"	- 2	20' 36"	- 8' 0"	+ 13	12' 47
10	340° 53' 52"	54' 38"	13' 7"	+ 1	7' 23"	+ 6' 12"	- 15	13' 9
11	51' 57"	52' 45"	14' 13"	+ 1	6' 35"	+ 6' 15"	- 22	12' 11
13	55' 44"	55' 50"	13' 8"	- 1	8' 54"	+ 6' 15"	- 22	15' 25
15	49' 42"	51' 33"	12' 13"	+ 11	3' 1"	+ 9' 52"	+ 59	12' 55
16	51' 14"	49' 54"	10' 58"	+ 33	2' 5"	+ 10' 4"	+ 92	12' 13
18	51' 43"	51' 24"	11' 3"	+ 30	3' 7"	+ 10' 5"	+ 94	12' 56
			Mean					251° 12' 59.6
2	71° 15' 34"	15' 8"	13' 28"	0	28' 49"	- 8' 11"	- 87	341° 21' 7
10	2' 41"	2' 43"	13' 7"	- 1	15' 48"	+ 6' 26"	- 88	21' 21
11	1' 3"	0' 38"	14' 13"	- 1	15' 2"	+ 6' 28"	- 88	20' 27
13	1' 15"	2' 23"	13' 8"	+ 1	14' 58"	+ 6' 28"	- 88	21' 18
15	70° 58' 12"	59' 25"	12' 13"	- 11	10' 50"	+ 10' 14"	+ 88	20' 13
20	57' 58"	57' 30"	12' 38"	- 13	10' 9"	+ 10' 29"	+ 82	20' 22
			Mean					341° 20' 48.0
2	68° 17' 43"	17' 50"	13' 28"	- 1	31' 13"	- 9' 49"	- 103	338° 21' 47
10	1' 25"	3' 22"	13' 7"	- 2	15' 28"	+ 7' 43"	- 103	22' 13
11	1' 3"	0' 58"	14' 13"	- 1	15' 13"	+ 7' 46"	- 104	21' 51
12	67° 58' 2"	58' 56"	15' 35"	- 3	14' 1"	+ 7' 46"	- 104	21' 21
13	68° 0' 20"	2' 15"	13' 8"	- 2	14' 23"	+ 7' 46"	- 104	21' 56
15	67° 57' 33"	57' 45"	12' 13"	- 11	9' 41"	+ 12' 18"	+ 105	22' 18
18	58° 53'	59' 22"	11' 3"	- 30	10' 34"	+ 12' 36"	+ 98	22' 55
19	57' 8"	58' 34"	11' 22"	- 20	8' 53"	+ 12' 36"	+ 98	22' 3
20	56' 12"	57' 7"	12' 38"	- 13	9' 4"	+ 12' 36"	+ 98	22' 29
			Mean					338° 22' 5.9
11	278° 5' 48"	7' 0"	14' 13"	+ 4	20' 41"	- 3' 4"	+ 48	188° 17' 23
12	4' 0"	4' 20"	15' 35"	+ 9	19' 54"	- 3' 4"	+ 48	17' 18
15	10' 45"	11' 25"	12' 13"	- 4	23' 14"	- 4' 52"	- 44	17' 47
19	11' 47"	11' 52"	11' 22"	- 9	23' 2"	- 4' 58"	- 36	17' 50
			Mean					188° 17' 34.5
2	79° 23' 48"	24' 47"	13' 28"	+ 4	37' 50"	- 8' 35"	- 98	349° 29' 40
3	23' 40"	25' 59"	13' 34"	+ 7	38' 31"	- 8' 35"	- 98	29' 27
9	8' 30"	9' 58"	14' 30"	+ 15	23' 59"	+ 6' 39"	- 97	29' 33
10	10' 40"	10' 56"	13' 7"	+ 2	23' 57"	+ 6' 45"	- 96	29' 46
11	10' 7"	10' 20"	14' 13"	+ 1	24' 28"	+ 6' 48"	- 95	30' 11
12	6' 45"	7' 52"	15' 35"	+ 3	22' 56"	+ 6' 48"	- 95	29' 21
13	10' 12"	11' 0"	13' 8"	+ 7	23' 51"	+ 6' 48"	- 95	30' 29
15	6' 4"	7' 24"	12' 13"	- 10	18' 47"	+ 10' 46"	+ 94	29' 48
16	8' 53"	9' 40"	10' 58"	- 31	19' 43"	+ 11' 0"	+ 86	30' 45
18	8' 12"	8' 35"	11' 3"	- 28	19' 48"	+ 11' 1"	+ 86	30' 30
19	6' 40"	7' 37"	11' 22"	- 19	18' 11"	+ 11' 1"	+ 86	29' 42
20	5' 42"	7' 2"	12' 38"	- 11	18' 49"	+ 11' 1"	+ 86	30' 35
			Mean					349° 29' 58.9

TABLE V.—RESULTS OF MEASURES OF DISTANCE. (Continued.)

Star No.	Plate.	Observed Dist.		Corrections for			Corrected Mean.	Scale Variation.	Proper Motion.	Parallax Co-efficient.	Final Corrected Distance.
		East.	West.	Refrac.	Aberr.	Scale.					
21 (21)	2	.0277	.0658	82	-13	100	.0636	+ 50	+.1945	+0.692	22.2720
	10	.4069	.4061	77	-14	100	.4227	- 9	-.1529	+ .775	.2789
	11	.4056	.3932	73	-14	100	.4152	- 16	-.1537	+ .792	.2701
	12	.3958	.3944	80	-14	100	.4116	- 13	-.1537	+ .792	.2666
	13	.3989	.3947	91	-14	100	.4144	- 3	-.1537	+ .792	.2706
	15	.5047	.5059	64	+14	101	.5231	- 24	-.2436	-.892	.2656
	20	.5184	.5169	65	+13	102	.5355	- 28	-.2492	-.943	.2714
						Mean					22.2708
22 (9)	2	.7426	.7498	340	-66	123	.7777	+252	-.1171	-0.187	110.6834
	3	.7438	.7714	350	-66	123	.7901	+185	-.1171	- .187	.6891
	13	.5671	.5651	345	-68	128	.5983	+14	+.0922	- .327	.6849
	15	.4800	.4844	331	+67	128	.5266	-116	+.1461	+ .472	.6672
	16	.4590	.4456	386	+64	128	.5018	- 74	+.1492	+ .590	.6512
	19	.4759	.4712	358	+64	128	.5204	- 36	+.1495	+ .599	.6740
	20	.4736	.4740	340	+65	132	.5193	-137	+.1495	+ .599	.6628
						Mean					110.6732
23 (10)	1	.3538	.3482	271	-52	134	.3820	+174	-.1201	-0.156	89.2773
	2	.3584	.3390	276	-53	134	.3801	+203	-.1192	- .199	.2786
	3	.3613	.3465	284	-53	134	.3860	+149	-.1192	- .199	.2791
	4	.2602	.2464	280	-55	135	.2849	- 2	-.0089	- .430	.2703
	5	.2526	.2460	277	-51	135	.2810	+ 39	-.0043	- .604	.2728
	6	.2462	.2428	309	-51	134	.2793	+ 80	-.0043	- .604	.2752
	7	.2490	.2478	290	-51	135	.2814	+ 83	-.0038	- .623	.2779
	8	.1524	.1357	432	-54	135	.1910	-113	+.0919	- .248	.2684
	9	.1444	.1497	293	-54	135	.1801	- 39	+.0919	- .248	.2649
	10	.1484	.1524	270	-54	135	.1812	- 36	+.0933	- .314	.2669
	11	.1523	.1553	268	-55	135	.1843	- 64	+.0938	- .339	.2673
	12	.1550	.1485	272	-55	135	.1826	- 53	+.0938	- .339	.2667
	13	.1528	.1490	278	-55	135	.1824	- 12	+.0938	- .339	.2706
	15	.0830	.0692	267	+54	135	.1173	- 93	+.1485	+ .484	.2627
24 (75)	11	.4972	.4884	25	- 5	29	.4977	- 6	+.0292	+0.064	8.5271
	13	.4776	.4791	26	- 5	32	.4837	- 1	+.0292	+ .064	.5136
						Mean					8.5204
	25										
	26										

TABLE VI.—RESULTS OF MEASURES OF ANGLE. (Continued.)

Plate	Observed Position Angle.		Zero Correction plus precession, etc.	Refrac.	Corrected Mean. <i>p</i>	Proper Motion.	Parallax Coefficient.	Final Corrected Angle π
	East.	West.						
2	298° 44' 53"	50° 40'	13' 28"	+14"	1' 28"	+12' 23"	+229	209° 16' 13"
10	299 12 10	13 43	13 7	+8	26 11	— 9 34	+202	17 29
11	11 45	10 38	14 13	+6	25 30	— 9 38	+195	16 31
12	8 36	5 25	15 35	+11	22 47	— 9 38	+195	14 30
13	10 50	9 6	13 8	+19	23 25	— 9 38	+195	15 21
15	21 38	21 3	12 13	+4	33 38	—15 11	—158	17 11
20	20 40	20 32	12 38	+5	33 19	—15 32	—108	17 22
			Mean					209 16 22.3
2	85 15 2	16 8	13 28	+6	29 9	— 5 22	— 64	355 24 24
3	16 17	17 35	13 34	+11	30 41	— 5 22	— 64	25 2
13	7 0	7 5	13 8	+10	20 20	+ 4 14	— 62	24 36
15	5 40	5 50	12 13	— 8	17 50	+ 6 43	+ 59	24 35
16	6 55	8 10	10 58	—28	18 2	+ 6 52	+ 53	24 44
19	5 53	6 13	11 22	—16	17 9	+ 6 52	+ 53	24 19
20	5 15	5 17	12 38	— 9	17 45	+ 6 52	+ 53	25 10
			Mean					355 24 41.4
1	85 58 25	59 45	12 2	+8	11 15	— 6 39	— 79	356 4 21
2	56 44	57 45	13 28	+6	10 48	— 6 36	— 79	4 44
3	57 6	58 2	13 34	+11	11 19	— 6 36	— 79	4 21
4	53 18	53 55	12 39	+9	6 25	— 0 30	— 73	4 54
5	52 30	53 10	11 38	+8	4 36	— 0 14	— 62	3 52
6	51 37	53 26	11 38	+27	4 37	— 0 14	— 62	4 18
7	48 48	48 42	12 52	+15	1 52	— 0 6	— 60	4 45
8	46 12	47 43	13 3	— 5	59 56	+ 5 6	— 78	4 22
9	45 25	45 34	14 30	+21	0 21	+ 5 6	— 78	4 29
10	46 30	47 30	13 7	+3	0 10	+ 5 11	— 77	4 32
11	45 10	46 20	14 13	+2	0 0	+ 5 13	— 76	4 15
12	43 18	44 27	15 35	+6	59 34	+ 5 13	— 76	4 31
13	45 52	46 40	13 8	+10	59 34	+ 5 13	— 76	4 44
15	43 43	44 12	12 13	— 8	56 3	+ 8 17	+ 73	4 27
16	45 27	46 0	10 58	—27	56 15	+ 8 27	+ 66	4 37
17	45 43	47 46	11 10	—18	57 37	+ 8 27	+ 66	4 23
18	45 18	45 28	11 3	—25	56 46	+ 8 28	+ 65	4 47
19	44 5	44 6	11 22	—15	55 13	+ 8 28	+ 65	4 3
20	43 15	43 37	12 38	— 9	55 57	+ 8 28	+ 65	5 2
			Mean					356 4 29.8
11	61 51 28	55 42	14 13	— 3	7 46	+ 6 2	—852	333 8 11
13	62 5 29	1 51	13 8	— 5	16 43	+ 6 3	—852	18 4
			Mean					333 13 7.5

TABLE V.—RESULTS OF MEASURES OF DISTANCE. (Continued.)

Star No.	Plate.	Observed Dist.		Corrections for			Cor- rected Mean.	Scale Varia- tion.	Proper Motion.	Parallax Co- efficient.	Final Corrected Distance.
		East.	West.	Refrac.	Aberr.	Scale.					
27 (30)	2	.2265	.2096	118	-23	109	.2380	+ 87	+.1228	+0.222	38.3724
	3	.2274	.1914	122	-23	109	.2298	+ 64	+.1228	+ .222	.3619
	10	.4421	.4243	141	-23	108	.4554	- 16	-.0969	+ .335	.3612
	11	.4299	.4405	116	-23	108	.4549	- 27	-.0974	+ .361	.3594
	12	.4387	.4402	118	-23	108	.4593	- 23	-.0974	+ .361	.3612
	13	.4381	.4337	121	-23	108	.4561	- 5	-.0974	+ .361	.3628
	15	.4898	.4942	114	+23	108	.5161	- 40	-.1546	- .504	.3510
	16	.4972	.5186	129	+22	108	.5334	- 26	-.1579	- .618	.3650
	18	.5107	.4993	130	+22	108	.5306	- 21	-.1582	- .627	.3622
	20	.4933	.5113	117	+22	108	.5266	- 48	-.1582	- .627	.3555
						Mean					38.3616
28 (60)	11	.8154	.8118	338	-68	112	.8433	- 80	-.1002	+0.381	111.7400
	12	.8212	.8102	343	-68	112	.8459	- 67	-.1002	+ .381	.7439
	13	.8050	.8032	351	-68	112	.8351	- 14	-.1002	+ .381	.7384
	15	.8830	.8616	329	+68	112	.9147	-117	-.1588	- .523	.7375
	18	.8925	.8660	374	+65	112	.9258	- 60	-.1625	- .645	.7490
	19	.8712	.8688	353	+65	112	.9145	- 36	-.1625	- .645	.7401
						Mean					111.7415
29 (5)	3	.1795	.1523	129	-21	112	.1876	+ 60	-.1601	-0.440	36.0279
	11	.8741	.8697	111	-22	112	.8917	- 26	+.1259	+ .567	.0077
	13	.8725	.8763	125	-22	112	.8956	- 5	+.1259	+ .567	.0137
						Mean					36.0164
30 (69)	11	.2444	.2182	60	-11	78	.2440	- 13	+.1536	-0.793	18.3861
31 (64)	11	.9278	.9310	179	-37	102	.9525	- 43	-.0820	+0.258	59.8695
32 (31)	1	.8124	.7994	227	-45	130	.8443	+150	+.1095	+0.100	76.9601
	2	.8056	.7947	235	-46	130	.8293	+175	+.1087	+ .142	.9573
	3	.7998	.8035	238	-46	130	.8311	+128	+.1087	+ .142	.9544
	4	.9032	.9052	238	-47	124	.9329	- 2	+.0081	+ .378	.9457
	5	.9166	.9137	235	-44	124	.9439	+ 34	+.0039	+ .560	.9584
	6	.9144	.8940	256	-44	130	.9356	+ 69	+.0039	+ .560	.9536
	7	.9134	.9000	245	-44	124	.9364	+ 71	+.0035	+ .580	.9544
	8	.0047	.0115	235	-46	124	.0366	- 98	-.0842	+ .191	.9451
	9	.0119	.0014	246	-46	124	.0363	- 34	-.0842	+ .191	.9512
	10	.0117	.9983	232	-47	124	.0331	- 31	-.0856	+ .258	.9477
	11	.0044	.0053	231	-47	124	.0328	- 55	-.0860	+ .284	.9449
	12	.0090	.0010	233	-47	124	.0332	- 46	-.0860	+ .284	.9462
	13	.9911	.0017	236	-47	124	.0249	- 10	-.0860	+ .284	.9415
	15	.0522	.0566	235	+47	124	.0922	- 81	-.1365	- .430	.9421
	16	.0533	.0692	270	+45	125	.1025	- 52	-.1394	- .552	.9508
	17	.0687	.0591	253	+45	124	.1033	- 55	-.1394	- .552	.9513
	18	.0672	.0500	276	+45	124	.1003	- 41	-.1396	- .562	.9494
	19	.0698	.0420	254	+45	124	.0954	- 25	-.1396	- .562	.9461
	20	.0621	.0665	240	+45	121	.1025	- 96	-.1396	- .562	.9461
						Mean					76.9498

TABLE VI.—RESULTS OF MEASURES OF ANGLE. (Continued).

Plate.	Observed Position Angle.		Zero Correction plus precession, etc.	Refract.	Corrected Mean. p	Proper Motion.	Parallax Coef. μ cent.	Final Corrected Angle. π
	East.	West.						
2	266 44 0	44 25 13	28	+ 7	57 48	+15 21	+183	177 15 15
3	45 17 44	12 13 34		+12	58 30	+15 21	+183	15 3
10	267 14 38	13 58 13	7	- 6	27 19	-11 59	+178	16 3
11	12 58	13 44 14	13	+ 2	27 37	-12 3	+176	16 6
12	11 6	9 35 15	35	+ 6	26 2	-12 3	+176	15 13
13	11 3	11 43 13	8	+12	24 43	-12 3	+176	14 7
15	22 30	24 28 12	13	- 8	35 34	-19 4	-169	15 10
16	25 5	26 10 10	58	-27	36 8	-19 28	-151	15 17
18	26 52	25 48 11	3	-23	37 40	-19 30	-149	16 26
20	22 0	24 2 12	38	- 9	35 30	-19 30	-149	15 20
				Mean				177 15 24.0
11	268 23 45	24 35 14	13	+ 2	38 25	- 4 7	+ 60	178 34 9
12	21 18	22 28 15	35	+ 6	37 34	- 4 7	+ 60	34 0
13	23 40	24 24 13	8	+12	37 22	- 4 7	+ 60	34 1
15	28 42	29 56 12	13	- 7	41 25	- 6 31	- 57	34 13
18	30 20	30 52 11	3	-25	41 14	- 6 40	- 51	33 26
19	30 22	30 00 11	22	-15	41 18	- 6 40	- 51	34 19
				Mean				178 34 1.3
3	101 6 44	4 42 13	34	+18	19 35	-12 54	-178	11 5 43
11	100 40 27	38 44 14	13	+ 5	53 53	+10 15	-165	2 38
13	42 10	42 40 13	8	+17	55 50	+10 15	-165	5 30
				Mean				11 4 37.0
11	119 16 43	11 55 14	13	+ 6	28 38	+11 41	-234	29 38 16
11	260 49 18	50 32 14	13	+ 2	4 10	- 8 19	+117	170 56 2.0
1	268 18 42	19 55 12	2	+ 6	31 26	+ 8 10	+ 93	172 40 22
2	16 50	17 32 13	28	+ 6	30 45	+ 8 6	+ 93	40 24
3	17 37	18 22 13	34	+ 9	31 43	+ 8 6	+ 93	40 28
4	26 12	26 36 12	39	+ 8	39 11	+ 0 36	+ 87	39 43
5	27 43	27 50 11	38	+ 6	39 31	+ 0 18	+ 75	40 8
6	26 38	27 51 11	38	+23	39 16	+ 0 18	+ 75	40 18
7	22 58	23 47 12	52	+12	36 26	+ 0 15	+ 73	40 28
8	33 25	33 30 13	3	+ 8	46 38	- 6 15	+ 92	40 44
9	31 55	32 2 14	30	+18	46 46	- 6 15	+ 92	40 34
10	33 5	33 55 13	7	+ 3	46 40	- 6 20	+ 91	40 32
11	32 24	33 5 14	13	+ 2	46 59	- 6 23	+ 90	40 37
12	30 31	31 8 15	35	+ 5	46 30	- 6 23	+ 90	40 50
13	32 30	33 5 13	8	+ 8	46 3	- 6 23	+ 90	40 36
15	38 40	40 8 12	13	- 8	51 31	-10 6	- 88	40 34
16	40 45	41 30 10	58	-30	51 35	-10 19	- 80	40 18
17	42 13	43 27 11	10	-19	53 41	-10 19	- 80	40 48
18	262 40 53	41 27 11	3	-27	52 46	-10 20	- 79	41 8
19	40 12	40 58 11	22	-17	51 40	-10 20	- 79	40 51
20	37 53	38 32 12	38	-10	50 40	-10 20	- 79	40 6
				Mean				172 40 30.0