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On the definitive places of the Stars used for comparison with the Planet Victoria in the observations for parallax 1889.

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The relative positions of the comparison stars employed in the observations of Victoria in 1889, are now, thanks to the generous and hearty cooperation of a large number of Astronomers, more accurately known than those of any other group of stars in the heavens, and may therefore be advantageously used for determining the optical distortion and scale-value of our photographic telescopes, and testing the various methods for the »raccordement des plaques«.

The following resumé of results is therefore communicated in advance of the full details (which will afterwards appear in a complete form in connection with the determination of the Solar Parallax) in order that advantage may be taken of the opportunity of making the necessary

photographs during the current year, and of utilizing them without delay.

The definitive positions of the 37 stars are based on the following data:

3766 Meridian observations of Right Ascension
3771 » » of Declination

made at the following observatories:

Algiers, Berlin, Bordeaux, Cape of Good Hope, Cambridge (Engl.), Cambridge (Mass.), Cincinnati, Cordoba, Dublin, Greenwich, Hamburg, Mt. Hamilton, Königsberg, Leiden, Leipzig, Melbourne, Naples, Oxford (Radcl. Obs.), Paris, Pulkowa, Vienna (Kuffner's Obs.), Washington;

also upon the following Heliometer observations:

	in the Triangulation	Standard Stars
	<i>Gill</i> 383 distances; 65 position angles	166 distances; 36 position angles
Cape	<i>Finlay</i> 270 » 35 » »	112 » 15 » »
	<i>Jacoby</i> 128 »	52 »
Yale	<i>Chase</i> 309 »	124 »
Göttingen	<i>Schur</i> 127 »	57 »
	<i>Ambrohn</i> 106 »	33 »

Total: 1867 distances; 151 position angles.

Each observation of position angle or of distance rests on four pointings, — two in each of the opposite positions of the segments.

A few position angles measured at Yale and Göttingen were not employed as they were not sufficiently numerous to be completely discussed.

The meridian observations, together with a large number of additional observations, made to secure uniformity in the determinations of the positions, have been completely discussed by Professor *A. Auwers*, and the results of his discussion, communicated in October 1891, have been taken as the basis of this work. The following is a brief summary of the results of combining the Meridian and Heliometer observations, and of the methods employed in so doing. The general plan of the Triangulation will be obvious by looking on the list of the 37 stars, Table I, and the measures of distances, Table II, at the end of this paper. Measures of distance have been chiefly employed. To give rigidity to the figure as a whole two auxiliary stars $E = \text{BD.} - 6^\circ 52' 01''$ and $F = \text{BD.} - 6^\circ 52' 94''$ were introduced. These stars were not observed at the 22 observatories. All the distances measured by each Heliometer ob-

server were reduced with an approximately correct mean scale value for each instrument, and corrected for refraction, aberration and proper motion to the Equinox 1889.0 and Epoch 1889.55.

A complete set of observations on any night should, according to the programme of work, contain three measures of the Standard distance (the distance between the stars $t-p$) one at the beginning, one in the middle, and one at the end of the set.

If Σ_0 is the adopted value of the standard distance Σ_1 Σ_2 and Σ_3 the three observed values and σ_1 σ_2 and σ_3 distances in the triangulation observed simultaneously with Σ_1 Σ_2 and Σ_3 respectively; then if Σ_1 Σ_2 and Σ_3 are observed without error the true values of σ_1 σ_2 and σ_3 will be

$$\begin{aligned}\sigma_1 + \frac{\sigma_1}{\Sigma_0} (\Sigma_0 - \Sigma_1) \\ \sigma_2 + \frac{\sigma_2}{\Sigma_0} (\Sigma_0 - \Sigma_2) \\ \sigma_3 + \frac{\sigma_3}{\Sigma_0} (\Sigma_0 - \Sigma_3)\end{aligned}$$

subject only to the accidental errors of measurement, and a final systematic correction on account of possible error in the adopted value of Σ_0 .

But σ_1 , σ_2 and σ_3 cannot be strictly simultaneously observed with Σ_1 , Σ_2 and Σ_3 and it becomes a practical question

- I. whether the mean of the three values $(\Sigma_0 - \Sigma_1)$, $(\Sigma_0 - \Sigma_2)$ and $(\Sigma_0 - \Sigma_3)$ should be adopted, or
- II. whether their values should be interpolated by means of a curve drawn through points on a diagram of which the ordinate and abscissa are the sidereal time and the corresponding value of $(\Sigma_0 - \Sigma)$.

If the variation of the measures of the standard distance depends more on accidental errors of pointing

$$x + \left(\frac{\sigma - 4000}{1000}\right)y + \left(\frac{\sigma - 4000}{1000}\right)^2 z = G - O \quad \text{with the weight } \frac{p_g \times p_o}{p_g + p_o}$$

where G is the distance according to *Gill*, O according to another observer, p_g and p_o the weights of *Gill*'s and the other observer's measures, depending on the number of observations.

The resulting corrections to *Gill* were:

Distance	<i>Finlay</i>	<i>Jacoby</i>	<i>Chase</i>	<i>Schur</i>	<i>Ambronn</i>
1000"	+".03	+".23	+".13	+".22	+".06
2000	.00	+".12	+".07	+".13	-.01
3000	-.02	+".03	+".02	+".05	-.06
4000	-.04	-.06	-.03	-.01	-.10
5000	-.06	-.13	-.07	-.04	-.12
6000	-.07	-.18	-.10	-.06	-.14
7000	-.08	-.23	-.12	-.06	-.14

These corrections having been applied and the means taken having regard to a preliminary system of weights found for the observations of different distances by different observers, and Tabular distances having been computed with their weights from the data of *Auwers*' discussion of the meridian observations, the observed and computed distances were compared by equations of the form

$$\sin p (m_2 - m_1) u + \sin p (m_2^2 - m_1^2) w - x - \left(\frac{\sigma - 4000}{1000}\right)y - \left(\frac{\sigma - 4000}{1000}\right)^2 z = O - C.$$

where m_1 is the magnitude of the brighter star (reckoned from 8.0), m_2 of the fainter star of the pair, p the position angle reckoned from the brighter star as origin, u , w , x , y , z constants to be determined. Each equation received a

weight = $\frac{p_o \times p_c}{p_o + p_c}$. The resulting corrections were:

Corrections to the Meridian RA. (arc)

Stars mag.	omitting w	with w
5.7	-.083	-.098
6.0	-.072	-.080
7.0	-.036	-.031
8.0	.000	.000
8.5	+".018	+".009

The term w was found to be $-.0085$ with mean error $\pm .0157$. The results of a solution without w were therefore adopted.

Correction to the Heliometer Distances

Distances	1000"	+".029
	2000	+".019
	3000	+".009
	4000	.000
	5000	-.009
	6000	-.018
	7000	-.024

These Heliometer corrections are applicable to *Gill*'s observations, and have to be further added to the reductions to *Gill* for the other observers. This done the mean error of each observer's work was derived, not from his own observations inter se but from the agreement of the observations for the same distance by the different observers, and the following Table of weights was derived, in which an estimated mean error of ± 0.2 corresponds with weight unity.

than on real changes of scale-value, then method I would be best, but if they depend chiefly on true variations of scale value then method II should be adopted. The observations were reduced independently by both methods, and in some cases method I seemed the better, in others method II, but for all the observers the probable errors were on the whole nearly identical for both methods, and the mean of the two better than either. Accordingly the mean was adopted.

The next step was to ascertain whether, in spite of this correction to a common scale value, there remained outstanding systematic differences between the various observers.

The different observers' measures were compared with *Gill*'s, each pair of stars affording an equation of the form

Weight of a single normal observation by each observer.

Distance	Gill	Finlay	Jacoby	Chase	Schur	Ambrohn
1000"	3.02	2.70	0.75	0.60	1.50	1.09
3000	1.42	1.27	0.40	0.50	0.69	0.56
5000	0.89	0.78	0.20	0.39	0.35	0.35
7000	0.67	0.52	0.14	0.30	0.27	0.25

The observations were then combined with the above weights, and these weights then received small corrections corresponding to the uncertainty of the correction for proper motion to 1889.55.

Adopting these combined weights as true, it was found from the discordances between the observed and computed distances that *Auwers'* original weights for the Meridian Right Ascensions should be multiplied by 0.71 and those of the Declinations by 1.33.

Now putting $x = \Delta\alpha \cos \delta$
 $y = \Delta\delta$

each of the 37 observed Right Ascensions gives an equation of the form

$x = \text{Correction for magnitude,}$

each of the 37 Declinations observed in the Meridian gives an equation of the form

$y = 0$

and these equations have the weights assigned by *Auwers* (after reduction to our system of weights) multiplied by the above mentioned factors.

There were observed in all 173 distances with the Heliometers — each of which gives an equation of the form

$$\begin{cases} \sin p x_1 + \cos p y_1 \\ - \sin p x_2 - \cos p y_2 \end{cases} = O. - C.$$

where $\begin{matrix} x_1 x_2 \\ y_1 y_2 \end{matrix}$ refer to the two stars of the pair, and 25 pairs measured in position angle, each of which, when the residuals are reduced to seconds of arc on the great circle, gives an equation of the form

$$\begin{cases} \cos p x_1 - \sin p y_1 \\ - \cos p x_2 + \sin p y_2 \end{cases} = O. - C.$$

From these 272 equations normal equations were formed having regard to the weights of the equations, the total number of these normals being 78 (viz. x and y for each of the 37 comparison stars and the two auxiliary stars). These 78 unknowns were eliminated with their weights, the results will be found in the following Table.*) The additional weights given in the Table are the weights of the meridian observations employed in the solution.

Definitive corrections from the complete discussion to the meridian observations as represented by *Auwers'* discussion of them alone.

*	$\Delta\alpha \cos \delta$	Weights		$\Delta\delta$	Weights		*	$\Delta\alpha \cos \delta$	Weights		$\Delta\delta$	Weights	
		From Hel. & Mer. obs. combined	From the Mer. obs. only		From Hel. & Mer. obs. combined	From the Mer. obs. only			From Hel. & Mer. obs. combined	From the Mer. obs. only		From Hel. & Mer. obs. combined	From the Mer. obs. only
a	+0.079	17.0	4.5	—0.020	17.6	11.0	u	—0.025	30.1	3.7	+0.045	17.5	9.6
b	— .061	11.8	3.3	+0.077	21.3	10.8	v	— .111	36.0	4.5	— .025	18.3	10.8
c	+ .050	19.0	3.1	+0.035	22.2	10.4	w	+ .078	34.1	5.6	— .013	23.7	13.8
d	+ .096	22.4	4.8	— .023	30.8	12.2	x	+ .039	30.8	5.3	— .014	25.3	13.8
e	+ .003	30.0	4.9	— .020	26.8	12.2	y	— .138	23.8	4.9	+0.011	22.4	12.5
f	+ .104	38.6	4.8	+0.011	29.4	11.6	z	+ .048	23.9	4.5	+0.006	25.0	11.7
g	— .090	25.0	4.1	+0.047	22.4	10.6	a	+ .081	19.9	3.1	— .032	18.3	8.4
h	+ .018	22.1	3.3	+0.033	19.6	8.1	β	— .006	14.7	3.3	— .088	13.8	7.8
i	+ .011	18.8	3.8	+0.004	19.2	9.7	γ	+ .108	18.2	4.2	— .030	15.5	10.9
k	+ .022	30.2	4.0	+0.029	27.2	10.8	δ	— .057	18.9	4.3	+0.022	22.5	10.8
l	— .198	6.1	3.1	— .038	16.5	8.2	ϵ	— .046	21.2	3.9	+0.012	25.0	9.6
m	— .053	51.8	4.7	— .044	33.7	12.4	ζ	+ .020	12.9	3.6	— .086	17.9	9.0
n	— .136	23.1	3.8	— .016	27.4	10.3	η	— .042	13.1	3.9	+0.027	17.2	9.4
o	— .114	20.5	3.1	— .076	17.7	8.9	θ	— .067	18.8	4.1	+0.092	21.3	10.1
p	— .027	50.5	7.0	+0.032	34.1	16.6	ι	+ .119	5.7	3.3	+0.010	10.3	8.5
q	+ .050	45.8	5.8	+0.080	26.2	14.6	κ	+ .071	12.5	3.1	— .068	19.1	8.2
r	+ .129	16.8	4.0	— .047	26.8	10.0	λ	+ .116	16.4	3.0	+0.013	20.4	6.2
s	— .030	25.3	3.7	+0.045	28.3	9.3	μ	— .073	12.0	6.0	+0.020	21.7	15.2
t	— .013	45.5	7.0	— .029	35.3	17.2							

An estimated mean error of ± 0.20 corresponds with weight unity.

*) The elimination of the unknowns and their weights was effected by a series of approximations of which an account will be afterwards given.

When the values of x and y for the different stars are substituted in the corresponding equations of condition, the residuals given in Table II at the end of this paper are found (in the column marked »Mean«).

The other columns represent the comparison of the definitive computed distance with the distance as observed by each observer and corrected for systematic error.

The corresponding weight is given beside each value of C . — O .

From the residuals of the 272 equations we get

$$[p\,vv] = 8.3825.$$

To the 78 unknown quantities eliminated from the normals must be added the terms u , x , y and z expressing the corrections of the Meridian observations in Right Ascension on account of magnitude, and the corrections of the Heliometer distances for systematic error, which, strictly speaking, should have entered into the simultaneous solution, but which were more conveniently, and without sensible error, eliminated before and gave the results tabulated p. 163, 164.

The total number of unknown quantities is therefore $= m = 82$.

$$\text{Whence } \frac{[p\,vv]}{n-m} = 0.0441 = \varepsilon^2$$

$$\text{and } \varepsilon = \pm 0.210$$

the assumed value was ± 0.200 .

The accordance between the estimated and actual errors is not so precise for the various classes of observations. If each class had proper weight one should have

Distance	Gill	Finlay	Jacoby	Chase	Schur	Ambrohn
600" to 3000"	± 223 (32)	± 244 (32)	± 209 (25)	± 217 (31)	± 234 (15)	± 211 (18)
3000 » 5000	.221 (65)	.239 (64)	.194 (42)	.219 (64)	.198 (39)	.211 (31)
5000 » 7300	.213 (74)	.214 (75)	.204 (47)	.236 (67)	.236 (29)	.217 (46)

Accepting these results as representing sufficiently the weights assigned to the different distances, the combined residuals of each observer give

	$\frac{[p\,vv]}{n_1}$	Factor	Weight of Factor
Gill	.0361	.77	356
Finlay	.0405	.69	230
Jacoby	.0286	.98	36
Chase	.0392	.71	122
Schur	.0361	.77	67
Ambrohn	.0338	.83	43

The factors are the quantities by which $\frac{[p\,vv]}{n_1}$ must be multiplied to give 0.0279 — or in other words the factors by which the weights of the table pag. 165 have to

Probable error of a single normal observation.

Distance	Gill	Finlay	Jacoby	Chase	Schur	Ambrohn
1000"	± 0.88	± 0.99	± 1.57	± 2.06	± 1.25	± 1.41
3000	.128	.144	.216	.225	.184	.197
5000	.162	.183	.302	.255	.260	.250
7000	.187	.225	.369	.294	.294	.294

*) If the magnitude corrections are omitted $\frac{[p\,vv]}{n_1}$ for the Right Ascension becomes 0.0287.

$$\frac{[p\,vv]}{n_1} = \varepsilon^2 \times \frac{n-m}{n} = 0.04 \times \frac{190}{272} = 0.0279$$

where n_1 is the number of observations belonging to each special class.

Instead we find:

	n_1	$\frac{[p\,vv]}{n_1}$	Corresp. mean error for weight 1
Heliometer Distances	173	.0329	± 216
» Pos. Angles	25	.0415	± 242
Meridian Right Ascensions	37	.0253*)	± 189
» Declinations	37	.0193	± 166

The overestimate of the weight of the position angles is probably due to an increase of small systematic errors in particular pairs consequent upon the unfavourable character of Heliometer images for measures in position angle. The underestimate of the weights of the meridian observations is traced to the neglect of small systematic errors in the Heliometer observations of distance (peculiar to different pairs of stars) which are not eliminated in the mean. *Auwers'* weights of the Right Ascensions should have been diminished 20% instead of 30%, and the weights of the Declinations increased 70% instead of 30%. It is shown that a new discussion with rigorous weights would not sensibly affect the results. The solution as it stands is accepted.

The mean error of an observation of weight unity is found to be in the mean

for Distances 600" to 3000"	± 207
3000 » 5000	± 195
5000 » 7300	± 226

For the various observers:

be multiplied. The weights of the factors are the sums of the weights which have been assigned to each observer. Having regard to these weights the resulting mean factor is

$$0.76$$

The corresponding factor from the combined observations of distance is

$$0.85.$$

Thus whilst the measures of the individual observers are affected by systematic errors which diminish their weight 24% on the average, the weight of the mean of the observers is affected by only 15% — a proof that the personal errors are to a sensible extent eliminated in the mean of several observers.

The corresponding probable errors are given in the following table.

These probable errors include the effect of errors in the measurement of the Standard stars (producing errors of scale-value) and all outstanding systematic errors personal and instrumental.

The mean residuals in distance are represented in groups as follows:

Distance	C. — O.	Weight
600" to 1500"	—0.008	52.7
1500 » 2500	— .014	104.8
2500 » 3500	— .005	131.2
3500 » 4500	+ .012	142.2
4500 » 5500	— .015	111.8
5500 » 6500	— .032	104.4
6500 » 7300	+ .023	68.1

If no systematic corrections had been applied to the original observations of the different observers their observations would be represented thus:

C. — O.

Distance	Gill	Finlay	Jacoby	Chase	Schur	Ambrohn
	$\bar{p}$	$\bar{p}$	$\bar{p}$	$\bar{p}$	$\bar{p}$	$\bar{p}$
600" to 1500"	+0.03 26.1	+0.07 21.5	+0.18 4.3	+0.14 6.5	+0.20 7.8	+0.14 4.0
1500 » 2500	+0.01 58.5	.00 36.6	+0.13 6.8	+0.08 14.6	+0.03 11.3	+0.02 10.4
2500 » 3500	+0.01 62.7	—0.04 39.8	+0.13 8.0	+0.08 24.0	+0.09 20.0	—0.11 4.9
3500 » 4500	+0.01 68.5	.00 48.2	.00 7.2	—0.01 25.8	—0.08 13.6	—0.11 6.5
4500 » 5500	—0.06 52.8	—0.05 34.5	—0.15 4.8	—0.10 22.1	—0.01 4.3	—0.15 8.1
5500 » 6500	—0.04 51.6	—0.13 31.8	—0.21 3.0	—0.18 19.1	—0.12 5.9	—0.22 5.6
6500 » 7300	.00 35.9	—0.12 17.5	—0.12 2.1	—0.08 12.2	—0.07 4.2	—0.21 3.6

These results depend on no assumed law, but represent the quantities required to reduce the uncorrected original observations of each group to zero. They prove conclusively the necessity for systematic corrections very similar with those which have been actually employed.

The residuals of Table II for the individual observers refer to the corrected observations.

The negative corrections required for the large di-

stances possibly arise from a peculiarity in the images (a difference of colour) of the Standard stars, which appears to produce a small personality in their observation by different observers. For the positive corrections for short distances no satisfactory explanation can presently be given. A closer examination of these points must be reserved for the more detailed publication.

Table 'I.

Definitive places of the Victoria Comparison Stars.

Equinox 1889.0. Epoch 1889.55.

*	Mag.	α	δ	Precession				μ_{α}	μ_{δ}	Probable Errors		
				α	δ	α	δ			α (arc)	δ	μ (arc)
				1850	1900	1850	1900					
a	7.8	19 ^h 21 ^m 25 ^s 200	—5° 57' 20".86	3.2046	.2029	+6.805	+7.023	—0.0006	—0.010	±0.032	±0.032	±0.013
b	8.2	23 2.485	6 24 0.52	.2142	.2123	6.938	7.156	—0.0012	+0.003	.039	.029	.015
c	8.5	24 6.225	5 9 5.82	.1864	.1846	7.027	7.242	—0.0036	+0.016	.031	.028	.022
d	8.4	25 17.932	5 54 12.54	.2027	.2009	7.124	7.340	—0.0004	—0.008	.028	.024	.020
e	8.3	25 40.295	5 21 2.34	.1905	.1887	7.155	7.370	—0.0038	—0.062	.025	.026	.018
f	7.5	27 50.504	4 58 48.96	.1820	.1801	7.332	7.546	—0.0012	+0.004	.022	.025	.011
g	8.5	28 37.608	4 41 23.26	.1755	.1737	7.396	7.610	+0.0010	+0.015	.027	.028	.024
h	7.8	29 20.727	4 33 5.37	.1724	.1705	7.455	7.668	—0.0005	—0.013	.029	.030	.011
i	7.7	30 41.136	5 1 2.44	.1823	.1804	7.563	7.776	(—0.003)	+(.01)	.031	.031	.049
k	7.9	30 53.379	4 32 43.39	.1720	.1701	7.580	7.792	+0.0024	—0.024	.024	.026	.020
l	8.0	31 22.109	3 43 18.95	.1540	.1523	7.620	7.831	(—0.001)	—(.02)	.055	.033	.040
m	5.7	31 53.995	4 53 40.08	.1794	.1775	7.662	7.874	+0.0056	—0.045	.019	.023	.007
n	6.6	34 26.876	5 42 7.34	.1964	.1944	7.866	8.079	—0.0007	.000	.028	.026	.011
o	7.6	34 53.498	4 17 21.16	.1658	.1639	7.904	8.114	+0.0012	+0.014	.030	.032	.022
p	7.6	35 56.005	4 32 49.33	.1712	.1692	7.987	8.197	—0.0014	+0.004	.019	.023	.011
q	8.4	39 23.665	4 47 22.28	.1758	.1737	8.264	8.472	—0.0010	+0.007	.020	.026	.011
r	7.9	40 59.498	3 56 0.58	.1572	.1552	8.392	8.599	+0.0001	.000	.033	.026	.011
s	7.9	41 53.285	5 30 22.53	.1906	.1884	8.461	8.670	—0.0011	+0.014	.027	.025	.013
t	7.9	43 4.463	4 46 18.32	.1747	.1725	8.556	8.763	—0.0007	—0.016	.020	.023	.011
u	8.0	43 43.816	4 48 25.24	.1753	.1731	8.608	8.815	—0.0025	—0.004	.025	.032	.013
v	6.7	44 56.178	4 58 27.07	.1786	.1764	8.703	8.909	—0.0002	—0.004	.022	.032	.009
w	8.2	19 47 27.184	—4 51 32.35	3.1757	.1734	+8.901	+9.106	—0.0032	+0.015	±0.023	±0.027	±0.022

*	Mag.	α	δ	Precession				μ_α	μ_δ	Probable Errors		
				α	δ	α	δ			α (arc)	δ	μ (arc)
				1850	1900	1850	1900					
x	8.1	19 ^h 48 ^m 22 ^s 375	-5° 19' 59".89	3 ^s 1855	.1831	+ 8".973	+ 9".178	+ ^s 0033	+ ^s 011	±".024	±".027	±".016
y	8.1	51 25.861	4 58 53.86	.1774	.1750	9.212	9.415	+ ^s 0021	- ^s 045	.028	.028	.013
z	8.5	52 3.490	5 28 58.91	.1877	.1852	9.260	9.463	(- ^s 001)	(+ ^s .1)	.028	.027	.038
α	8.0	52 18.113	6 38 55.75	.2121	.2094	9.278	9.483	- ^s 0036	- ^s 001	.030	.032	.011
β	8.0	52 38.022	4 39 16.34	.1703	.1679	9.305	9.508	- ^s 0029	+ ^s 035	.035	.036	.013
γ	7.4	54 57.309	4 36 52.23	.1690	.1666	9.485	9.686	- ^s 0003	- ^s 023	.032	.034	.009
δ	8.3	55 39.735	6 40 49.00	.2117	.2090	9.537	9.741	- ^s 0022	+ ^s 021	.031	.028	.017
ϵ	6.6	56 17.659	5 17 48.65	.1828	.1803	9.587	9.788	+ ^s 0011	- ^s 025	.029	.027	.013
ζ	8.0	57 4.779	8 0 14.38	.2388	.2358	9.645	9.849	.0000	- ^s 10	.038	.032	.033
η	8.1	57 21.729	4 56 27.93	.1752	.1727	9.670	9.870	- ^s 0041	+ ^s 017	.037	.032	.011
θ	8.4	19 59 23.785	6 53 57.31	.2151	.2122	9.823	10.025	- ^s 0021	- ^s 053	.031	.029	.007
ι	7.0	20 0 44.858	4 44 4.02	.1702	.1676	9.929	10.127	+ ^s 0021	- ^s 006	.056	.042	.011
κ	7.5	1 3.695	8 29 59.20	.2475	.2444	9.949	10.151	+ ^s 0014	- ^s 022	.038	.031	.011
λ	8.1	2 45.811	7 20 32.96	.2230	.2200	10.079	10.279	- ^s 0017	- ^s 020	.033	.030	.015
μ	6.5	20 5 8.919	-9 10 12.56	3.2596	.2562	+10.257	+10.458	+ ^s 0001	.000	±.039	±.029	±.007

The Precessions and Proper motions of the above Table were communicated by Dr. *Auwers*. The probable errors of the proper motions are so comparatively large that it is desirable to obtain the photographs for determining scale value, distortion &c. as soon as possible.

The approximate places of the two auxiliary stars used in the Triangulation are, for Eq. 1889.0:

$$E \ 8^{\text{h}} 0 \ 19^{\text{h}} 30^{\text{m}} 30^{\text{s}} \ -6^{\circ} 12' 55'' \quad F \ 8^{\text{h}} 3 \ 19^{\text{h}} 47^{\text{m}} 26^{\text{s}} \ -6^{\circ} 17' 24''.$$

Table II.

Comparison of the Heliometer observations of Distance with the
Distances computed from the Definitive Coordinates.

C. — O.

Ro- tation No.	Stars	Definitive Distance	<i>Gill</i>		<i>Finlay</i>		<i>Jacoby</i>		<i>Chase</i>		<i>Schur</i>		<i>Ambrohn</i>		Mean	
1	<i>fn</i>	6464".881	+".31	1.44	—".22	1.14	—1".05	0.15	+".09	0.96	+".04	0.29	—	—	+".035	3.8
2	<i>fc</i>	3407.345	+".23	1.86	+".00	1.15	—	—	+".69	0.48	—	—	—	—	+".222	3.1
3	<i>ps</i>	6358.023	+".32	1.44	—".13	1.16	—	—	+".09	0.64	+".27	0.29	—".43	0.27	+".090	3.6
4	<i>pl</i>	5061.074	+".01	0.89	+".12	0.78	—	—	—".36	0.39	—	—	—".04	0.35	—".018	1.9
5	<i>qo</i>	4223.104	+".32	1.55	+".15	1.15	—	—	+".25	0.88	+".17	0.94	—	—	+".236	3.9
6	<i>qt</i>	3301.063	—".05	2.88	—".04	2.66	—	—	—".06	1.44	+".13	1.28	—	—	—".018	7.4
7	<i>ec</i>	1577.275	—".14	5.42	—".00	2.14	—	—	—".07	1.14	—".25	2.44	—	—	—".135	7.5
8	<i>eE</i>	5327.079	.00	3.01	+".11	1.48	—	—	—".08	1.11	—	—	—".11	0.32	+".006	5.4
9	<i>da</i>	3477.413	—".01	2.44	+".01	2.26	—	—	—".18	1.92	—".07	1.20	—	—	—".052	6.3
10	<i>dE</i>	4788.715	+".00	2.79	—".04	1.62	—".24	0.22	+".20	1.20	—	—	+".29	0.37	+".039	5.4
11	<i>tr</i>	3549.671	+".08	1.80	—".02	3.89	—	—	+".01	1.41	+".11	1.18	—	—	+".026	7.4
12	<i>tF</i>	6721.389	—".01	1.38	+".22	1.08	—	—	—".42	0.64	—	—	+".25	0.26	+".005	3.3
13	<i>θη</i>	7280.782	+".05	1.32	+".11	0.77	—	—	—	—	+".25	0.52	—	—	+".110	2.5
14	<i>θκ</i>	5950.193	—".06	1.54	+".14	0.95	—	—	—	—	—".69	0.60	—	—	—".118	3.0
15	<i>λθ</i>	3404.129	—".23	2.48	+".24	1.73	—	—	—	—	—".03	1.22	—	—	—".036	5.1
16	<i>λκ</i>	4433.861	+".02	3.96	—".10	2.64	—	—	—".29	0.84	—".25	0.45	—	—	—".068	6.8
17	<i>mk</i>	1549.317	+".04	4.86	—".21	4.34	—	—	—".03	1.14	—".07	2.46	—	—	—".075	9.8
18	<i>mn</i>	3696.760	—".09	2.32	+".20	2.14	—	—	+".37	0.92	—".28	1.12	—	—	+".038	6.1
19	<i>zx</i>	3345.678	—".22	1.58	+".03	2.34	—	—	+".02	0.96	+".39	1.24	—	—	+".035	3.8
20	<i>zε</i>	3854.403	+".03	1.67	—".09	1.53	—	—	—".14	0.92	—".07	1.06	—	—	—".053	3.5
21	<i>xs</i>	5843.512	+".08	1.20	—".22	0.99	—	—	—".27	0.70	—	—	—".05	0.30	—".100	2.9
22	<i>xε</i>	7099.830	—".05	2.00	—".23	1.16	—	—	—	—	—	—	+".08	0.50	—".089	3.4
23	<i>kl</i>	2995.443	—".06	1.42	—".29	1.27	—".37	0.40	+".09	0.50	—	—	—".35	0.56	—".178	2.8
24	<i>ki</i>	1708.877	+".02	2.29	+".07	2.02	—".40	0.59	+".01	0.56	—	—	—".09	0.88	—".022	3.2
25	<i>yx</i>	3019.386	+".01	1.41	—".27	1.27	—".19	0.40	+".05	0.50	—	—	—".12	0.56	—".112	3.6
26	<i>γγ</i>	3425.806	+".12	1.24	—".37	1.15	—".45	0.36	—".43	0.48	—	—	+".53	0.50	—".106	3.4

Rotation No.	Stars	Definitive Distance	Gill		Finlay		Jacoby		Chase		Schur		Ambronn		Mean	
28	$\delta\zeta$	4930.463	-.02	1.36	-.05	0.79	—	—	-.25	0.78	—	—	—	—	-.086	2.4
29	$\epsilon\gamma$	2734.177	-.05	1.16	+.03	0.35	+.26	0.44	—	—	—	—	+.11	0.62	+.050	2.5
30	$\epsilon\theta$	6401.850	-.06	1.44	+.04	1.16	—	—	-.01	0.65	-.09	0.58	—	—	-.026	3.7
31	ζa	6479.911	-.07	3.20	+.16	1.14	—	—	-.16	0.64	—	—	-.06	0.26	-.029	3.8
32	ζx	3970.402	+.03	4.84	+.05	2.94	—	—	-.27	0.90	—	—	+.22	0.86	+.027	5.8
33	$g c$	4383.267	+.03	0.50	-.10	0.89	-.24	0.26	-.16	0.63	—	—	—	—	-.107	2.0
34	$g k$	2095.474	+.03	1.95	+.07	1.74	-.26	0.55	-.11	0.55	—	—	+.32	0.78	+.045	4.3
35	$E b$	6706.187	+.05	1.38	-.02	0.54	—	—	-.23	0.62	—	—	-.01	0.26	-.034	2.7
36	$E n$	3986.304	-.13	2.14	-.07	1.45	-.11	0.30	+.11	1.35	—	—	+.08	0.43	-.037	5.4
37	$F s$	5715.462	+.04	3.66	-.06	1.70	—	—	-.07	1.40	—	—	+.46	0.30	+.014	6.6
38	$F a$	4535.736	-.03	3.92	+.06	1.94	—	—	-.17	1.68	—	—	-.29	0.39	-.054	7.2
39	$s n$	6701.289	-.16	2.59	-.47	0.40	—	—	+.23	0.93	+.04	0.28	—	—	-.091	3.9
40	$s w$	5505.427	-.19	1.68	-.47	1.60	—	—	.00	0.70	—	—	-.30	0.31	-.274	3.7
41	$r o$	5623.594	-.18	1.24	-.09	0.88	—	—	-.07	0.72	+.26	0.34	—	—	-.079	2.9
42	$r w$	6687.227	+.02	1.04	-.31	0.81	—	—	-.01	0.93	—	—	.00	0.26	-.082	2.8
43	$\gamma\beta$	2087.464	+.19	1.95	-.21	1.74	+.20	0.55	+.26	0.55	—	—	-.43	0.78	-.010	5.1
44	$\gamma\eta$	2458.159	+.16	1.70	+.22	1.54	.00	0.48	+.04	0.53	—	—	-.18	0.69	+.102	4.7
45	$w\beta$	4704.430	-.44	1.19	-.10	0.82	—	—	+.13	0.82	—	—	-.04	0.38	-.160	2.9
46	$w v$	2294.555	+.00	2.70	+.20	1.63	—	—	+.15	1.06	—	—	-.08	0.73	+.074	5.1
47	$n i$	4176.273	-.07	2.06	+.01	0.93	—	—	-.14	0.44	—	—	+.30	0.41	-.016	2.5
48	$n o$	5101.719	+.27	1.11	-.08	1.14	—	—	+.61	0.77	—	—	-.36	0.34	+.164	3.0
49	$i h$	2063.291	+.13	4.95	-.26	0.88	—	—	-.71	0.55	—	—	+.07	0.79	+.012	3.6
50	$b c$	4594.263	-.27	1.92	-.01	1.68	—	—	.00	0.82	—	—	+.01	0.37	-.108	4.1
51	$b a$	2159.570	+.01	5.73	+.19	1.70	—	—	+.32	1.08	—	—	+.03	0.76	+.081	7.7
52	$f i$	2553.233	-.23	1.64	+.09	1.48	-.05	0.47	+.33	0.52	+.35	0.83	—	—	+.042	2.9
53	$f a$	6740.367	+.05	2.07	-.04	0.53	—	—	+.36	0.60	—	—	-.59	0.26	+.039	3.2
54	$p q$	3224.962	+.09	5.28	-.31	1.21	—	—	+.03	1.47	+.07	0.65	-.30	0.53	+.005	8.0
55	$p k$	4525.105	+.04	0.98	-.27	0.86	+.01	0.50	+.18	0.84	+.02	0.44	+.58	0.38	+.051	3.6
56	$q s$	3413.786	+.06	3.72	-.09	1.73	+.19	0.36	-.22	1.44	-.02	0.61	-.44	0.50	-.053	7.3
57	$q r$	3398.718	+.21	3.72	+.03	1.73	-.12	0.36	-.41	1.44	-.17	1.22	—	—	-.003	7.5
58	$e i$	4651.565	-.20	1.44	+.22	0.83	+.66	0.23	+.23	0.41	+.30	0.42	—	—	+.081	2.2
59	$e a$	4386.949	-.27	1.00	-.65	0.45	+.15	0.26	+.08	0.86	+.28	0.45	—	—	-.110	2.8
60	$d m$	6940.902	+.17	2.03	+.08	0.52	+.39	0.14	-.20	0.90	-.21	0.54	—	—	+.038	3.7
61	$d b$	2697.651	-.04	1.57	-.07	1.40	+.57	0.48	-.11	1.03	+.02	1.56	—	—	+.006	5.0
62	$t v$	1821.767	+.05	3.26	-.21	1.92	+.12	0.60	-.04	1.12	-.16	2.22	—	—	-.065	8.2
63	$t s$	2850.021	-.05	3.75	+.26	2.01	+.43	0.43	-.21	1.53	-.10	1.48	—	—	+.007	8.0
64	$\theta\delta$	3429.025	-.16	2.48	+.09	1.15	+.24	0.36	+.22	0.96	+.03	1.22	—	—	+.008	5.5
65	$\theta\zeta$	4482.342	+.02	1.98	—	—	+.22	0.25	-.26	0.84	-.31	0.89	—	—	-.099	3.2
66	$\lambda\mu$	6914.024	+.01	2.70	+.01	0.78	-.67	0.14	+.64	0.90	-.52	0.54	—	—	+.051	4.7
67	$\lambda\zeta$	5601.102	+.05	4.15	-.03	1.23	—	—	-.37	0.72	-.39	0.66	—	—	-.050	4.6
68	$m o$	3457.027	+.10	1.23	-.20	1.14	+.44	0.36	-.20	0.48	+.13	0.60	—	—	+.006	3.5
69	$m i$	1175.229	-.08	3.54	+.09	2.52	—	—	+.26	0.59	+.13	1.41	—	—	+.034	3.8
70	μx	4362.951	-.08	5.50	+.19	1.34	+.24	0.26	+.31	1.29	-.16	0.90	—	—	+.015	8.5
71	$z a$	4202.502	-.03	3.09	-.06	1.15	—	—	-.04	0.88	-.12	0.94	—	—	-.049	3.8
72	$z w$	4699.460	-.16	1.90	-.16	1.66	—	—	-.01	0.82	-.07	0.84	—	—	-.122	3.3
73	$x a$	5898.773	+.05	1.58	+.15	0.65	-.10	0.16	-.23	0.69	—	—	—	—	+.004	2.8
74	$x w$	1896.207	-.08	4.22	+.04	2.33	—	—	+.09	1.11	—	—	+.35	1.66	+.044	6.7
75	$k n$	5245.191	-.18	0.22	+.09	0.75	+.15	0.19	-.26	0.38	—	—	+.01	0.32	-.020	1.7
76	$k h$	1385.581	+.19	2.59	-.02	2.32	-.25	0.67	-.13	1.16	—	—	+.10	0.97	+.030	6.3
77	$y a$	6052.330	-.03	1.14	-.02	0.62	—	—	+.16	0.34	—	—	-.29	0.28	-.031	2.2
78	$y\beta$	1596.850	+.28	2.39	-.06	2.12	+.11	0.63	+.25	0.57	—	—	-.07	0.91	+.104	5.6
79	$\delta\eta$	6443.400	-.32	1.08	-.33	0.58	—	—	-.16	0.32	—	—	-.55	0.26	-.326	2.1
80	δa	3006.023	-.02	2.84	+.17	1.27	-.40	0.40	+.14	1.00	—	—	-.01	0.56	+.025	5.2
81	ϵi	4476.612	-.29	0.49	-.25	1.30	-.74	0.25	+.03	0.84	—	—	+.24	0.39	-.161	3.1
82	$\epsilon\beta$	4014.870	+.04	1.34	+.33	0.97	—	—	-.07	0.45	—	—	-.07	0.43	+.098	3.0
83	$g n$	6364.028	-.04	0.90	-.01	0.58	—	—	-.59	0.32	—	—	-.49	0.27	-.177	1.9

Ro- tation No.	Stars	Definitive Distance	Gill		Finlay		Jacoby		Chase		Schur		Ambronn		Mean	
84	<i>gl</i>	4265.696	+".14	1.53	+".60	0.91	—	—	+".32	0.44	—	—	—".27	0.41	+".236	2.4
85	<i>Em</i>	4915.713	—".19	2.73	+".16	1.60	+".03	0.21	+".25	1.18	—	—	—".19	0.35	—".002	6.0
86	<i>Ec</i>	6890.039	+".03	1.01	+".30	0.66	—	—	—".10	0.60	—	—	+".26	0.25	+".092	2.4
87	<i>Fz</i>	5054.101	—".06	1.33	—".26	0.77	+".33	0.20	—".12	0.78	—	—	—".39	0.35	—".128	3.2
88	<i>Fv</i>	5241.838	—".18	1.74	—".01	1.12	—	—	—".17	0.76	—	—	—".24	0.33	—".137	3.9
89	<i>sv</i>	3336.517	+".03	2.54	+".39	1.76	—	—	+".35	0.96	—".14	0.62	—	—	+".169	5.4
90	<i>sr</i>	5718.762	—".05	1.63	+".38	1.02	—	—	—".04	0.72	+".57	0.32	—	—	+".127	3.5
91	<i>γw</i>	6786.124	+".08	1.36	+".02	0.53	—".39	0.14	+".32	0.60	—	—	+".16	0.25	+".107	2.6
92	<i>nh</i>	6170.524	—".47	0.74	+".34	0.60	—".05	0.16	—".31	0.33	—	—	—".04	0.28	—".122	2.0
93	<i>ac</i>	3763.057	+".16	2.26	+".17	2.08	+".27	0.64	—".04	1.15	—	—	—".14	0.45	+".115	5.3
94	<i>vu</i>	1237.641	+".02	5.52	—".10	2.46	+".02	0.70	—".10	1.18	—	—	+".05	1.02	—".016	9.3
95	<i>fm</i>	3651.896	+".05	5.27	—".03	4.34	—".07	0.68	+".10	1.41	—".14	0.57	—	—	+".008	10.8
96	<i>fl</i>	5526.064	+".29	1.68	+".04	1.43	—	—	+".09	0.36	—	—	—".28	0.30	+".135	2.8
97	<i>pu</i>	7056.139	—".32	0.67	+".26	0.52	+".41	0.14	—	—	—	—	.00	0.25	—".015	1.5
98	<i>po</i>	1317.341	.00	5.36	—".03	2.40	.00	0.69	—".18	1.17	—".23	1.35	—".11	1.00	—".058	8.7
99	<i>qv</i>	5013.854	+".13	3.56	—".15	2.73	+".20	0.20	—".03	1.17	—".07	0.39	+".42	0.35	+".025	7.5
100	<i>qm</i>	6731.595	—".03	2.75	—".08	1.88	+".23	0.14	—".21	1.22	—".14	0.55	—	—	—".086	6.2
101	<i>ek</i>	5504.030	—".14	1.68	—".07	0.71	—	—	—".02	0.73	+".38	0.34	—	—	—".049	3.0
102	<i>eb</i>	4451.882	—".14	0.99	+".32	0.88	+".20	0.26	+".04	0.84	+".09	0.45	—	—	+".081	3.1
103	<i>di</i>	5785.060	—".20	0.80	—".44	0.66	+".17	0.16	—	—	—".06	0.31	—	—	—".229	1.5
104	<i>tx</i>	5162.402	—".10	1.74	+".16	1.50	—".59	0.19	—".04	0.38	+".05	0.37	—	—	—".008	3.8
105	<i>ld</i>	6776.484	+".05	3.06	+".06	0.93	+".15	0.14	—".37	0.60	+".45	0.55	—	—	+".052	4.6
106	<i>ml</i>	4247.997	+".28	1.02	+".15	0.91	—".10	0.28	—".29	0.44	—".08	0.47	—	—	+".070	2.4
107	<i>zd</i>	5383.282	+".15	1.70	—".23	0.73	—".07	0.19	—".18	0.37	—	—	—	—	+".004	2.3
108	<i>zγ</i>	4064.637	+".20	1.06	+".08	0.96	+".19	0.30	—".50	0.45	—".05	0.49	—	—	+".027	2.5
109	<i>xγ</i>	6444.042	—".17	0.72	+".10	0.58	+".48	0.23	+".28	0.32	—	—	—".23	0.26	+".038	2.0
110	<i>ko</i>	3707.611	—".01	1.73	+".43	0.53	+".23	0.32	+".26	0.46	—".01	0.56	+".01	0.46	+".100	3.4
111	<i>yδ</i>	7193.459	+".33	0.66	—".09	0.51	+".83	0.14	—	—	—	—	—	—	+".219	1.2
112	<i>yw</i>	3594.171	+".18	1.19	+".23	1.10	—".48	0.34	—".08	0.47	—	—	—".03	0.47	+".072	3.0
115	<i>gi</i>	2190.700	—".23	1.87	—".02	1.68	+".13	0.53	—".17	0.54	—	—	+".06	0.75	—".082	2.9
116	<i>Ei</i>	4314.118	—".01	1.02	+".17	0.91	+".32	0.27	—".29	0.43	—	—	—".41	0.40	—".021	2.2
117	<i>Fx</i>	3545.292	+".31	1.20	+".16	1.68	+".33	0.35	—".22	0.47	—	—	—".57	0.48	+".093	3.9
118	<i>su</i>	3010.540	+".03	2.84	—".02	1.27	—".15	0.40	—".08	1.00	—".08	0.69	—	—	—".022	5.5
119	<i>rv</i>	5154.003	—".06	1.74	+".44	0.75	—".03	0.20	—".15	0.76	—	—	+".11	0.33	—".012	3.6
120	<i>wu</i>	3343.846	+".03	2.55	—".45	0.58	+".15	0.36	+".06	0.96	—	—	—".09	0.51	—".028	4.2
122	<i>fe</i>	2358.319	—".07	6.16	+".06	2.40	—".04	0.50	—".14	1.59	—	—	—".14	0.71	—".056	8.9
124	<i>qw</i>	7231.412	+".05	2.64	+".27	0.51	+".08	0.14	—	—	—".36	0.27	—".30	0.25	+".031	3.4
125	<i>eh</i>	4373.571	—".07	1.00	+".11	0.89	.00	0.26	+".01	0.43	—".38	0.45	—	—	—".045	2.8
126	<i>dk</i>	7000.763	.00	0.67	+".11	0.52	+".20	0.14	—".40	0.30	+".43	0.27	—	—	+".046	1.8
127	<i>tw</i>	3939.444	+".14	1.62	—".31	0.48	+".20	0.30	+".13	0.45	.00	0.50	—	—	+".063	3.0
128	<i>mg</i>	3026.568	+".08	1.41	—".30	1.26	—".13	0.40	+".26	0.50	+".55	0.69	—	—	+".043	3.7
129	<i>zβ</i>	3026.879	+".27	1.41	—".15	1.26	+".49	0.40	—".36	0.50	—".37	0.69	—	—	—".012	3.1
130	<i>xβ</i>	4534.787	+".22	0.98	+".24	0.86	—".03	0.24	—".02	0.41	—	—	—".24	0.37	+".108	2.7
131	<i>kc</i>	6464.942	+".19	0.71	+".16	0.57	—	—	+".37	0.31	—	—	+".25	0.26	+".221	1.7
132	<i>yv</i>	5823.259	—".04	1.20	—".31	0.33	—".26	0.16	+".02	0.35	—	—	—	—	—".092	1.9
133	<i>εη</i>	1598.901	—".01	2.39	+".25	2.12	.00	0.63	—".04	0.57	—	—	—".05	0.91	+".067	6.0
134	<i>go</i>	5803.086	+".05	0.80	.00	0.66	+".04	0.17	+".04	0.35	—	—	+".02	0.29	+".025	2.0
135	<i>EH</i>	6076.853	—	—	—".13	0.62	+".19	0.16	—".46	0.34	—	—	—".61	0.28	—".267	1.4
136	<i>Fw</i>	5152.924	—".04	2.62	—".03	0.75	+".12	0.20	—".09	0.77	—	—	—	—	—".036	3.9
137	<i>ru</i>	3991.078	+".03	1.60	+".17	0.97	—".17	0.30	+".02	0.45	—	—	+".02	0.43	+".046	3.5
138	<i>fb</i>	6678.956	+".48	0.69	+".21	0.53	—".47	0.14	+".53	0.30	—	—	+".35	0.25	+".322	1.8
139	<i>pr</i>	5048.697	—".34	1.78	+".01	1.17	—".14	0.20	—".06	1.17	+".27	0.39	+".70	0.35	—".070	4.7
140	<i>qu</i>	3889.100	—".08	1.65	—".05	1.00	+".38	0.31	+".01	0.90	+".25	0.50	+".27	0.43	+".039	4.5
141	<i>em</i>	5819.612	—".02	3.20	—".20	2.31	—".31	0.16	—".20	1.75	—".32	0.62	—	—	—".138	6.9
142	<i>dh</i>	6069.776	+".30	1.52	+".26	1.24	+".11	0.16	+".33	0.34	+".39	0.30	—	—	+".284	3.2
143	<i>tu</i>	601.775	—".21	1.76	—".06	6.40	—".13	0.80	+".15	1.22	+".01	3.40	—	—	—".049	11.1

Ro- tation No.	Stars	Definitive Distance	<i>Gill</i>		<i>Finlay</i>		<i>Jacoby</i>		<i>Chase</i>		<i>Schur</i>		<i>Ambrohn</i>		<i>Mean</i>	
144	<i>mh</i>	2602.717	+".10	0.41	—".19	1.45	+".21	0.46	—".01	0.52	+".03	0.81	—	—	—".036	3.5
145	<i>zη</i>	5138.599	+".31	0.88	—".29	0.76	—".11	0.19	+".47	0.39	.00	0.39	—	—	+".081	2.1
146	<i>xu</i>	4572.962	—".04	1.92	+".04	0.84	+".31	0.24	—".24	0.82	+".04	0.43	—".09	0.37	—".037	4.1
147	<i>yε</i>	4504.656	+".07	0.98	—".01	0.86	—".34	0.25	—".21	0.42	—	—	—".16	0.38	—".064	2.7
148	<i>εα</i>	6038.157	—".13	1.54	+".26	0.63	—".13	0.16	—".27	0.34	—	—	+".47	0.28	—".009	2.8
149	<i>gh</i>	814.563	—".13	3.28	—".01	2.91	+".20	0.76	—".06	0.60	—".17	1.60	—	—	—".064	6.8
150	<i>Ek</i>	6020.077	—".01	0.77	—".01	0.31	—".25	0.16	+".51	0.34	—	—	—".19	0.28	+".034	1.8
151	<i>Fy</i>	5914.165	+".10	0.78	+".33	0.64	+".53	0.16	+".48	0.34	—	—	+".61	0.28	+".327	2.1
152	<i>fo</i>	6795.865	—".13	0.68	+".01	1.06	—".16	0.14	+".51	0.60	+".06	0.27	—	—	+".083	2.5
153	<i>ph</i>	5910.509	—".02	0.78	—".06	0.64	—".07	0.16	—".01	0.34	—	—	+".81	0.28	+".072	2.1
154	<i>qn</i>	5517.645	—".05	2.52	—".03	1.43	+".24	0.18	—".04	1.08	—".15	0.68	—	—	—".051	5.4
155	<i>eg</i>	3560.857	+".18	1.20	—".05	1.11	+".05	0.34	—".28	0.47	—".07	0.59	—	—	—".002	3.2
156	<i>dc</i>	2910.765	+".13	2.94	+".11	1.31	+".56	0.41	—".40	1.00	—".04	1.44	—	—	+".044	5.3
157	<i>mc</i>	7050.633	+".17	0.67	—".26	0.52	+".64	0.14	+".46	0.30	—".09	0.27	—	—	+".099	1.8
158	<i>zv</i>	6640.657	.00	3.14	—".01	1.64	+".45	0.14	+".12	1.55	+".58	0.28	+".11	0.26	+".057	4.3
159	<i>xv</i>	3340.738	—".25	2.52	—".06	1.17	+".18	0.36	+".22	0.97	+".27	0.62	+".10	0.51	—".035	5.5
160	<i>yu</i>	6933.942	+".07	0.67	—".10	0.52	—".09	0.14	+".28	0.30	—	—	+".01	0.25	+".039	1.8
161	<i>εδ</i>	5012.382	—".08	3.11	+".38	1.56	+".63	0.40	+".14	0.39	—	—	—".04	0.70	+".103	5.3
162	<i>Eg</i>	5741.134	—".16	0.81	—".27	0.67	—".02	0.17	+".19	0.35	—	—	—".36	0.29	—".150	2.1
163	<i>Fu</i>	6289.293	—".09	1.47	—".13	0.60	—".04	0.16	—".12	0.33	—	—	—".09	0.28	—".096	2.8
164	<i>fk</i>	3150.220	—".06	3.38	—".18	2.45	—".12	0.38	—".12	1.47	—".04	1.32	—	—	—".102	7.1
165	<i>pi</i>	5001.854	—".02	0.89	+".16	0.78	—".40	0.20	—".34	0.39	—	—	—".36	0.35	—".085	1.9
166	<i>ed</i>	2018.006	—".14	4.06	—".19	1.79	+".09	0.57	+".15	1.10	—".25	2.04	—	—	—".130	6.9
167	<i>θα</i>	6404.272	—".18	2.52	—".03	1.74	—".13	0.15	—".20	1.28	+".35	0.58	—	—	—".090	5.7
168	<i>zy</i>	1890.544	—".10	2.11	—".26	1.86	+".10	0.59	—".32	0.55	+".21	1.07	—	—	—".091	3.8
169	<i>yη</i>	5320.028	—".05	1.72	—".14	0.74	+".42	0.19	—".47	0.75	—	—	+".07	0.32	—".120	3.4
170	<i>Ef</i>	5042.418	+".22	1.78	+".08	1.94	+".14	0.20	+".11	1.17	—	—	—".06	0.35	+".123	5.2
171	<i>fh</i>	2049.774	—".13	0.50	+".01	2.64	—".13	0.57	—".07	0.55	+".04	1.02	—	—	—".017	4.8
172	<i>fd</i>	4029.456	—".07	3.20	—".19	1.93	+".51	0.30	—".16	0.45	—".08	0.50	+".39	0.43	—".060	5.6
173	<i>pm</i>	3827.938	—".02	4.20	+".08	2.55	—".21	0.32	+".23	0.92	—".22	0.54	—".35	0.45	—".003	8.2
174	<i>pn</i>	4366.019	—".11	3.50	—".02	2.23	—	—	+".08	1.72	—	—	—	—	—".040	6.7
175	<i>dg</i>	5290.052	—".34	0.86	+".25	0.74	—".97	0.19	—	—	—".04	0.36	—	—	—".140	1.9
176	<i>fg</i>	1260.625	+".12	4.11	+".27	2.45	—".33	0.70	+".04	0.59	—	—	+".17	1.01	+".131	6.7
177	<i>pg</i>	6574.719	+".29	0.70	—".15	0.55	+".56	0.15	—".59	0.31	—	—	—".92	0.26	—".111	1.8

In conclusion, I desire to convey to the Astronomers and Directors of Observatories who have shared this work, an expression of my warm thanks for their hearty and ready cooperation — and also gratefully to acknowledge the aid received towards the cost of the reductions by a grant from the *Bruce Fund*.

Royal Observatory, Cape of Good Hope, 1892 June 27.

David Gill.

Ueber die unregelmässige Eigenbewegung von Procyon nach O. Struve's Mikromettermessungen.

Von *L. Struve*.

Im Jahre 1883 veröffentlichte ich eine Abhandlung unter dem Titel »Resultate aus den in Pulkowa angestellten Vergleichen von Procyon mit benachbarten Sternen« (*Mémoires de l'Académie Impériale des sciences de St. Pétersbourg* VII^e série, Tome XXXI, No. 2). Diese Schrift enthält u. a. auch eine Bearbeitung der von O. Struve in den Jahren 1851–1882 angestellten mikrometrischen Vergleichen von Procyon mit zwei kleinen Sternen in seiner Nachbarschaft.

Als Resultat ergab sich, dass der Halbmesser der, kreisförmig vorausgesetzten, Bahn des Procyon um den Schwerpunkt seines Systems höchst wahrscheinlich kleiner ist, als ihn die bekannte, von Auwers aus Meridianbeobachtungen abgeleitete Bahn (Monatsberichte der K. Preussischen Akademie der Wissenschaften zu Berlin, Mai 1873) angiebt. Allerdings zeigen die von Auwers aus den Rectascensionen und Declinationen gesondert abgeleiteten Resultate verhältnissmässig