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9.

Measures of Double Stars made at Sydney.

By *H. C. Russell.*

The following list contains the measures of Double Stars made at the Sydney Observatory during the year 1895. The measures are a continuation of the work published in *Astronomische Nachrichten* No. 3303.

The instrument is the 11 1/2 inch Refractor, 12 1/2 feet focal length, by Schröder, with micrometer by the same maker, and the power generally used is 800.

The star places have been reduced as heretofore to the epoch 1900.0.

The last column contains the weight on a scale of 10 assigned to each observation from a consideration of the circumstances under which it was taken.

Only two abbreviations of double star observers' names are employed in the present list, namely the well known synonyms α and β which stand respectively for Sir John Herschel and S. W. Burnham. In all other cases the observer's name is printed in full.

For the new double stars found by Messrs. Gale and Innes, some measures of which appear in this list, see *Monthly Notices of the Royal Astronomical Society* Vol. LV No. 5.

The observations were made and reduced by *R. P. Sellors.*

New Double Stars.

The reference numbers attached to these new double stars are continued from the list published in *Monthly Notices of Royal Astronomical Society* Vol. LIV No. 2.

Epoch	PA.	Dist.	Magn.	Wt.
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Sellors 15. St. 2707.

RA. 5^h 52^m 17^s Decl. —61° 51'.

1895.077	326°3	0.62	7 , 7	7
093	323.4	0.70	7 , 7.5	7
118	323.5	0.82	7 , 8	6
1895.095	324.4	0.71	7 , 7.5	

Sellors 16. St. 4841.

RA. 9^h 1^m 58^s Decl. —64° 17'.

1895.246	304.9	0.95	7.5 , 9	8
266	308.1	1.00	7.8 , 10	7
405	309.2	1.27	8 , 10	3
1895.280	306.9	1.02	7.8 , 9.7	

Sellors 17. St. 5575.

RA. 10^h 10^m 1^s Decl. —64° 40'.

1895.266	340.1	3.32	7 , 12	4
386	336.6	3.51	7 , 11	6
424	339.2	2.67	7 , 11.5	6
1895.370	338.5	3.15	7 , 11.5	

Epoch	PA.	Dist.	Magn.	Wt.
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Sellors 18. St. 7327.

RA. 13^h 16^m 55^s Decl. —47° 25'.

1895.427	226°2	0.71	7 , 8	7
444	222.0	0.80	6.5 , 7.5	8
476	224.2	0.80	6.8 , 7.5	5
1895.446	224.0	0.77	6.8 , 7.7	

There is an 8.5 mag. comes at 62° ± 38" ±.

Sellors 19. St. 7723.

RA. 14^h 1^m 13^s Decl. —49° 24'.

1895.444	225.6	1.09	6.8 , 7.3	8
476	231.9	1.12	6.5 , 7.5	7
518	231.5	1.00	7 , 7.8	8
1895.479	229.6	1.07	6.8 , 7.5	

Sellors 20. St. 8348.

RA. 15^h 15^m 41^s Decl. —47° 33'.

1895.539	218.0	1.73	7.8 , 8	8
553	217.0	1.60	7 , 8	5
561	217.9	1.52	7.5 , 8	8
1895.551	217.7	1.62	7.4 , 8	

Epoch	PA.	Dist.	Magn.	Wt.
Sellors 21. St. 9034.				
RA. $16^h 33^m 41^s$ Decl. $-47^\circ 33'$.				
1895.602	321.1	1.57	7 , 8.8	9
611	323.8	1.37	7 , 9	6
679	321.3	1.57	7.5 , 9	6
1895.627	321.9	1.51	7.2 , 8.9	

Measures of Double Stars.

Epoch	PA.	Dist.	Magn.	Wt.
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h 3415. St. 413.				
RA. $0^h 59^m 19^s$ Decl. $-41^\circ 11'$.				
1895.871	148.3	1.03	7 , 8.3	6
994	152.0	1.41	7 , 8.5	7
1895.937	150.3	1.23	7 , 8.4	
p Eridani. Dunlop 5. St. 667-8.				
RA. $1^h 35^m 59^s$ Decl. $-56^\circ 42'$.				
1895.920	223.3	7.65	5 , 5	4
936	223.7	7.61	5.5 , 5.5	7
947	225.1	7.74	6 , 6	5
1895.935	224.0	7.66	5.5 , 5.5	
β 1004. St. 1710.				
RA. $3^h 58^m 12^s$ Decl. $-34^\circ 46'$.				
1895.063	144.9	1.34	7 , 9	4
077	144.9	1.57	7 , 8.5	9
093	144.6	1.60	7 , 8	10
1895.082	144.8	1.54	7 , 8.5	

Sellors 6. St. 1898.				
RA. $4^h 23^m 5^s$ Decl. $-53^\circ 20'$.				
1895.077	93.7	0.87	7 , 9.5	5
104	92.1	0.66	7 , 9	6
112	93.8	0.78	7 , 9.2	5
1895.098	93.1	0.76	7 , 9.2	

β 746. Cord. GC. 5107.				
RA. $4^h 27^m 57^s$ Decl. $-36^\circ 7'$.				
1895.077	12.4	1.11	8 , 9	7
104	11.5	1.02	7.8 , 9	9
112	12.1	1.02	8 , 9	5
1895.097	11.9	1.05	7.9 , 9	

h 3696. Anon.				
RA. $4^h 46^m 0^s$ Decl. $-56^\circ 11'$.				
1895.077	287.6	3.71	8.5 , 9.5	7
104	287.3	3.51	8.5 , 9.5	7
118	287.2	3.55	9 , 10	5
1895.098	287.4	3.59	8.7 , 9.7	
Other measures indicate change.				
1834.93	265.7	2 \pm	h	2 n
1873.05	278.7	3.62	Russell	1 n

Epoch	PA.	Dist.	Magn.	Wt.
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h 3724. Cord. ZC. $5^h 16$.				
RA. $5^h 0^m 52^s$ Decl. $-55^\circ 56'$.				
1895.137	281.8	3.01	9.5 , 9.5	6
178	280.7	3.21	9.5 , 9.5	4
192	282.6	2.91	9 , 9	8
1895.171	281.9	3.01	9.3 , 9.3	
Hargrave ... Cord. ZC. $5^h 10 65$.				
RA. $5^h 29^m 12^s$ Decl. $-66^\circ 41'$.				
1895.077	21.5	1.66	8.3 , 8.3	6
156	19.3	1.43	9 , 9	4
194	22.3	1.60	9 , 9	5
1895.137	21.2	1.58	8.8 , 8.8	

Measured by Hargrave 1883.17 in mistake for h 3768 which has about the same declination, but is $3^m 10^s$ preceding the above pair.

h 3784. St. 2542.				
RA. $5^h 35^m 22^s$ Decl. $-46^\circ 9'$.				
1895.137	62.2	4.99	7.5 , 10	6
192	62.1	5.33	7 , 8.3	9
194	61.9	5.12	7 , 9	5
1895.176	62.1	5.18	7.2 , 9.1	

Other measures indicate change.

1834.99	48.6	$2\frac{1}{2} \pm$	h	1 n
1837.92	51.3	$3\frac{1}{2} \pm$	h	1 n
1852.14	56.0	$5 \pm$	Santiago	1 n
1879.14	58.6	4.65	Hargrave	1 n

Cord. ZC. $5^h 20 57$ »dpl. I«. St. 2722.

RA. $5^h 53^m 59^s$ Decl. $-41^\circ 46'$.				
1895.112	209.7	1.89	7 , 7.2	5
137	209.5	1.60	7 , 7.3	7
156	211.2	1.55	7 , 7.5	5
1895.135	210.1	1.67	7 , 7.3	

Also noted »close double« in St. and »n sq« in Cord. GC. No other measures.

Epoch	PA.	Dist.	Magn.	Wt.
h 3834. St. 2789.				
RA. 6 ^h 1 ^m 48 ^s Decl. -45° 5'.				
1895.112	225.7	3.55	6 , 10	6
137	227.7	3.78	6.3 , 9	7
156	225.3	3.49	5.8 , 9	5
1895.134	226.4	3.62	6.0 , 9.3	

Other measures indicate change.

1837.92	245.9	1 $\frac{1}{4}$ ±	h	1 n
1854.05	237.3	2.58	Jacob	2 n
1873.12	230.6	3.04	Russell	1 n

Dunlop 23. St. 2795.				
RA. 6 ^h 2 ^m 11 ^s Decl. -48° 27'.				
1895.137	32.8	1.60	6 , 6	7
151	33.3	1.28	6.8 , 7	8
192	33.0	1.64	7 , 7.3	10
1895.163	33.0	1.51	6.6 , 6.8	

h 4000. St. 3850.				
RA. 7 ^h 40 ^m 31 ^s Decl. -58° 26'.				
1895.227	233.6	1.52	6.5 , 11	7
236	235.7	1.48	7 , 10.5	8
246	237.0	1.36	6 , 10	8
1895.237	235.5	1.45	6.5 , 10.5	

The principal star has proper motion according to St. 0.000 in RA., +0.05 in NPD.

h 4019. Cord. GC. 10435-6.				
RA. 7 ^h 51 ^m 57 ^s Decl. -41° 34'.				
1895.211	153.8	5.31	8 , 10.5	7
227	152.8	5.15	8 , 10.5	7
236	153.1	5.28	7.8 , 10.5	8
1895.225	153.2	5.25	7.9 , 10.5	

h 4045. Cord. ZC. 8 ^h 1.				
RA. 8 ^h 0 ^m 42 ^s Decl. -50° 10'.				
1895.227	223.7	4.60	8 , 10	7
266	225.0	4.62	8 , 9	8
348	224.0	4.44	8 , 9	5
1895.273	224.3	4.57	8 , 9.3	

h 4073. St. 4265.				
RA. 8 ^h 14 ^m 30 ^s Decl. -37° 4'.				
1895.230	179.6	1.71	7.8 , 9.5	5
266	179.5	1.84	7 , 8	9
348	180.9	1.57	7 , 8	6
1895.282	179.9	1.73	7.3 , 8.5	

No change. Russell's position angle 1878.16 was 176° 52' and not 276° 52' as misprinted on page 22 of the »Sydney Observatory Double Star Results 1871-81.«

Epoch	PA.	Dist.	Magn.	Wt.
h 4085. St. 4295.				
RA. 8 ^h 17 ^m 34 ^s Decl. -36° 10'.				
1895.236	270.1	5.55	5.8 , 12	7
266	269.7	6.10	5.5 , 11.5	7
386	270.2	6.54	5.5 , 11	8
1895.300	270.0	6.09	5.6 , 11.5	

Sellors 9. Cord. ZC. 8 ^h 3683.				
RA. 8 ^h 45 ^m 25 ^s Decl. -63° 27'.				
1895.246	0.8	1.21	7.8 , 8.8	8
266	0.8	1.25	8 , 9	8
386	0.2	1.19	8 , 9	9
1895.303	0.6	1.22	7.9 , 8.9	

h 4165. St. 4816.				
RA. 8 ^h 58 ^m 38 ^s Decl. -51° 48'.				
1895.227	95.2	1.09	6 , 7	7
230	96.3	0.91	6 , 8	6
386	98.5	1.09	6 , 7.5	9
1895.293	96.9	1.04	6 , 7.5	

St. 6641 »very close double« (Washburn 114).

RA. 11 ^h 49 ^m 57 ^s Decl. -55° 32'.				
1895.383	201.3	1.66	7 , 7.5	7
424	203.0	1.84	7 , 7.3	10
427	203.1	1.77	7 , 7.5	10
1895.414	202.6	1.77	7 , 7.4	

Cord. ZC. 12^h 291 »dpl. II«. Cord. GC. 16635.
(Sydney₁ 192 = Innes 14?).

RA. 12 ^h 6 ^m 2 ^s Decl. -51° 40'.				
1895.405	98.0	2.89	8 , 9.5	8
411	100.5	2.92	7.5 , 9.5	5
441	98.9	2.96	7.8 , 9.5	5
1895.417	98.9	2.92	7.8 , 9.5	

The position angle as estimated by Innes in 1894 differs 40° from the above measures.

Sellors 10. Cord. GC. 16725.				
RA. 12 ^h 9 ^m 48 ^s Decl. -35° 40'.				
1895.424	245.3	1.85	7.5 , 9	7
444	244.7	1.93	7.3 , 10	6
487	244.8	2.18	7.5 , 9	10
1895.457	244.9	2.01	7.4 , 9.3	

Sydney ₁ 193. St. 6838.				
RA. 12 ^h 12 ^m 34 ^s Decl. -35° 32'.				
1895.487	167.8	0.98	6.5 , 7.5	9
501	165.6	0.96	6.5 , 7.3	7
518	166.0	1.12	7.3 , 7.5	8
1895.501	166.6	1.02	6.8 , 7.4	

Epoch	PA.	Dist.	Magn.	Wt.
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Cord. ZC. $12^h 10^m 33^s$ »dpl. II« (Sydney₁ 198).

RA. $12^h 17^m 59^s$ Decl. $-51^\circ 38'$.

1895.405	51.7	2.85	8.5 , 9	8
411	51.2	3.37	8 , 9	5
441	52.0	2.80	8 , 9	8
1895.420	51.7	2.95	8.2 , 9	

γ Centauri. h 4539. St. 7022.

RA. $12^h 36^m 0^s$ Decl. $-48^\circ 25'$.

1895.386	359.6	1.48	4 , 4	5
405	359.3	1.44	4 , 4	10
424	358.0	1.36	4 , 4	7
1895.407	359.0	1.42	4 , 4	

β Muscae. Sydney₁ 207. St. 7053.

RA. $12^h 40^m 9^s$ Decl. $-67^\circ 34'$.

1895.424	336.0	1.11	5 , 5	7
441	337.0	1.41	4 , 4	4
476	336.2	1.07	4.5 , 4.5	7
1895.448	336.3	1.16	4.5 , 4.5	

Sydney₂ 80. Anon.

RA. $12^h 46^m 5^s$ Decl. $-58^\circ 31'$.

1895.411	166.5	3.90	9 , 10	5
501	165.7	4.10	8.5 , 9.5	5
518	166.2	4.07	8.3 , 9	6
1895.479	166.1	4.03	8.6 , 9.5	

h 4580. St. 7328.

RA. $13^h 17^m 4^s$ Decl. $-48^\circ 2'$.

1895.487	Single, definit. good	7 , —	—
523	Single, definit. good	7 , —	—
537	Sgl., defin. very good	7 , —	—

h made the position angle $10^\circ 3$ and the distance $0''.5$ on 1836.19 (1N) which is the only observation there is of this star.

Dunlop 151. St. 7641.

RA. $13^h 50^m 40^s$ Decl. $-55^\circ 33'$.

1895.479	22.8	13.30	7 , 8	8
515	23.5	13.48	7 , 8.5	5
526	22.8	13.44	7.5 , 8.5	8
1895.505	23.0	13.40	7.2 , 8.3	

Cord. ZC. $13^h 35^m 13^s$ »dpl. I«.

RA. $13^h 58^m 59^s$ Decl. $-49^\circ 55'$.

1895.444	66.2	2.48	8 , 8.5	7
476	68.3	2.37	8 , 9	7
518	68.6	2.69	7.5 , 8	7
1895.479	67.7	2.51	7.8 , 8.5	

Epoch	PA.	Dist.	Magn.	Wt.
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α Centauri. St. 7964-5.

RA. $14^h 32^m 49^s$ Decl. $-60^\circ 25'$.

1895.441	209.1	21.09	1 , 3	6
476	208.0	20.99	1 , 3	8
479	207.6	21.43	1 , 3	6
515	208.2	20.97	1 , 3	5
534	208.1	21.16	1 , 3	5
1895.486	208.2	21.12	1 , 3	

π Lupi. h 4728. St. 8191.

RA. $14^h 58^m 18^s$ Decl. $-46^\circ 40'$.

1895.523	87.2	1.18	4.5 , 4.5	7
534	87.7	1.30	5 , 5	5
537	87.0	1.27	5 , 5	10
1895.532	87.2	1.25	4.8 , 4.8	

γ Lupi. h 4786. St. 8464.

RA. $15^h 28^m 29^s$ Decl. $-40^\circ 50'$.

1895.526	Single, definit. good	5 , —	—
561	Sgl., definit. very fair	— , —	—
591	Sgl., seeing ver. good	5 , —	—

δ Lupi. h 4788. St. 8468.

RA. $15^h 29^m 0^s$ Decl. $-44^\circ 37'$.

1895.515	357.8	2.12	5 , 8.5	5
518	359.3	2.21	5 , 8	7
526	358.7	2.10	5 , 8	8
1895.520	358.7	2.14	5 , 8.2	

Washburn 124. St. 8542.

RA. $15^h 37^m 39^s$ Decl. $-50^\circ 28'$.

1895.537	208.8	2.50	6.5 , 8	8
545	205.5	2.44	6.8 , 8.3	6
553	206.6	2.59	6.8 , 8	5
1895.544	207.2	2.50	6.7 , 8.1	

Sellors 11. St. 8614.

RA. $15^h 46^m 25^s$ Decl. $-60^\circ 27'$.

1895.526	91.2	0.96	6.5 , 8	6
539	90.4	1.18	6.8 , 8	5
561	92.1	1.12	6.5 , 8	8
1895.544	91.4	1.09	6.6 , 8	

Innes 15. St. 8844.

RA. $16^h 10^m 42^s$ Decl. $-64^\circ 24'$.

1895.561	313.4	1.27	7 , 9.3	8
591	315.5	1.14	6.8 , 9.3	7
602	314.8	1.19	7.5 , 9	8
1895.584	314.5	1.20	7.1 , 9.2	

Epoch	PA.	Dist.	Magn.	Wt.
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Cord. ZC. 16^h1114 »dpl. I«. Cord. GC. 22203.

RA. 16^h17^m52^s Decl. —48°55'.

A and B.

1895.553	207.0	1.57	7.5 , 7.5	6
561	206.9	1.64	7.3 , 7.3	8
564	206.6	1.71	7.3 , 7.3	5
1895.559	206.9	1.64	7.4 , 7.4	

A and C.

1895.553	108.8	9.72	7.5 , 11	5
561	108.6	10.04	7.3 , 11	8
564	107.3	9.90	7.3 , 10.5	5
1895.560	108.3	9.91	7.4 , 10.8	

Sellors 12. St. 9020.

RA. 16^h32^m33^s Decl. —47°35'.

1895.602	181.3	1.23	7 , 7.3	8
611	181.2	1.39	7 , 7.3	7
652	181.7	1.34	7.5 , 7.8	5
1895.618	181.4	1.31	7.2 , 7.5	

In the list of New Double Stars published in Monthly Notices of R. A. S. Vol. LIV No. 2, and also in the Measures of Double Stars published in Astronomische Nachrichten No. 3240, this pair is wrongly identified with Cord. ZC. 16^h2139.

Cord. ZC. 16^h2202 »dpl. II«.

RA. 16^h33^m19^s Decl. —47°28'.

1895.602	99.4	2.60	7.8 , 8.3	8
611	101.2	2.59	8 , 9	5
652	98.9	2.64	8 , 9	5
1895.618	99.8	2.61	7.9 , 8.8	

Washburn 131. St. 9229.

RA. 16^h52^m46^s Decl. —56°24'.

1895.537	133.7	2.05	6.5 , 10.5	5
679	136.0	2.14	6.5 , 10	5
1895.608	134.9	2.10	6.5 , 10.3	

The Washburn Catalogue wrongly identifies the principal star with St. 9221.

Melbourne GC. (1870) 870 »double«. St. 9423.

(β 416 = Sydney, 298).

RA. 17^h12^m7^s Decl. —34°53'.

1895.602	322.2	1.34	6 , 7.5	10
611	322.4	1.55	6 , 7.5	8
657	321.7	1.43	6 , 7.8	5
1895.617	322.2	1.43	6 , 7.6	

In 1877 Russell made the distance of this pair 1.97 and not 1.77 as misprinted at page 65 of the »Sydney Observatory Double Star Results 1871-81«. The correct distance is given with star No. 555 on page 42 of the same volume.

Epoch	PA.	Dist.	Magn.	Wt.
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h 5014. St. 9853.

RA. 17^h59^m36^s Decl. —43°26'.

1895.611	68.0	1.48	6 , 6	6
652	66.0	1.46	5.5 , 5.5	5
679	67.5	1.48	6 , 6	7
1895.649	67.3	1.47	5.8 , 5.8	

h calls this star B 6308, but it is identical with B 6302.

η Sagittarii. β 760. St. 9962.

RA. 18^h10^m52^s Decl. —36°47'.

1895.679	99.5	3.67	4.5 , 9.3	9
712	98.5	3.46	5.5 , 10	7
824	99.7	3.69	5 , 10.5	5
1895.725	99.2	3.60	5 , 9.9	

ξ Pavonis. Gale 2. St. 9984.

RA. 18^h14^m1^s Decl. —61°32'.

1895.679	149.7	3.07	5 , 9.5	7
790	153.0	—	— , —	3
1895.712	150.7	3.07	5 , 9.5	

γ Cor. Austr. h 5084. St. 10373.

RA. 18^h59^m40^s Decl. —37°12'.

1895.679	159.7	1.53	5.3 , 5.3	7
712	160.6	1.62	5.5 , 5.5	6
769	160.9	1.68	5.5 , 5.5	5
1895.715	160.3	1.60	5.4 , 5.4	

Innes ... St. 10974.

RA. 20^h29^m35^s Decl. —45°54'.

1895.846	1.5	2.00	7.5 , 8	5
871	0.2	1.78	7.5 , 8	5
1895.859	0.9	1.89	7.5 , 8	

From a manuscript list of new double stars forwarded to the Sydney Observatory by Mr. Innes.

Innes 17. St. 11035.

RA. 20^h37^m46^s Decl. —50°51'.

1895.794	221.3	1.05	7.5 , 7.5	5
824	222.9	1.41	7.5 , 7.5	6
871	218.6	1.23	7.5 , 7.5	5
1895.829	221.1	1.24	7.5 , 7.5	

θ Indi. h 5258. St. 11299.

RA. 21^h12^m44^s Decl. —53°52'.

1895.783	282.9	3.98	5 , 7	5
794	282.2	3.92	5 , 8	5
805	282.2	4.03	5 , 8	5
1895.794	282.4	3.98	5 , 7.7	

Epoch	PA.	Dist.	Magn.	Wt.
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θ Gruis. Jacob 238. St. 12013.

RA. 23^h 1^m 15^s Decl. —44° 4'.

1895.824	28°9	2"25	5 , 8	5
841	28.7	1.84	5 , 7.5	4
846	28.2	1.94	5 , 8	5
1895.837	28.6	2.02	5 , 7.8	

Cord. ZC. 23^h 7^m 12^s dpl. 6. St. 12192.

RA. 23^h 27^m 52^s Decl. —57° 35'.

1895.871	206.8	1.96	7.5 , 8	6
936	208.2	1.94	7.8 , 8.8	6
961	207.5	1.93	7.5 , 8.5	4
1895.918	207.5	1.95	7.6 , 8.4	

Sydney Observatory 1896 Febr. 21.

Epoch	PA.	Dist.	Magn.	Wt.
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Innes 25. Cord. GC. 31907.

RA. 23^h 29^m 47^s Decl. —58° 3'.

1895.871	238°5	1"14	7.5 , 7.8	6
936	236.9	1.16	7.3 , 7.8	5
961	235.4	1.28	7 , 7.5	4
1895.917	237.1	1.18	7.3 , 7.7	

Sellors 14. St. 12307.

RA. 23^h 45^m 17^s Decl. —52° 16'.

1895.871	65.9	1.27	7.3 , 7.3	7
994	62.6	1.28	7 , 7	8
1895.937	64.1	1.28	7.2 , 7.2	

H. C. Russell.

Note on the orbit of Sirius.

In the Astr. Nachr. No. 3336 Dr. Zwiers gives a very elegant method of determining the orbit of a double star, illustrating his formulae by the orbital movement of Sirius.

In instancing previous orbits he makes no reference to one I determined some time ago, mainly with this object in view, to demonstrate that a definitive determination of the orbit of Sirius was, at present, an impossibility.

I do not call attention to this, however, as a protest against Zwiers' orbit, but the rather to call attention to the close agreement between Zwiers' orbit and my own, an agreement that would no doubt have been referred to had it been known.

The following are the two orbits:

Lovedale, South Africa, 1896 April 1.

	Zwiers	Roberts
T	1893.75	1893.60
P	51.10 years	51.10 years
e	0.6131	0.6068
λ	223°61	226°26
i	44.60	47.22
Ω	37.06	35.45
a	7"77	8"35

The agreement, I think, is very remarkable, and cannot be the result of mere chance. The paper, in which my determination is made, is in the Astr. Journal No. 328.

I have another determination ready — one in which account is taken of the weight of the several observations — but I am waiting for the appearance of the companion.

Alex. W. Roberts.

Zur Reduction wegen Krümmung des Parallels beim Meridiankreis.

Zur Reduction der am Meridiankreis gemachten Ablesung wegen Krümmung des Parallels geben Brünnow und Chauvenet und wohl auch die anderen Lehrbücher über praktische Astronomie die Formel

$$\frac{1}{2} \sin 2\delta \cdot \frac{2 \sin^2 \frac{1}{2} t}{\sin 1''} + \sin 2\delta \cdot \sin^2 \delta \frac{2 \sin^4 \frac{1}{2} t}{\sin 1''}.$$

Bei Chauvenet ist für δ geschrieben δ' , welches die aus der Kreisablesung hervorgehende Declination bedeutet, die von der wahren um den Betrag des Reductionsausdrucks abweicht; doch ist hinzugefügt, dass man statt δ' auch die wahre Declination δ zur Berechnung des Reductionsausdrucks benutzen könne. Bei Brünnow ist überhaupt nicht besonders erwähnt, dass eigentlich die unreducirte Declination δ' zur Verwendung zu kommen hätte.

Man wird nun wohl kaum jemals die unreducirte Declination δ' bei der Berechnung der Reduction zur Verwendung bringen wollen, sondern immer die entweder genau

oder mindestens in hinlänglicher Näherung bekannte wahre Declination δ .

Aus der Gleichung $\operatorname{tg} \delta = \operatorname{tg} \delta' \cos t$ ergibt sich jedoch die Reduction $\delta' - \delta$, durch δ ausgedrückt, gleich

$$\frac{1}{2} \sin 2\delta \cdot \frac{2 \sin^2 \frac{1}{2} t}{\sin 1''} + \sin 2\delta \cdot \cos^2 \delta \frac{2 \sin^4 \frac{1}{2} t}{\sin 1''}.$$

Das zweite Glied dieses Ausdrucks kann selbst bei polnahen, unter einem erheblichen Stundenwinkel im Meridianrohr zu beobachtenden Sternen nicht 0"01 ausmachen, so dass also das erste Glied die gesamte Reduction darstellt. In der ersten Formel kann das zweite Glied bei polnahen Sternen jedoch sehr wohl mehrere Bogensekunden betragen. Benutzt man daher bei Berechnung der Reduction nach der ersten Formel statt der unreducirten Declination die wahre, so fälscht man das Resultat um den vollen Betrag des zweiten Gliedes.

Jena, Grossherz. Sternwarte, 1896 Mai 10.

Otto Knopf.