UNIVERSITY OF CALIFORNIA PUBLICATIONS

ASTRONOMY

LICK OBSERVATORY BULLETIN

NUMBER 29

MEASURES OF 117 NEW DOUBLE STARS

The stars in the present list are numbered in continuation of those previously published in the *Astronomische Nachrichten* and the LICK OBSERVATORY BULLETINS. As before, the work of discovery has been carried on mainly with the 12-inch telescope, but nearly all of the measures have been made with the 36-inch. The following pairs were also discovered with the larger instrument: Nos. 313-317, 319, 322-329, 332-337, 339, 340, 343, 352, 358, 362, 366, 369, 370, 386, 405, 411, 418, 421, 423 and 428, in all 36 pairs.

With respect to the angular separation of their components the double stars in this list may be classified as follows:

0".25	or less	8
0.26	to 0".50	24
0.51	to 1.00	28
1.01	to 2.00	29
2.01	to 5.00	28

In other words more than one-half of the pairs have distances not exceeding 1", and more than three-fourths, distances of 2" or less.

Professor Burnham has been kind enough to compare this list with his General Catalogue and has confirmed my belief that it contains no previously announced discoveries.

The star places are for 1900.0.

R. G. AITKEN.

January 19, 1903.

A. 313. BD. — 6°251.

R.A. 1^h 14^m 34^s ; Decl. — 5° 51'
(8.4—8.8)

1902.684	207.3	0".18	3	36
.736	207.9	0.19	3	36
.903	206.3	0.20	2	36
1902.77	207.2	0.19		

A. 314. BD. — 9°301.

R.A. 1^h 29^m 20^s ; Decl. — 8° 58'
(8.3—8.6)

1902.684	360.3	0".32	3	36
.736	359.3	0.34	3	36
.903	360.2	0.34	2	36
1902.77	359.9	0.33		

315. BD. — 2°346.

R.A. 1^h 57^m 49^s ; Decl. — 2° 14'
(9.0—14.5)

1902.720	325.1	3.31	2	36
.736	325.3	3.04	3	36
.903	322.2	3.69	2	36
1902.79	324.2	3.35		

316. BD. — 2°433.

R.A. 2^h 27^m 36^s ; Decl. — 2° 12'
(8.4—9.0)

1902.684	84.4	0.44	3	36
.736	84.0	0.42	3	36
.903	83.5	0.42	2	36
1902.77	84.0	0.43		

317. BD. — 2°476.

R.A. 2^h 37^m 13^s ; Decl. — 2° 47'
(9.0—13.9)

1902.684	86.9	4.12	3	36
.736	87.8	4.05	3	36
1902.71	87.4	4.08		

318. A.G. Berlin B. 1746.

R.A. 5^h 21^m 25^s ; Decl. +24° 39'
(8.7—13.7)

1902.027	356.7	2.77	2	36
1903.026	360.2	2.90	2	36
1902.53	358.4	2.84		

A. 319. BD. — 4°1135.

R.A. 5^h 22^m 46^s; Decl. —4° 5′

(9.5—10.0)

1902.736	50.8	0.45	3	36
.794	54.1	0.45	2	36
.870	51.7	0.47	3	36
1902.80	52.2	0.46		

320. BD. — 2°1312.

R.A. 5^h 31^m 33^s; Decl. —2° 1′

(9.5—10.0)

1902.736	177.7	0.91	3	36
.794	178.0	0.93	2	36
.870	177.5	0.86	3	36
1902.80	177.7	0.90		

321. BD. — 3°1241.

R.A. 5^h 51^m 50^s; Decl. —3° 5′

(8.7—9.1)

1902.202	132.2	0.53	3	36
.736	125.9	0.48	3	36
.794	125.9	0.47	2	36
1902.58	128.0	0.49		

322. BD. — 4°1310.

R.A. 5^h 53^m 25^s; Decl. —4° 39′

(7.0—13.8)

1902.736	357.1	4.11	3	36
.794	356.3	4.23	3	36
1902.76	356.7	4.17		

The principal star is Ll. 11327, and, according to Porter, has an annual proper motion of 0".24 in 173°.9. If the small star does not share in this motion, the distance between the two will increase at very nearly this same rate.

323. BD. — 5°1576.

R.A. 6^h 13^m 23^s; Decl. —5° 37′

(7.0—10.0)

1902.030	214.8	1.04	2	36
.202	219.2	—	2	36
.794	215.8	0.94	3	36
1902.34	216.6	0.99		

324. BD. — 4°1498.

R.A. 6^h 20^m 8^s; Decl. —4° 23′

(9.0—9.1)

1902.870	353.2	0.92	3	36
.873	353.8	0.99	3	36
1902.87	353.5	0.96		

A. 325. BD. — 3°1553.

R.A. 6^h 36^m 32^s; Decl. —3° 53′

(8.0—11.0)

1902.870	78.3	1.49	3	36
.873	77.4	1.45	3	36
1902.87	77.8	1.47		

326. BD. — 4°1751.

R.A. 6^h 53^m 22^s; Decl. —4° 31′

A and B. (9.2—9.4)

1902.794	136.3	2.82	2	36
.870	137.6	2.76	3	36
1902.83	137.0	2.79		

B and C. (9.4—13.0)

1902.794	75.1	7.83	2	36
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327. BD. — 5°1970.

R.A. 7^h 2^m 17^s; Decl. —5° 34′

(9.0—13.8)

1902.873	332.4	4.71	3	36
.969	333.3	4.66	3	36
1902.92	332.8	4.68		

328. BD. — 4°1852.

R.A. 7^h 6^m 44^s; Decl. —4° 30′

(9.0—11.7)

1902.030	192.7	1.39	2	36
.202	194.5	—	2	36
.794	192.8	1.63	2	36
.870	191.6	1.43	3	36
1902.47	192.9	1.48		

329. BD. — 3°1789.

R.A. 7^h 6^m 48^s; Decl. —3° 58′

(8.3—13.2)

1902.030	125.5	3.72	2	36
.202	127.2	3.40	2	36
.870	128.8	3.79	3	36
1902.37	127.2	3.64		

330. BD. — 2°1976.

R.A. 7^h 7^m 14^s; Decl. —2° 51′

(8.4—10.2)

1902.202	184.6	—	2	36
.794	178.5	1.32	2	36
.870	180.0	1.35	3	36
1902.62	181.0	1.34		

331. BD. — 2°1982.

R.A. 7^h 7^m 32^s; Decl. —2° 47′

(8.2—12.3)

1902.202	126.4	3.97	2	36
.238	126.1	4.27	3	12
.870	123.2	4.20	2	36
1902.44	125.2	4.15		

A. 332. BD. — 5°2092.R.A. 7^h 18^m 25^s ; Decl. — 5° 26'
(9.0—9.0)

1902.030	(114°1)	0.37	2	36
.794	104.5	0.38	3	36
.873	106.2	0.41	3	36
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1902.57	105.4	0.39		

The first angle is probably 10° in error, though the change may be due to motion.

333. BD. — 5°2095.R.A. 7^h 18^m 45^s ; Decl. — 5° 16'
(8.7—11.0)

1902.030	329.7	0.79	2	36
.794	332.6	—	2	36
.873	332.0	0.75	3	36
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1902.57	331.4	0.77		

334. BD. — 4°2092.R.A. 7^h 43^m 25^s ; Decl. — 4° 32'
(8.5—9.4)

1902.334	114.3	0.19	3	36
.873	117.2	0.27	4	36
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1902.60	115.8	0.23		

335. BD. — 4°2242.R.A. 8^h 5^m 57^s ; Decl. — 4° 37'
(8.4—9.2)

1902.030	124.2	1.22	2	36
.205	125.3	1.03	4	12
.254	126.7	1.10	3	12
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1902.16	125.4	1.12		

336. BD. 5°2474.R.A. 8^h 12^m 7^s ; Decl. — 6° 6'
(8.4—12.6)

1902.030	347.2	4.34	2	36
.205	345.2	4.44	4	12
.274	348.4	4.21	3	12
.279	347.0	4.23	2	36
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1902.20	347.0	4.30		

337. BD. — 4°2288.R.A. 8^h 12^m 19^s ; Decl. — 5° 4'
(7.9—8.2)

1902.030	65.7	0.29	2	36
.254	66.0	—	4	12
.279	64.5	0.28	3	36
.334	59.6	0.25	3	36
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1902.22	64.0	0.27		

A. 338. BD. — 4°2306.R.A. 8^h 15^m 43^s ; Decl. — 4° 51'
(8.5—8.5)

1902.279	341.8	0.31	3	36
.334	341.4	0.30	3	36
.873	336.8	0.27	3	36
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1902.47	340.0	0.29		

339. BD. — 5°2590.R.A. 8^h 32^m 37^s ; Decl. — 6° 7'
(8.1—12.8)

1902.030	7.9	2.00	2	36
.279	8.6	1.89	3	36
.334	10.0	2.08	3	36
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1902.21	8.8	1.99		

340. BD. — 5°2608.R.A. 8^h 35^m 46^s ; Decl. — 5° 20'
(9.0—12.8)

1902.030	300.1	1.97	2	36
.279	300.9	1.99	3	36
.334	301.8	2.07	3	36
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1902.21	300.9	2.01		

341. BD. — 3°2520.R.A. 8^h 53^m 3^s ; Decl. — 3° 12'
(8.1—13.7)

1902.279	327.2	4.68	2	36
.334	325.5	4.95	3	36
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1902.31	326.4	4.82		

342. BD. — 3°2577.R.A. 9^h 2^m 9^s ; Decl. — 3° 23'
(8.6—9.5)

1902.205	154.4	4.46	3	12
.274	154.0	4.67	3	12
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1902.24	154.2	4.56		

343. A.G. Leiden 3914.R.A. 9^h 29^m 55^s ; Decl. +29° 53'
(8.6—11.2)

1902.027	170.9	0.96	3	36
.205	172.5	0.97	3	12
.241	174.9	1.01	3	36
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1902.16	172.8	0.98		

344. A.G. Cambridge 5120.R.A. 9^h 46^m 18^s ; Decl. +29° 44'
(8.6—9.2)

1902.241	29.7	0.41	3	36
.279	28.3	0.47	3	36
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1902.26	29.0	0.44		

A. 345. BD. —7°3055.

R.A. 10^h 27^m 14^s ; Decl. —7° 41'
(8.2—11.0.)

1901.354	212.3	0.60	3	36
1903.040	212.0	0.64	3	36
1902.20	212.2	0.62		

346. A. G. Cambridge 6723.

R.A. 14^h 3^m 16^s ; Decl. +25° 12'
(8.6—9.6)

1902.394	335.8	0.64	2	36
.736	338.9	0.60	3	36
1902.56	337.4	0.62		

347. A. G. Bonn 9531.

R.A. 14^h 33^m 24^s ; Decl. +48° 39'
(8.0—8.5)

1902.640	72.7	0.32	3	36
.679	73.1	0.35	3	36
1902.66	72.9	0.34		

348. A.G. Leiden 5741.

R.A. 16^h 12^m 6^s ; Decl. +29° 51'
(8.2—10.5)

1902.624	121.7	0.94	3	36
.736	119.0	0.89	3	36
1902.68	120.4	0.92		

349. BD. +30°2860.

R.A. 16^h 37^m 24^s ; Decl. +30° 17'
(9.2—10.0)

1902.624	114.6	0.57	3	36
.679	107.9	0.58	2	36
.736	112.9	0.54	3	36
1902.68	111.8	0.56		

This pair is 149'' in 168° from the 8.3 mag. star
A.G. Leiden 5887.

350. A.G. Cambridge 7883.

R.A. 16^h 50^m 4^s ; Decl. +29° 16'
(9.0—9.0)

1902.736	141.1	0.37	3	36
.794	138.2	0.38	2	36
.838	141.0	0.39	4	36
1902.79	140.1	0.38		

351. A.G. Cambridge 8236.

R.A. 17^h 25^m 29^s ; Decl. +29° 29'
(9.5—9.9)

1902.350	65.9	0.59	3	12
.391	68.1	0.62	3	12
.547	62.0	0.53	3	36
.624	65.6	0.46	3	36
1902.48	65.4	0.55		

A. 352. A.G. Cambridge 8267.

R.A. 17^h 28^m 28^s ; Decl. +28° 53'
(8.2—8.5)

1902.624	179.0	0.18	3	36
.838	187.1	0.17	4	36
1902.73	183.0	0.18		

353. A.G. Albany 6143.

R.A. 18^h 7^m 29^s ; Decl. +4° 14'
(8.9—11.0)

1902.698	13.6	1.66	4	12
.701	15.6	1.68	3	36
.775	12.7	1.60	3	12
1902.72	14.0	1.65		

354. A.G. Albany 6284.

R.A. 18^h 31^m 7^s ; Decl. +5° 2'
(8.9—12.2)

1902.690	6.2	4.20	3	12
.698	7.8	4.46	3	12
.701	10.7	4.34	3	36
1902.70	8.2	4.33		

355. A.G. Leipzig II 8657.

R.A. 18^h 31^m 24^s ; Decl. +5° 11'
(9.0—11.5)

1902.698	144.2	1.22	3	12
.701	143.3	1.15	3	36
1902.70	143.8	1.18		

356. A.G. Leipzig II 8694.

R.A. 18^h 33^m 11^s ; Decl. +7° 55'
(8.8—10.8)

1902.701	224.1	0.84	3	36
.788	223.5	0.71	4	12
.794	223.6	0.79	2	36
1902.76	223.7	0.78		

357. A.G. Albany 6343.

R.A. 18^h 38^m 38^s ; Decl. +4° 38'
(9.0—9.1)

1902.701	73.2	0.49	3	36
.788	75.0	0.60	4	12
.794	75.9	0.60	2	36
1902.76	74.7	0.56		

358. A.G. Albany 6407.

R.A. 18^h 48^m 14^s ; Decl. +4° 6'
(9.0—14.8)

1902.701	111.1	1.43	3	36
.838	116.0	1.26	3	36
1902.77	113.6	1.34		

A. 359. BD. +6°3998.R.A. 18^h 57^m 25^s ; Decl. +6° 44'
(9.0—11.2)

1902.640	275.0	1.95	2	36
.701	276.4	2.00	3	36
.775	275.1	1.91	2	12
1902.71	275.5	1.95		

360. A.G. Leipzig II 8986.R.A. 18^h 58^m 33^s ; Decl. +7° 9'
(9.4—9.5)

1902.640	285.2	0.45	2	36
.701	291.0	0.42	3	36
.838	285.5	0.45	3	36
1902.73	287.2	0.44		

361. A.G. Leipzig II 9041.R.A. 19^h 2^m 36^s ; Decl. +8° 2'
(9.6—9.8)

1902.547	22.4	0.33	3	36
.624	27.3	0.25	3	36
.701	23.8	0.35	3	36
1902.62	24.5	0.31		

362. A.G. Albany 6584.R.A. 19^h 7^m 46^s ; Decl. +4° 54'
(8.7—14.2)

1902.336	246.4	4.58	3	36
.394	247.3	—	2	36
.547	245.9	4.95	3	36
.624	247.7	4.96	3	36
1902.48	246.8	4.83		

363. A.G. Leipzig II 9140.R.A. 19^h 12^m 9^s ; Decl. +7° 13'
(8.6—13.5)

1902.547	173.1	1.75	3	36
.624	174.4	1.99	2	36
.640	175.0	1.78	2	36
1902.60	174.2	1.84		

364. A.G. Leipzig II 9225.R.A. 19^h 20^m 26^s ; Decl. +7° 28'
(8.6—11.2)

1902.545	50.7	1.13	3	36
.624	49.1	—	2	36
.640	51.3	1.23	2	36
1902.60	50.4	1.18		

365. A.G. Leipzig II 9229.R.A. 19^h 20^m 45^s ; Decl. +7° 46'
(8.5—12.2)

1902.547	154.2	1.24	3	36
.624	158.9	1.25	2	36
.640	154.2	1.38	2	36
1902.60	155.8	1.26		

A. 366. A.G. Albany 6721.R.A. 19^m 26^m 3^s ; Decl. +4° 16'
(8.2—10.2)

1902.336	309.2	0.44	2	36
.701	307.9	0.61	3	36
.838	314.2	0.49	3	36
1902.62	310.4	0.51		

367. A.G. Leipzig II 9329.R.A. 19^h 28^m 3^s ; Decl. +5° 33'
(8.7—10.0)

1902.640	337.9	0.52	3	36
.701	333.6	0.54	3	36
.777	337.0	0.52	3	36
1902.71	336.2	0.53		

368. A.G. Cambridge 10134.R.A. 19^h 31^m 3^s ; Decl. +29° 34'
(8.5—8.8)

1902.547	158.7	0.50	3	36
.608	158.0	0.48	3	36
.701	159.0	0.49	3	36
1902.62	158.6	0.49		

369. A.G. Leiden 7499.R.A. 19^h 32^m 56^s ; Decl. +30° 6'
(7.8—14.3)

1902.608	6.4	3.89	3	36
.701	5.3	4.31	3	36
.794	2.9	4.08	3	36
1902.70	4.9	4.09		

370. A.G. Leiden 7503.R.A. 19^h 33^m 27^s ; Decl. +30° 12'
(8.0—14.5)

1902.547	267.1	4.65	3	36
.608	269.2	4.76	3	36
.701	268.0	4.90	3	36
1902.62	268.1	4.77		

There are several faint stars in the field, two of them forming a 5'' pair, NF of A.

371. A.G. Leiden 7577.R.A. 19^h 37^m 49^s ; Decl. +30° 49'
(8.9—11.0)

1902.575	36.9	2.07	3	12
.594	35.8	—	3	12
.608	34.9	2.17	3	36
.632	34.2	2.17	3	12
1902.60	35.4	2.14		

A. 372. A.G. Cambridge 10318.

R.A. $19^{\text{h}} 39^{\text{m}} 3^{\text{s}}$; Decl. $+28^{\circ} 40'$
(8.8—9.7)

1902.547	118.6	0.32	3	36
.608	118.2	—	3	36
.701	117.3	0.29	3	36
1902.62	118.0	0.30		

373. A.G. Albany 6829.

R.A. $19^{\text{h}} 40^{\text{m}} 15^{\text{s}}$; Decl. $+4^{\circ} 46'$
(8.7—14.0)

1902.761	81.0	3.99	2	36
.777	85.2	4.12	2	36
1902.77	83.1	4.06		

374. A.G. Albany 6845.

R.A. $19^{\text{h}} 41^{\text{m}} 47^{\text{s}}$; Decl. $+4^{\circ} 55'$
(9.0—13.8)

1902.761	10.6	2.99	2	36
.777	11.4	3.00	2	36
1902.77	11.0	3.00		

375. A.G. Leiden 7682.

R.A. $19^{\text{h}} 45^{\text{m}} 13^{\text{s}}$; Decl. $+31^{\circ} 56'$
(9.5—9.6)

1902.597	168.6	1.11	3	12
.632	168.9	1.11	3	12
.701	167.0	1.04	3	36
.794	168.8	0.99	3	36
1902.68	168.3	1.06		

376. A.G. Leipzig II 9605.

R.A. $19^{\text{h}} 46^{\text{m}} 50^{\text{s}}$; Decl. $+7^{\circ} 23'$
(9.0—10.0)

1902.775	127.1	1.79	3	12
.777	128.0	1.76	2	36
1902.78	127.6	1.78		

377. A.G. Leiden 7734.

R.A. $19^{\text{h}} 48^{\text{m}} 48^{\text{s}}$; Decl. $+31^{\circ} 41'$
(8.8—13.2)

1902.701	262.0	3.85	3	36
.794	259.1	3.75	3	36
.903	260.1	3.73	2	36
1902.80	260.4	3.78		

378. A.G. Leiden 7840.

R.A. $19^{\text{h}} 55^{\text{m}} 27^{\text{s}}$; Decl. $+31^{\circ} 50'$
(8.4—8.8)

1902.701	321.8	0.41	3	36
.796	317.9	0.36	3	36
.903	316.5	0.46	2	36
1902.80	318.7	0.41		

A. 379. A.G. Leiden 7844.

R.A. $19^{\text{h}} 55^{\text{m}} 44^{\text{s}}$; Decl. $+30^{\circ} 38'$
(8.0—13.2)

1902.701	227.0	2.51	3	36
.794	225.6	2.34	3	36
.903	224.9	2.51	2	36
1902.80	225.8	2.45		

380. A.G. Leiden 7902.

R.A. $19^{\text{h}} 59^{\text{m}} 40^{\text{s}}$; Decl. $+32^{\circ} 3'$
(9.3—9.4)

1902.632	202.3	0.96	3	12
.701	200.9	0.80	3	36
.794	201.0	0.91	3	36
1902.71	201.4	0.89		

381. A.G. Bonn 13738.

R.A. $20^{\text{h}} 1^{\text{m}} 42^{\text{s}}$; Decl. $+40^{\circ} 27'$
(8.8—10.8)

1902.794	278.8	0.78	3	36
.838	284.9	0.74	4	36
.873	285.2	0.76	3	36
1902.84	283.0	0.76		

382. A.G. Bonn 13793.

R.A. $20^{\text{h}} 4^{\text{m}} 37^{\text{s}}$; Decl. $+42^{\circ} 6'$
(6.9—10.3)

1902.788	85.0	1.29	4	12
.794	86.0	1.21	3	36
.796	84.4	1.38	3	36
1902.79	85.1	1.29		

383. A.G. Bonn 13794.

R.A. $20^{\text{h}} 4^{\text{m}} 38^{\text{s}}$; Decl. $+41^{\circ} 45'$
(9.5—9.5)

1902.838	235.7	0.29	4	36
.873	233.9	0.26	3	36
1902.86	234.8	0.28		

384. A.G. Berlin B. 7526.

R.A. $20^{\text{h}} 6^{\text{m}} 10^{\text{s}}$; Decl. $+24^{\circ} 22'$
(9.0—10.8)

1902.772	355.9	1.12	4	12
.786	356.0	1.24	4	12
.794	353.7	1.08	3	36
1902.78	355.2	1.15		

385. A.G. Bonn 13919.

R.A. $20^{\text{h}} 10^{\text{m}} 14^{\text{s}}$; Decl. $+40^{\circ} 32'$
(9.5—9.7)

1902.788	257.1	2.64	3	12
.794	257.4	2.61	3	36
1902.79	257.2	2.62		

A. 386. A.G. Albany 7048.R.A. 20^h 10^m 44^s ; Decl. +4° 21'
(9.0—14.2)

1902.720	91.9	2.46	2	36
.777	89.6	2.42	2	36
1902.75	90.8	2.44		

387. A.G. Bonn 13945.R.A. 20^h 11^m 38^s ; Decl. +41° 0'
(7.7—13.6)

1902.794	150.8	4.81	2	36
.838	152.3	4.97	4	36
1902.82	151.6	4.89		

388. A.G. Bonn 13950.R.A. 20^h 11^m 43^s ; Decl. +42° 31'
(9.5—9.5)

1902.838	35.1	0.70	4	36
.873	35.9	0.66	3	36
1902.86	35.5	0.68		

389. A.G. Cambridge 11065.R.A. 20^h 11^m 50^s ; Decl. +26° 45'
(9.3—9.6)

1902.753	210.6	1.49	3	12
.773	210.5	1.56	4	12
.794	210.3	1.44	3	36
1902.77	210.5	1.50		

390. A.G. Bonn 13955.R.A. 20^h 11^m 55^s ; Decl. +40° 12'
(8.4—11.0)

1902.838	323.7	0.70	4	36
.873	324.9	0.66	3	36
1902.86	324.3	0.68		

391. BD. +24°4086.R.A. 20^h 14^m 55^s ; Decl. +24° 22'
(9.0—10.7)

1902.772	275.3	0.82	4	12
.786	275.2	0.83	4	12
.794	275.2	0.64	3	36
1902.78	274.6	0.76		

392. BD. +24°4123.R.A. 20^h 21^m 18^s ; Decl. +24° 44'
(9.0—11.2)

1902.772	298.3	0.79	4	12
.786	297.3	0.91	4	12
.794	298.6	0.76	3	36
1902.78	298.1	0.82		

A. 393. A.G. Cambridge 11317.R.A. 20^h 22^m 36^s ; Decl. +27° 44'
(8.7—9.2)

1902.794	212.4	0.36	3	36
.873	209.2	0.38	3	36
.903	209.5	0.37	2	36
1902.86	210.4	0.37		

394. A.G. Cambridge 11366.R.A. 20^h 24^m 49^s ; Decl. +26° 38'
(9.0—10.3)

1902.794	281.7	0.59	3	36
.873	286.7	0.52	3	36
.903	282.2	0.53	2	36
1902.86	283.5	0.55		

395. A.G. Albany 7149.R.A. 20^h 26^m 39^s ; Decl. +5° 9'
(9.0—10.8)

1902.701	159.5	0.70	3	36
.969	161.2	0.75	3	36
1902.84	160.4	0.72		

396. A.G. Bonn 14413.R.A. 20^h 30^m 46^s ; Decl. +43° 6'
(8.5—11.3)

1902.827	158.9	1.55	3	12
.838	157.8	1.50	4	36
.873	159.5	1.51	3	36
1902.85	158.7	1.52		

397. BD. +42°3793.R.A. 20^h 31^m 46^s ; Decl. +42° 32'
(9.1—12.0)

1902.838	215.8	1.17	4	36
.873	216.1	1.06	3	36
1902.86	216.0	1.12		

This pair is 53.8 distant in 121.9 from the 8.5 mag. star A.G. Bonn 14433.

398. A.G. Bonn 14473.R.A. 20^h 33^m 59^s ; Decl. +42° 13'
(8.9—10.2)

1902.827	358.7	0.89	3	12
.838	358.5	0.90	4	36
.873	357.9	0.91	3	36
1902.85	358.4	0.90		

399. A.G. Bonn 14507.R.A. 20^h 35^m 59^s ; Decl. +41° 40'
(8.5—10.8)

1902.827	74.0	0.75	3	12
.838	74.0	0.61	4	36
.873	74.4	0.67	3	36
1902.85	74.1	0.68		

A. 400. A.G. Bonn 14897.

R.A. 20 ^h 53 ^m 49 ^s ; Decl. +40° 35'				
(9.2—9.4)				
1902.597	65.9	1.77	3	12
.613	66.8	1.57	3	12
.638	67.0	1.63	4	12
.643	64.1	1.61	3	36
1902.62	66.0	1.64		

401. A.G. Bonn 15299.

R.A. 21 ^h 13 ^m 19 ^s ; Decl. +42° 47'				
(8.7—8.8)				
1902.794	152.2	0.39	3	36
.838	149.2	0.42	4	36
.873	150.8	0.37	3	36
1902.84	150.7	0.39		

402. A.G. Bonn 15772.

R.A. 21 ^h 34 ^m 1 ^s ; Decl. +41° 26'				
(8.5—11.5)				
1902.873	42.2	0.69	3	36
.947	41.5	0.73	3	36
1902.91	41.8	0.71		

403. A.G. Bonn 15871.

R.A. 21 ^h 38 ^m 15 ^s ; Decl. +43° 46'				
(9.3—9.5)				
1902.608	79.0	—	3	36
.643	76.7	0.37	3	36
.662	80.5	0.40	2	36
1902.64	78.7	0.38		

404. A.G. Bonn 15969.

R.A. 21 ^h 43 ^m 16 ^s ; Decl. +41° 21'				
(8.6—13.5.)				
1902.608	95.3	4.00	3	36
.643	96.1	4.18	3	36
1902.63	95.7	4.09		

The 36-inch telescope shows a faint star, 14-15 magnitude, about 10" preceding A.

405. A.G. Bonn 15971.

R.A. 21 ^h 43 ^m 23 ^s ; Decl. +42° 28'				
(9.0—13.2)				
1902.608	273.4	—	3	36
.643	274.1	1.69	3	36
.662	276.9	1.72	2	36
1902.64	274.8	1.70		

406. A.G. Bonn 16201.

R.A. 21 ^h 55 ^m 7 ^s ; Decl. +41° 29'				
B and C. (11.0—13.0)				
1902.586	293.3	1.51	3	36
.640	292.9	1.50	3	36
1902.61	293.1	1.50		

A and B. (8.0—11.0)

1902.586	3.3	34.09	3	33
.640	3.2	34.26	3	36
1902.61	3.2	34.18		

A and D. (8.0—14.0)

1902.640	115.4	22.53	3	36
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A. 407. A.G. Bonn 16343.

R.A. 22^h 1^m 55^s ; Decl. +41° 29'

(9.2—9.2)				
1902.586	27.1	0.68	3	36
.640	27.3	0.65	3	36
.662	28.8	0.69	2	36
1902.63	27.7	0.67		

An 11th magnitude star is 13½" distant from this pair in 58°.

408. A.G. Bonn 16405.

R.A. 22^h 5^m 20^s ; Decl. +42° 8'

(9.0—12.5)				
1902.586	184.7	1.23	3	36
.640	184.6	1.33	3	36
.701	184.2	1.37	3	36
1902.64	184.5	1.31		

409. A.G. Bonn 16461.

R.A. 22^h 8^m 12^s ; Decl. +40° 26'

(9.1—9.2)				
1902.586	22.3	0.43	3	36
.640	23.9	0.54	3	36
.662	22.4	0.50	3	36
1902.63	22.9	0.49		

410. A.G. Bonn 16508.

R.A. 22^h 10^m 41^s ; Decl. +41° 12'

(8.6—11.5)				
1902.643	342.6	0.63	3	36
.701	343.7	0.65	3	36
.873	343.2	0.70	3	36
1902.74	343.2	0.66		

411. A.G. Bonn 16625.

R.A. 22^h 17^m 4^s ; Decl. +41° 18'

(8.0—8.7)				
1902.643	201.6	0.26	3	36
.662	200.8	0.29	3	36
.701	199.5	0.28	3	36
1902.67	200.6	0.28		

412. A.G. Bonn 16685.

R.A. 22^h 20^m 0^s ; Decl. +43° 32'

(8.9—13.3)				
1902.657	123.2	2.21	4	12
.662	127.1	2.18	3	36
.701	127.7	2.22	3	36
1902.67	126.0	2.20		

The 36-inch telescope also shows a 14.0 magnitude star 22'3 from A in 73°7.

A. 413. A.G. Cambridge 13621.

R.A. $22^{\text{h}} 34^{\text{m}} 54$; Decl. $+27^{\circ} 51'$
(8.9—12.8)

1902.660	18.8	0.98	3	36
.903	14.6	0.88	3	36
1902.78	16.7	0.93		

414. A.G. Bonn 17029.

R.A. $22^{\text{h}} 38^{\text{m}} 12^{\text{s}}$; Decl. $+43^{\circ} 30'$
(9.2—9.3)

1902.632	15.1	1.70	3	12
.635	16.8	1.84	4	12
.640	15.5	1.93	3	36
1902.64	15.8	1.82		

415. A.G. Bonn 17169.

R.A. $22^{\text{h}} 46^{\text{m}} 37^{\text{s}}$; Decl. $+43^{\circ} 33'$
(9.0—13.3)

1902.635	332.9	3.85	4	12
.638	333.6	—	3	12
.640	332.0	3.96	3	36
1902.64	332.8	3.90		

416. A.G. Bonn 17256.

R.A. $22^{\text{h}} 51^{\text{m}} 48^{\text{s}}$; Decl. $+42^{\circ} 15'$
(9.2—9.7)

1902.640	8.3	0.42	2	36
.701	7.9	0.33	3	36
1902.67	8.1	0.38		

The double is the north-preceding and brighter star of two in the field.

417. 83 *Aquarii*.R.A. $22^{\text{h}} 59^{\text{m}} 57^{\text{s}}$; Decl. $-8^{\circ} 14'$
(6.0—6.0)

1902.624	55.8	0.21	2	36
.640	63.8	0.16	3	36
.643	62.7	0.20	3	36
.660	61.5	0.18	3	36
1902.64	61.0	0.19		

According to Auwers, this star has an annual proper motion of $0''.023$ in $17^{\circ} 5$. This motion is evidently common to the two components, as the pair would otherwise have been an easy one when Struve connected 83 and 84 *Aquarii* to form the wide pair $\Sigma 59^1$.

418. BD. $-9^{\circ} 6146$.R.A. $23^{\text{h}} 8^{\text{m}} 16^{\text{s}}$; Decl. $-9^{\circ} 27'$
(8.0—9.0)

1902.640	21.5	0.21	3	36
.643	20.0	0.20	3	36
.660	29.9	0.23	3	36
1902.65	23.8	0.21		

A. 419. BD. $-6^{\circ} 6184$.R.A. $23^{\text{h}} 12^{\text{m}} 36^{\text{s}}$; Decl. $-6^{\circ} 7'$
(8.8—10.5)

1902.638	215.3	1.04	3	12
.640	210.1	1.26	3	36
.643	206.4	1.42	3	36
.660	211.1	1.19	3	36
1902.45	210.7	1.23		

420. A.G. Cambridge 14122.

R.A. $23^{\text{h}} 24^{\text{m}} 29^{\text{s}}$; Decl. $+25^{\circ} 44'$
(9.2—9.2)

1902.873	288.6	0.42	3	36
.903	280.4	0.48	2	36
1902.89	284.5	0.45		

421. BD. $-8^{\circ} 6130$.R.A. $23^{\text{h}} 27^{\text{m}} 36^{\text{s}}$; Decl. $-8^{\circ} 35'$
(9.2—9.4)

1902.624	107.4	1.07	2	36
.640	107.1	0.99	3	36
.643	107.9	0.99	3	36
1902.64	107.5	1.02		

422. A.G. Cambridge 14159.

R.A. $23^{\text{h}} 29^{\text{m}} 27^{\text{s}}$; Decl. $+26^{\circ} 10'$
(8.6—13.6)

1902.660	301.7	4.29	3	36
.873	302.0	4.38	3	36
1902.77	301.8	4.34		

423. BD. $-9^{\circ} 6232$.R.A. $23^{\text{h}} 36^{\text{m}} 14^{\text{s}}$; Decl. $-9^{\circ} 11'$
(8.9—10.5)

1902.640	168.2	1.84	3	36
.643	166.0	1.73	3	36
.657	165.3	1.71	3	12
1902.65	166.5	1.76		

424. A.G. Cambridge 14307.

R.A. $23^{\text{h}} 44^{\text{m}} 47$; Decl. $+27^{\circ} 7'$
(7.3—7.8)

1902.794	228.3	0.21	2	36
.873	229.5	0.18	3	36
.903	231.9	0.20	3	36
1902.86	229.9	0.20		

425. A.G. Cambridge 14355.

R.A. $23^{\text{h}} 50^{\text{m}} 57^{\text{s}}$; Decl. $+27^{\circ} 41'$
(9.3—9.8)

1902.753	162.7	1.60	3	12
.794	164.2	1.44	2	36
.873	161.6	1.58	3	36
1902.81	162.8	1.54		

A. 426. A.G. Berlin B. 9147.

R.A. $23^{\text{h}} 51^{\text{m}} 5^{\text{s}}$; Decl. $+24^{\circ} 47'$
(8.9—9.0)

1902.794	272.0	0.26	2	36
.873	270.2	0.20	3	36
.903	279.4	0.27	3	36
1902.86	273.9	0.24		

427. A.G. Cambridge 14370.

R.A. $23^{\text{h}} 52^{\text{m}} 15^{\text{s}}$; Decl. $+27^{\circ} 11'$
(8.7—13.2)

1902.794	222.2	1.75	3	36
.873	221.9	1.36	3	36
.903	220.2	1.63	3	36
1902.86	221.4	1.58		

428. BD. $-9^{\circ} 63' 10''$.

R.A. $23^{\text{h}} 57^{\text{m}} 32^{\text{s}}$; Decl. $-9^{\circ} 3'$
(8.7—8.8)

1902.640	109.5	0.20	3	36
.660	112.6	0.26	3	36
.931	111.1	0.21	3	36
1902.74	111.1	0.22		

A. 429. A.G. Cambridge 14424.

R.A. $23^{\text{h}} 58^{\text{m}} 46^{\text{s}}$; Decl. $+27^{\circ} 25'$
A and B. (8.8—9.0)

1902.794	165.2	0.41	3	36
.873	163.9	0.49	3	36
.903	163.0	0.47	3	36
1902.86	164.0	0.46		

AB and C = h 1929. (8.4—9.0)

1902.794	288.8	4.97	2	36
.873	290.4	4.95	3	36
.903	287.5	5.00	3	36
1902.86	288.9	4.97		

Herschel's measure of the wide pair is:

" $287^{\circ} 5' 3''$ 9.10, 10.11, Fine . "