PUBLICATIONS
DE
L'OBSERVATOIRE ASTRONOMIQUE DE L'UNIVERSITÉ DE TARTU
(DORPAT)
TOME XXVI № 5

MEASURES OF DOUBLE STARS

(1924—1926)

BY

E. ÖPIK

TARTU 1927

PUBLICATIONS

DE

L'OBSERVATOIRE ASTRONOMIQUE DE L'UNIVERSITÉ DE TARTU

(DORPAT)

TOME XXVI, № 5

MEASURING OF DOUBLE STARS

K. Mattiesen, Tartu.

The following measures were made in the years 1924, 1925 and 1926 with the Zeiss refractor (aperture 200 mm, focal length 360 cm) of the Tartu Observatory. The measures form part of a more wide program that has for its object the measurement or remeasurement of the following categories of double stars within reach of the 200 mm refractor, or of wide „proper motion" pairs, chiefly north of the equator, and for which measures are wanted: 1) companions to naked-eye stars of the list published in T. P. 25_6; 2) pairs from Burnham's „Measures of Proper Motion Stars" with a proper motion of the primary exceeding 0.″15 annually; 3) neglected, or recently discovered double stars of Burnham's General Catalogue, with the distance less than 32.″5 and where the primary occurs in the Bonner Durchmusterung, or in one of the meridian catalogues; 4) more wide pairs of Burnham's General Catalogue and of Jonckheere's Catalogue where the primary is assigned a proper motion of at least 0.″075 annually in one coordinate; a few pairs occasionally noted by the writer are also included.

Classification is to be regarded as the chief purpose of the measures; i. e., the measures were made chiefly to help to decide whether a pair of stars is physically connected, or not. Frequently, sometimes too frequently measured pairs like the Σ stars are therefore, as a rule, not included. The character of the program is such that it appeared necessary to include a large proportion of pairs far above the limit of difficulty ordinarily accepted for instruments of small size; especially a large number of very faint companions near the limit of visibility of our refractor was measured. Though some loss in accuracy may be observed for the faintest companions, the probable errors seem to justify the choice of the program. For some neglected pairs sometimes even a less accurate measure is of value, from the standpoint of classification. It may be generally remarked that with special precautions every object that can be seen, can be measured; the

progress of double star astronomy will doubtlessly be more rapid when observers with large instruments will go up to the limit of visibility of their instruments.

As a rule, each pair was measured on 2 nights; if the measures were discordant, a third night's measure was added; in the case of pairs with appreciable proper motion a single night's measure was frequently regarded as sufficient to determine the physical character of the pair. The measure of one night consisted ordinarily of 4 settings in angle and 4 setting in distance = 2 double distances. Symmetry in making the settings was carefully observed.

The magnitudes were estimated independently, the limit of visibility of the refractor being assumed at 13.2. The estimates were made originally in effective "naked-eye" magnitudes, i. e. the apparent magnitude of a star in the telescope was estimated as if it were seen with the naked eye; to these estimates was applied the constant correction +7.1, which made the mean of the estimated magnitudes of a sample of Harvard Revised Photometry stars equal to the mean of their photometric magnitudes. No conscious allowance for the nearness of the bright primary was made, contrary to the recommendation of several double star observers; it is impossible to avoid systematic errors caused by the nearness of two stars even in the case of most careful estimates (vide T. P. 25_6), and a natural systematic error it is much easier to treat than an artificially introduced error.

The table on p. 5 gives an idea of the accuracy of the measures. In this table n denotes the number of pairs used for the error in angle, whereas the number for distance may sometimes slightly differ. The approximate formula was used

$$\text{p. e.} = \pm 0.845 \frac{\Sigma|\Delta|}{m} \sqrt{\frac{m}{m-n}},$$

where m denotes the number of measures, n — the number of pairs, $|\Delta|$ — the arithmetical deviation of the measure of a single night from the mean of all nights.

The first part of the measures printed below refers to stars of Burnham's General Catalogue of Double Stars; the number of this catalogue is printed in heavy type; next follow the usual name of the double star, and the mean of the estimates of magnitude; below are given: the epoch, the position angle

and distance for each night, and their mean values. Remarks follow, relating chiefly to the probable character of the pair; in making these remarks, the measures printed in Burnham's General Catalogue, and in Burnham's Measures of Proper Motion Stars were almost alone taken into account. The pairs are arranged in the order of the number of the General Catalogue (including the Appendix).

The second part contains measures of pairs not included in Burnham's General Catalogue; the coordinates for 1925.0, if not stated otherwise, are given, and the pairs are arranged in the order of right ascension. Many of the pairs were taken from Burnham's Measures of Proper Motion Stars; in this case the name of the star is preceded by the denotation *β. p. m.* For the naked eye stars the number of Harvard Revised Photometry is given. The numbers of Jonckheere's Catalogue of Double Stars (1920) are printed in parentheses.

My thanks are to Miss Hilda Johannson for her aid in preparing these measures for press.

Probable error of one night, as derived from the internal agreement of the measures.

The error in angle is given in arc measure.

Distance	Magnitude of fainter component																					
	⩽ 9.0			9.1 ... 10.0			10.1 ... 11.0			11.1 ... 12.0			12.1 ... 12.5			12.6 ... 13.2					
	p. e.			p. e.			p. e.			p. e.			p. e.			p. e.					
	angle	dist.	*n*	angle	dist.	*n*	angle	dist.	*n*	angle	dist.	*n*	angle	dist.	*n*	angle	dist.	*n*			
⩽ 2."99	±0."08	±0."11	6	±0."09	±0."18	27	±0."06	±0."20	17	±0."13	±0."14	6	— — —	— — —	—	±0."61	±0."33	5			
3."00 ... 4."99	±0. 14	±0. 11	5	±0. 20	±0. 16	17	±0. 21	±0. 30	35	±0. 22	±0. 24	38	±0. 30	±0. 42	21	±0. 46	±0. 30	12			
5."00 ... 9."99	±0. 10	±0. 08	7	±0. 12	±0. 23	33	±0. 14	±0. 19	56	±0. 20	±0. 30	63	±0. 24	±0. 31	41	±0. 33	±0. 29	24			
10."00 ... 24."99	±0. 14	±0. 11	5	±0. 20	±0. 16	17	±0. 21	±0. 30	35	±0. 22	±0. 24	38	±0. 30	±0. 42	21	±0. 46	±0. 30	12			
25."00 ... 59."99	±0. 19	±0. 20	12	±0. 35	±0. 20	6	±0. 24	±0. 31	9	±0. 28	±0. 33	5	±0. 45	±0. 24	6						
⩾ 60."00																					

The following abbreviations were used:

β. G. C. = Burnham's General Catalogue of Double Stars.
β. p. m. = Burnham's Measures of Proper Motion Stars.
H. R. = Harvard Revised Photometry.
p. m. = proper motion
c. p. m. = common proper motion
f. = relatively fixed
opt. = optical.

I. Stars from Burnham's General Catalogue.

8 Σ 3064 rej. 6.8 . . . 9.9

6.035	360.°5	24.″18
6.044	359. 3	23. 84
1926. 04	359. 9	24. 01

opt., angle increasing.

12 H 1935 9.1 . . . 9.4

6.044	7.°6	15.″66
6.082	9. 6	14. 95
1926. 06	8. 6	15. 30

f. ?

27 Arg. I. 9.5 . . . 9.5

6.044	144.°7	24.″39
6.082	143. 9	24. 00
1926. 06	144. 3	24. 20

Distance perhaps increasing.

28 H 1001 9.3 . . . 11.2

6.044	76.°8	15.″87
6.082	77. 3	15. 97
1926. 06	77. 0	15. 92

f.

60 H 1943 9.5 . . . 11.0

6.035	235.°7	12.″37
6.098	232. 2	13. 20
1926. 07	234. 0	12. 78

106 β 392 6.6 . . . 12.6

5.285	69.°3	20.″08
6.161	68. 0	18. 78
1925. 72	68. 6	19. 43

f.

125 Es 41 8.3 . . . 11.6

6.082	221.°6	5.″54
6.101	217. 6	6. 07
1926. 09	219. 6	5. 80

c. p. m.

166 Es 115 8.5 . . . 10.8

6.082	79.°9	9.″43
6.101	81. 4	9. 76
1926. 09	80. 6	9. 60

167 Es 42 8.9 . . . 11.5

6.082	192.°8	10.″11
6.101	193. 3	10. 91
1926. 09	193. 0	10. 51

f. $\delta = 53^{0}55'$ (1926).

This is the northern in a small triangle of equal stars (2′×4′); 20′ to north from this is an 8 mg. star. The declination in *β. G. C.* is by 15′ too large.

246 Es 2 9.2 . . . 10.5

6.082	111.°1	6.″78
6.101	114. 3	6. 15
1926. 09	112. 7	6. 46

f. ?

250 Es 116 9.5 . . . 9.5

6.082	255.°5	8.″07
6.101	254. 4	8. 09
1926. 09	255. 0	8. 08

f. About 2.′5 north from this is a $6^{1}/_{2}$ mg. star.

276 β 1310 *A* and *C* 7.1 . . . 13.1

1926.106 297.°5 16.″66

opt.

A and *D* . . . 10.3

1926.106 146.°9 95.″20

opt. The motion of *A* relative to *C* and *D* is about 0.″09 in 82°.

297 Es 3 9.3 ... 11.2

6.082	154.°2	8.″64
6.101	155. 4	8. 44
1926. 09	154. 8	8. 54

f. ?

319 A. G. 6 8.6 ... 10.9

1926.112 12.°3 62.″16

opt. Relative proper motion smaller than derived from meridian observations.

329 H V. 17 *A* and *B* 4.0 ... 8.1

4.925	173.°2	...
5.052	174. 1	35.″93
5.055	173. 2	35. 87
1925. 01	173. 5	35. 90

A and *C* ... 11.7

5.052	357.°5	55.″84
5.055	357. 0	55. 34
1925. 05	357. 2	55. 59

opt. ?

365 *B. D.* 51°127 9.1 ... 10.1

1926.101 71.°0 22.″51

opt.

395 β 231 3.6 ... 10.7

5.011	303.°4	32.″51
5.044	303. 4	33. 14
1925. 03	303. 4	32. 82

f.

437 $O\Sigma$ (App.) 9 *A* and *B* 8.3 ... 9.0

1924.816 238.°4 100.″19

opt.

A and *C* ... ...

1924.816 321.°9 109.″30

opt.

C and *D* 10.0 ... 12.5

1924.925 219.°5 19.″72

C and *D* relatively fixed.

542 H 1064 5.3 ... 11.6

5.011	4.°5	20.″81
5.044	6. 0	19. 25
1925. 03	5. 2	20. 03

f. ?

576 H IV. 66 7.3 ... 10.3

5.011	74.°9	21.″58
5.044	75. 6	21. 84
1925. 03	75. 2	21. 71

opt. ?

691 H III. 23 *A* and *B* 4.1 ... 6.8

1925.282 230.°7 134.″51

A and *C* ... 11.6

1925.282 208.°2 48.″15

There are many other stars in the field.

712 A. G. 17 7.8 ... 9.5

6.046	98.°3	54.″56
6.106	98. 6	54. 71
1926. 08	98. 4	54. 64

f. (c. p. m. ?)

718 Σ 115 *A* and *B* 7.3 ... 7.5

1925.282 148.°2 1.″16

AB and *C* ... 12.0

1925.282 280.°0 46.″44

opt.

735 H 1078 *A* and *B* 8.9 ... 12.6

6.046	93.°5	16.″14
6.112	94. 6	15. 17
1926. 08	94. 0	15. 66

c. p. m.

A and *C* ... 11.1

6.046	87.°4	26.″86
6.112	89. 2	26. 72
1926. 08	88. 3	26. 79

opt.

757 Ho 7 6.9 ... 11.7

5.011	162.°8	14.″26
5.044	163. 5	15. 40
1925. 03	163. 2	14. 83

opt.

765 β 1164 *AB* and *C* 6.6 ... 11.6

1925.044 221.°6 147.″36

opt.

794 Σ 132 *Dd* 10.5 ... 11.5

4.925	290.°8	4.″03
4.953	291. 9	4. 45
1924. 94	291. 4	4. 24

Some change ?

819 H 2054 5.1 ... 10.7

5.285	236.°5	52.″94
5.309	236. 2	52. 95
1925. 30	236. 4	52. 94

f.

861 τ Androm. 4.4 ... 10.7

5.011	328.°6	52.″84
5.044	329. 6	52. 09
1925. 03	329. 1	52. 46

f.

868 H 1088 6.9 ... 9.7

5.285	168.°2	19.″97
6.161	165. 9	19. 64
1925. 72	167. 0	19. 80

c. p. m.

960 Σ 167 *rej.* 8.6 ... 10.6

1925.285 356.°2 15.″99

opt.

1008 Σ 4, App. I. *A* and *B* 6.2 ... 11.2

5.052	79.°6	18.″78
5.063	76. 6	18. 81
1925. 06	78. 1	18. 80

c. p. m. (0.″15 in 83°).

A is the *SE* component (the brighter) of a wide pair; in T. P. 25$_6$ the proper motion is erroneously ascribed to the other star whereas it belongs to *A*.

1023 H 1100 5.9 ... 10.4

5.110	310.°7	39.″89
5.123	308. 9	38. 93
5.142	310. 0	39. 55
1925. 12	309. 9	39. 46

opt.

1068 H 647 9.6 ... 11.0

1926.112 31.°5 26.″14

opt.

1109 A. G. 32 *A* and *B* 10.1 ... 10.9

5.939	98.°7	21.″46
6.049	98. 4	21. 31
1925. 99	98. 6	21. 38

f.

A and *C* ... 13.1

5.939	332.°0	14.″47
6.049	332. 5	15. 20
1925. 99	332. 2	14. 84

1111 Es 48 7.1 ... 12.7

5.939	206.°6	8.″78
6.049	209. 5	8. 89
1925. 99	208. 0	8. 84

Certainly optical; the relative proper motion is about 0.″18 in 105° (*A*) or 285° (*B*).

The meridian positions suggest for the proper motion of *A* a value of about 0.″10 in 140°. Thus, perhaps *B* has some sensible proper motion of its own.

1112 Arg. 7 8.0 ... 9.5

6.046	260.°9	17.″91
6.049	261. 3	18. 22
1926. 05	261. 1	18. 06

opt.?

1121 H 1109 9.6 ... 11.1

6.148	175.°2	25.″60
6.161	173. 7	25. 63
1926. 15	174. 4	25. 62

opt.

1131 $O\Sigma$ (App.) 24 *A* and *C* 6.6 ... 11.1

1925.285 219.°2 102.″12

opt.

A and *B*: ... 7.1; 330° ±; 60″ ± (est.)

1133 Es 47 *A* and *B* 9.3 ... 12.2

6.046	294.°7	5.″78
6.049	293. 5	6. 14
1926. 05	294. 1	5. 96

Distance increasing?

A and *C* ... 11.7

6.046	256.°0	20.″48
6.049	256. 7	20. 25
1926. 05	256. 4	20. 36

opt.?

1171 β 786 8.7 ... 10.4

6.046	353.°3	5.″13
6.049	351. 1	5. 42
1926. 05	352. 2	5. 28

f.

1186 Tucker ... 9.3 ... 11.5

5.939	244.°9	2.″13
6.046	237. 3	2. 56
1925. 99	241. 1	2. 34

1198 H 1115 5.4 ... 12.2

4.063	203.°9	56.″11
4.665	206. 0	56. 74
5.044	204. 3	57. 28
1924. 59	204. 7	56. 71

f.

1208 H 2127 9.9 ... 10.9

6.046	135.°8	7.″55
6.049	134. 0	7. 17
1926. 05	134. 9	7. 36

There is an 8 mg. star about 160″ in 220° from this.

1211 H 2128 *A* and *B* 9.9 ... 11.6

6.046	52.°8	9.″91
6.049	54. 5	9. 77
1926. 05	53. 6	9. 84

A and *C* ... 13.2; 90° ± 16″ ± (est.)
A and *D* ... 10.3; 140° ± 110″ ± (est.)

1216 A. G. 36 9.3 ... 11.1

5.928	220.°9	3.″16
5.939	216. 9	3. 65
1925. 93	218. 9	3. 40

1223 A. G. 37 9.6 ... 11.3

5.928	292.°5	4.″69
5.939	294. 2	4. 38
1925. 93	293. 4	4. 54

f. ?

1231 Σ 255 *rej.* 9.3 ... 9.6

6.046	360.°7	7.″25
6.049	360. 9	7. 44
1926. 05	360. 8	7. 34

f.

1239 A. G. 38 *A* and *B* 7.6 ... 8.2

1925.928	260.°3	34.″59

c. p. m.

A and *C* ... 12.1

1925.928	181.°4	129.″25

opt.

1241 Hn 7 8.3 ... 10.8

6.049	190.°0	2.″22
6.161	186. 6	1. 93
1926. 10	188. 3	2. 08

f.

1261 A. G. 39 9.1 ... 11.9

6.112	354.°8	20.″14
6.148	357. 8	20. 83
1926. 13	356. 3	20. 48

A is the northern of two equal stars about 4′ distant.

1273 H 2137 8.8 ... 10.3

6.101	132.°8	26.″57
6.148	133. 5	26. 75
1926. 12	133. 2	26. 66

1274 H 2136 8.7 ... 9.4

6.101	29.°5	5.″08
6.148	31. 0	4. 52
1926. 12	30. 2	4. 80

f. ?

1281 H 2139 *A* and *B* 9.1 ... 9.1

6.148	120.°7	3.″29
6.161	117. 3	2. 55
1926. 15	119. 0	2. 92

f. ?

AB and *C* ... 12.3

6.148	15.°9	18.″84
6.161	13. 6	18. 46
1926. 15	14. 8	18. 65

Perhaps decreasing distance.

1290 H 2142 *A* and *B* 9.7 ... 11.4

6.148	313.°8	7.″78
6.161	311. 8	7. 92
1926. 15	312. 8	7. 85

A and *C* ... 10.6

6.148	352.°1	8.″01
6.161	351. 3	8. 04
1926. 15	351. 7	8. 02

1291 β 304 7.8 ... 12.4

5.928	284.°5	19.″91
5.939	282. 1	19. 90
1925. 93	283. 3	19. 90

Distance increasing.

1293 A. G. 40 10.4 ... 12.1

5.928	247.°1	5.″22
5.939	245. 6	5. 75
1925. 93	246. 4	5. 48

f.

1294 Ku 10 9.7 ... 10.4

5.928	356.°9	2."90
5.939	355. 0	3. 43
1925. 93	356. 0	3. 16

1297 H 2143 8.7 ... 10.2

1926.148	20.°1	23."40

f.

1298 H 2144 8.9 ... 10.9

6.148	258.°4	26."67
6.161	258. 1	26. 16
1926. 15	258. 2	26. 42

1306 A. G. 41 10.3 ... 10.3

5.928	262.°7	4."25
5.939	261. 9	4. 30
1925. 93	262. 3	4. 28

f.

1310 H 653 8.1 ... 12.5

5.928	43.°8	. . .
5.939	43. 1	23."13
1925. 93	43. 4	23. 13

f. ? A is the western of two 8 mg. stars about 5′ distant.

1313 A. G. 42 8.5 ... 10.7

5.939	142.°5	6."58
6.049	142. 6	6. 27
1925. 99	142. 6	6. 42

f. ?

1318 H 1120 *A* and *B* 6.7 ... 11.4

5.011	88.°7	17."52
5.044	89. 4	17. 42
1925. 03	89. 0	17. 47

A and *C* ... 11.6

5.011	320.°7	39."92
5.044	320. 0	39. 93
1925. 03	320. 4	39. 92

1340 β 305 6.2 ... 10.8

5.011	203.°1	20."84
5.044	204. 6	20. 17
1925. 03	203. 8	20. 50

f. ?

1384 β 521 7.3 ... 11.9

5.052	152.°4	6."09
5.090	150. 1	6. 12
1925. 07	151. 2	6. 10

f.

1390 β 522 6.4 ... 12.5

5.011	264.°4	18."58
5.052	265. 7	19. 42
1925. 03	265. 0	19. 00

c. p. m.

1391 Hu 540 8.8 ... 11.3

6.049	220.°1	4."36
6.161	219. 1	3. 95
1926. 10	219. 6	4. 16

c. p. m.

1398 β 306 *A* and *C* 6.1 ... 11.7

1925.044	89.°2	51."17

A and *B* ... 8.1; 20° ±; 2″ ± (est.)

1418 β 9 6.3 ... 9.1

5.011	178.°1	1."98
5.052	176. 2	2. 02
1925. 03	177. 2	2. 00

Some change.

1440 Σ 307 *A* and *C* 3.6 ... ...

5.090	268.°5	66."61
5.205	269. 0	66. 45
5.224	269. 4	65. 83
1925. 17	269. 0	66. 30

f.

C and *D* 10.7 ... 11.7

5.090	116.°5	5."52
5.205	115. 6	. . .
5.224	119. 1	5. 79
1925. 17	117. 1	5. 66

f.

A and *B* ... 7.6; 300° ±; 30″ ± (est.)

1468 τ Persei *A* and *B* 4.5 ... ...

5.090	106.°4	51."72
5.142	106. 6	51. 12
1925. 12	106. 5	51. 42

opt. ?

B and *C* 11.6 ... 12.7

5.090	82.°0	3."5 ± (est.)
5.142	91. 8	3. 5 ± (est.)
1925. 12	86. 9	3. 5 ± (est.)

1489 Σ 324 *rej.* 7.0 ... 11.8

5.052	202.°8	25."36
5.090	202. 7	24. 17
1925. 07	202. 8	24. 76

f.

1521 Σ 327 *rej.* 5.6 ... 10.3

5.285	283.°9	23.″77
5.309	283. 6	23. 67
1925. 30	283. 8	23. 72

opt.

1642 Σ 368 *A* and *B* 7.1 ... 7.1

350°±; 2″± (est.)

AB and *C* ... 12.2

5.285	37.°3	64.″76
6.049	37. 6	65. 09
1925. 67	37. 4	64. 92

The Greenwich Astrographic Catalogue assigns to *AB* a proper motion of 0.″094 in 137°. The prior measures are too recent to decide whether *C* is moving with *AB*, or not.

1802 Webb ... 5.6 ... 7.6

1925.181 35.°4 54.″81

f.

1859 H 2004 5.6 ... 12.6

4.036	64.°8	63.″89
4.063	64. 7	64. 55
1924. 05	64. 8	64. 22

opt. ?

1933 43 Persei *A* and *C* 5.1 ... 11.4

1925.268 132.°6 99.″46

opt.

A and *B*: ...9.3; 30°±; 70″± (est.)

1936 Ho 325 6.2 ... 11.3

5.044	12.°7	22.″70
5.052	11. 6	23. 04
1925. 05	12. 2	22. 87

c. p. m. probable.

2038 Ho 506

No companion seen in the position observed by Hough (2.″1 in 72°; 8.5 : 10.5) and Doolittle (2.″2 in 73°; 8.2 : 11.0); the seeing was good, and a companion of the 11th magn. 2″ distant could not escape detection.

On the other hand, on two nights there seemed to be an extremely faint companion:

6.9 ... 13.0

1926.25 341.° (2n); 2.″55 (1n)

On a third night, however, I failed to find any companion.

The coordinates were controlled and were found to correspond to those given by Doolittle.

$\alpha = 4^h 0^m 33^s$; $\delta = +67°40'$ (1880)

2049 H 2223 10.0 ... 11.3

6.178	199.°0	17.″69
6.197	197. 0	18. 86
1926. 19	198. 0	18. 28

f. ?

2055 A. G. 78 9.4 ... 10.1

6.235	198.°8	17.″96
6.238	198. 1	17. 82
1926. 24	198. 4	17. 89

f.

2064 Σ 502 *rej.* *A* and *B* 8.8 ... ...

6.211	279.°0	15.″80
6.222	278. 0	16. 02
1926. 22	278. 5	15. 91

opt.

B and *C* 10.9 ... 10.7

6.211	302.°7	10.″83
6.222	299. 3	10. 56
1926. 22	301. 0	10. 70

f.

2073 *O*Σ 73 *A* and *B* 3.9 ... 11.1

5.268	350.°9	14.″70
5.271	355. 0	14. 52
1925. 27	353. 0	14. 61

A and *C* ... 9.5

5.268	232.°2	83.″54
5.271	232. 0	83. 96
1925. 27	232. 1	83. 75

2076 β 1233 6.9 ... 13.0

6.238	45.°6	5.″49
6.265	27. 2	5. 59
6.276	43. 4	5. 49
1926. 26	38. 7	5. 52

f. ? Very difficult with the 8 inch.

2087 H 2225 8.3 ... 10.7

6.238	231.°4	30.″28
6.265	231. 0	30. 23
1926. 25	231. 2	30. 26

f.

2091 Kr 22 9.5 ... 9.7

6.235	183.°5	3.″25
6.238	182. 2	3. 43
1926. 24	182. 8	3. 34

f.

2112 Ho 507 8.5 ... 12.4

6.197	29.°9	5.″29
6.211	27. 9	5. 29
1926. 20	28. 9	5. 29

f. ?

2118 Σ 519 *rej.* 7.3 ... 9.5

6.235	347.°6	18.″32
6.238	347. 1	18. 14
1926. 24	347. 4	18. 23

f.

2119 A. G. 79 9.1 ... 10.0

6.211	110.°1	25.″17
6.222	110. 3	25. 99
1926. 22	110. 2	25. 58

f.

2143 Knott 2 10.1 ... 10.3

6.211	197.°6	3.″62
6.222	198. 5	2. 95
1926. 22	198. 0	3. 28

f. ?

2145 Ho 508 8.3 ... 12.3

6.197	225.°5	3.″39
6.222	221. 4	3. 82
1926. 21	223. 4	3. 60

2190 H 2230 9.1 ... 9.1

6.178	323.°1	34.″86
6.197	323. 4	34. 47
1926. 19	323. 2	34. 66

2191 H 677 9.3 ... 10.2

6.178	111.°6	4.″55
6.197	109. 3	5. 02
1926. 19	110. 4	4. 78

f.

2202 H 678 9.7 ... 11.4

6.178	320.°5	13.″15
6.197	321. 8	12. 63
1926. 19	321. 2	12. 89

The angle by *H* is quite different.

AC: ... 10.7; 260°±; 120″± (est.)

2205 Kr 23 9.3 ... 10.2

6.235	132.°5	4.″28
6.238	131. 2	4. 10
1926. 24	131. 8	4. 19

f.

2228 Ku 18 9.6 ... 10.1

6.197	56.°4	1.″43
6.235	50. 3	1. 95
1926. 22	53. 4	1. 69

2231 β 789 8.9 ... 9.5

6.197	331.°3	1.″09
6.235	328. 1	1. 47
1926. 22	329. 7	1. 28

f. ?

2232 Σ 556 *rej.* *A* and *B* 9.4 ... 9.7

6.178	287.°2	3.″60
6.197	287. 7	3. 73
1926. 19	287. 4	3. 66

A and *C*: ... 10.3; 160°±; 75″± (est.)

2235 A. G. 80 9.5 ... 10.1

6.235	361.°4	15.″16
6.238	361. 2	15. 56
1926. 24	361. 3	15. 36

f. ?

2237 H 1146 *A* and *B* 7.9 ... 10.3

6.238	40.°0	26.″72
6.265	39. 4	25. 89
1926. 25	39. 7	26. 30

Little or no change.

A and *C*: ... 8.5; 280°±; 100″± (est.)

2251 H 5461 *A* and *B* 5.9 ... 10.7

4.036	102.°5	25.″74
4.079	102. 2	26. 30
1924. 06	102. 4	26. 02

A and *C* ... 12.5

4.036	133.°9	49.″09
5.044	133. 0	50. 50
1924. 54	133. 4	49. 80

2261 H 344 9.1 ... 12.1

6.235	103.°5	11.″00
6.238	104. 4	10. 66
1926. 24	104. 0	10. 83

f.

2263 Kr 24 $A = 9.7$; $B = 9.6$

6.235	236.°8	3."19
6.238	237. 8	3. 33
1926. 24	237. 3	3. 26

f. B appeared to be slightly brighter than A; thus the angle should be changed by 180°.

AB is the northern of two equal stars,

$p.\ a. = 200° \pm$; $d = 3' \pm$

2304 H 346 5.9 ... 11.2

4.036	54.°4	44."42
5.044	54. 9	42. 82
1924. 54	54. 6	43. 62

c. p. m.

2313 S 455 4.1 ... 9.9

1924.036	213.°0	63."15

f.

2368 β 551 A and B 6.5 ... ...

5.224	57.°2	29."35
5.241	57. 4	29. 32
1925. 23	57. 3	29. 34

B and C 11.3 ... 12.6

5.224	205.°4	6."24
5.241	203. 5	6. 21
1925. 23	204. 4	6. 22

A and BC

1924.036	60.°0	27."48

This measure reduced to A and B gives 58.°4:; 28."8:, in satisfactory agreement with the mean of the two other measures. The reduction was made assuming the centre of the combined light of BC at a distance from B equal to $^1/_4$ the distance of B and C.

2448 Sh 49 A and B 5.6 ... 9.6

1924.063	305.°3	39."46

f.

A and C ... 10.6

1924.063	88.°7	53."88

f.

2451 Σ 618 A and B 6.5 ... 6.9

1925.263	211.°4	33."21

c. p. m.

B and C ... 10.4

1925.263	184.°6	91."64

opt. About 5′ to south there is a pair:

8.6 ... 9.6; 125° ±; 15" ±. Not in *β. G. C.*

2455 S 459 4.7 ... 7.0

5.200	208.°6	81."13
5.205	208. 7	80. 37
1925. 20	208. 6	80. 75

2459 β 554 = ε Aurigae

A and B 2.3 ... 12.1

5.241	223.°1	28."98
5.249	224. 9	28. 29
1925. 24	224. 0	28. 64

A and C ... 11.2

5.241	275.°3	42."84
5.249	275. 0	42. 99
1925. 24	275. 2	42. 92

f.

A and D ... 12.1

5.241	316.°5	44."45
5.249	316. 7	45. 58
1925. 24	316. 6	45. 02

2495 (β 1046) A and C 4.3 ... 8.3

1925.249	61.°2	90."05

c. p. m.

C and D ... 12.8

1925.249	122.°0	46."18

opt.

The common proper motion of AC is confirmed by the measure of D.

2528 S 466 6.1 ... 9.1

1925.266	250.°6	111."00

2531 Edgecomb... A and B 6.0 ... 12.4

5.222	151.°4	14."49
5.224	149. 0	14. 40
1925. 22	150. 2	14. 44

opt.

A and C ... 11.2

4.066	197.°5	35."81
5.142	196. 6	. . .
5.222	198. 1	35. 13
5.224	197. 4	35. 01
1924. 91	197. 4	35. 32

f.

2734 H 365 *A* and *B* 5.3 . . . 12.1

5.123	348.°4	37.″42
5.266	349. 1	38. 26
1925. 19	348. 8	37. 84

f. ?

A and *C* . . . 11.0

5.123	192.°7	58.″70
5.266	192. 6	58. 30
1925. 19	192. 6	58. 50

f.

A and *D* . . . 12.4

5.123	278.°4	73.″13
5.266	279. 8	73. 50
1925. 19	279. 1	73. 32

opt. ?

2757 *O*Σ (App.) 63 5.3 . . . 6.6

5.255	275.°0	75.″50
5.257	275. 1	75. 60
1925. 26	275. 0	75. 55

opt.

2943 Σ 789 *rej.* 6.1 . . . 9.5

5.099	149.°9	16.″76
5.110	149. 8	17. 21
1925. 10	149. 8	16. 98

f. ?

2959 H IV. 125 *A* and *B* 6.7 . . . 10.4

4.290	129.°1	24.″99
5.241	130. 7	25. 47
5.249	129. 8	25. 46
1924. 96	129. 9	25. 31

f. ?

A and *C*: . . . 12.1; 50″±; 140°±

2972 *O*Σ 118 *AB* and *C* 5.1 . . . 7.1

1925.255	161.°2	75.″50

f. (c. p. m.)

3005 Σ 793 *rej.* 8.9 . . . 11.4

1926.238	242.°7	10.″93

opt.

3022 β 1054 (230° : 15″; 6 . . . 12)

Examined on 4 nights, companion invisible with the 8 inch; certainly fainter than magn. 13.

3079 H V. 100 6.5 . . . 10.9

5.099	203.°6	36.″14
5.110	203. 7	36. 79
1925. 10	203. 6	36. 46

3089 Ho 21 5.9 . . . 12.1

1925.052	247.°1	8.″64

opt.

3121 β 893 5.7 . . . 11.7

5.216	130.°5	17.″92
5.222	128. 6	18. 04
1925. 22	129. 6	17. 98

f.

3153 H 378 9.1 . . . 9.1

6.112	76.°5	13.″56
6.148	76. 8	12. 59
1926. 13	76. 6	13. 08

3165 Arg. 13 7.8 . . . 9.1

1926.233	256.°3	24.″12

opt.

3166 H 379 7.7 . . . 12.2

6.197	110.°2	8.″84
6.200	112. 8	9. 27
1926. 20	111. 5	9. 06

opt. (angle decreasing.)

3189 A. G. 106 *A* and *B* 9.5 . . . 9.5

6.112	216.°1	26.″89
6.148	214. 1	27. 43
1926. 13	215. 1	27. 16

f.

A and *C* . . . 11.8

6.112	285.°3	18.″24
6.233	286. 6	17. 64
1926. 17	286. 0	17. 94

No prior measures of *AC*.
β. G. C. **3187** is 3′ in *SW* from this.

3206 H VI. 72 6.1 . . . 8.7

5.255	212.°3	86.″40
5.257	212. 2	86. 29
1925. 26	212. 2	86. 34

opt.

3211 Σ 857 *rej.* 6.9 . . . 10.9

6.233	216.°1	31.″85
6.235	216. 6	32. 20
1926. 23	216. 4	32. 02

opt.

3215 A. G. 107 9.2 . . . 9.4

6.148	186.°4	2.″25
6.161	188. 1	. . .
6.175	180. 7	1. 49
1926. 16	185. 1	1. 87

f. ?

3232 H 2300 9.3 . . . 12.5

6.230	95.°0	15.″13
6.233	94. 3	14. 49
1926. 23	94. 6	14. 81

Distance decreasing ?

There is a star somewhat brighter than *A*, 3′± in 180°±.

3235 Ho 23 *A* and *B* 6.9 . . . . . .

1926.227	198.°2	170.″03

f.

B and *C* 7.9 . . . 12.7

6.178	251.°06	2.″38
6.227	261. 6	2. 39
1926. 20	256. 6	2. 38

f. ?

3238 Σ 872 *A* and *C* 5.1 . . . 11.1

1925.266	284.°4	200.″63

No relative change.

3258 β 894 8.1 . . . 12.2

6.175	124.°8	4.″56
6.178	129. 5	5. 45
1926. 18	127. 2	5. 00

c. p. m. (0.″08 in 40°)

Perhaps decreasing angle; slow orbital motion ?

3260 β 567

Examined on 2 nights, companion invisible.

3267 Σ 878 *A* and *B* 7.3 . . . 10.3

1926.235	333.°7	25.″07

opt.

A and *C* . . . 10.3

6.233	67.°5	115.″37
6.235	67. 6	115. 65
1926. 23	67. 5	115. 51

opt.

The relative change is, however, only one-half the change expected from the meridian value of the proper motion of *A*.

3271 β 96 *A* and *B* 5.5 . . . 11.8

5.268	258.°1	62.″76
5.271	258. 3	62. 58
1925. 27	258. 2	62. 67

A and *C* . . . . . .

5.268	159.°1	117.″07
5.271	159. 4	117. 46
1925. 27	159. 2	117. 26

opt., relative change agrees with proper motion.

C and *D* 9.9 . . . 12.2

5.268	226.°4	5.″15
5.271	226. 2	5. 00
1925. 27	226. 3	5. 08

f.

3279 Ho 24 *A* and *B* 7.7 . . . 11.4

6.175	156.°5	4.″40
6.178	159. 5	4. 53
1926. 18	158. 0	4. 46

f.

A and *C* . . . 12.9

6.178	227.°6	24.″99
6.194	227. 1	24. 92
1926. 19	227. 4	24. 96

A and *D* . . . 12.5

6.178	352.°9	30.″57
6.194	352. 9	29. 79
1926. 19	352. 9	30. 18

A and *E*: . . . 13.1; 20°±; 45″± (est.)

3284 H 2307 9.3 . . . 11.7

6.230	92.°4	21.″74
6.233	91. 1	22. 97
6.235	92. 5	23. 30
1926. 23	92. 0	22. 67

f. ?

The first discordant distance may be due to a misreading of the micrometer (10 units of micrometer screw = 2.″86 in the double distance, or 1.″43 in the distance); rejecting the discordant measure, the distance becomes 23.″14 (2n).

3286 Es . . . 9.3 . . . 9.4

6.230	24.°6	9.″63
6.233	25. 5	9. 41
1926. 23	25. 0	9. 52

f.

3297 A. G. 109 9.0 . . . 9.2

6.200	21.°7	1.″85
6.227	20. 1	2. 30
1926. 21	20. 9	2. 08

3306 Σ 890 *rej.* 9.6 . . . 12.4

6.112	269.°4	16.″44
6.161	270. 8	16. 84
1926. 14	270. 1	16. 64

A is the northern of two equal stars, 95″ ± distant.

3318 H 386

A and *B* *A* = 9.6 . . . *B* = 10.5

6.112	62.°9	20.″25
6.161	63. 8	19. 67
1926. 14	63. 4	19. 96

f. ?

A and *C* . . . *C* = 9.2

6.112	165.°4	56.″91
6.161	165. 0	56. 78
1926. 14	165. 2	56. 84

No prior measures.

3321 H 2308 8.6 . . . 12.1

1926.238 221.°0 37.″07

A is the northern and brighter of two nearby stars.

3334 A. G. 110 9.5 . . . 9.9

6.200	322.°5	10.″10
6.227	322. 7	10. 66
1926. 21	322. 6	10. 38

opt.

On the second night there seemed to be a faint companion, . . . 13.1; 20°±; 4″±; however doubtful.

3338 *S* 514 *A* and *B* 4.6 . . . 10.9

4.290	139.°5	31.″18
4.320	138. 7	31. 55
1924. 30	139. 1	31. 36

opt. ?

A and *C* . . . 8.9

4.290	271.°9	96.″10
4.320	271. 6	95. 87
1924. 30	271. 8	95. 99

opt. ?

3348 A. G. 111 9.6 . . . 10.3

6.175	166.°4	7.″09
6.178	164. 4	6. 87
1926. 18	165. 4	6. 98

f.

3350 Es 65 9.7 . . . 10.9

6.049	90.°3	1.″41
6.175	91. 5	2. 15
1926. 11	90. 9	1. 78

f.

3364 Ku 25 9.7 . . . 10.7

6.175	128.°9	3.″45
6.178	121. 7	4. 22
1926. 18	125. 3	3. 84

f.

AC: . . . 9½; 120°±; 4′±

3365 H 3282 9.1 . . . 12.1

6.227	314.°2	16.″91
6.265	315. 0	15. 86
1926. 25	314. 6	16. 38

3374 A. G. 112 9.1 . . . 9.5

6.175	207.°7	2.″39
6.178	209. 9	2. 89
1926. 18	208. 8	2. 64

f.

AC: . . . 11.1; 330°±; 35″± (est.)

3384 A. G. 113 9.6 . . . 9.9

6.178	314.°9	10.″23
6.197	315. 8	10. 68
1926. 19	315. 4	10. 46

3389 H 2317 9.1 . . . 12.2

6.265	51.°8	12.″47
6.276	53. 5	13. 33
1926. 27	52. 6	12. 90

3397 β 1192 *A* and *BC* 3.1 . . . 9.9

1924.096 329.°4 112.″58

f.

A and *F* . . . 12.9

1924.096 254.°1 55.″64

opt. ?

3398 A. G. 114 9.1 . . . 9.9

6.175	361.°1	4.″73
6.178	360. 2	5. 75
1926. 18	360. 6	5. 24

f. ?

3399 A. G. 115 9.2 . . . 9.9

6.175	353.°4	4.″72
6.178	353. 3	4. 39
1926. 18	353. 4	4. 56

3403 Arg. 14 9.7 . . . 10.3

6.049	231.°1	6.″84
6.161	229. 4	7. 42
1926. 10	230. 2	7. 13

f. ?

3404 H 391 8.9 . . . 11.4

6.200	231.°4	18.″39
6.205	230. 8	17. 55
1926. 20	231. 1	17. 97

3417 Weisse 12 8.2 . . . 8.2

6.200	63.°0	8.″89
6.205	64. 3	8. 82
1926. 20	63. 6	8. 86

3422 *OΣ* 143 *A* and *B* 7.2 . . . 11.9

4.167	99.°4	8.″38
4.200	98. 4	7. 57
4.255	103. 4	7. 91
1924. 21	100. 4	7. 95

A and *C* . . . 11.1

4.167	344.°4	42.″77
4.200	343. 5	42. 94
1924. 18	344. 0	42. 85

3428 H 2319 *A* and *B* 8.9 . . . 10.5

6.049	306.°7	3.″50
6.175	307. 1	2. 68
6.200	308. 3	2. 79
1926. 14	307. 4	2. 99

A and *C* . . . 12.8

6.049	261.°1	14.″80
6.200	258. 0	15. 02
1926. 12	259. 6	14. 91

3440 *OΣ* 146 *rej.* 6.1 . . . 9.6

1925.110	140.°4	31.″70

opt.

3462 Σ 923 *rej.* 6.7 . . . 10.3

6.230	144.°4	31.″02
6.233	145. 4	31. 14
1926. 23	144. 9	31. 08

3469 Σ 938 6.3 . . . 10.1

5.268	207.°8	10.″41
5.271	210. 0	9. 94
1925. 27	208. 9	10. 18

f.

3473 A. G. 116 9.6 . . . 10.3

6.049	28.°9	1.″98
6.197	22. 7	2. 02
1926. 12	25. 8	2. 00

f.

3568 S 533 3.1 . . . 9.1

1925.110	94.°1	110.″44

f.

3633 Σ 968 *A* and *B* 7.6 . . . . . .

6.227	289.°1	20.″50
6.230	288. 8	20. 51
1926. 23	289. 0	20. 50

f. (*c. p. m.* ?)

B and *C* 8.3 . . . 12.8

6.227	56.°4	7.″94
6.230	57. 5	8. 49
1926. 23	57. 0	8. 22

f. (*c. p. m.* ?)

3752 *OΣ* 162 *rej.* 6.9 . . . 11.2

4.255	154.°2	21.″53
5.110	155. 2	20. 94
1924. 68	154. 7	21. 24

f.

3797 Sh 77 *A* and *B* 3.9 . . . 10.6

5.110	83.°7	87.″86
5.257	83. 6	87. 64
1925. 18	83. 6	87. 75

f. ?

A and *C* . . . 7.1

5.110	350.°15	96.″53

opt.

The smaller star C has an appreciable proper motion.

3811 $O\Sigma$ (App.) 82 6.3 . . . 6.9

1925.110 318.°5 90.″38

f.

3876 (Σ 1037)

AB and C 6.1 . . . 12.0

1925.216 102.°1 15.″30

opt.

3893 H VI. 74

A and B: 6.1 . . . 9.1; 30°±; 130″± (est.)

A and C: . . . 9.1; 45°±; 200″± (est.)

Too wide to be of any interest.

4183 H 765 A and B 8.1 . . . 11.1

5.222	214.°5	22.″27
5.224	213. 1	22. 43
1925. 22	213. 8	22. 35

opt. ?

A and C . . . 11.4

5.222	297.°4	41.″42
5.224	297. 2	41. 49
1925. 22	297. 3	41. 46

opt. ?

The measures of B and C seem to indicate for A a proper motion of about 0.″05 in 165°.

4361 Sh 87 A and B 4.6 . . . 8.1

1925.266 76.°9 88.″65

opt.

A and C . . . 8.8

1925.266 150.°3 120.″00

opt.

A and D . . . 10.3

1925.266 284.°2 116.″31

opt.

4375 Σ 1164 *rej.* 7.6 . . . 11.9

1926.238 356.°9 29.″92

opt.

4383 H VI. 75 A and B 6.5 . . . 12.3

4.255	23.°2	45.″30
5.090	23. 6	45. 24
1924. 67	23. 4	45. 27

f.

A and C . . . 10.3

5.090	295.°2	108.″31
5.110	295. 4	108. 29
1925. 10	295. 3	108. 30

Some change in distance?

4441 A. G. 149 9.6 . . . 10.6

6.290	228.°7	6.″41
6.320	235. 6	5. 72
1926. 30	232. 2	6. 06

4454 H 3308 A and B 5.6 . . . 10.1

1926.279 270.°4 51.″40

opt.

A and C . . . 10.6

1926.279 132.°8 65.″63

No prior measures.

4461 H 2430 A and B 9.3 . . .

6.265	311.°6	18.″52
6.279	310. 6	19. 19
1926. 27	311. 1	18. 86

opt.

B and C 12.3 . . . 12.7

6.265	178.°5	7.″31
6.279	181. 6	8. 62
1926. 27	180. 0	7. 96

4468 Es 71 9.5 . . . 10.4

6.233	274.°4	2.″90
6.235	282. 6	2. 95
6.279	283. 2	3. 19
1926. 25	280. 1	3. 01

f ?

4471 H 777 9.3 . . . 10.6

6.279	350.°2	11.″07
6.290	348. 5	10. 48
1926. 28	349. 4	10. 78

f. ?

4483 A. G. 151 9.2 . . . 9.5

6.279	146.°7	5.″84
6.290	150. 2	6. 45
1926. 28	148. 4	6. 14

f.

4491 B. D. 27° 1563 8.5 . . . 12.3

6.290	305.°3	18.″71
6.320	302. 4	19. 44
1926. 30	303. 8	19. 08

4493 Σ 1199 *rej.* 8.2 . . . 11.1

6.233	361.°06	24.″73
6.235	362. o	24. 94
1926. 23	361. 8	24. 84

f.

4496 Pritchett . . . 8.7 . . . 9.3

6.279	346.°5	1.″56
6.320	349. 2	1. 37
1926. 30	347. 8	1. 46

f.

4499 β 1243 *A* and *C* 7.3 . . . 10.6

1924.167 301.°2 62.″96

4519 Ho 524 *A* and *B* 8.0 . . . 12.4

6.279	340.°8	4.″76
6.320	345. 2	4. 55
1926. 30	343. o	4. 66

A and *C*: . . . 10.9; 70°±; 40″± (est.)

4530 H 781 9.7 . . . 9.7

6.279	324.°5	5.″78
6.290	323. 5	5. 49
1926. 28	324. o	5. 64

4531 Σ 1211 *A* and *C* 8.3 . . . 8.9

1925.224 131.°4 99.″35

opt.

4536 Ho 39

The star on the place of β. G. C., and 4 other neighbouring stars were examined on two nights, and no double found.

According to the description of Hough and Doolittle, this must be one of the easiest pairs:

Ho $d = 6.''2$; 9 . . . 10
Doo $d = 6.\ 2$; 9.6 . . . 10.2

4563 Arg. 18 9.1 . . . 9.1

6.265	22.°1	19.″93
6.279	21. 9	19. 75
1926. 27	22. o	19. 84

f.

4583 H 2443 *A* and *B* 9.6 . . . 12.7

6.265	322.°9	17.″56
6.279	323. 9	16. 94
1926. 27	323. 4	17. 25

A and *C*: . . . 10.2; 120°±; 100″± (est.)

4592 H 446 *A* and *B* 8.8 . . . 11.7

6.290	345.°3	32.″20
6.320	344. 6	32. 34
1926. 30	345. o	32. 27

A and *C*: 260°±; 3′±
A and *D*: 45°±; 8′±

Both *C* and *D* slightly fainter than *A*.

4595 Es 18 8.6 . . . 10.3

6.290	234.°6	11.″96
6.320	235. o	12. 08
1926. 30	234. 8	12. 02

f. ?

4612 2 Hydrae 5.0 . . . 10.8

4.200	3.°0	73.″40
5.260	3. 1	75. 02
5.263	3. 2	73. 76
1924. 57	3. 1	74. 06

Measures of distance discordant; Burnham's measures also discordant.

4645 Σ 1234 7.6 . . . 8.6

1926.265 69.°0 22.″90

opt.

4693 Σ 1250 *A* and *B* 9.4 . . . 9.7

1926.265 166.°8 21.″95

c. p. m.

A and *C*: $C = 6.1$; 150°±; 200″± (est.)

4746 S 579 4.1 . . . 7.3

5.260	309.°4	78.″69
5.263	309. 9	79. 05
1925. 26	309. 6	78. 87

4822 S 583 5.6 . . . 9.5

4.255	23.°4	79.″12
5.090	23. 4	78. 85
1924. 67	23. 4	78. 98

f.

4823 H 460 6.6 . . . 11.6

1924.167	332.°6	42.″85

4828 (β 587)
H V. 120 = *AB* and *C* 6.2 . . . 11.1

4.183	360.°0	(44.″83 *rej.*)
5.260	359. 7	45. 73
5.263	360. 0	46. 44
1924. 90	359. 9	46. 08

opt.

AB and *D* . . . 11.7

4.183	55.°0	(50.″27 *rej.*)
5.260	53. 7	52. 26
5.263	53. 7	52. 31
1924. 90	54. 1	52. 28

4844 Ho 357 7.1 . . . 13.0

1925.216	2.°8	43.″97

opt.

4948 Σ 1314 *rej.* 8.6 . . . 10.6

1926.265	89.°6	39.″06

Estimated: 90°±; 40″±.
The prior measure is:

1905.0 126.°9 36.″26 β 1 n.

If this is correct, the small star must possess a considerable proper motion, about 1″ annually; the question may be settled after remeasuring this pair within 2—3 years.

5291 H 2517 6.5 . . . 12.6

5.216	150.°8	43.″85
5.222	150. 5	43. 65
1925. 22	150. 6	43. 75

opt.

The proper motion of *A* relative to *B*, about 0.″11 annually, does not agree with the meridian value.

5326 H 475 5.9 . . . 12.9

4.252	177.°±	. . .
4.260	172. 2	25.″40
4.320	175. 0	. . .
5.216	172. 8	27. 38
5.222	171. 9	27. 25
1924. 75	173. 0	26. 68

c. p. m.

5327 Weisse 23 9.5 . . . 10.1

5.343	315.°7	. . .
6.197	314. 3	2.″78
6.200	314. 0	2. 88
1925. 91	314. 7	2. 83

There is a slightly brighter star than *A*, 5′ distant in about 345° p. a.

5333 H 2520 8.1 . . . 11.1

1925.309	343.°9	32.″60

5335 H 2521 8.7 . . . 12.4

5.340	272.°8	25.″80
5.361	272. 0	26. 63
1925. 35	272. 4	26. 22

5337 Σ 1412 *rej.*

A and *B* 7.5 . . . 11.9

6.194	292.°8	30.″72
6.200	294. 2	30. 01
1926. 20	293. 5	30. 36

A and *C* . . . 7.8

6.194	49.°5	95.″24
6.200	49. 8	95. 22
1926. 20	49. 6	95. 23

opt.

5341 H 2522 8.3 . . . 11.1

5.337	147.°8	29.″35
5.340	147. 9	30. 12
1925. 34	147. 8	29. 74

5345 H 476 7.5 . . . 10.9

5.337	49.°2	24.″41
5.340	48. 7	24. 27
1925. 34	49. 0	24. 34

f.

5352 H 477 *A* and *B* 9.5 . . . 9.8

5.337	98.°3	8.″87
5.340	96. 9	8. 59
1925. 34	97. 6	8. 73

A and *C* . . . 12.7

5.337	3.°1	14.″60
5.340	0. 8	14. 26
1925. 34	2. 0	14. 43

f.

5354 Lewis 10 9.2 . . . 9.3

6.227	7.°9	1.″51
6.276	2. 0	1. 59
1926. 25	5. 0	1. 55

f.

5355 H 4296 8.3 . . . 11.1

5.337	141.°0	15.″79
5.340	140. 4	15. 85
1925. 34	140. 7	15. 82

5360 H 1176 8.5 . . . 8.5

5.340	317.°5	9.″34
5.361	319. 1	8. 78
1925. 35	318. 3	9. 06

5364 H 156 *A* and *B* 9.6 . . . 11.9

6.194	237.°3	19.″41
6.200	240. 6	18. 65
1926. 20	239. 0	19. 03

opt. ?

A and *C* . . . 11.5

6.194	315.°8	21.″65
6.200	317. 9	22. 68
1926. 20	316. 8	22. 16

opt. ?

The change in *AB* and *AC* may be explained by the same motion of *A*, about 0.″05 in 310°.

5366 Ho 45 9.9 . . . 10.8

6.194	143.°1	9.″73
6.200	143. 8	9. 81
1926. 20	143. 4	9. 77

f. ?

5376 H 3324 8.1 . . . 9.8

5.340	199.°0	18.″95
5.361	198. 9	18. 44
1925. 35	199. 0	18. 70

5391 H 158 8.4 . . . 11.7

6.194	160.°3	20.″83
6.200	162. 4	21. 65
1926. 20	161. 4	21. 24

5403 Kr 36 8.7 . . . 9.5

5.340	241.°8	5.″82
5.361	243. 7	5. 74
1925. 35	242. 8	5. 78

5423 Σ 1430 *rej.*

A and *B* 7.2 . . . 11.9

5.337	270.°4	20.″45
5.340	271. 3	20. 68
1925. 34	270. 8	20. 56

A and *C* . . . 9.8

5.337	235.°7	23.″24
5.340	235. 0	22. 40
1925. 34	235. 4	22. 82

5436 H 832 6.3 . . . 11.9

4.252	132.°0	37.″34
5.208	132. 2	37. 11
1924. 73	132. 1	37. 22

opt.

5441 Σ 1438 *rej.* 8.5 . . . 10.7

6.194	245.°5	13.″36
6.200	248. 9	13. 57
1926. 20	247. 2	13. 46

opt.

This is B. D. + 13° 2265

$\alpha = 10^h25.^m2$ (1926).

It is the eastern of two equal stars, $\triangle\ \alpha = 0.^m7$.

In *β. G. C.* the position and *B. D.* number refer erroneously to the western; in *β. p. m.* the *B. D.* number is given correctly, but the right ascension is still wrong.

5442 H 2532 9.4 . . . 9.5

5.337	69.°1	12.″96
5.340	70. 5	13. 27
1925. 34	69. 8	13. 12

There is an 8 mg. star in 250°±; 200″± from this.

5452 Ho 372

A and *B* 8.3 ... 12.9

6.211	77.°9	14.″35
6.227	77. o	14. 60
1926. 22	77. 4	14. 48

opt. ?

A and *C* ... 10.3

6.211	201.°4	46.″56
6.227	202. 6	46. 57
1926. 22	202. o	46. 56

opt. ?

The change in *AB* and *AC* may be explained by a proper motion of *A* of about o.″05 in 260°.

5458 H 482 5.8 ... 12.2

4.252	245.°4	42.″95
4.260	246. 1	43. 71
5.208	244. 3	43. 14
1924. 57	245. 3	43. 27

opt.

Relative proper motion o.″15 annually belongs evidently chiefly to the small star.

5460 H 483 8.1 ... 11.4

5.337	137.°4	14.″93
5.340	135. 9	15. 22
1925. 34	136. 6	15. 08

f.

5463 H 2533 9.5 ... 10.2

6.211	325.°9	8.″69
6.227	328. o	8. 49
1926. 22	327. o	8. 59

5475 Σ 1444 *rej.* 7.7 ... 10.4

5.361	266.°5	17.″65
5.367	265. 7	18. 18
1925. 36	266. 1	17. 92

f.

5485 Σ 1451

A and *B*: 9.1 ... 10.2; 270°±; 8″± (est.)

A and *C* ... 13.1

1926.200	328.°7	42.″84

opt.

The relative proper motion is perhaps smaller than the meridian value.

5486 H 487 10.0 ... 10.1

5.337	361.°0	12.″86
5.340	360. 4	12. 76
1925. 34	360. 7	12. 81

A and *C*: ... 10.3; 290°±; 50″± (est.)

5490 Weisse 24 7.7 ... 8.8

5.337	240.°7	17.″64
5.340	241. 1	17. 64
1925. 34	240. 9	17. 64

5575 H 838 6.1 ... 11.7

5.260	306.°7	27.″61
5.266	305. 9	26. 93
1925. 26	306. 3	27. 27

5623 Σ 1494 *A* and *B* 8.2 ... 9.2

5.263	331.°9	11.″00
5.266	331. 5	10. 24
1925. 26	331. 7	10. 62

A and *C* .. 12.3

5.263	73.°9	136.″40
5.266	73. 5	136. 65
1925. 26	73. 7	136. 52

Relative proper motion only o.″07 in 250°.

5655 H 2554 6.1 ... 7.6

1926.200	280.°7	47.″90

opt.

5690 H 2561 9.2 ... 12.1

6.200	220.°7	15.″75
6.211	221. 9	14. 20
6.227	221. 5	14. 72
1926. 21	221. 4	14. 89

c. p. m.

Rejecting the first outstanding measure of distance, the average distance becomes 14.″46 (2 n).

The declination in *β. G. C.* is by 3′ too small. Near the place of *β. G. C.* there is another 10.5 mg. star.

5699 *OΣ* (App.) 108

A and *C* 5.6 ... 12.1

1925.241	157.°2	86.″69

opt.

5732 (β 600) *A* and *C* 6.0 . . . 7.7

5.260	97.°8	58.″54
5.263	97. 8	58. 68
1925. 26	97. 8	58. 61

opt.

5895 *OΣ* 239 *rej.* 5.9 . . . 10.3

4.260	23.°7	37.″57
4.320	24. 8	36. 60
4.331	24. 4	37. 37
1924. 31	24. 3	37. 18

opt., angle increasing.

5935 H 1201 6.6 . . . 11.3

4.260	189.°5	15.″25
4.331	188. 7	14. 59
1924. 30	189. 1	14. 92

5985 Ho 534 8.1 . . . 12.1

6.200	133.°0	10.″68
6.211	133. 6	10. 17
1926. 21	133. 3	10. 42

The meridian value of the proper motion of *A* is 0.″11 in 85°; the observed change in *AB* is in the opposite direction and smaller by amount. Perhaps a physical pair with some orbital motion.

This is the eastern of two stars, *p. a.* 260°±, distance 5′±.

5992 H 513 8.3 . . . 10.4

6.200	251.°4	21.″15
6.211	251. 6	20. 64
1926. 21	251. 5	20. 90

c. p. m.

6033 H 1210 8.3 . . . 10.7

5.320	108.°0	7.″37
5.328	105. 2	7. 64
1925. 32	106. 6	7. 50

6037 H 199 8.2 . . . 12.3

5.320	75.°4	17.″64
5.328	74. 8	17. 62
1925. 32	75. 1	17. 63

6043 Ku 42 9.5 . . . 10.0

5.320	259.°8	9.″27
5.334	259. 7	9. 24
1925. 33	259. 8	9. 26

Change in angle?

6051 Es 73 *A* and *B* 8.0 . . . . . .

6.320	22.°8	32.″62
6.375	24. 6	32. 65
1926. 35	23. 7	32. 64

opt.

B and *C* 10.7 . . . 11.1

5.370	[317.°0]*)	. . .
6.320	300. 0	3.″93
6.375	314. 8	3. 03
1926. 35	309. 2	3. 48

f.

6062 Σ 1610 *rej.* 7.8 . . . 9.9

5.320	331.°3	29.″48
5.334	331. 7	29. 46
1925. 33	331. 5	29. 47

6081 H 2603 7.6 . . . 12.5

5.320	17.°7	23.″72
5.334	17. 8	22. 95
1925. 33	17. 8	23. 34

6085 H 2604 9.3 . . . 12.4

5.370	338.°4	18.″58
6.320	338. 6	19. 38
1925. 84	338. 5	18. 98

6089 Σ 1617 *rej.* 7.5 . . . 10.4

5.320	262.°5	31.″77
5.334	262. 9	31. 18
1925. 33	262. 7	31. 48

6090 Σ 1619 *A* and *B* 7.6 . . . 7.8

1925.255	276.°9	7.″24

A and *C* . . . 10.1

1925.255	175.°4	98.″11

opt.

*) 2 settings only, ½ weight.

6093 H 1214 *A* and *B* 9.5 ... 12.5

6.227	336.°9	12.″96
6.317	333. 7	13. 30
1926. 27	335. 3	13. 13

A and *C* ... 12.3

6.227	185.°4	18.″21
6.317	185. 7	18. 01
1926. 27	185. 6	18. 11

6103 Es 124 8.0 ... 12.6

5.320	114.°8	7.″18
5.334	115. 9	8. 27
5.361	110. 3	7. 72
1925. 34	113. 7	7. 72

6104 H 1215 9.3 ... 9.5

5.320	18.°4	25.″96
5.334	20. 1	25. 99
1925. 33	19. 2	25. 98

There is an 8.6 mg. star in 20° ±; 100″± from this.

6106 A. G. 176 7.7 ... 7.9

5.361	182.°8	2.″76
5.367	177. 8	2. 93
1925. 36	180. 3	2. 84

f.

6110 H 2606 9.3 ... 12.3

5.320	163.°7	11.″33
5.334	161. 3	10. 86
1925. 33	162. 5	11. 10

6120 Σ 1629 *rej.* 9.6 ... 11.9

5.378	301.°2	25.″79
6.211	301. 2	26. 07
1925. 79	301. 2	25. 93

6122 H 2607 9.9 ... 11.9

5.361	252.°2	14.″20
5.367	251. 9	14. 02
1925. 36	252. 0	14. 11

6129 β 27 7.3 ... 11.3

6.317	94.°9	3.″33
6.386	101. 3	3. 28
1926. 35	98. 1	3. 30

Perhaps change in angle?

6136 Ho 536 8.3 ... 10.0

5.361	98.°4	3.″86
5.367	98. 8	3. 88
1925. 36	98. 6	3. 87

6137 H 517 8.0 ... 12.7

5.361	251.°6	19.″84
5.367	250. 2	19. 12
1925. 36	250. 9	19. 48

6140 H 2610 9.0 ... 9.5

5.361	140.°9	25.″80
5.370	141. 4	25. 03
1925. 37	141. 2	25. 42

6143 Es 75

Nothing found on this place, several stars being examined on 3 nights in the neighbourhood. At or near the place given in *β. G. C.* there is no such pair.

In searching for this a new pair was found at

$\alpha = 12^h17.^m4$; $\delta = +45°56'$ (1926):

1926.320 256.°7 3.″88 7.6 ... 12.3 (in)

6150 H 208 9.8 ... 11.3

5.370	174.°6	13.″39
5.378	174. 6	13. 70
1925. 37	174. 6	13. 54

6157 Σ 1638 *rej.* 8.9 ... 10.3

5.367	282.°1	7.″52
5.370	284. 0	8. 02
1925. 37	283. 0	7. 77

There is a 6 mg. star in the field, about 2′ in *NE* from this.

6182 β 1324 *A* and *B* 9.1 ... 9.8

5.378	217.°7	2.″39
6.317	219. 0	2. 78
1925. 85	218. 4	2. 58

f. ?

A and *C* ... 8.7

5.378	181.°1	71.″14 (*AB* and *C*)
6.317	181. 3	71. 27 (*A* and *C*)

The first measure refers to the center of light of *A* and *B*; assuming this center at a distance from *A* equal to 1/3 of the distance of *B* from *A*,

the first measure reduced to *A* and *C* becomes: 1925.378 181.°5 71.″86, and the mean of the two measures:

A and *C*

1925.85 (2n) 181.°4 71.″56

opt. ?

6188 H 519 9.2 . . . 9.2

5.370	7.°0	19.″83
6.227	6. 4	19. 49
1925. 80	6. 7	19. 66

6205 H 212 9.2 . . . 9.4

5.370	265.°1	21.″60
6.227	264. 4	21. 40
1925. 80	264. 8	21. 50

f.

6345 β 112 *A* and *BC* 5.1 . . . . . .

1926.317 351.°5 146.″82

opt.

B and *C* 9.9 . . . 10.1

1926.317 292.°8 1.″53

f.

6379 H 220 8.5 . . . 12.5

6.317	38.°4	16.″74
6.375	40. 2	16. 99
1926. 35	39. 3	16. 86

If the proper motion, 0.″15 in 286°, is correct, the stars must form a physical pair. There, however, seems to be some change in angle and distance.

6393 $O\Sigma$ 259 *rej.* 7.6 . . . 7.7

1926.317 21.°2 39.″25

c. p. m.

6432 $O\Sigma$ (App.) 122

A and *B* 6.8 . . . . .

1926.320 212.°7 117.″50

opt.

B and *C* 7.6 . . . 9.1

1926.320 245.°2 62.″45

6442 β 800 *A* and *B* 5.1 . . . 8.3

1925.255 109.°2 4.″86

Distance increasing.

A and *C* . . . 10.3

1925.255 362.°7 92.″54

opt.

6540 H 1234 5.7 . . . 10.2

4.320	20.°2	32.″01
5.260	19. 5	32. 22
1924. 79	19. 8	32. 12

6618 (β 935)

AB and *CD* 5.1 . . . 11.1

4.290	164.°9	26.″09
5.255	163. 1	26. 49
1924. 77	164. 0	26. 29

f.

6632 S 654 5.1 . . . 9.6

1924.320 237.°5 71.″30

c. p. m.

6654 H 2688 9.2 . . . 11.0

6.375	284.°1	24.″33
6.378	283. 8	24. 53
1926. 38	284. 0	24. 43

opt.

The relative change is only one-half the change expected from the meridian value of the proper motion of *A*.

6662 H 3342 5.1 . . . 12.1

1924.846 26.°0 54.″82

f.

6710 Swift . . . 9.2 . . . 9.3

6.375	15.°7	3.″16
6.378	11. 8	2. 78
1926. 38	13. 8	2. 97

c. p. m.

Angle perhaps increasing.

6741 H 539 9.9 . . . 11.1

6.375	169.°8	29.″63
6.378	170. 4	29. 31
1926. 38	170. 1	29. 47

Angle 175° ±, distance 35″± estimated. Nothing else in the neighbourhood.

6744 H 540 9.1 . . . 9.7

6.375	212.°0	8.″90
6.378	211. 0	9. 24
1926. 38	211. 5	9. 07

f.

6745 H 2703 9.0 . . . 9.6

5.646	1.°9	9.″10
5.649	0. 3	. . .
5.663	2. 4	8. 90
1925. 65	1. 5	9. 00

opt. Angle decreasing.

6753 H 3343 4.5 . . . 11.1

4.260	213.°4	61.″03
4.285	212. 6	60. 52
4.331	213. 2	61. 24
1924. 29	213. 1	60. 93

Apparently optical.

6771 Σ 1822 *rej.* 9.3 . . . 10.2

5.646	49.°3	14.″97
5.663	49. 0	15. 05
1925. 65	49. 2	15 .01

$\alpha = 14^h08.^m9$; $\delta = +73^0 11'$ (1925).

This is Σ 1822 *rej.*, the identification in H (V) being right; in *β. G. C.* wrongly identified.

6771a *β* . . . 8.7 . . . 11.5

5.646	156.°0	11.″81
5.663	155. 3	12. 07
1925. 65	155. 6	11. 94

$\alpha = 14^h09.^m3$; $\delta = +72^0 57'$ (1925).

This pair was measured by Burnham for Σ 1822 *rej.* In *β. G. C.* part II there is much confusion in the description of this and the preceding pair.

6779 H 2706 10.3 . . . 10.8

5.646	74.°9	10.″73
5.663	73. 1	10. 48
1925. 65	74. 0	10. 60

6791 Howe 32 9.2 . . . 11.1

6.375	191.°2	4.″16
6.378	190. 7	4. 13
1926. 38	191. 0	4. 14

Distance decreasing.

6802 Σ 26 App. I.

A and *C* 4.1 . . . 12.4

1925.643	194.°4	86.″69

opt.

A and *B*: . . . 7.1; 40° ± ; 30″ ± (est.)

6821 A. G. 193 8.9 . . . 9.3

6.375	131.°0	7.″12
6.378	131. 4	7. 52
1926. 38	131. 2	7. 32

6829 Σ 1836 *rej.* 9.7 . . . 10.2

5.646	110.°5	21.″80
5.663	110. 7	21. 90
1925. 65	110. 6	21. 85

6854 H 2716 9.7 . . . 10.1

5.646	88.°0	5.″59
5.649	88. 7	5. 97
1925. 65	88. 4	5. 78

6856 Σ 3084 *rej.* 7.9 . . . 10.9

5.646	16.°7	30.″57
5.649	15. 9	30. 31
1925. 65	16. 3	30. 44

A and *C*: . . . 11.3; 350° ± ; 50″ ± (est.)

6864 H 2720 9.6 . . . 12.5

1925.646	29.°9	20.″30

6895 Σ 1854 *rej.* 6.3 . . . 11.0

4.194	256.°3	(25.″1 *rej.*)
4.197	256. 4	25. 73
4.290	256. 0	25. 32
1924. 24	256. 2	25. 52

6898 H 2725 8.7 . . . 11.7

5.646	136.°3	24.″50
5.649	136. 2	24. 43
1925. 65	136. 2	24. 46

Change in distance ?

6899 H 2727 *A* and *B* 9.0 . . . . . .

5.646	39.°3	22.″35
5.663	38. 3	22. 08
1925. 65	38. 8	22. 22

B and *C* 10.6 . . . 11.6

5.646	218.°0	6.″25
5.663	218. 3	6. 31
1925. 65	218. 2	6. 28

6908 H 2729 8.5 . . . 11.1

5.646	56.°6	26.″86
5.649	56. 5	27. 02
1925. 65	56. 6	26. 94

6919 H 2733 4.6 . . . 11.3

5.646	130.°8	58.″13
5.649	130. 3	58. 41
1925. 65	130. 6	58. 27

opt.

6920 Σ 1859 *rej.* 7.7 . . . 9.2

5.646	235.°2	20.″00
5.649	234. 2	19. 93
1925. 65	234. 7	19. 96

6926 Σ 1858 *A* and *B* 7.1 . . . 7.8

1925.255	39.°1	2.″88

A and *C* . . . 12.5

1925.255	314.°6	33.″17

opt.

There is another small star in 310°±; 80″±.

6977 Σ 1872 *A* and *B* 7.3 . . . 8.1

4.846	43.°8	7.″85
5.645	43. 6	7. 81
1925. 25	43. 7	7. 83

c. p. m.

A and *C* . . . 10.3

4.846	57.° 0	75.″93
5.645	56. 9	75. 93
1925. 25	56. 95	75. 93

Decided change in angle, but only one-half the amount expected from Porter's proper motion.

6999 Σ 1879 *A* and *B* 6.6 . . . 7.1

1925. 255	110.°2	1.″16

AB and *C* . . . 11.9

1925.255	207.°5	52.″98

opt.

AB and *D* . . . 10.6

1925.255	219.°4	130.″39

opt.

7032 Σ 1889 *rej.* 5.9 . . . 9.3

4.674	88.°3	15.″63
4.676	89. 3	15. 85
1924. 68	88. 8	15. 74

f.

7034 Σ 1888 *A* and *B* 3.9 . . . 8.1

1924.320	40.°5	3.″16

A and *C* . . . 12.8

4.320	349.°8	61.″67
4.331	350. 6	60. 79
1924. 33	350. 2	61. 23

opt.

7040 (β 31) *A* and *C* 8.7 . . . 12.1

4.331	170.°3	(6.″1 ± *rej.*)
5.255	166. 3	9. 28
1924. 79	168. 3	9. 28

A and *D* . . . 10.9

1924.331	274.°3	93.″51

opt.

A and *B*: . . . 10.6: 190°±; 2″± est.

7068 H VI. 51 5.1 . . . 9.6

4.197	224.°1	85.″65
4.260	224. 1	85. 40
5.285	223. 7	86. 06
1924. 58	224. 0	85. 70

c. p. m. ?

7108 Ho 391 *A* and *C* 7.1 . . . 12.7

1925.255	300.°2	37.″75

opt.

7140 H 2766 6.3 . . . 11.0

4.194	330.°8	55.″74
4.260	331. 3	56. 43
5.260	331. 2	56. 84
1924. 57	331. 1	56. 34

f.

7362 Σ 1972 *B* and *C* 6.1 ... 11.1

1925.663 103.°9 135.″35

opt.

A and *B*: 5.4 ...; 80°±; 40″± (est.)

7495 (β 948) *A* and *C* 6.8 ... 10.9

4.194	231.°8	29.″43
4.260	233. 7	27. 98
5.260	234. 5	28. 38
1924. 57	233. 3	28. 60

A and *D* ... 11.5

4.194	195.°2	...
4.197	195. 8	52.″86
4.260	195. 0	52. 69
5.260	195. 1	52. 24
1924. 57	195. 3	52. 60

7499 A. G. 201 9.4 ... 9.7

6.652	252.°2	7.″61
6.663	253. 4	7. 79
1926. 66	252. 8	7. 70

f. ?

7508 A. G. 202 9.7 ... 9.8

6.652	282.°9	21.″54
6.663	283. 7	22. 11
1926. 66	283. 3	21. 82

7512 Weisse 30 8.5 ... 9.9

6.652	225.°2	12.″20
6.663	225. 7	12. 36
1926. 66	225. 4	12. 28

f.

7521 Arg. 29 8.3 ... 9.7

6.652	139.°2	26.″12
6.663	139. 4	26. 27
1926. 66	139. 3	26. 19

7527 (β 355) *AB* and *C* 7.9 ... 12.3

6.684	315.°5	(26.″8 ± 0.″2*)
6.704	314. 8	25. 90
1926. 69	315. 2	26. 20

f.

*) Incomplete measure, 1/2 weight.

7553 Σ 2024 *rej.* 6.6 ... 10.5

4.674	43.°9	23.″52
4.676	44. 7	23. 44
1924. 68	44. 3	23. 48

c. p. m.

7566 H 2801 9.0 ... 11.9

6.652	212.°8	28.″76
6.674	212. 9	28. 05
1926. 66	212. 8	28. 40

7573 H 1291 9.4 ... 11.4

6.652	114.°5	19.″44
6.674	113. 4	19. 02
1926. 66	114. 0	19. 23

Angle decreasing?

7580 H 584 9.4 ... 12.2

6.652	231.°7	16.″16
6.674	231. 4	15. 50
1926. 66	231. 6	15. 83

Angle decreasing?

7602 Σ 2039 *rej.* 8.8 ... 12.1

6.652	7.°7	16.″21
6.663	6. 8	16. 25
1926. 66	7. 2	16. 23

Change?

7616 Ku 53 9.5 ... 10.1

6.652	50.°4	4.″99
6.663	49. 8	5. 12
1926. 66	50. 1	5. 06

f. ?

7628 Ho 405 *A* and *B* 9.4 ... 12.7

6.731	357.°9	3.″23
6.734	347. 0	...
6.750	345. 7	3. 66
1926. 74	350. 2	3. 44

Change?

A and *C* ... 12.6

6.731	335.°4	13.″25
6.750	332. 0	13. 05
1926. 74	333. 7	13. 15

Change?

7642 Σ 2052 *AB* and *C* 6.6 ... 12.1

1925.337	29.°2	143.″31

opt.

7643 Σ 2053 *rej.* 9.2 ... 9.8

6.652	352.°1	21.″31
6.663	352. 1	21. 68
1926. 66	352. 1	21. 49

f.

7656 Ho 64 10.5 ... 10.8

6.652	110.°6	4.″06
6.663	111. 0	3. 76
1926. 66	110. 8	3. 91

$\delta = +27^{0}58'$ (1926).

f. ?

7730 Σ 2087 *A* and *B* 8.1 ... 8.2

6.695	290.°0	5.″71

A and *C* ... 11.7

6.695	353.°7	121.″77
6.723	353. 6	121. 03
1926. 71	353. 6	121. 40

The proper motion of *A* is given: 0″09 in 290° (*Be B*). If this is correct, all three stars appear to have the same motion.

7886 Ho 412 5.7 ... 11.2

4.364	139.°4	19.″56
4.646	139. 7	19. 28
1924. 50	139. 6	19. 42

opt. ?

7894 Es 77 6.9 ... 11.1

4.679	273.°8	17.″02
4.682	273. 6	17. 05
1924. 68	273. 7	17. 04

c. p. m.

7926 H 854 5.7 ... 11.3

4.364	356.°2	20.″61
5.337	356. 9	20. 63
1924. 85	356. 6	20. 62

f.

8013 H 1299 *A* and *B* 7.1 ... 11.5

4.364	21.°1	49.″55
4.627	20. 8	49. 55
1924. 50	21. 0	49. 55

opt.

A and *C* ... 12.1

4.364	59.°6	51.″65
4.627	57. 0	51. 66
1924. 50	58. 3	51. 66

opt.

8059 Σ 2181 *rej.*

A and *B* 7.9 ... 10.1

1926.674	313.°4	27.″15

opt.

A and *C* ... 11.1

1926.674	210.°2	47.″78

No prior measures.

8137 H 1303 7.6 ... 11.9

1924.627	150.°2	38.″05

f.

8245 Ho 72 *A* and *B* 10.3 ... 11.3

1924.701	2.°5	12.″51

opt.

A and *C* ... 12.3

1924.701	35.°0	9.″21

c. p. m.

A and *D* ... 11.1

1924.701	52.°0	141.″01

opt.

A and *C* form a physical pair with a common proper motion of about 0.″24 in 170°.

8251 *A* 17 9.4 ... 9.7

1926.674	130.°4	24.″22

f. (c. p. m.).

There is a 9 mg. star about 3′ distant in 90°±.

8284 (β 1124) *A* and *C* 3.9 . . . . . .

5.665	141.°9	54.″26
5.701	142. 1	54. 42
1925. 68	142. 0	54. 34

f. ?

A and *E* . . . 12.6

5.665	179.°7	44.″12
5.701	178. 3	44. 77
1925. 68	179. 0	44. 44

opt.

C and *D* 7.4 . . . 12.8

5.665	122.°9	. . .
5.701	117. 2	8.″48
1925. 68	120. 0	8. 48

8309 Ho 76 6.7 . . . 12.0

4.616	202.°4	13.″32
4.643	205. 3	14. 06
1924. 63	203. 8	13. 69

f.

8316 Ho 564 *A* and *C* 7.6 . . . 11.9

1924.619	57.°3	80.″34

opt.

8351 Es 79 *A* and *B* 9.9 . . . 12.4

5.701	76.°4	5.″87
5.717	72. 7	5. 40
1925. 71	74. 6	5. 64

A and *C* . . . 10.1

5.701	93.°2	24.″84
5.717	93. 3	24. 87
1925. 71	93. 2	24. 86

8352 Ho 78 8.0 . . . 12.1

5.701	199.°3	8.″21
5.712	199. 2	7. 64
1925. 71	199. 2	7. 92

8358 β 418 8.4 . . . 12.5

5.701	224.°9	14.″72
5.717	225. 1	14. 50
1925. 71	225. 0	14. 61

8361 H 1313 9.5 . . . 11.8

5.676	307.°5	13.″50
5.698	306. 6	13. 87
1925. 69	307. 0	13. 68

Change in distance (β. *p. m.*). The distance by Bigourdan in 1893.56, 8.″68, is quite wrong.

8362 A. G. 216 9.7 . . . 9.8

5.717	97.°0	2.″13
5.723	88. 7	2. 09
1925. 72	92. 8	2. 11

8369 H V. 74 6.9 . . . 10.1

1925.643	137.°3	41.″79

f.

8374 H 1314 9.7 . . . 11.1

5.676	151.°7	16.″74
5.698	151. 9	17. 26
1925. 69	151. 8	17. 00

f.

8388 β 637 *A* and *C* 6.6 . . . 10.3

1924.747	238.°5	103.″50

opt.

8394 Σ 2288 *rej.* 9.7 . . . 11.9

5.717	56.°7	16.″24
5.723	56. 6	15. 77
1925. 72	56. 6	16. 00

Angle decreasing.

8407 Ho 81 8.7 . . . 11.6

5.701	212.°5	3.″32
5.723	214. 1	2. 98
1925. 71	213. 3	3. 15

8417 Σ 2293 *rej.* 8.3 . . . 10.9

5.676	82.°3	13.″35
5.701	82. 3	13. 53
1925. 69	82. 3	13. 44

f.

8425 H 2825 8.4 . . . 10.9

5.676	28.°3	15.″25
5.698	29. 2	15. 00
1925. 69	28. 8	15. 12

f.

8431 H V. 93 7.6 . . . 8.0

1926.674	136.°3	55.″12

c. p. m.

8437 A. G. 217 10.3 ... 11.1

5.676	239.°3	15.″42
5.701	238. 7	15. 70
1925. 69	239. o	15. 56

Decreasing angle?

8444 H 2828 8.9 ... 9.5

5.676	110.°2	16.″61
5.698	109. 9	16. 31
1925. 69	110. o	16. 46

8445 H 1316 9.9 ... 11.2

5.676	258.°5	14.″26
5.698	257. 7	14. 79
1925. 69	258. 1	14. 52

Large discrepancies in angle of prior measures:

H	265.°3	1828 +
Cogshall	251. 2	1904.7 In

8476 (β 1274) A and BC 6.3 .....

4.928	238.°9	95.″03
4.953	239. 2	95. 43
1924. 94	239. o	95. 23

BC and D 10.5 ... 10.8

4.928	7.°7	5.″75
4.953	6. 8	6. 12.
1924. 94	7. 2	5. 94

8477 H 2831 10.1 ... 11.1

5.676	345.°1	15.″00
5.698	344. 3	15. 29
1925. 69	344. 7	15. 14

Change in distance?

8490 Perrine ... 8.9 ... 10.7

5.676	4.°9	3.″65
5.698	2. 1	3. 20
1925. 69	3. 5	3. 42

f. ?

8492 A. G. 220 9.9 ... 10.1

5.676	306.°4	10.″83
5.701	306. 9	11. 07
1925. 69	306. 6	10. 95

8497 A. G. 221 $A = 9.5 \ldots B = 9.4$

5.676	13.°8	1.″89
5.698	13. 7	1. 85
1925. 69	13. 8	1. 87

8500 H 1319 8.9 ... 11.4

5.676	194.°7	17.″06
5.698	192. 3	17. 48
1925. 69	193. 5	17. 27

f.

8503 Es ... 8.3 ... 12.6

5.701	334.°9	7.″18
5.717	332. 6	7. 58
1925. 71	333. 8	7. 38

8511 Ho 430 9.1 ... 10.0

5.676	192.°9	2.″62
5.698	197. 8	3. 28
1925. 69	195. 4	2. 95

f.

8516 A. G. 222 9.5 ... 9.8

5.676	159.°3	1.″71
5.701	153. o	1. 88
1925. 69	156. 2	1. 80

Change in angle?

8521 H 1320 10.3 ... 10.6

5.676	153.°o	18.″61
5.698	154. 3	19. 08
1925. 69	153. 6	18. 85

f.

8522 H 1321 10.1 ... 11.7

5.676	82.°5	9.″64
5.698	81. 4	9. 78
1925. 69	82. o	9. 71

Change in angle?

8541 Ho 431 7.5 ... 12.7

5.701	4.°4	20.″43
5.712	4. 4	20. 78
1925. 71	4. 4	20. 60

Increasing angle.

8542 Ho 432

Companion invisible on two nights.

8550 Σ 2317 *rej.* *A* and *BC* 7.7 . . .

5.701	223.°9	24.″69
5.717	223. 8	24. 70
1925. 71	223. 8	24. 70

B and *C* 11.3 . . . 11.5

5.701	340.°4	1.″ ± (est.)
5.717	338. 5	0. 8 ± (est.)
1925. 71	339. 4	0.9 ± (est.)

Perhaps change in angle.

A and *D* . . . 10.0

5.701	189.°3	44.″51
5.717	189. 4	44. 42
1925. 71	189. 4	44. 46

8552 Ho 85 8.7 . . . 11.6

5.701	195.°5	4.″98
5.717	195. 2	4. 99
1925. 71	195. 4	4. 98

8560 Es . . . 8.8 . . . 9.1

5.676	200.°6	2.″25
5.698	202. 5	2. 82
1925. 69	201. 6	2. 54

c. p. m. (0.″10 in 360°, Cambr. Mass.).

8569 (β 1326) *A* and *C* 7.1 . . . 9.1

1924.627	60.°3	62.″30

f. ?

8581 Ho 433 8.7 . . . 12.3

5.701	333.°9	8.″89
5.717	334. 2	8. 81
1925. 71	334. 0	8. 85

Angle increasing ?

8588 *O*Σ 352 *rej.* 7.6 . . . 9.5

5.676	221.°2	24.″50
5.698	221. 1	23. 90
1925. 69	221. 2	24. 20

f. ?

8599 Ho 434 7.5 . . . 12.2

5.701	186.°7	13.″82
5.717	185. 0	13. 59
1925. 71	185. 8	13. 70

Increasing distance.

8608 Σ 2334 *rej.* 9.7 . . . 11.5

5.676	205.°6	14.″97
5.701	205. 7	14. 99
1925. 69	205. 6	14. 98

Change in distance ?

8611 H 860 9.6 . . . 10.9

5.717	276.°5	23.″23
5.723	277. 1	22. 74
1925. 72	276. 8	22. 98

8620 β 420 *A* and *B* 9.7 . . . 10.5

5.723	286.°6	1.″66
5.862	285. 7	1. 29
1925. 79	286. 2	1. 48

AB and *C* . . . 11.5

5.723	198.°3	20.″85
5.862	198. 9	20. 54
1925. 79	198. 6	20. 70

Distance decreasing ?

8632 H 1328 9.3 . . . 12.0

5.676	113.°1	22.″03
5.701	113. 3	21. 74
1925. 69	113. 2	21. 88

Change ?

8635 H 861 10.1 . . . 11.7

5.723	176.°8	18.″49
5.775	177. 1	17. 86
1925. 75	177. 0	18. 18

f.

The distance by Miller as quoted in *β. G. C.* is doubtlessly erroneous.

8644 H 1329 9.3 . . . 12.9

5.717	320.°1	15.″72
5.723	318. 5	15. 45
1925. 72	319. 3	15. 58

8646 *O*Σ (App.) 171 *Aa* 7.6 . . . 11.1

1926.706	137.°2	84.″92

opt.

8652 Es 21 *A* = 11.0, *B* = 10.9

5.676	104.°7	6.″01
5.701	104. 0	5. 68
1925. 69	104. 4	5. 84

8656 O. Stone 43 9.5 ... 11.3

5.723	27.°7	9.″83
5.775	27. 3	9. 18
1925. 75	27. 5	9. 50

f.

8707 Σ 2355 *rej.* 6.6 ... 10.9

4.660	137.°0	. . .
4.665	136. 8	24.″76
4.668	137. 9	. . .
4.671	137. 2	24. 54
1924. 67	137. 2	24. 65

8713 Σ 2365 *rej.* 7.6 ... 10.1

1926.778 24.°9 20.″23

c. p. m. (0.″27 in 190°)

8788 (ζ Lyrae) (β 968)

A and *E* 4.1 ... 12.2

4.627	301.°8	61.″10
4.643	301. 4	61. 22
1924. 63	301. 6	61. 16

opt. ?

8862 H V. 40 *A* and *B* 6.4 ... 11.4

4.616	74.°2	34.″61
4.627	71. 8	34. 43
4.643	72. 9	35. 46
1924. 63	73. 0	34. 83

opt. ?

A and *C* ... 10.3

4.616	122.°0	57.″90
4.627	122. 0	58. 73
4.643	121. 9	57. 87
1924. 63	122. 0	58. 17

opt. ?

A and *E*: ... 10.9; 345° ±; 80″±

C and *D*: ... 12.6; 280° ±

8864 Ho 440 4.3 ... 12.6

4.616	176.°6	. . .
4.671	181. 5	18.″15
4.674	177. 2	18. 89
4.679	175. 6	19. 22
1924. 66	177. 7	18. 75

8868 (β Lyrae) Σ 39, App. I.

A and *B* 3.6 ... 9.1

1924.622 149.°5 45.″61

A and *D* ... 10.1

1924.622 317.°4 67.″05

A and *E* ... 9.9

1924.622 19.°3 85.″56

A and *C*: ... 12.9; 250° ±

8908 β 646 *A* and *B* 5.3 ... 12.3

4.646	33.°1	35.″07
4.671	32. 3	35. 46
1924. 66	32. 7	35. 26

opt. ?

A and *C* ... 12.5

4.646	22.°8	38.″42
4.671	22. 7	37. 19
1924. 66	22. 8	37. 80

opt.

B and *C* ...

1924.671 330.°9 . . .

8916 *O*Σ 525 *A* and *C* 6.9 ... 8.3

4.622	350.°0	45.″07
4.627	350. 0	45. 11
1924. 62	350. 0	45. 09

f.

8923 Ho 270 *A* and *C* 5.2 ... 11.9

4.671	40.°3	23.″56
4.674	39. 9	24. 62
4.679	39. 8	24. 37
1924. 67	40. 0	24. 18

opt. ?

8989 H 2851 *A* and *B* 6.9 ... 12.4

6.706	128.°7	. . .
6.723	133. 8	15.″73
6.728	130. 0	14. 95
1926. 72	130. 8	15. 34

opt.

A and *C* ... 11.2

6.723	298.°4	44.″14
6.728	298. 2	44. 19
1926. 73	298. 3	44. 16

opt.

9120 (A 264) *A* and *C* 8.4 ... 12.9

6.723	41.°8	4.″13
6.750	56. 2	4. 60
6.766	31. 2	4. 90
1926. 75	43. 1	4. 54

Change from proper motion. The discrepancies in angle are due to the extreme faintness of the companion.

9137 Σ 2486 *A* and *B* 6.6 ... 6.8

4.756	215.°8	9.″14

A and *C* ... 11.3

4.756	12.°6	47.″11

opt.

9166 H 2862 *A* and *B* 3.9 ... 11.1

4.665	12.°6	39.″29
4.671	12. 1	39. 33
1924. 67	12. 4	39. 31

f.

A and *C* ... 11.9

4.665	157.°2	43.″15
4.671	157. 0	44. 02
1924. 67	157. 1	43. 58

9186 Sh 292 4.6 ... 9.1

1924.627	71.°2	99.″65

f.

9432 Σ 2572 *rej.* 6.1 ... 10.5

5.646	198.°3	24.″62
5.663	198. 9	24. 67
1925. 65	198. 6	24. 64

9444 H V. 104 6.3 ... 11.0

1926.723	128.°0	38.″92

opt.

9470 H 1423 *A* and *B* 6.3 ... 10.9

4.646	127.°8	20.″54
4.665	127. 9	20. 61
1924. 66	127. 8	20. 58

A and *C* ... 12.2

1924.665	356.°7	35.″07

A and *D* ... 13.1

1924.665 340° ± 28.″ ± (est.)

9486 H 2886 4.6 ... 11.3

1924.676	327.°8	47.″84

f.

9504 H 2888 5.3 ... 12.5

4.679	353.°6	42.″21
4.682	353. 4	42. 11
1924. 68	353. 5	42. 16

opt. ?

9516 Σ 2560 *rej.* 6.9 ... 10.4

4.643	296.°0	15.″56
4.646	295. 6	15. 00
1924. 64	295. 8	15. 28

f.

9536 A 371 9.1 ... 10.9

6.723	32.°2	2.″08
6.750	31. 2	2. 39
1926. 74	31. 7	2. 23

c. p. m.

9576 Ho 453 *A* and *B* 5.8 ... 12.4

4.674	54.°0	15.″43
4.676	52. 1	15. 30
1924. 68	53. 0	15. 36

Some change in angle?

A and *C* ... 12.4

4.674	136.°5	33.″35
4.676	136. 7	33. 93
1924. 68	136. 6	33. 64

Change in angle?

9638 H 601 5.6 ... 12.3

4.674	238.°6	24.″03
4.676	239. 4	24. 96
1924. 68	239. 0	24. 50

opt.

9661 Es 84 *A* and *B* 6.3 ... 12.0

4.674	157.°9	11.″20
4.676	156. 6	11. 76
1924. 68	157. 2	11. 48

A and *C* ... 12.3

4.674	96.°8	22.″91
4.676	97. 1	23. 31
1924. 68	97. 0	23. 11

9752 (β 980) *A* and *C* 3.1 ... 10.9

1924.687	328.°6	45.″66

opt.

A and *D* ... 11.3

1924.687	166.°8	48.″70

opt.

A and *E* ... 11.6

4.682	245.°9	60.″22
4.687	246. 2	60. 17
1924. 68	246. 0	60. 20

opt.

9797/9800 (H IV. 100)

A and *B* 6.0 ... 12.1

4.682	207.°0	28.″15
4.687	206. 2	27. 92
4.701	205. 7	28. 49
1924. 69	206. 3	28. 19

opt.

A and *C* ...

4.682	116.°9	113.″85
4.687	117. 2	113. 71
1924. 68	117. 0	113. 78

f.

A and *E* ... 11.5

4.682	115.°4	46.″93
4.687	115. 7	47. 34
1924. 68	115. 6	47. 14

No early measures.

C and *D* 9.3 ... 9.9

4.682	255.°9	23.″77
4.687	255. 9	23. 80
1924. 68	255. 9	23. 78

f.

9806 Arg. 35 8.6 ... 9.2

6.723	228.°5	7.″55
6.728	227. 5	7. 49
1926. 73	228. 0	7. 52

f. (*c. p. m.*?)

9882 H 1471 5.6 ... 10.6

4.643	7.°2	30.″94
4.665	7. 3	30. 60
1924. 65	7. 2	30. 77

opt.

9888 Hn 156 9.6 ... 10.0

5.791	(243.°3)*)	...
5.862	270. 5	1.″03
5.865	242. 4	1. 09
1925. 85	254. 9	1. 06

f. ?

9897 H 1480 9.6 ... 13.1

5.676	92.°5	20.″± est.
5.854	97. 2	17. 92
5.865	95. 6	17. 01
1925. 83	95. 6	17. 46

The first measure of pos. angle received $1/2$ weight (only 2 settings).

9898 H 1473 10.0 ... 10.1

5.665	139.°9	10.″37
5.674	141. 3	10. 63
1925. 67	140. 6	10. 50

9899 H 902 10.1 ... 10.1

5.665	16.°6	7.″72
5.674	17. 8	7. 41
1925. 67	17. 2	7. 56

9904 H 1476 9.7 ... 11.5

5.665	72.°2	12.″17
5.674	72. 1	12. 72
1925. 67	72. 2	12. 44

9905 H 1477 8.3 ... 12.1

5.665	273.°3	19.″45
5.674	271. 9	20. 14
1925. 67	272. 6	19. 80

9910 Ku 58 9.8 ... 10.1

5.717	188.°4	3.″03
5.723	188. 6	2. 82
1925. 72	188. 5	2. 92

f.

9911 H 904 8.3 ... 11.1

5.665	315.°9	27.″72
5.674	315. 8	28. 22
1925. 67	315. 8	27. 97

Change in angle?

*) Only one setting, interrupted by clouds; $1/4$ weight.

9917 H 905 8.9... 11.9

5.665	171.°6	11.″81
5.674	171. 9	11. 44
1925. 67	171. 8	11. 62

9923 H 1481

A and *B* *A* = 10.7; *B* = 10.3

5.676	8.°5	17.″41
5.717	8. 7	18. 05
1925. 70	8. 6	17. 73

f.

A and *C* *C* = 10.0

5.676	269.°6	27.″56
5.717	268. 7	28. 06
1925. 70	269. 2	27. 81

f.

9924 Σ 2629 *rej.* 7.4... 11.1

5.665	186.°8	8.″91
5.674	187. 4	9. 01
1925. 67	187. 1	8. 96

9934 H 1482 10.1... 11.7

5.665	111.°7	6.″65
5.674	110. 9	6. 15
1925. 67	111. 3	6. 40

9937 H 2934 *A* and *B* 9.7... 12.5

5.676	313.°0	9.″91
5.854	312. 1	9. 34
1925. 76	312. 6	9. 62

A and *C* ...9.5

5.676	(85.°1)*)	(36.″90)*)
5.854	84. 1	36. 89
1925. 76	84. 3	36. 89

6′ north and 1.^{m}1 west from this is a faint pair: 11.1... 11.4

1925.676 125.°7 6.″± (est.)

9938 H 2932 *A* and *B* 9.7... 10.8

5.665	150.°5	11.″98
5.674	150. 2	12. 11
1925. 67	150. 4	12. 04

A and *C* ... 12.5

5.665	210.°8	20.″97
5.674	211. 7	21. 45
1925. 67	211. 2	21. 21

$\delta = +17^{0}55'$ (1925).

*) One setting, 1/4 weight.

The declination in *β. G. C.* is by 3′ too small.

9939 *β* 470 9.0... 10.1

5.854	206.°9	2.″65
5.865	212. 9	2. 89
1925. 86	209. 9	2. 77

f. ?

9944 Σ 2642 *A* and *B* 9.1... 9.1

1925.011 179.°9 2.″15

AB and *C* ...11.6

1925.011 39.°4 87.″22

opt.

9948 H 2933 9.8... 10.5

5.775	27.°1	20.″90
5.835	25. 8	21. 73
1925. 80	26. 4	21. 32

9949 Σ 2634 *A* and *B* 8.9... 10.6

1924.687 10°± 7″± (est.)

A and *C* ... 12.1

1924.687 312.°4 74.″75

opt.

9950 Σ 2635 *A* and *B* 7.6... 10.3

1924.665 78.°1 7.″69

A and *C* ... 12.1

1924.665 42.°3 73.″25

opt.

9952 Σ 2638 *rej.* 8.7... 10.7

5.665	72.°7	16.″56
5.674	73. 5	16. 65
1925. 67	73. 1	16. 60

9957 H 1487 *A* and *B* 10.5...

15°±; 60″± (est.)

Too wide, not measured.

B and *C* 10.8... 12.3

5.665	298.°6	12.″96
5.674	297. 5	13. 57
1925. 67	298. 0	13. 26

9958 H 1485 7.9 . . . 8.7

5.665	278.°5	4.″88
5.674	276. 5	4. 82
1925. 67	277. 5	4. 85

9965 H 2936 9.0 . . . 9.8

1925.865	251.°4	12.″40

f. ?

9970 Es 87 9.1 . . . 9.7

5.665	298.°0	9.″33
5.674	297. 5	8. 59
1925. 67	297. 8	8. 96

9975 Σ 2650 *rej.* 6.7 . . . 10.1

5.854	227.°7	21.″71
5.865	227. 2	22. 04
1925. 86	227. 4	21. 88

f. ?

9976 Ho 587 8.3 . . . 13.0

5.723	61.°5	14.″02
5.778	62. 3	13. 93
1925. 75	61. 9	13. 98

Some change.

9981 Doo 13

About 15 neighbouring stars were examined on two nights with good seeing, and no such pair found.

9986 H 907 9.6 . . . 10.9

5.674	133.°6	5.″58
5.715	132. 8	6. 09
1925. 69	133. 2	5. 84

9987 β 430 *A* and *B* 9.9 . . . 10.3

5.674	14.°7	1.″± estim.
5.723	20. 5	1. 24
1925. 70	17. 6	1. 24

f.

AB and *C* . . . 10.1

5.674	51.°1	17.″34
5.723	51. 3	17. 04
1925. 70	51. 2	17. 19

f.

9990 Doo 14 9.9 . . . 10.2

5.778	268.°9	1.″79
5.788	263. 8	1. 64
1925. 78	266. 4	1. 72

9995 H 2938 9.1 . . . 11.3

5.775	148.°8	19.″16
5.800	148. 7	18. 84
1925. 79	148. 8	19. 00

9996 H 908 9.0 . . . 11.1

5.775	347.°3	25.″86
5.800	346. 5	24. 94
1925. 79	346. 9	25. 40

9997 Es 132 *A* and *B* 9.3 . . . 9.5

5.835	83.°1	5.″75
5.854	81. 6	5. 39
1925. 84	82. 4	5. 57

f.

B and *C* . . . 9.5

5.835	56.°9	31.″68
5.854	56. 6	31. 80
1925. 84	56. 8	31. 74

Perhaps decreasing distance.

9999 A. G. 248 9.5 . . . 10.9

5.835	360.°7	3.″53
5.862	355. 0	3. 83
1925. 85	357. 8	3. 68

10003 Doo 15 *A* and *B* 7.5 . . .

5.901	300.° 6	124.″36
5.903	300. 5	123. 29
1925. 90	300. 55	123. 82

opt. ?

B and *C* 10.1 . . . 10.8

1925.901	167.°9	2.″22

f.

B and *D*: . . . 12.6; 230°±; 15″± (est.)
B and *E*: . . . 11.0; 240°±; 28″± (est.)

The angle of *AB*, printed in *β. G. C.* p. I 201.°8, is evidently a misprint; the angle should be 301.°8.

10010 H 1492 9.7 . . . 9.7

5.715	53.°9	18.″54
5.717	54. 5	18. 59
1925. 72	54. 2	18. 56

10013 A. G. 250 8.3 ... 10.9

5.715	54.°0	8.″94
5.717	52. 9	8. 84
1925. 72	53. 4	8. 89

10014 Arg. 36 8.3 ... 9.4

5.854	127.°9	8.″27
5.865	127. 4	7. 84
1925. 86	127. 6	8. 06

f.

10015 H 2941 10.2 ... 10.5

5.715	111.°1	6.″24
5.717	110. 5	5. 75
1925. 72	110. 8	6. 00

10029 H 910 *A* and *B* 7.7 ... 12.9

5.775	322.°8	13.″± (one approx. setting)
5.835	323. 9	15. 00
1925. 80	323. 4	15. 00

A and *C* ... 12.3

5.775	245.°06	29.″38
5.835	245. 9	30. 28
1925. 80	245. 8	29. 83

opt.

10031 β 660 6.3 ... 12.8

1924.687 318.° ...

Angle from two settings; extremely difficult with the 8 inch; the observation seems to indicate common proper motion.

10037 Ho 122 9.9 ... 10.1

5.778	73.°2	1.″04
5.788	77. 2	1. 19
1925. 78	75. 2	1. 12

f.

10045 Es 27 10.3 ... 10.5

5.715	339.°9	3.″76
5.717	341. 7	3. 88
1925. 72	340. 8	3. 82

f.

$\delta = 46^{0}34'$ (1925).

The declination given in *β. G. C.* is by 4′ too large. At the place of *β. G. C.* is another faint pair:

11 ... 11; 240°±; 6″±.

A third pair at

$\delta = 46^{0}38'$; $\alpha = 20^{h}11.^{m}0$ (1925):

1925.95 (2n). 9.5 ... 11.8; 284.°0; 7.″96.

10048 H 2944 7.7 ... 12.1

5.854	190.°5	25.″72
5.865	190. 4	25. 03
1925. 86	190. 4	25. 38

10061 A. G. 251 9.0 ... 10.8

1925.788 185.°7 7.″35

f.

10064 Ho 588 *A* and *B* 6.5 ... ...

5.788	297.°6	50.″87
5.862	297. 4	51. 23
1925. 82	297. 5	51. 05

f.

B and *C* 7.9 ... 12.6

5.788	17.°5	8.″04
5.862	16. 9	7. 51
1925. 82	17. 2	7. 78

Distance by Doolittle in 1902.34 perhaps too large.

10066 Ho 455 *A* and *B* 7.7 ...

5.723	80.°8	33.″51
5.835	82. 4	33. 14
1925. 78	81. 6	33. 32

B and *C* 11.3 ... 11.9

5.723	180.°1	3.″54
5.835	183. 7	3. 86
1925. 78	181. 9	3. 70

Some change?

A and *D* ... 11.0

5.723	257.°5	32.″71
5.835	259. 3	32. 00
1925. 78	258. 4	32. 36

f.

A and *E* ... 10.6

5.723	74.°8	37.″98
5.835	74. 5	38. 18
1925. 78	74. 6	38. 08

Change?

E and *B* ...

5.723	212.°2	5.″± (est.)
5.835	207. 1	5. 68
1925. 78	209. 6	5. 68

10069 Ho 590 *A* and *B* 9.5 ... 11.9

5.723	212.°9	3.″05
5.788	203. 1	2. 82
1925. 76	208. 0	2. 94

A and *C* ... 13.1

5.723	86.°6	26.″54
5.788	84. 4	26. 78
1925. 76	85. 5	26. 66

10077 β 661 6.0 ... 11.3

4.643	64.°6	12.″59
4.665	64. 4	12. 67
1924. 65	64. 5	12. 63

10087 H 1500 *A* and *B* 8.8 ... 11.0

5.862	67.°1	12.″90
5.865	66. 8	12. 28
1925. 86	67. 0	12. 59

Considerable change; *opt.*

A and *C* ... 11.7

5.862	338.°5	29.″93
5.865	338. 3	30. 26
1925. 86	338. 4	30. 10

f.

A and *D* ... 10.9

5.862	316.°2	38.″50
5.865	316. 2	38. 09
1925. 86	316. 2	38. 30

10093 Kr 49 9.5 ... 9.7

5.723	119.°5	1.″76
5.835	122. 0	1. 74
1925. 78	120. 8	1. 75

10094 A. G. 252 8.9 ... 9.4

5.715	124.°7	11.″04
5.717	124. 7	10. 88
1925. 72	124. 7	10. 96

f.

10098 H 1501 *A* and *B* 9.7 ... 11.5

5.772	357.°3	12.″83
5.775	358. 5	12. 37
1925. 77	357. 9	12. 60

f.

A and *C* ... 10.8

1925.775	351.°0	56.″93

C and *D* ... 12.5

1925.775	11.°0	18.″21

f. ?

10108 H 2951

No such pair; identical with **10094**.

10114 H 2950 9.6 ... 10.1

5.830	286.°5	13.″10
5.835	287. 9	12. 34
1925. 83	287. 2	12. 72

10119 H 1503 9.5 ... 10.5

5.715	75.°2	15.″62
5.717	75. 6	16. 39
1925. 72	75. 4	16. 00

10120 A. G. 253 9.7 ... 10.1

5.715	118.°3	9.″74
5.717	116. 8	9. 51
1925. 72	117. 6	9. 62

f.

10121 Ho 126 10.1 ... 10.4

5.715	160.°1	2.″88
5.717	156. 7	2. 35
1925. 72	158. 4	2. 62

10122 Arg. 37 9.3 ... 12.7

5.715	193.°4	15.″56
5.717	193. 9	15. 07
1925. 72	193. 6	15. 32

f.

10124 H 2952 9.2 ... 12.1

5.830	279.°7	20.″47
5.835	281. 4	20. 21
1925. 83	280. 6	20. 34

10126 Kr 50 8.7 ... 10.0

5.723	137.°5	2.″33
5.835	133. 3	1. 93
1925. 78	135. 4	2. 13

10130 H 2953 9.1 ... 12.9

5.830	261.°5	25.″40
5.835	260. 1	25. 03
1925. 83	260. 8	25. 22

f.

The magnitude of *B*, 10.7, as given by Burnham in Yerkes Public. II is doubtlessly underestimated.

The magnitudes by H are 9 ... 16.

10137 H 2954 *A* and *B* 9.5 . . . 9.6

5.788	308.°3	2.″55
5.791	305. 2	2. 95
1925. 79	306. 8	2. 75

B and *C* . . . 12.0

5.788	292.°1	19.″18
5.791	291. 1	19. 35
1925. 79	291. 6	19. 26

No other measures of this.

10138 Ho 593 9.3 . . . 11.6

5.758	320.°2	4.″98
5.788	323. 7	4. 99
1925. 77	322. 0	4. 98

Change in angle?

The declination as given in *β. G. C.* is by 4′ too large:

$\delta = 39^0 19'$ (1925).

10162 H 1505 8.4 . . . 11.5

1925.758 109.°2 17.″14

f.

The angle by Espin as quoted in *β. G. C.* is evidently erroneous.

10164 H 1504 7.5 . . . 11.5

5.830	248.°3	22.″65
5.835	249. 7	21. 35
1925. 83	249. 0	22. 00

10165 H. C. Wilson 19 10.3 . . . 10.3

5.830	356.°1	1.″80
5.862	350. 6	1. 63
5.865	358. 7	2. 00
1925. 85	355. 1	1. 81

About 200″ in 230° from this is a bright star with a faint companion; not in *β. G. C.*: 8.4 . . . 12.5

1925.86 (2n) 350.°8 8.″73

10171 H 1510 *A* and *B* 9.4 . . . 10.0

5.928	152.°1	4.″55
5.939	150. 1	5. 19
1925. 93	151. 1	4. 87

c. p. m.?

A and *C* . . . 12.3

5.928	348.°9	5.″55
5.939	342. 7	5. 25
1925. 93	345. 8	5. 40

opt.

A and *D* . . . 10.7

5.928	320.°7	30.″67
5.939	320. 3	30. 74
1925. 93	320. 5	30. 70

opt.

The change in *AC* and *AD* may be explained by a proper motion of *A* of about 0.″06 in 340°; the same motion must belong to *B*.

About 5′ in 90° from this there is a wide pair:

9.1 . . . 10.6; 230°±; 35″± (est.)

10174 H 1506 *A* and *B* 8.3 . . . 11.0

5.800	200.°6	9.″19
5.830	200. 8	9. 06
1925. 82	200. 7	9. 12

f.

10186 H 1509 9.5 . . . 9.8

5.835	180.°7	18.″49
5.862	181. 1	19. 52
1925. 85	180. 9	19. 00

10192 Ho 457 *A* and *B* 8.8 . . . 9.0

5.865	59.°1	2.″15
5.901	58. 9	2. 05
5.928	54. 3	1. 76
1925. 90	57. 4	1. 99

f.

A and *C* . . . 12.8

5.865	271.°9	27.″41
5.928	271. 3	25. 30
1925. 90	271. 6	26. 36

10198 A. G. 254 9.2 . . . 10.0

1925.788 344.°8 5.″49

f.

10199 H 1513 8.9 . . . 10.9

1925.758 326.°0 13.″77

f.

10208 Σ 2682 *rej.* 8.7 . . . 10.2

5.830	301.°4	20.″57
5.835	301. 0	20. 27
1925. 83	301. 2	20. 42

f.

10209 H 1514 9.7 . . . 11.3

5.758	171.°0	10.″04
5.800	171. 0	9. 87
1925. 78	171. 0	9. 96

$\delta = +45^{0}11'$; $\alpha = 20^{h}21.^{m}2$ (1925)

The angle differs largely from the value given by H.

The declination as given in *β. G. C.* is by 3′ too large.

10213 Δ 22 *A* and *B* 7.3 . . . 8.8

5.800	151.°2	2.″72
5.830	150. 9	2. 82
1925. 82	151. 0	2. 77

Angle increasing.

A and *C* . . . 13.2; 90° ±; 18″±

Too faint for measure.

10220 Ho 130 9.1 . . . 9.5

5.788	289.°6	1.″39
5.800	285. 9	1. 56
1925. 79	287. 8	1. 48

f. ?

10222 A. G. 255 9.7 . . . 10.2

5.800	286.°1	5.″33
5.830	287. 5	5. 09
1925. 82	286. 8	5. 21

f.

10231 A. G. 256 9.4 . . . 10.3

5.830	351.°7	5.″38
5.835	351. 2	5. 12
1925. 83	351. 4	5. 25

f.

10252 H 1517 10.2 . . . 10.5

5.830	104.°7	12.″49
5.835	103. 7	11. 97
1925. 83	104. 2	12. 23

f. ?

10253 H 2970 9.7 . . . 10.4

5.862	179.°7	11.″86
5.865	179. 6	11. 98
1925. 86	179. 6	11. 92

10255 Ku 59 *A* and *B* 9.5 . . .

5.830	139.°7	32.″75
5.835	139. 8	32. 94
1925. 83	139. 8	32. 84

B and *C* 9.8 . . . 10.9

5.830	321.°5	4.″12
5.835	321. 7	3. 89
1925. 83	321. 6	4. 00

10257 β 433 *A* and *B* 8.6 . . . 11.7

5.854	206.°3	8.″01
5.865	203. 7	7. 02
1925. 86	205. 0	7. 52

A and *C* . . . 11.5

5.854	241.°7	28.″18
5.865	242. 6	27. 52
1925. 86	242. 2	27. 85

10265 Ho 594 6.7 . . . 13.0

5.865	207.°4	17.″81
5.928	209. 0	18. 02
1925. 90	208. 2	17. 92

f. ?

10267 H 1521 9.5 . . . 11.5

5.835	191.°7	14.″59
5.865	192. 2	15. 05
1925. 85	192. 0	14. 82

10269 Weisse 35

A and *B* 8.5 . . . 9.0

5.800	212.°8	3.″96
5.835	213. 1	3. 90
1925. 82	213. 0	3. 93

f.

C and *D* 9.3 . . . 10.8

5.800	200.°2	11.″91
5.835	201. 7	12. 23
1925. 82	201. 0	12. 07

A and *C* . . . . . .

1925.800	99.°1	87.″10

f.

10273 H 1524 9.5 ... 11.1

5.800	128.°3	5.″41
5.835	129. 9	5. 25
1925. 82	129. 1	5. 33

f. ?

10274 H 1523 9.1 ... 9.9

5.800	349.°5	14.″00
5.835	349. 5	14. 07
1925. 82	349. 5	14. 04

Decreasing angle?

The prior measures of this pair are discordant.

10278 A. G. 257 8.9 ... 9.2

5.862	62.°9	1.″54
5.865	56. 3	2. 20
1925. 86	59. 6	1. 87

c. p. m.

10282 H 1525 *A* and *B* 9.3 ... 9.6

5.800	232.°9	9.″51
5.835	232. 1	8. 87
1925. 82	232. 5	9. 19

Change from proper motion?

A and *C* ... 13.1

5.800	35.°6	15.″23
5.835	40. 5	15. 95
1925. 82	38. 0	15. 59

Change from proper motion?

10288 H 2974 9.5 ... 9.7

5.903	292.°2	13.″66
5.939	291. 3	13. 52
1925. 92	291. 8	13. 59

10299 H 2978 9.9 ... 10.4

5.854	277.°3	14.″13
5.865	276. 9	...
1925. 86	277. 1	14. 13

10311 H 2977 9.7 ... 10.3

5.903	321.°9	18.″59
5.939	320. 8	18. 71
1925. 92	321. 4	18. 65

10313 H 1531 9.3 ... 10.1

5.865	317.°8	6.″59
5.903	318. 1	5. 61
1925. 88	318. 0	6. 10

10321 Ma 8 8.9 ... 11.6

5.903	246.°6	19.″06
5.939	247. 5	19. 91
1925. 92	247. 0	19. 48

opt. ?

10323 H 1540 8.5 ... 12.2

5.854	346.°7	21.″61
5.928	346. 9	21. 63
1925. 89	346. 8	21. 62

Some change.

10325 H 1535 *A* and *B* 8.2 ... 11.7

4.788	248.°1	16.″29
4.816	244. 0	16. 39
4.928	244. 2	16. 79
1924. 84	245. 4	16. 49

c. p. m.

A and *C* ... 12.3

4.788	165.°6	(21.″± est.)
4.816	163. 9	19. 11
1924. 80	164. 8	19. 11

opt.

10330 Schj. 26 7.7 ... 9.5

5.862	86.°0	24.″37
5.865	86. 7	24. 54
1925. 86	86. 4	24. 46

10343 H 1541 *A* and *C* 9.1 ... 10.9

1925.800	268.°1	6.″27

f. *B* invisible, bad images.

10356 *OΣ* (App.) 208 7.3 ... 7.9

5.903	241.°1	78.″49
5.928	241. 3	78. 54
1925. 92	241. 2	78. 52

opt.

10440 H 612 6.9 ... 10.2

4.643	9.°0	49.″20
4.665	8. 9	48. 93
1924. 65	9. 0	49. 06

opt.

10453 H N. 73 = *α* Cygni 1.1 ... 10.6

4.747	105.°3	75.″90
4.756	106. 1	74. 69
1924. 75	105. 7	75. 30

10476 β 675 A and C 5.3 ... 12.4

4.679	183.°0	25.″80
4.747	183. 1	24. 23
4.956	183. 8	25. 22
1924. 79	183. 3	25. 08

A and D ... 11.7

4.679	328.°7	32.″61
4.747	328. 9	32. 78
4.956	328. 8	32. 37
1924. 79	328. 8	32. 59

10543 Ho 280 6.7 ... 12.0

4.674	76.°4	13.″86
4.676	76. 8	12. 59
4.679	76. 7	13. 42
1924. 68	76. 6	13. 29

10552 Es 93 6.9 ... 12.6

1925.903	302.°5	9.″81

opt.

10569 β 250 6.7 ... 11.2

4.674	7.°06	19.″55
4.676	8. 3	19. 32
1924. 68	8. 0	19. 44

Change in angle.

10643 (Σ 2737)

AB and D 6.1 ... 11.6

1924.753	280.°1	74.″82

opt.

AB and C ... 8.6

1924.753 80° ± ; 15″ ± (est.)

10654 $O\Sigma$ (App.) 213 6.7 ... 7.5

4.676	36.°7	70.″51
4.679	36. 7	70. 54
1924. 68	36. 7	70. 52

c. p. m.

The apparent change in angle is due to precession.

10685 Σ 2744 A and B 7.6 ... 8.3

4.756	158.°8	1.″67
4.788	156. 1	1. 34
1924. 77	157. 4	1. 50

A and C ... 12.5

4.756	101.°9	88.″75
4.788	102. 2	89. 41
1924. 77	102. 0	89. 08

opt.

Relative proper motion somewhat smaller than derived from meridian observations.

10903 Ho 601 6.1 ... 12.9

4.674	180.°4	17.″42
4.676	177. 9	. . .
1924. 67	179. 2	17. 42

f.

10983 69 Cygni A and B 5.6 ... 10.3

4.679	30.°1	33.″77
4.687	30. 1	34. 04
1924. 68	30. 1	33. 90

opt. ?

A and C ... 9.3

4.679	98.°4	53.″75
4.687	98. 3	53. 71
1924. 68	98. 4	53. 73

f.

11005 H 1647 A and B 5.6 ... 9.9

1924.671	177.°5	40.″88

A and C ... 11.1

1924.671	126.°4	40.″93

11014 β 685 3.6 ... 12.3

4.671	331.°2	29.″66
4.679	331. 9	30. 09
1924. 68	331. 6	29. 88

opt.

11164 A. Clark 20

A and C 4.1 ... 9.5

4.671	253.°6	58.″05
4.674	253. 8	57. 71
1924. 67	253. 7	57. 88

opt.

11227 μ Cephei = β 690

A and B 4.1 . . . 12.1

4.928	263.°6	19.″65
4.953	260. 9	19. 12
1924. 94	262. 2	19. 38

A and C . . . 11.6

4.928	298.°6	40.″69
4.953	298. 8	41. 05
1924. 94	298. 7	40. 87

11301 H 947 A and B 5.2 . . . 10.9

4.671	95.°6	19.″55
4.676	94. 9	19. 35
1924. 67	95. 2	19. 45

opt.

A and C . . . 12.5

4.671	318.°9	23.″24
4.676	320. 2	24. 46
1924. 67	319. 6	23. 85

opt.

11307 Hn 49 8.9 . . . 10.9

5.939	341.°3	2.″33
6.003	344. 6	2. 45
1925. 97	343. 0	2. 39

c. p. m.

The right ascension as given in β. *G. C.* is by about 20^s too large.

11346 β 75 A and B 8.5 . . . 8.8

1924.747	47.°7	1.″37

AB and C . . . 11.0

1924.747	212.°0	46.″36

opt.

11425 H 1713 8.9 . . . 10.7

5.903	127.°6	19.″74
5.928	127. 4	19. 39
1925. 92	127. 5	19. 56

Probably *c. p. m.*

This is the southern of two stars, about 5′ distant.

11433 $O\Sigma$ (App.) 228

A and C 7.6 . . . 12.4

1925.969	159.°6	22.″40

opt.

A and B: . . . 9.1; 30°±; 70″± (est.)

11447 A 307 9.7 . . . 10.2

5.939	168.°1	1.″60
6.003	168. 1	1. 42
1925. 97	168. 1	1. 51

c. p. m.

11464 (β 696) AB and C 7.5 . . . 8.1

5.969	318.° 8	60.″12
6.003	318. 9	60. 69
1925. 99	318. 85	60. 40

opt.

C and D . . . 8.9

5.969	28.°3	83.″83
6.003	27. 9	84. 95
1925. 99	28. 1	84. 39

f.

11469 H 953 6.5 . . . 10.8

4.665	107.°0	21.″57
4.671	105. 7	21. 21
1924. 67	106. 4	21. 39

f. ?

11483 Σ 2863 A and B 4.6 . . . 6.3

1925.052	280.°6	7.″35

A and C . . . 12.1

1925.052	200.°2	96.″82

opt.

11485 H 1721 7.3 . . . 8.8

5.966	272.°6	9.″63
5.969	274. 3	9. 47
1925. 97	273. 4	9. 55

opt.

Jc. 1225 = [**3642**] is about 3′ in 150° from this.

11487 H 1722 9.7 . . . 10.7

5.966	48.°2	17.″75
6.003	47. 0	17. 96
1925. 98	47. 6	17. 86

A is the eastern of two stars about 5′ distant.

11509 H 1728 *A* and *B* 9.4 . . . 12.6

6.731	332.°0	7.″62
6.747	335. 9	6. 02
6.792	331. 8	7. 95
1926. 76	333. 2	7. 20

f.

A and *C* . . . 12.4

6.731	[191.°4]*)	. . .
6.747	188. 6	14.″90
6.792	188. 8	15. 73
1926. 77	188. 7	15. 32

Change?

11546 A. G. 280 9.3 . . . 10.0

6.690	180.°5	11.″31
6.720	180. 3	10. 80
1926. 70	180. 4	11. 06

f.

11553 β 698 7.3 . . . 12.0

6.720	337.°4	10.″54
6.723	337. 6	. . .
6.747	337. 9	10. 90
1926. 73	337. 6	10. 72

f.

11567 Ku 63 9.7 . . . 10.3

6.720	240.°0	3.″98
6.747	240. 7	4. 15
1926. 73	240. 3	4. 06

f.

11573 H 958 9.3 . . . 9.9

6.720	229.°4	5.″89
6.747	231. 3	5. 75
1926. 73	230. 3	5. 82

Increasing distance?

11596 Hd 170 10.1 . . . 10.6

6.690	244.°7	6.″77
6.720	238. 3	7. 31
1926. 70	241. 5	7. 04

11601 A. G. 281 8.8 . . . 9.2

6.720	17.°9	2.″29
6.747	21. 1	2. 43
1926. 73	19. 5	2. 36

f. ?

*) Only one setting.

11623 H 293 9.2 . . . 12.9

6.747	276.°8	18.″46
6.792	277. 5	18. 21
1926. 77	277. 1	18. 33

f.

11632 H 961 7.9 . . . 12.3

6.747	291.°0	15.″33
6.792	293. 6	16. 34
1926. 77	292. 3	15. 84

Change.

11656 H 1752 9.4 . . . 10.1

6.690	295.°7	16.″11
6.720	294. 6	16. 21
1926. 70	295. 1	16. 16

11666 Ho 615 *A* and *B* 4.5 . . .

4.679	127.°3	72.″47
4.687	127. 1	72. 59
1924. 68	127. 2	72. 53

A and *D* . . . 11.7

4.679	307.°3	41.″95
4.687	306. 6	41. 88
1924. 68	307. 0	41. 92

A and *E* . . . 11.5

4.679	115.°5	59.″79
4.687	116. 5	60. 76
1924. 68	116. 0	60. 28

B and *C* 10.4 . . . 11.2

4.679	13.°6	2.″60
4.687	17. 9	3. 16
1924. 68	15. 8	2. 88

11669 H 1755 4.2 . . . 10.9

4.674	8.°7	48.″01
4.676	8. 4	48. 06
1924. 68	8. 6	48. 04

opt.

11687 Ho 182 9.6 . . . 9.9

6.720	147.°0	1.″26
6.766	130. 9	1. 71
1926. 74	138. 9	1. 48

f.

11695 H 1758 9.7 . . . 10.0

6.720	260.°0	10.″20
6.805	259. 1	9. 74
1926. 76	259. 6	9. 97

Distance decreasing.

11701 Weisse 38

A and *B* 8.7 . . . 9.2

6.720	54.°5	6.″55
6.805	54. 7	6. 75
1926. 76	54. 6	6. 65

f.

A and *C* . . . 11.0

1926.805 361.°7 42.″78

No other measures.

11716 (β 290) *A* and *C* 5.7 . . . 12.3

4.747	271.°0	103.″62
4.756	272. 0	103. 07
1924. 75	271. 5	103. 34

The change is smaller than required by the proper motion of the principal star.

11736 (β 701) *A* and *C* 6.3 . . . 10.9

4.756	129.°0	119.″52
4.788	129. 2	119. 14
1924. 77	129. 1	119. 33

c. p. m. (0.″18 in 87°).

11769 A 309 8.5 . . . 11.6

5.939	72.°8	5.″85
6.005	74. 3	5. 48
1925. 97	73. 6	5. 66

c. p. m.

Perhaps some change in distance?

11793 Ho 475 *A* and *B* 9.2 . . . 9.6

5.939	323.°1	0.″83
6.046	323. 8	1. 00
1925. 99	323. 4	0. 92

f.

AB and *C* . . . 11.1

5.939	220.°4	8.″49
6.046	221. 9	8. 32
1925. 99	221. 2	8. 40

Some change?

11823 Hn 51 *AB* and *C* 8.3 . . . 9.2

4.756	29.° 1	131.″79
4.788	29. 4	132. 03
1924. 77	29. 25	131. 91

Either *c. p. m.*, or is the meridian value of the proper motion wrong.

A and *B* 9.0 . . . 9.1

1924.788 172°. (1 setting) (0.″85 est.)

11845 H 1791 *A* and *C* 7.6 . . . 10.9

1925.044 149.°1 85.″52

opt.

A and *B*: . . . 8.6; 60°±; 17″± (est.).

11877 S 813 5.2 . . . 9.6

4.674	49.°0	62.″17
4.676	48. 7	61. 86
1924. 68	48. 8	62. 02

opt.

11895 (Ho 296) *AB* and *C* 5.9 . . . 10.9

1924.747 234.°9 72.″19

opt.

11997 Σ 2947 *A* and *B* 7.1 . . . 7.2

1925.052 64.°1 4.″13

A and *C* . . . 11.0

1925.052 206.°4 111.″19

B and *C* . . . . . .

1925.044 207.°3 113.″67

The proper motion of *AB* relative to *C* seems to be smaller than given by the meridian observations.

12037 Σ 2952 *rej.*

A and *B* 6.9 . . . 10.9

1925.939 136.°4 17.″54

c. p. m.

A and *C*: . . . 9.9; 230°±; 200″± (est.)

12063 Σ 2957 *A* and *B* 8.6 . . . 10.6

1924.953 228.°2 4.″50

A and *C* . . . 11.9

1924.953 55.°2 129.″41

opt.

12130 $O\Sigma$ 485 *rej.*

A and *B* 7.7 . . . 10.0

4.928	50.°8	20.″44
4.953	51. 2	21. 03
1924. 94	51. 0	20. 74

A and *C* . . . 10.0

4.928	79.°8	56.″63
4.953	80. 4	56. 47
1924. 94	80. 1	56. 55

12230 Σ 2991 *rej.* 6.1 . . . 10.1

1924.665 359.°2 33.″44

f.

12245 H 1859 6.3 . . . 10.5

4.665	120.°7	35.″13
4.671	121. 5	35. 40
1924. 67	121. 1	35. 26

f.

12305 $O\Sigma$ (App.) 244

A and *C* 6.3 . . . 10.5

1925.044 105.°0 134.″32

opt.

A and *B*: . . . 8.1; 300°±; 70″± (est.)

12573 $O\Sigma$ 507 *A* and *B* 6.1 . . . 6.6

1925.110 259.° 0.″44

AB and *C* . . . 6.6

1925.110 352.°3 49.″62

opt.

12740 $O\Sigma$ 547 *A* and *B* 8.0 . . . 8.5

1925.049 146.°6 5.″41

A and *C* . . . 12.5

1925.049 230.°0 44.″53

opt.

A and *D* . . . 10.3

1925.049 182.°8 84.″12

opt.

A and *E* . . . 10.4

1925.049 55.°8 77.″09

opt.

12750 Σ 3060 *A* and *B* 8.3 . . . 8.7

1924.788 126.°4 3.″78

A and *C* . . . 11.1

1924.788 263.°3 77.″75

opt.

13210 Hu 885 8.7 . . . 9.5

6.211	290.°1	2.″05
6.227	290. 0	1. 82
1926. 22	290. 0	1. 94

c. p. m.

13477 A 714 8.9 . . . 9.3

6.723	340.°6	1.″66
6.750	334. 8	1. 80
1926. 74	337. 7	1. 73

c. p. m.

1213 Ku 9 10.3 . . . 12.5

5.928	45.°3	11.″48
5.939	41. 3	11. 01
1925. 93	43. 3	11. 24

opt. ?

3223 A. G. 108 9.1 . . . 11.2

6.112	275.°1	11.″74
6.161	276. 3	11. 74
1926. 14	275. 7	11. 74

II. Stars not in Burnham's General Catalogue.

H. R. 1 (Es) = *BD* 44°4550
0h01m; + 44°48′
A and *B* 6.8 . . . 13.2

5.052	118.°2	12.″53
5.068	124. 6	13. 05
1925. 06	121. 4	12. 79

Extremely difficult with the 8 inch.

A and *C* . . . 10.6

5.052	235.°3	20.″98
5.068	234. 5	20. 88
1925. 06	234. 9	20. 93

(*β. p. m.*) *δ* **Cassiopejae** *H. R.* 403
2.6 . . . 11.1
1h20.m8; + 59°51′

1925.282 65.°9 131.″74
opt.

(*β. p. m.*) **Lal. 2682** *A* and *D* 7.6 . . . 10.1
1h24.m9; + 21°20′

1925.052 190.°7 80.″12
opt.

(*β. p. m.*) **Lal. 3621** *A* and *C* 7.8 . . . 11.9
1h54.m7; + 32°52′

1925.055 27.°1 89.″31
opt.

(*β. p. m.*) **Lal. 3962**
2h05.m9; + 29°28′
A and *B* 7.9 . . . 11.9

1925.063 171.°8 96.″57
opt.

A and *C* . . . 11.1

1925.063 360.°5 163.″24
opt.

A and *D* . . . 10.5

1925.063 241.°8 214.″04
opt.

(*β. p. m.*) **Lal. 5273** *H. R.* 860
2h49.m9; + 61°13′
A and *B* 4.8 . . . 13.0

5.282	256.°4	52.″06
6.049	255. 7	53. 12
1925. 67	256. 0	52. 59

opt.

A and *C* . . . 10.4

1925.282 42.°6 89.″62
opt.

ϰ **Persei** *H. R.* 941 (Espin...) 4.0 . . . 12.0
3h04m; + 44°35′

5.052	331.°2	24.″07
5.090	331. 0	23. 53
1925. 07	331. 1	23. 80

opt.

(*β. p. m.*) **Lal. 7097**
3h49.m9; + 59°26′
A and *D* 6.7 . . . 13.1

5.282	207.°8	10.″± (est.)
6.049	221. 4	8. ± (est.)
1925. 67	214. 6	9. ± (est.)

D is at the limit of visibility with the 8 inch. This position if compared with Burnham's early measures seems to indicate common proper motion for *AD*.

A and *E* . . . 12.8

5.282 74.°8 37.″63
opt.

H. R. 1352 (Espin . . .) 5.9 . . . 8.9
4h16m; + 59°27′

5.224	59.°1	32.″61
5.241	59. 6	32. 34
1925. 23	59. 4	32. 48

f. ?

H. R. 1382 B. D. $57^{0}800$ 5.7 ... 12.7
$4^{h}20.^{m}5$; $+57^{0}25'$

6.235	170.°0	22.″11
6.238	171. 9	22. 00
1926. 24	171. 0	22. 06

No prior measures. Occasionally noted.

(*β. p. m.*) **B. D. $+45^{0}992$** 7.1 ... 12.1
$4^{h}46.^{m}0$; $+45^{0}43'$

1925.268	81.°06	95.″89

opt.

Es 888 *H. R.* 1630
$5^{h}0^{m}$; $+54^{0}17'$
A and *B* 6.7 ... 11.5

5.224	189.°9	7.″12
5.241	189. 9	6. 37
1925. 23	189. 9	6. 74

opt. (considerable change in angle.)

A and *C* ... 11.9

5.224	244.°5	26.″10
5.241	245. 6	25. 93
1925. 23	245. 0	26. 02

opt. ?

[905] A 2434 9.1 ... 11.0
$5^{h}28.^{m}7$; $+19^{0}59'$

6.197	152.°5	3.″76
6.235	153. 8	3. 82
1926. 22	153. 2	3. 79

c. p. m.

(*β. p. m.*) **P1 5^{h}146** *H. R.* 1925
$5^{h}35.^{m}2$; $+53^{0}27'$
A and *a* 6.3 ... 12.6

1925. 260	306.°08	87.″05

opt.

A and *B* ... 7.6

1925.260	70.°08	97.″50

c. p. m.

Jc 251 *H. R.* 1987 6.7 ... 12.2
$5^{h}43^{m}$; $+9^{0}29'$

5.255	280.°9	16.″59
5.257	281. 4	. . .
1925. 26	281. 2	16. 59

opt.

Proper motion about 0.″07 in 180^{0}.

Es 415 *H. R.* 2018 6.6 ... 12.5
$5^{h}46^{m}$; $+32^{0}06'$

5.216	19.°1	15.″06
5.222	17. 2	15. 80
1925. 22	18. 2	15. 43

(*β. p. m.*) **58 Aurigae** *H. R.* 2516
$6^{h}45.^{m}5$; $+41^{0}53'$
A and *B* 5.6 ... 10.3

1925.260	99.°6	40.″90

opt.

A and *C* ... 11.9

1925.260	74.°08	118.″01

opt.

(*β. p. m.*) **39 Geminorum** *H. R.* 2601
5.3 ... 11.1
$6^{h}54.^{m}1$; $+26^{0}13'$

1925.222	33.°08	28.″83

opt.

Es 339 *H. R.* 2620
$6^{h}56^{m}$; $+32^{0}30'$
A and *B* 6.5 ... 12.3

5.216	189.°06	15.″93
5.222	186. 8	15. 77
1925. 22	188. 2	15. 85

A and *C* ... 10.9

5.216	293.°3	32.″42
5.222	293. 0	31. 87
1925. 22	293. 2	32. 14

(*β. p. m.*) **P1 6^{h}329/332** *B* and *C*; *C* = 11.9
$7^{h}03.^{m}7$; $+15^{0}39'$

1925.266	84.°08	90.″41

opt.

A and *B*: 7.6 ... 7.7; $100^{0}\pm$; $170''\pm$ (est.)
(*c. p. m.*)

(*β. p. m.*) **B. D. $+27^{0}1350$**
A and *C* 9.5 ... 12.6
$7^{h}12.^{m}3$; $+27^{0}02'$

5.271	135.°6	29.″96
5.282	136. 0	29. 19
1925. 28	135. 8	29. 58

Either *c. p. m.*, or no senisble proper motion at all.

[1664] A 1331 9.0 ... 12.9
$7^h42.^m8$; $+53^0 51'$

6.238	271.°8	2.″85
6.265	247. 1	4. 45
6.276	253. 4	3. 52
1926. 26	257. 4	3. 61

c. p. m.
Difficult with the 8 inch.

[1668] A 2468 9.0 ... 11.6
$7^h44.^m5$; $+41^0 40'$

6.238	205.°7	2.″70
6.265	208. 0	2. 66
1926. 25	206. 8	2. 68

c. p. m.
Distance increasing?

(*β. p. m.*) **Lal. 15290** 8.0 ... 12.4
$7^h48.^m8$; $+30^0 51'$

1925.222 355.°08 97.″64
opt.

(*β. p. m.*) **Lal. 15394**
$7^h50.^m5$; $+19^0 27'$
A and *a* 7.6 ... 11.1

1925.222 28.°2 43.″11
opt.

(*β. p. m.*) ψ_2 **Cancri** *H. R.* 3191
$8^h05.^m9$; $+25^0 46'$
A and *B* 5.3 ... 11.6

1925.260 297.°2 73.″78
opt.
A and *C* ... 10.9

1925.260 212.°08 112.″09
opt.

(*β. p. m.*) **B. D.** $+23^0 2063$
$9^h10.^m9$; $+23^0 42'$
A and *B* 7.9 ... 10.9

5.260	170.°0	58.″94
5.263	170. 1	59. 74
1925. 26	170. 0	59. 34

c. p. m.
A and *C* ... 8.5

1925.260 81.°2 63.″73
opt.

Thus the small star *B* shares in the proper motion of *A*, whereas *C* appears to be "fixed" and confirms the meridian value of the *p. m.* of *A*.

(*β. p. m.*) **Bradl. 1300** *H. R.* 3664
6.1 ... 10.1
$9^h10.^m9$; $+34^0 57'$

1925.260 261.°07 150.″64
opt.

H. R. 4545 (Espin ...) 5.3 ... 9.2
11^h47^m; $+33^0 47'$

5.241	273.°9	46.″21
5.255	273. 2	46. 16
1925. 25	273. 6	46. 18

Change in distance?

Jc 92 *H. R.* 4580 6.7 ... 12.7
11^h55^m; $+0^0 56'$

5.222	172.°3	14.″05
5.241	172. 8	14. 30
1925. 23	172. 6	14. 18

c. p. m.? (0.″07 in 285°)

(*β. p. m.*) **Lal. 22954** *H. R.* 4657 6.6 ... 12.4
$12^h11.^m2$; $-9^0 52'$

1925.255 143.°9 73.″33
opt.

(*β. p. m.*) **16 Virginis** *H. R.* 4695
4.1 ... 12.1
$12^h16.^m5$; $+3^0 44'$

1925.222 4.°25 132.″23
opt.

(*β. p. m.*) *κ* **Coronae** *H. R.* 5901
5.6 ... 12.1
$15^h48.^m5$; $+35^0 54'$

1925.643 202.°06 134.″65
opt.

[2448] A. G.... 9.9 ... 10.0

$16^h43.^m1$; $+24^0 46'$

6.695	301.°4	2."63
6.731	304. 6	2. 34
1926. 71	303. 0	2. 48

c. p. m.

Jc 99 *H. R.* 6987 5.6 ... 12.9

18^h33^m; $+6^0 37'$

4.665	327.°0	27."49
4.671	327. 3	28. 22
4.682	325. 1	27. 78
1924. 67	326. 5	27. 83

opt.

[2688] Lewis ... 7.7 ... 11.7

$18^h38.^m0$; $+31^0 28'$

6.723	161.°8	8."75
6.728	157. 6	8. 98
1926. 72	158. 7	8. 86

B. D. $+31^0 3330$. Lei 6797.

The star has a very considerable proper motion, 0."82 in 176° (Ci 18); the spectrum is K_3. Lewis gives: 1904.7 163.°7 2."97 (1n). Magn. 8.1 ... 10.0. The companion moves thus with the bright star, the change in distance being due evidently to orbital motion. This is an interesting system, perhaps of the 61 Cygni type.

[2779] A. G.... 9.5 ... 10.3

$18^h58.^m5$; $+27^0 17'$

6.723	341.°7	3."76
6.728	344. 0	3. 82
1926. 72	342. 8	3. 79

c. p. m.

Jc 112 *H. R.* 7212 6.2 ... 12.3

18^h59^m; $+33^0 31'$

4.674	178.°3	25."26
4.682	178. 6	25. 33
1924. 68	178. 4	25. 30

f. ?

Jc 117 *H. R.* 7419

19^h28^m; $+36^0 05'$

A and *B* 6.9 ... 12.7

4.682	28.°4	22."68
4.747	29. 4	22. 71
1924. 71	28. 9	22. 70

f. ?

A and *C* ... 12.9

4.682	158.°5	28."02
4.747	160. 7	27. 48
1924. 71	159. 6	27. 75

f. ?

Jc 133 *H. R.* 7456

19^h33^m; $+11^0 07'$

A and *C* 6.7 ... 12.2

4.747	314.°9	20."07
4.756	315. 0	20. 18
1924. 75	315. 0	20. 12

Change in distance?

Jc 121 *H. R.* 7479 4.3 ... 11.8

19^h37^m; $+17^0 51'$

4.747	179.°8	31."57
4.756	179. 7	31. 45
1924. 75	179. 8	31. 51

(*β. p. m.*) **Lal. 37626**

$19^h43.^m6$; $+0^0 55'$

B and *C* 10.1 ... 12.1

1924.643	196.°0	30."41

f.

(*β. p. m.*) **o Aquilae** = Jc 124 *H. R.* 7560 5.4 ... 12.4

$19^h47.^m4$; $+10^0 14'$

4.619	223.°2	23."28
4.643	220. 7	21. 85
4.788	220. 3	21. 51
1924. 69	221. 4	22. 21

c. p. m. (0."27 in 122°).

The principal star is a dwarf of type *G*; the absolute magnitude of the companion suggests a dwarf of spectrum *M*.

(β. p. m.) **Pi 19 306** *H. R.* 7569
6.1 . . . 12.1
19h48.m8; + 11°27′

1924.619 155.°7 90.″49
opt.

(β. p. m.) **Groombr. 2961**
19h50.m4; + 38°34′
A and *B* 8.3 . . . 11.3

4.747 285.°8 24.″53
4.756 286. 8 24. 73
1924. 75 286. 3 24. 63
No prior measures.

A and *C* . . . 10.6
1924.709 308.°3 39.″42
opt.
A nearby wide pair was once measured for Groombr. 2961:

8.9 . . . 11.9 1924.687 31.°7 48.″13

(β. p. m.) **15 Sagittae** *H. R.* 7672
5.6 . . . 10.9
20h00.m8; + 16°52′

1924.709 329.°7 59.″97
opt.

(β. p. m.) **27 Cygni** *H. R.* 7689
20h03.m6; + 35°46′
A and *B* 5.1 . . . 12.1

1924.816 52.°8 23.″23
opt.
A and *C* . . . 11.3
1924.816 144.°4 36.″24
opt.

A and *D*: . . . 12.6; 130°±; 35″± (est.)

B. D. + 46°2881 9.5 . . . 11.8
20h11.m0; + 46°38′

5.939 284.°3 7.″92
5.966 283. 7 8. 01
1925. 95 284. 0 7. 96

A and *C*: . . . 10.1; 330°±; 85″± (est.)
Noted in measuring β. *G. C.* **10045.**

(β. p. m.) **29 Cygni** *H. R.* 7736
20h11.m7; + 36°35′
A and *D* 7.1 . . . 8.6

1924.832 153.°82 212.″03
opt.

A and *B*: . . . 10.6; 350°±; 40″± (est.)
A and *C*: . . . 11.1; 40°±; 50″± (est.)
A and *E*: . . . 9.6; 20°±; 200″± (est.)

The measure was made through clouds, whence the low estimate of the brightness of *A*. *H. R.* gives for *A* magn. = 4.98.

B. D. + 5°4494 8.4 . . . 12.5
20h19.m6; + 5°18′

5.862 350.°2 8.″52
5.865 351. 5 8. 94
1925. 86 350. 8 8. 73
Found in measuring β. *G. C.* **10165.**

(β. p. m.) **B. D. + 26°3915**
20h27.m0; + 26°36′
A and *B* 8.6 . . . 12.3

1925.665 258.°3 18.″61
opt.
A and *C* . . . 9.9
1925.665 273.°0 104.″95
opt.

B. D. + 26°3916
20h27.m8; + 26°42′
A and *B* 9.3 . . . 12.8

1924.816 17.°8 10.″86

A and *C* . . . 11.8
1924.816 313.°7 25.″43

A and *D* . . . 11.1
1924.816 355.°5 99.″86
Measured for *BD* 26°3915. No prior measures.

[3318] A 1678 9.0 . . . 11.1
20h29.m2; + 55°04′

5.928 361.°2 2.″35
5.939 356. 2 2. 39
1925. 93 358. 7 2. 37
c. p. m.

(*β. p. m.*) **74 Draconis** *H. R.* 7908
$20^h33.^m8$; $+80^0 49'$
B and *C* 6.3 ... 11.7

1925.663 304.°1 104.″45
opt.

The measures indicate that *A* and *B* have a common proper motion of about 0.″2 in 20°.

In *β. p. m.* Burnham derives for the proper motion of *A* relative to *B* the value 0.″124 in 131°, which, however, is erroneous; the measures give for the relative proper motion practically zero; the mistake has been made because Burnham does not take into consideration precession, which for this star attains 3° per century in angle; the distance being large (215″), the apparent motion in angle becomes very considerable.

[**3349**] A 1681 9.0 ... 11.7
$20^h35.^m6$; $+53^0 35'$

5.928	214.°9	4.″08
5.939	211. 1	3. 30
1925. 93	213. 0	3. 69

c. p. m.

(*β. p. m.*) **Lal. 39956** *H. R.* 7914
7.2 ... 11.3
$20^h37.^m3$; $+19^0 37'$

1924.747 24.°7 93.″71
opt.

(*β. p. m.*) **B. D.** $+25^0$**4347**
$20^h40.^m1$; $+25^0 33'$
A and *B* 7.6 ... 12.8

1924.816 286.°8 16.″35 (290° ±; 15″± est.)

In *β. p. m.* the position is:

1910.45 228.°1 16.″94

Either refers this to another companion, or is there some misprint in *β. p. m.*

A and *C* ... 12.1

1924.816 207.°6 38.″98
f.

The proper motion as assumed by Burnham in *β. p. m.* is too large; the Greenwich 10 year Catalogue (1910) makes the proper motion very small.

(*β. p. m.*) **B. D.** $+33^0$**4117**
$20^h57.^m6$; $+33^0 37'$
A and *B* 9.1 ... 12.3

1924.953 208.°8 17.″06
opt.

A and *C* ... 11.1

1924.953 7.°1 91.″45
opt.

A and *D*: ... 12.4; 220° ±; 40″± (est.)

(*β. p. m.*) **Lal. 40848**
$20^h59.^m9$; $+45^0 35'$
A and *C* 8.6 ... 12.4

1924.674 69.°4 9.″88
opt.

(*β. p. m.*) **4 Equulei** *H. R.* 8077
7.4 ... 11.5
$21^h01.^m7$; $+5^0 40'$

1924.816 277.°6 34.″86
opt.

H. R. 8206 (Espin) 6.2 ... 12.1
21^h23^m; $+49^0 05'$

4.747	164.°9	20.″50
4.788	162. 8	20. 17
1924. 77	163. 8	20. 34

opt. ?

Perhaps is the change due chiefly to the proper motion of the small star. The prior measure is by Espin:

1907.7 161.°5 19.″16 (3n)

(*β. p. m.*) **B. D.** $+25^0$**4607** 8.5 ... 13.0
$21^h40.^m7$; $+26^0 10'$

1925.939 314.°9 31.″57
opt.

[**3642**] Jc 1225 10.5 ... 10.9
$22^h02.^m5$; $+29^0 31'$

5.966	117.°2	3.″12
5.969	116. 1	3. 92
1925. 97	116. 6	3. 52

Distance perhaps increasing.

Noted independently in measuring *β. G. C.* **11485.**

(*β. p. m.*) **B. D. +53°2911**
$22^h29.^m6$; $+53^0 24'$
A and *B* 9.6 ... 12.4
1924.747 225.°0 ± 40.″ ± (est.)
opt. certain.
A and *C* ... 11.6
1924.747 209.°9 57.″18
opt.
C and *B* ...
1924.747 0.°0 ± 30.″ ± (est.)

The principal star has a very large proper motion of about 1.″2 annually.

(*β. p. m.*) **60 Pegasi** *H. R.* 8827
Aa 5.4 ... 11.0
$23^h08.^m1$; $+26^0 27'$
1924.788 240.°2 82.″87
opt.

This publication contains all measures completed between Jan. 14, 1924 and Okt. 21, 1926; the total number is: 1411 complete and 42 incomplete measures, relating to 798 pairs.