1867phae.proj..320W

KG
11365
320
N37

Observations with E. Equatorial

Jan 14 1867 to Apr. 26 1867

Vol. 4.

(Copy.)

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Chron 236 Correction and Rate

| Date and M.T. | clock − Chron. ~~Chron − Clo~~ | Corr. to clock | Corr. to Chron. | Rate |
|---|---|---|---|---|
| Jan 3 5 10 | −1 13·1 | +1 13·8 | +0·7 | losing 1·7 |
| | | | +43·48 | |
| Jan 28 5 45 | +14·12 | +29·36 | ~~+15·2#~~ | |
| | | | | 0·2 |
| Feb 11 7 30 | +10·8 | +35·7 | +46·5 | gaining |
| Feb 17 9 10 | +2·1 | +37·6 | +39·7 | 1·1 |
| 25 5 0 | −1·0 | +32·9 | +31·9 | 1·0 |
| Mar 8 3 55 | +7·0 | +23·2 | +30·2 | 0·2 |
| 15 4 45 | +13·3 | +14·5 | +27·8 | 0·3 |
| 19 16 0 | direct obs'n, eye and ear | | +19·6 | 1·8 |
| 29 7 15 | +15·1 | −6·1 | +9·0 | 1·1 |
| | | | | 2·4 |
| Apr 9 10 55 | +7·36 | −25·07 | −17·7 | |
| 21 14 45 | −47·91 | −5·51 | −53·4 | 2·9 |

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1867 Jan 14 Monday
(continued from vol. 3.)

Transits of
75 (1) Orionis.

Position circle 170° 40'
Power no 3.
Wire e in coincidence

| | 6h 15m | 16 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | G.M.S. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 16·5 | 24·7 | 34·1 | 22·1 | 17·2 | 9·4 | 53·4 | 39·7 | 35·5 | 31·5 | |
| d | 33·3 | 41·5 | 50·9 | 38·8 | 33·8 | 26·1 | 10 1 | 56·1 | 52·4 | 48·2 | |
| c | 34·0 | 42·2 | 51·6 | 39·6 | 34·5 | 26·8 | 10 7 | 56·9 | 53·1 | 48·8 | |
| b | 46·8 | 54·7 | 4·1 | 52·0 | 47·1 | 39·3 | 23·3 | 9·3 | 5·6 | 1 1 7 | |
| a | 50·1 | 58·2 | 7·4 | 55·3 | 50·3 | 42·7 | 26·7 | 12·9 | 9·0 | 4·8 | |
| Sum | 180·7 | 221·3 | 148·1 | 207·8 | 182·9 | 144·3 | 64·2 | 294·9 | 275·5 | 255·0 | |
| Mean | 36·14 | 44·26 | 29·62 | 41·56 | 36·58 | 28·86 | 12·84 | 58·98 | 55·10 | 51·00 | |

Differences from mean.

Mean of 10 differences

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 19·64 | 56 | 52 | 46 | 38 | 46 | 44 | 28 | 60 | 50 | 19·484 |
| d | 2·84 | 76 | 72 | 76 | 78 | 76 | 74 | 88 | 70 | 80 | 2·772 |
| c | −2·14 | 06 | 02 | 1·96 | 08 | 06 | 14 | 08 | 10 | 20 | −2·084 |
| b | +10·66 | 44 | 48 | 44 | 52 | 44 | 46 | 32 | 50 | 70 | +10·494 |
| a | 13·96 | 94 | 78 | 74 | 72 | 84 | 86 | 92 | 90 | 80 | 13·846 |
| − | 24·62 | 38 | 26 | 18 | 24 | 28 | 32 | 24 | 40 | 50 | −24·340 |
| + | 24·62 | 38 | 26 | 18 | 24 | 28 | 32 | 24 | 40 | 50 | +24·340 |

Power no 1. substituted after 5th measure of this set.
Wire d nearly in coincidence

| | 27m | 28 | 29 | 30 | 31 | 42 | 43 | 44 | 45 | 45 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 30·5 | 29·0 | 38·0 | 29·1 | 24·3 | 46·7 | 36·9 | 23·3 | 8·2 | 54·0 | |
| d | 47·1 | 45·7 | 54·5 | 45·6 | 40·7 | 3·1 | 53·3 | 39·9 | 24·7 | 10·6 | |
| c | 47·9 | 46·2 | 55·2 | 46·5 | 41·5 | 3·8 | 54·0 | 40 4 | 25·3 | 11·3 | |
| b | 0·3 | 58·9 | 7·9 | 59·0 | 54·0 | 16·2 | 6·5 | 53·0 | 38·0 | 23·7 | |
| a | 4·0 | 2·2 | 11·0 | 2·6 | 57·5 | 19·7 | 9·9 | 56·4 | 41·2 | 27·0 | |
| Sum | 249·8 | 242·0 | 286·6 | 242·8 | 218·0 | 29·5 | 280·6 | 213·0 | 137·4 | 16·6 | |
| Mean | 49·96 | 48·40 | 57·32 | 48·56 | 43·60 | 5·90 | 56·12 | 42·60 | 27·48 | 13·32 | |

Differences from mean

Mean of 10 differences

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 19·46 | 40 | 32 | 46 | 30 | 19·20 | 22 | 30 | 28 | 32 | 19·326 |
| d | 2·86 | 70 | 82 | 96 | 90 | 2 80 | 82 | 70 | 78 | 72 | 2·806 |
| c | 2·06 | 20 | 12 | 06 | 10 | 2 10 | 2 12 | 20 | 18 | 02 | −2·116 |
| b | 10·34 | 50 | 58 | 44 | 40 | 10 30 | 38 | 40 | 52 | 38 | +10·424 |
| a | 14·04 | 13·80 | 68 | 14·04 | 90 | 13·80 | 78 | 80 | 72 | 68 | 13·824 |
| − | 24·38 | 30 | 26 | 48 | 30 | 24·10 | 16 | 20 | 24 | 06 | −24·248 |
| + | 38 | 30 | 26 | 48 | 30 | 10 | 16 | 20 | 24 | 06 | +24·248 |

| | 46m | 47 | 48 | 48 | 49 | 50 | 51 | 52 | 53 | 53 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 38·4 | 25·1 | 11·2 | 58·6 | 50·4 | 37·0 | 26·5 | 12·9 | 0·3 | 45·6 | |
| d | 55·0 | 41·6 | 27·8 | 15·2 | 6·9 | 53·4 | 43·0 | 29·4 | 16·7 | 2·2 | |
| c | 55·7 | 42·2 | 28·4 | 16·0 | 7·6 | 54·1 | 43·6 | 30·1 | 17·4 | 3·0 | |
| b | 8·1 | 54·7 | 40·9 | 28·2 | 20·2 | 6·5 | 56·1 | 42·6 | 30·0 | 15·3 | |
| a | 11·3 | 58·1 | 44·2 | 31·6 | 23·5 | 10·1 | 59·6 | 46·0 | 33·2 | 18·9 | |
| Sum | 288·5 | 221·7 | 152·5 | 89·6 | 48·6 | 281·1 | 228·8 | 161·0 | 97·6 | 25·0 | |
| Mean | 57·70 | 44·34 | 30·50 | 17·92 | 9·72 | 56·22 | 45·76 | 32·20 | 19·52 | 5·00 | |

Differences from mean

Mean of 10 differences

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 19·30 | 24 | 30 | 32 | 32 | 22 | 26 | 30 | 22 | 40 | 19·288 |
| d | 2·70 | 74 | 70 | 72 | 82 | 82 | 76 | 80 | 82 | 80 | 2·768 |
| c | −2·00 | 2 14 | 2 10 | 1·92 | 2 12 | 12 | 16 | 10 | 12 | 00 | −2·078 |
| b | +10·40 | 36 | 40 | 28 | 48 | 28 | 34 | 40 | 48 | 30 | +10·372 |
| a | 13·60 | 76 | 70 | 68 | 78 | 88 | 84 | 80 | 68 | 90 | 13·762 |
| − | 24·00 | 12 | 10 | 2396 | 2426 | 16 | 18 | 20 | 16 | 20 | −24·134 |
| + | 00 | 12 | 10 | 96 | 26 | 16 | 18 | 20 | 16 | 20 | +24·134 |

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| $6^h$ $54^m$ | 55 | 56 | 56 | Differences from mean | | | Mean of 4 Differences |
|---|---|---|---|---|---|---|---|
| 31·5 | 17·2 | 5·3 | 52·9 | 19·20 | 36 | 38 | 22 | 19·270 |
| 47·9 | 33·8 | 22·0 | 9·4 | 2·80 | 76 | 68 | 72 | 2·740 |
| 48·5 | 34·5 | 22·6 | 10·0 | 2·20 | 06 | 08 | 12 | −2·115 |
| 1·1 | 46·9 | 35·0 | 22·6 | 10·40 | 34 | 32 | 48 | +10·385 |
| 4·5 | 50·4 | 38·5 | 25·7 | 13·80 | 84 | 82 | 58 | 13·760 |
| Sum 253·5 | 182·8 | 123·4 | 60·6 | − 24·20 | 18 | 14 | 06 | − 24·145 |
| Mean 50·70 | 36·56 | 24·68 | 12·12 | + 24·20 | 18 | 14 | 06 | + 24·145 |

| Mean of 15 Power no 3. | Mean of 19 Power no 1. |
|---|---|
| −19·452 | −19·282 |
| − 2·797 | − 2·761 |
| − 2·093 | − 2·098 |
| +10·480 | +10·381 |
| +13·861 | +13·760 |
| − 24·341 | − 24·141 |
| +24·341 | +24·141 |

| Reduced to equator | Reduced to equator |
|---|---|
| −19·157 | −18·990 |
| − 2·755 | − 2·719 |
| − 2·060 | − 2·066 |
| +10·321 | +10·224 |
| +13·651 | +13·552 |
| − 23·972 | − 23·775 |
| +23·972 | +23·776 |

The set with power no 3 give for the value of 1 rev. 9″·8272

| | C−O | (C−O)² |
|---|---|---|
| −19·130 | +027 | 000729 |
| − 2·765 | −010 | 000100 |
| − 2·110 | −050 | 002500 |
| +10·347 | +026 | 000676 |
| +13·659 | +008 | 000064 |
| −24·005 | | ·004069 |
| +24·006 | | |

With power no 1. 1 rev = 9″·7445

| | | |
|---|---|---|
| −18·969 | +021 | 000441 |
| − 2·742 | −023 | 000529 |
| − 2·092 | −026 | 000676 |
| +10·260 | +036 | 001296 |
| +13·544 | −008 | 000064 |
| −23·803 | | ·003006 |
| +23·804 | | |

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Set the telescope to observe the occultation of Aldebaran, but clouds prevented seeing the moon.

Stellar focus adjusted by J W. Reads 29.5

Transits of W VI 639 for value of screw revolution

Power no 1.

Position circle 170° 40'

Mic. wire at 31 rev. half way between a & b.

| | | $6^h$ $14^m$ | 14 | 15 | 16 | 17 | 17 | 19 | 20 | 20 | 21 | G.M.S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | e | 8·6 | 52·7 | 42·0 | 28·2 | 13·3 | 58·8 | 22·1 | 9·0 | 55·3 | 40·1 | |
| | d | 24·8 | 9·0 | 58·3 | 44·5 | 29·7 | 15·0 | 38·4 | 25·5 | 11·6 | 56·3 | |
| | c | 25·5 | 9·7 | 59·1 | 45·0 | 30·2 | 15·7 | 39·1 | 26·0 | 12·2 | 57·1 | |
| | b | 37·9 | 22·0 | 11·3 | 57·7 | 42·8 | 28·0 | 51·6 | 38·6 | 24·7 | 9·4 | |
| | a | 41·2 | 25·3 | 14·8 | 1·0 | 46·1 | 31·4 | 55·0 | 42·0 | 28·0 | 13·0 | |
| | Sum | 138·0 | 58·7 | 55 | 236·4 | 162·1 | 88·9 | 206·2 | 141·1 | 71·8 | 295·9 | |
| | Mean | 27·60 | 11·74 | 1·10 | 47·28 | 32·42 | 17·78 | 41·24 | 28·22 | 14·36 | 59·18 | |

Differences from mean

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 19·00 | 04 | 10 | 08 | 12 | 1898 | ·14 | 22 | 06 | 19·08 | | − 19·082 |
| d | 2·80 | 74 | 80 | 78 | 72 | 78 | 84 | 72 | 76 | 88 | | − 2·782 |
| c | 2·10 | 04 | 00 | 28 | 22 | 08 | 14 | 22 | 16 | 2·08 | | − 2·132 |
| b | 10·30 | 26 | 20 | 42 | 38 | 22 | 36 | 38 | 34 | 22 | | + 10·308 |
| a | 13·60 | 56 | 70 | 72 | 68 | 62 | 76 | 78 | 64 | 82 | | + 13·688 |
| − | 23·90 | 2382 | 2390 | 24·14 | 24·06 | 23·84 | 24·12 | 24·16 | 23·98 | 2404 | | − 23·996 |
| + | 90 | 82 | 90 | 14 | 06 | 84 | 12 | 16 | 98 | 04 | | + 23·996 |

| | | 22 | 24 | 24 | 25 | 26 | 28 | 29 | 30 | 31 | 32 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | e | 243 | 10·0 | 55·1 | 41·5 | 28·0 | 42·9 | 28·2 | 11·0 | 37·9 | 22·9 |
| | d | 40·9 | 26·3 | 11·7 | 57·9 | 44·2 | 59·2 | 44·7 | 27·3 | 54·1 | 39·1 |
| | c | 41·7 | 27·0 | 12·3 | 58·5 | 45·0 | 59·9 | 45·4 | 28·0 | 54·9 | 40·0 |
| | b | 53·9 | 39·5 | 24·6 | 11·0 | 57·3 | 12·3 | 57·9 | 40·2 | 7·2 | 52·2 |
| | a | 57·3 | 42·8 | 28·0 | 14·2 | 0·6 | 15·5 | 1·1 | 43·7 | 10·6 | 55·7 |
| | Sum | 218·1 | 145·6 | 71·7 | 3·1 | 235·1 | 9·8 | 237·3 | 150·2 | 284·7 | 209·9 |
| | Mean | 43·62 | 29·12 | 14·34 | 0·62 | 47·02 | 1·96 | 47·46 | 30·04 | 56·94 | 41·98 |

Differences from mean

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 19·32 | 12 | 24 | 12 | 02 | 06 | 26 | 04 | 04 | 08 | | − 19·180 |
| d | 2·72 | 82 | 64 | 72 | 82 | 76 | 76 | 74 | 84 | 88 | | − 2·770 |
| c | 1·92 | 2·12 | 04 | 12 | 02 | 06 | 06 | 04 | 04 | 1·98 | | − 2·040 |
| b | 10·28 | 38 | 26 | 38 | 28 | 34 | 44 | 16 | 26 | 22 | | + 10·300 |
| a | 13·68 | 68 | 66 | 58 | 58 | 54 | 64 | 66 | 66 | 72 | | + 13·640 |
| − | 23·96 | 2406 | 2392 | 96 | 86 | 88 | 2408 | 2382 | 92 | 94 | | − 23·960 |
| + | 96 | 06 | 92 | 96 | 86 | 88 | 08 | 82 | 92 | 94 | | + 23·940 |

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1867 Jan 16 Wednesday

$6^h$

| | 33 | 34 | 35 | 36 | 37 | 39 | 40 | 41 | 42 | 44 | 45 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 10·9 | 10·3 | 14·8 | 3·5 | 51·0 | 17·3 | 3·9 | 28·0 | 9·5 | 7·8 | 50·6 |
| d | 27·1 | 26·7 | 30·9 | 19·0 | 7·2 | 33·7 | 20·1 | 44·4 | 26·0 | 24·1 | 7·0 |
| c | 27·7 | 27·2 | 31·7 | 20·4 | 8·0 | 34·2 | 21·0 | 45·1 | 26·6 | 24·8 | 7·6 |
| b | 46·1 | 39·8 | 44·1 | 33·0 | 20·3 | 46·9 | 33·2 | 57·7 | 39·1 | 37·2 | 20·0 |
| a | 43·6 | 43·0 | 47·5 | 36·3 | 23·9 | 50·1 | 36·7 | 1·0 | 42·3 | 40·7 | 23·5 |
| Sum | 148·4 | 147·0 | 169·0 | 113·1 | 50·4 | 182·2 | 114·9 | 236·2 | 143·5 | 134·6 | 48·7 |
| Mean | 29·88 | 29·40 | 33·80 | 22·62 | 10·08 | 36·44 | 22·98 | 47·24 | 28·70 | 26·92 | 9·74 |

Differences from mean

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| e | 18·98 | 19·10 | 00 | 12 | 08 | 14 | 08 | 24 | 20 | 12 | 14 |
| d | 2·78 | 70 | 90 | 72 | 88 | 74 | 88 | 84 | 70 | 82 | 74 |
| c | 2·18 | 20 | 10 | 22 | 08 | 24 | 1·98 | 2·14 | 10 | 12 | 14 |
| b | 16·22 | 40 | 30 | 38 | 22 | 46 | 22 | 46 | 40 | 28 | 26 |
| a | 13·72 | 60 | 70 | 68 | 82 | 66 | 72 | 76 | 60 | 78 | 76 |
| − | 23·94 | 24·00 | 00 | 06 | 04 | 12 | 23·94 | 24·22 | 00 | 06 | 02 |
| + | | 94 | 00 | 00 | 06 | 04 | 12 | 94 | 22 | 00 | 06 | 02 |

Mean of 10 differences

−19·120
−2·870
−2·150
+10·360
+13·780

−24·140
+24·140

Mean of 30 differences

| | reduced to equator |
|---|---|
| −19·111 | −19·094 |
| −2·807 | −2·805 |
| −2·107 | −2·105 |
| +10·323 | +10·314 |
| +13·703 | +13·691 |
| −24·025 | −24·004 |
| +24·026 | +24·005 |

These give for the value of the screw rev. 9″·8200

| Computed from this value | C − O | (C − O)² |
|---|---|---|
| −19·116 | −022 | ·000484 |
| −2·763 | +042 | ·001764 |
| −2·109 | −004 | ·000016 |
| +10·339 | +025 | ·000625 |
| +13·649 | −042 | ·001764 |
| | | ·004653 |

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| | | | | | |
|---|---|---|---|---|---|
| Σ 622 | | | | | Set for this star, but did not find it. |
| Σ 844 | | | | | " " " " " Pretty cluster near the place |
| Σ 901 | | 107 30 | | JW | Companion precedes. Seeing wretched. |
| | | 104 20 | | | Is no use to try any more |
| | | 90°+ | | | |
| | | 196 30 | 45·87 | | Very rough measure; stars like nebulæ |
| | | | 92 | | |
| | mean | 106 7 | 45·895 | 1·792 | |
| | | | 47·67 | | |
| | | | 70 | | |
| | | | 69 | | |
| | | | 47·687 | | |
| | | | | | Seeing too bad to continue observation. |

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1867 Jan. 19 Saturday

Planet (91)?
and Arg 2.
+13° No 318

by Chron 236

| | | | Δα cos δ | | |
|---|---|---|---|---|---|
| | 3h | 45m | 43·18 | JW | Pos. circle 170° 40′ |
| | | 47·7 | 48 | | Planet precedes |
| | | 48·5 | 10 | | |
| | | 49·0 | 43·05 | | |
| | | 49·5 | 42·88 | | |
| | | 50·0 | 42·80 | | |
| | | 51·0 | 43·05 | | best |
| | | 52·8 | 43·19 | | |
| mean of 8 | 3 | 49·09 | 43·091 | −5·600 | |

| | | | | |
|---|---|---|---|---|
| coinc. | | 47·71 | | with wrong thread |
| | | 72 | | r 0·998 = bc from mean of |
| | | 72 | | all the measures (see Vol 3 p 67) |
| | | 68 | | |
| | | 65 | | |
| | | 65 | | |
| | | 47·688 | | = 48·686 |
| | | 48·80 | | with right thread |
| | | 65 | | |
| | | 65 | | |
| | | 48·70 | | |
| mean of 9 coinc. | | 48·691 | | |
| | | Δδ | | Planet South |
| | 3 | 56·5 | 19·91 | |
| | | 57·3 | 92 | |
| | | 57·7 | 92 | |
| | | 57·8 | 83 | Same coincidence |
| | | 58·1 | 83 | |
| mean of 5 | 3 | 57·43 | 19·882 | −28·809 |
| | | | Δα cos δ | |
| | 4 | 4·5 | 42·61 | |
| | | 5·0 | 43·10 | |
| mean of 2 | 4 | 4·75 | 42·855 | −5·836 |

Σ 622 4 15

Duplicity of star just
perceptible; seeing very bad.
Distance evidently much
less than 1 rw. (JW & GMS.)

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Σ 622 $5^h\ 30^m$

176 50
177 15
175 40
176 40

mean of 4 176 36

90 +

[81 20]

49.48
465 ½ wt
435 ½ wt
50 ½ wt
44

85 15
84 55
85 45
84 40

mean of 5 49.463 0.415

mean of 4 175 9

conic.
49.06
04
05
04

mean 49.048

JW Seeing improved, though still poor.
Components equal

Not a careful measure of position; afterward seen to be evidently wrong
Measure of distance better than the three following
Pretty good measure

Σ 850

If found, not well enough seen for measurement

Star for zero point
260 38
80 36

Ext. Therm $-2^\circ$

Transits of δ Draconis over e d c b a

JW Mic. wire in conic. with c at 48.12

| | $6^h$ $29^m$ | 31 | 33 | 35 | 37 | 40 | 41 | 44 | 46 | 48 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 7.1 | 22.5 | 25.3 | 26.2 | 51.9 | 0.0 | 59.8 | 0.1 | 2.5 | 11.0 |
| | 49.9 | 5.1 | 7.8 | 9.0 | 34.1 | 42.5 | 42.5 | 42.8 | 44.9 | 53.3 |
| | 51.4 | 6.7 | 9.6 | 10.7 | 36.0 | 44.3 | 43.9 | 44.6 | 46.9 | 55.4 |
| | 23.9 | 39.2 | 42.0 | 42.9 | 8.3 | 16.7 | 16.4 | 16.9 | 18.9 | 27.6 |
| | 32.3 | 47.8 | 50.5 | 51.4 | 17.1 | 25.0 | 25.1 | 25.7 | 27.8 | 36.1 |
| Sum | 284.6 | 61.3 | 75.2 | 80.2 | 207.4 | 248.5 | 247.7 | 250.1 | 261.0 | 3.4 |
| Mean | 56.92 | 12.26 | 15.04 | 16.04 | 41.48 | 49.70 | 49.54 | 50.02 | 52.20 | 0.68 |

All these read off $2^s$ too small.

Differences from mean

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| −49.82 | −49.76 | −49.74 | 49.84 | 49.58 | 49.70 | 49.74 | 49.92 | 49.70 | 49.68 | −49.748 | .17 |
| −7.02 | −7.16 | −7.24 | 7.04 | 7.38 | 7.20 | 7.04 | 4.22 | 7.30 | 7.38 | −7.198 | .18 |
| −5.52 | −5.56 | −5.44 | 5.34 | 5.48 | 5.40 | 5.64 | 5.42 | 5.30 | 5.28 | −5.438 | .20 |
| +26.98 | +26.94 | +26.96 | 26.86 | 26.82 | 27.00 | 26.86 | 26.88 | 26.70 | 26.92 | +26.892 | .19 |
| +35.38 | +35.54 | +35.46 | 35.36 | 35.62 | 35.30 | 35.56 | 35.68 | 35.60 | 35.42 | +35.492 | .19 |
| 62.36 | 62.48 | 62.42 | 62.22 | 62.44 | 62.30 | 62.42 | 62.56 | 62.30 | 62.34 | 62.384 | |
| 36 | 48 | 42 | 22 | 44 | 30 | 42 | 56 | 30 | 34 | 384 | |

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8

1867 Jan 19 Saturday

| | 6h 50m | 52 | 54 | 56 | 58 | 7h 0 | 13 |
|---|---|---|---|---|---|---|---|
| | 12·6 | 50·0 | 45·7 | 43·9 | 49·9 | 44·3 | 57·1 |
| | 56·0 | 32·3 | 28·1 | 26·1 | 32·1 | 27·0 | 39·5 |
| | 56·7 | 34·1 | 30·0 | 28·2 | 33·7 | 28·8 | 41·3 |
| | 28·9 | 6·4 | 2·2 | 0·6 | 6·2 | 1·3 | 13·8 |
| | 37·7 | 15·1 | 11·0 | 9·0 | 14·9 | 9·9 | 22·2 |
| Sum | 10·9 | 197·9 | 177·0 | 167·8 | 196·8 | 171·3 | 233·9 |
| Mean | 2·18 | 39·58 | 35·40 | 33·56 | 39·36 | 34·26 | 46·78 |
| | −49·58 | 49·58 | 49·70 | 49·66 | 49·46 | 49·96 | 49·68 |
| | − 7·18 | 7·28 | 7·30 | 7·46 | 7·26 | 7·26 | 7·28 |
| | − 5·48 | 5·48 | 5·40 | 5·36 | 5·66 | 5·46 | 5·48 |
| | + 26·72 | 26·82 | 26·80 | 27·04 | 26·84 | 27·04 | 27·02 |
| | + 35·52 | 35·52 | 35·60 | 35·44 | 35·54 | 35·64 | 35·42 |
| | −62·24 | 62·34 | 62·40 | 62·48 | 62·38 | 62·68 | 62·44 |
| | + 24 | 34 | 40 | 48 | 38 | ·68 | 44 |

Mean of all 17

| | |
|---|---|
| −49·712 | |
| − 7·235 | |
| − 5·453 | |
| + 26·894 | |
| + 35·506 | |
| −62·400 | |
| + ·400 | |

Reduced to equator
log cos δ = [9·58414]

| | Computed |
|---|---|
| −19·081 | −19·086 |
| − 2·777 | − 2·757 |
| − 2·093 | − 2·104 |
| + 10·323 | + 10·320 |
| + 13·628 | + 13·627 |
| −23·951 | −23·947 |
| + 951 | +23·947 |

These results give 9″·8032 for the value of 1 revolution representing them as above

| C − O | (C − O)² |
|---|---|
| −·005 | ·000025 |
| +·020 | ·000400 |
| −·011 | ·000121 |
| −·003 | ·000009 |
| −·001 | ·000001 |
| | ·000556 |

Note, April 28, 1880. See book N 8 for original record. External thermometer at close of observations −6°; at beginning −2° as on p. 7 of this book.

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Star observed for planet (91) Jan 19 with Arg. Z. +13° No 318

Found to be still in place.

Uranus

JVV Seeing good
Stellar focus adjusted; to read 28.9

Diameter 49.47 0.47
49.06

Could not see the satellites

by Chron 236

| | | | | | |
|---|---|---|---|---|---|
| | | | 90°+ | | |
| 2nd Satellite (preceding) | 4 | 50m | 174 | 45 | GMS Seeing good, what there is of it. Cannot measure the distance. |
| | | 52 | 172 | 15 | |
| | | 52 45 | 174 | 40 | |
| | | 53 30 | 175 | 35 | |
| | | 54 0 | 171 | 40 | |
| mean | 4 | 52 27 | 263 | 47 | |
| | | | 90+ | | |
| 3d Satellite (also preceding) | 4 | 55 | 190 | 5 | |
| | | 55.9 | 188 | 1 | |
| | | 56.5 | 188 | 5 | |
| | | 57.1 | 189 | 35 | |
| | | 58 | 191 | 17 | Too faint to measure the distance |
| | 4 | 56.50 | 279 | 25 | |

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1867 Jan 23 Wednesday.

Sirius $6^h\ 10^m$

| | | | | | | |
|---|---|---|---|---|---|---|
| | 99 | 0 | | | JW | Companion distinctly seen by W. & S. (Must be variable. JW.) |
| | 97 | 15 | | | | |
| | 100 | 1 | | | | |
| | 100 | 15 | | | | |
| | 100 | 0 | | | | |
| | 99 | 45 | | | | |
| mean | 99 | 33 | 50.05 | | | |
| | | | 02 | | | |
| | | | 02 | | | Very unsteady |
| | | | 49.94 | | | |
| | | | 50.04 | | | |
| | | | 50.014 | 1.027 | | |
| | | | conn. | | | |
| | | | 48.98 | | | Companion appears reddish to JW. |
| | | | 49.00 | | | |
| | | | 01 | | | |
| | | | 48.96 | | | |
| | | | 98 | | | |
| | | | 99 | | | |
| | | | 48.987 | | | |
| | 90+ | | | | | |
| | 5 | 0 | | | | Cannot measure satisfactorily in this manner owing to brightness of large star. Companion well seen, notwithstanding thick haze. |
| | 96 | 10 | | | JMS | Star unsteady |
| | 95 | 32 | | | | |
| | 95 | 25 | | | | |
| mean | 95 | 42 | | | | |
| | 90+ | | | | | |
| | 5 | 22 | 49.99 | | | |
| | 6 | 30 | 97 | | | |
| | 6 | 17 | 98 | | | ½ wt. in dist. & angle |
| mean | 96 | 2 | 49.980 | 1.049 | | |
| | | | conn | | | |
| | | | 48.92 | | | (probably has been changed) |
| | | | 92 | | | |
| | | | 93 | | | |
| | | | 92 | | | |
| | | | 94 | | | |
| | | | 48.95 | | JW | |
| | | | 95 | | | |
| | | | 93 | | | |
| | | | 92 | | | |
| mean | | | 48.931 | | | |

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93 45
99 15

90 +
3°

JW

Not good enough to be combined with the others.

Trapezium
θ Orionis
sixth star
from near
star of
trapezium
preceding
it.

90 +
323 25

JW

∴ No 6
Trapezium.

Upper line
of trapezium

40 25
40 0
39 15
39 3
39 8

mean 39 34

Further obsns. prevented by clouds.

Companion of Sirius seen much better than the sixth star of trapezium.

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1867 Jan. 24 Thursday

3h 10m

Zodiacal light remarkably conspicuous. Vertex about at ♈ Piscium. Base extending from W. 18° or 20° to S. Middle obscured by clouds.

12 Lyncis
(Z 948)

B A C
∴ C

AB

| | |
|---|---|
| 218 | 15 |
| 216 | 10 |
| 217 | 20 |
| 216 | 20 |
| 217 | 50 |
| 217 | 11 |

JW — Seeing remarkably good. Wires parallel to eyes. A brighter than B.

AC

| | |
|---|---|
| 227 | 20 |
| 224 | 25 |
| 224 | 50 |
| 223 | 0 |
| 226 | 0 |
| 225 | 7 |

C precedes. obscured by clouds. Wires parallel to eyes

AB

49·17
18
23
49·193 — 0·256

AC

49·87
77
81
86
80
80
49·818 — 0·881

conc

48·93
94
94
48·937

Same as last night

Obsns. interrupted by clouds

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(No gas illumination.)

Sirius 5h 40m 99 22 JMS Companion not quite as well
98 12 seen as last night. Air fully
99 15 as clear, apparently, and no moon.
mean 98 56 Air becomes clearer
90+

| | | | | |
|---|---|---|---|---|
| | 5 | 35 | 49.94 | |
| | 6 | 58 | 50.02 | Best distance yet measured; companion well seen on wire |
| | 6 | 25 | 07 | Nearly as good |
| | 6 | 45 | 49.98 | |
| | 4 | 52 | 50.00 | |
| mean | 96 | 7 | 50.002 | 1.064 |

[48.89]
94
93
94
95
93
48.938

Seeing worse. Tried to measure direction in the ordinary way, but could not see the companion.

ζ Cancri 7 30 Could not be sure of elongation of principal star. Seeing poor.

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1867 Jan 25 Friday

$2^h\ 45^m$ GMS Zodiacal light not so bright as last night, but apparently ~~xx~~ more haze. Vertex at δ Piscium. Base obscured by cloud

Sirius GMS Companion well seen when first looked at notwithstanding haze, which presented in the telescope the appearance of a driving snow storm, numerous particles crossing very rapidly (from W to E, if remembered right.) Clouds closed over before any measures could be taken.

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Correction of Chronometer +42$^s$; sec for. 0.

| | | | by Chron 236 | 90°+ | | | |
|---|---|---|---|---|---|---|---|
| Uranus | | 4 | 48 | 169 20 | 59.09 | | GMS } Stars on wires |
| 3d Satellite | | | | 168 25 | 59.085 | | Double weights to this set of distances; satellite best seen. |
| (following.) | | | 53 | 168 27 | 59.07 | | |
| | mean | 4 | 50 | 258 44 | 59.082 | 3.152 | |
| | | 4 | 56 | 168 3 | 52.28 | | Planet in middle |
| | | | | 168 38 | 52.45 | | |
| | | 5 | 0 | 168 20 | 52.29 | | |
| | mean | 4 | 58 | 258 20 | 52.340 | 3.590 | |
| | | 5 | 6 | 168 53 | 59.39 | | Stars on wires |
| | | | 8 | 168 5 | 59.45 | | |
| | mean | 5 | 7 | 258 29 | 59.420 | 3.490 | |
| | | | | | corrc. | | Wires perp. to eyes in all the above measures. |
| | | | | | 55.91 | | Note May 17, 1881. Hence eyes parallel to stars. |
| | | | | | 94 | | |
| | | | | | 95 | | |
| | | | | | 94 | | |
| | | | | | 95 | | |
| | | | | | 92 | | |
| | mean of all | 4 | 57 | 258 31 | | 3.333 | |
| | | | | 90+ | | | |
| 4th Satellite | | 5 | 12 | 103 58 | 51.25 | | |
| s. f. | | | 13 | 104 50 | 30 | | Stars on wires |
| | | | 14 | 104 15 | 32 | | Wires horizontal on retina (parallel to eyes) |
| | | | 17 | 104 20 | 36 | | |
| | | | | 103 25 | 39 | | Note May 17, 1881. Hence eyes perpendicular to stars. |
| | mean | 5 | 14 | 194 10 | 51.324 | 4.606 | |
| | | | | | corrc | | |
| | | | | | 55.93 | | |
| | | | | | 92 | | |
| | | | | | 92 | | |
| | | | | | 92 | | |
| | mean of 10 corrc. | | | | 55.930 | | |
| Diameter in direction of 4th Satellite | | | | | 56.40 | 0.450 | Limb not well defined, though the stars were steady. |
| | | | | | 36 | | |
| | | | | | 38 | | |
| | | | | | 56.380 | | |

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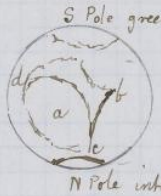


Jan. 27 Sunday

Mars

| | | | | |
|---|---|---|---|---|
| | | 90 + | | |
| angular point b from centre | 6h 35m | 155½ | 58.79 | |
| | 6 36 | 149½ | 58.75 | |
| coincidence (in this direction) | | | 58.32 | |
| on following limb | | | 32 | |
| on preceding limb | | | 59.80 | |
| | | | 85 | |
| N Pole | | [170 12] | reject | |
| | | 185 50 | seeing better | |
| | | 185 15 | | |
| | | 185 5 | | |

S Pole greenish not so well defined




N Pole intensely bright

Seen perhaps better than ever before. Markings occasionally very distinct.

Space a, dusky red.
Space c b d, dark, point b darkest of all.
Limb yellow, as usual.

N. Pole very bright and seems to project from the general line of the limb.
Line b c well defined
" b d poorly "

Sirius 7 5

Both W. & S. felt pretty sure of having seen the companion but too faint & unsteady to measure
Seems bluish to W.

Trapezium & Orionis

W. cannot see the sixth star.
Observations so far with power no 4. Changed to no. 2.
J.W. thinks there is some spirality in the n.p. angle of nebula. Rest a good deal mottled, but no spirality.

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| | | | | | | |
|---|---|---|---|---|---|---|
| Double Star noticed by J W | | 3h 20m | 222 50 | | J W | Comp. s. f. Mags. 9 & 10 |
| 3h 55m.5 −16° 10'.3 | | | 225 5 | | | Vernier read on side of companion |
| | | | 224 55 | | | |
| | | | | 58.71 | | |
| | | | | 65 | | |
| | | | | 80 | | |
| | mean | | | 58.720 | 0.917 | |
| | | | | coinc | | |
| | | | | 57.80 | | Stars became quite faint before |
| | | | | 80 | | completion of measure |
| | | | | 81 | | |
| | | | 90 + | | | |
| | | | 131 50 | | | |
| | mean | | 223 40 | | | Stars perp. to line of eyes. |
| 4h 1m −16° 10'.3 | | 3 35 | 270 30 | | | Both 9 mag. |
| | | | 269 45 | | | |
| | | | 269 30 | | | |
| | | | 270 45 | | | |
| | | | 268 15 | | | |
| | | | | 59.62 | | |
| | | | | 65 | | |
| | | | | 67 | | |
| | | | | 69 | | |
| | | | | 59.658 | 1.855 | |
| | | | 90 + | | | Stars parallel to eyes. |
| | | | 180 45 | | | |
| | mean | | 269 55 | | | |
| | | | | coinc | | |
| | | | | 57.795 | | |
| | | | | 81 | | |
| | mean of 5 coinc. | | | 57.803 | | |

Correction of chronometer + 43s ; see p. 0

| | | | | | | |
|---|---|---|---|---|---|---|
| Uranus | | by chron 236 | 90 + | | | |
| 3d Satellite | | 3 53 | 212 5 | | | |
| m. f. | | 4 0.5 | 212 45 | 61.10 | | Stars on wires |
| | | 1.7 | | 61.40 | | Same coincidence |
| | | 2.7 | 213 55 | 61.34 | | |
| | | 5.0 | | 61.25 | | |
| | mean | 4 2.5 | | 61.272 | 3.469 | |
| | mean | 3 58.7 | 302 55 | | | |

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1867 Jan 28 Monday

by chron 236

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 90+ | | | | |
| Uranus | | 4 8 | 312 | | | JW | Coincidence changed |
| 4th Satellite | | 12 | | | [53·74] | | Reject. |
| | | 17 | 310 | 0 | 53·00 | | |
| | | 20 | | | 52·97 | | |
| | | 24 | 307 | 15 | 53·02 | | |
| | | 26·5 | | | 53·02 | | |
| | | 28·5 | 308 | 30 | 53·17 | | |
| | mean | 4 19·4 | 39 | 26 | | | |
| | mean | 4 23·2 | | | 53·036 | 4·646 | |
| | | | | | conc. | | |
| | | | | | 57·66 | | |
| | | | | | 69 | | |
| | | | | | 69 | | |
| | | | | | 67 | | |
| | | | | | 71 | | |
| | | | | | 67 | | |
| | | | | | 57·682 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Σ 1037 | | | 219 | 40 | | JW | Measure of direction very difficult |
| | | | 219 | 15 | | | Components equal |
| | | | 221 | 0 | | | |
| | | | 221 | 45 | | | |
| | | | 220 | 40 | | | |
| | mean | | 220 | 28 | | | |
| | | | | | 33·00 | | |
| | | | | | 32·95 | | |
| | | | | | 93 | | |
| | | | | | 97 | | |
| | mean | | | | 32·962 | 0·265 | |
| | | | | | conc. | | |
| | | | | | 32·70 | | |
| | | | | | 70 | | |
| | | | | | [63] | | |
| | | | | | 70 | | |
| | | | | | 70 | | |
| | | | | | 69 | | |
| | | | | | 69 | | |
| | | | | | 32·697 | | |

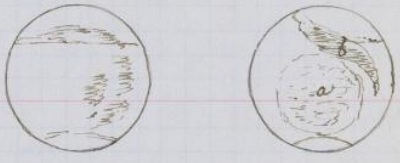
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Mars JW White at S. Pole nearly twice as wide as that at N. Pole and = 1/2 the radius of the planet. (JW)

J W G M S




Red spot a not very well defined
Space b is dark.
S. Pole greenish
N Pole yellow, very bright. (G M S)

Observations thus far with power no 3.

$5^h\ 20^m$ Zodiacal light still quite conspicuous. Base from 3° N. of W. to 4° S. of W about; vertex about midway between α Arietis & α Ceti.

Sirius $6^h\ 25^m$

| | |
|---|---|
| 95 | 30 |
| 97 | 10 |
| 96 | 30 |
| 98 | 15 |
| 97 | 15 |
| mean 97 | 20 |

JW Companion better seen with power no 4. than 3.

Power no 4

| | |
|---|---|
| 52·33 | |
| | 38 |
| | 39 |
| | 38 |
| | 40 |
| 52·376 | 1·085 |

Companion reddish; well seen on wire. Better defined than yet seen, and easily measured

| | |
|---|---|
| corrc | |
| 51·29 | |
| | 29 |
| | 285 |
| | 30 |
| 51·291 | |

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1867 Jan 28 Monday

| | | | | | |
|---|---|---|---|---|---|
| Trapezium θ Orionis Sixth star | 6h 45m | 90+<br>140 45<br>140 45<br>142 30<br>231 20 | | JW | Becomes blurred. |
| | | | 51.65<br>66<br>63<br>65<br>51.648 | 0.357 | |
| Upper line of trapezium | | 40 30<br>39 5<br>40 55<br>40 20<br>39 50 | | | Stars parallel to eyes |
| | mean | 40 8 | | | |
| 5th star from nearest of trapezium | | 354 20<br>356 15<br>355 50<br>357 15<br>357 5 | | | |
| | mean | 356 9 | | | |
| preceding pair of trapezium | | 318 40<br>318 40<br>318 0<br>318 15<br>318 10 | | | Stars perp. to eyes. |
| | mean | 318 21 | | | |
| Lower line of trapezium | | 231 25<br>231 40<br>230 15<br>229 -15<br>229 40 | | | Stars parallel to eyes |
| | mean | 230 27 | | | |
| Following pair of trapezium | | 292 15<br>292 10<br>288 45<br>290 30<br>291 0 | | | Stars perp. to eyes. |
| | | 290 56 | | | |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ζ Cancri (close pair) | | 7h 40m | 304 10<br>303 30<br>306 15<br>304 20 | | | JW | Smaller star also appears double. |
| | mean | | 304 34 | | | | |
| | | | 304 58<br>303 32<br>302 17<br>302 13 | | | GMS | Companion precedes.<br>Power measure; ½ wt. |
| | mean | | 303 23 | | | | |
| | | | | 51·31<br>25 | 0·06 | | A mere estimate |
| | | | | | From 0″6 to 0″75 | | Distance estimated by JW |
| | | | | | | | Obsns. with power no 5. |
| Σ 1216 | | 8 25 | 228 45 | | | JW | Unsatisfactory |
| | | | | | about 0″·5 | | Distance about 0″·5 |
| ω Leonis | | | | | | | Cannot separate. Power no 4. |

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1867 Jan 29 Tuesday

Stellar focus

adjusted by JW to read 28.8
Seeing not so good as last night

Sweeps in S. declination for double stars by

JW

Star
$3^h 40^m - 16° 53'$ $3^h\ 45^m$

| | | | | | |
|---|---|---|---|---|---|
| | 52 | 45 | | | |
| | 52 | 15 | | | |
| | 53 | 30 | | | |
| mean | 52 | 50 | | | |

Both 9 mag. S estimated them 10 & 10.5 smaller star preceding. W. adopts this estimate

| | | |
|---|---|---|
| 54.15 | | |
| 02 | | |
| 53.95 | | |
| 95 | | |
| 54.018 | 2.681 | |
| corrc. | | |
| 51.34 | | |
| 33 | | |
| 34 | | |
| 51.337 | | |

$4^h$

Zodiacal light of unusual brilliancy, 15° broad at the horizon i.e. from W to 15° S W and extending upward to the Pleiades near the zenith, tapering to a point there JW.

$\Sigma$ 8H 8 $4^h\ 17^m$

GMS

| | | |
|---|---|---|
| 239 | 20 | |
| 241 | 10 | |
| 238 | 50 | |
| 241 | 16 | |
| 90 + | | |
| 152 | 45 | |
| 240 | 40 | |

| | | |
|---|---|---|
| 51.05 | | |
| 10 | | |
| 51.075 | 0.237 | |
| corrc | | |
| 51.31 | | |
| 30 | | |
| 31 | | |

Seeing not very good. Stars perp. to eyes. companion following This star appears to be W V 1550 being preceded by 1544 $12^s.5$ on the same parallel. 1552 also follows to the south apparently. The stars are in a pretty rich cluster.

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1867phae.proj:326W



Time-piece not stated; if B.236, correction +44$^s$; see p. 0.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | 90+ | | | | |
| Uranus | 4 | 44·0 | 257 | 14 | 54·82 | | GMS |
| 3d Satellite | | 45· 45·8 | 258 | 5 | 73 | | stars persp. to eyes. |
| (nearly north) | | 47·1 | 258 | 7 | 79 | | |
| | | 48·1 | 255 | 47 | 77 | | |
| | | 49·4 | 256 | 15 | 67 | | |
| | mean | 4 46·9 | 347 | 6 | 54·756 | 3·444 | |
| | | | | | conc | | |
| | | | | | 51·31 | | |
| | | | | | 32 | | |
| | | | 90+ | | | | |
| 4th Satellite | | 4 53·4 | 332 | 15 | 55·82 | | |
| s. f. | | 54·8 | 331 | 45 | 56·00 | | |
| | | 56·6 | 332 | 30 | 55·77 | | |
| | | 57·9 | 331 | 55 | 55·56 | | |
| | | 59·4 | 332 | 28 | 55·89 | | |
| | 4 | 56·4 | 62 | 11 | 55·808 | 4·496 | |
| | | | | | conc | | |
| | | | | | 51·32 | | |
| mean of 6 coinc. | | | | | 51·312 | | |

Mars

S could see nothing upon it different from last night. Seeing not as good.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Trapezium | | | 232 | 35 | | | WMD |
| θ Orionis | | | 231 | 30 | | | |
| (lower bale) | | | 229 | 30 | | | |
| | | | 90+ | | | | |
| | | | 324 | 25 | 53·89 | | |
| | | | 324 | 10 | 53·90 | | |
| | mean | | 232 | 26 | 53·895 | 2·005 | |
| | | | | | conc | | |
| | | | | | 51·88 | | |
| | | | | | ·90 | | |
| | | | | | 51·890 | | |

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1867 Jan 29 Tuesday

Sirius — $6^h\ 25^m$ — Companion not visible (2 8 5)
Power no 4. Sky quite clear.

Trapezium
θ Orionis — G M S — Fifth star visible. Sixth star seen with extreme difficulty if at all.

Following pair — Stars perp. to eyes.

| | | |
|---|---|---|
| | 290 | 25 |
| | 289 | 44 |
| | 288 | 50 |
| | 290 | 27 |
| | 290 | 8 |
| mean | 289 | 55 |

Upper pair — Obsns. with right eye (left commonly used)
Stars parallel to eyes.

| | | |
|---|---|---|
| | 38 | 55 |
| | 39 | 43 |
| | 40 | 2 |
| | 39 | 44 |
| | 38 | 50 |
| mean | 39 | 27 |

preceding pair — Stars perp. to eyes
Right eye

| | | |
|---|---|---|
| | 318 | 13 |
| | 317 | 28 |
| | 317 | 43 |
| | 318 | 45 |
| | 318 | 21 |
| mean | 318 | 6 |

" — Left eye

| | | |
|---|---|---|
| | 317 | 0 |
| | 314 | 44 |
| | 314 | 31 |
| | 314 | 38 |
| | 316 | 48 |
| mean | 317 | 20 |

Upper pair — Left eye

| | | |
|---|---|---|
| | 41 | 21 |
| | 41 | 6 |
| | 41 | 2 |
| | 39 | 30 |
| | 41 | 15 |
| mean | 40 | 51 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| θ Orionis for zero of pos. circle | | | 80 32 | | | | Power no 4. |
| | | | 260 " | | | | |
| | | | 80 31 | | | | |
| | | | 260 " | | | | |
| Star near meridian | | | 80 27 | | | | |
| | | | 260 " | | | | |
| | | | 80 25 | | | | |
| | | | 260 " | | | | |
| | | | 80 38 | | | | |
| | | | 260 " | | | | |
| | mean | | 80 31 | | | | |
| | | | 260 " | | | | |
| Σ 1104 | | | 38 32 | | | 3 MS | Companion n. f. |
| | | | 39 57 | | | | |
| | | | 38 50 | 52·77 | 0·18 | | Stars parallel to eyes. |
| | | | 41 58 | comc | | | |
| | | | 38 43 | | | | |
| | | | | 52·96 | | | |
| | mean | | 39 26 | 95 | | | |
| | | | | 94 | | | |
| | | | | 52·95 | | | |
| | | 7h 15m | 32 0 | | | W MS | |
| | | | 35 0 | | | | |
| | | | 33 38 | | | | |
| | | | 32 22 | | | | |
| | | | 30 52 | | | | |
| | mean | | 32 46 | | | | |
| | | | 31 45 | | | J W | ½ wt. (Can only measure elongation) |
| | | | | | | | Power no 3. Answers better |
| | | | 36 0 | | | | |
| | | | 36 30 | | | | |
| | | | 33 30 | | | | Power no 2 |
| | | | 37 15 | | | | better than the preceding nos by W. |
| | | | 34 35 | | | | |
| | mean | | 35 46 | | | | |
| ξ Ursae Maj. | | | | | | | Seeing too bad for measures. |

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1867 Jan 30 Wednesday

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Zodiacal light | | 3h 30m | | | | GMS | Base about from W 2° to 22° S. Vertex at the Pleiades |
| Auroral arch | | | | | | " | Pretty bright, vertex of upper limb of well-defined part at 3h 30m (Chron. 236) about 4° or 5° W. of η Ursae Maj. at the same altitude with this star. Incomplete at eastern end. |
| Stellar focus | | | | | | J W | Adjusted by J W to read 28.95 |
| Σ 348 close companion | | 4 15 | 238 45<br>241 45<br>241 45<br>243 30<br>239 40 | | | J W | unsatisfactory<br>Vernier read on the side (apparently toward of the companion, which follows. |
| | mean | | 240 53 | | | | |
| | | | | 52.29<br>.74 | 0.225 | GMS | Mic wire on companion<br>" " " principal star |
| Σ. 848 (principal star) and W T 1552 (W T 1552 south) | mean | | | Δδ<br>51.27<br>24<br>51.255 | <br><br>−1.438 | | Position circle 260 35 |
| W T 1544 | | | | | 0.00 | | |
| 1552 | | | | Δα cos δ<br>50.21 | <br>+2.483 | | " 170 35 |
| 1544 | | | | 70.94 | −18.247 | | |
| | | | | coinc<br>52.69<br>69 | | | |
| Faint companion of 848 (preceding) | | | 56 40<br>54 16<br>56 0 | | | | |
| | mean | | 55 39 | | | | |
| | | | | 51 10<br>18<br>16 | | | |
| | mean | | | 51.147 | 1.546 | | |
| | | | | Coinc.<br>52.70 | | | |
| | | | | 52.693 | | | |

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Correction of Chronometer +44$^s$; sec p. O.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | by chron 236 | 90 + | | | | | |
| 4th Satellite of | 5$^h$ | 11$^m$ | 1 | 0 | 48·53 | | GMS | |
| Uranus | | 13 | 359 | 0 | 59 | | | Extremely faint. |
| (following) | | 15 | 0 | 0 | 75 | | | Disc of planet much blurred. |
| | | 17 | 358 | 50 | 56 | | | |
| | | 18 | 358 | 44 | 53 | | | |
| mean | 5 | 15 | 89 | 31 | 48·592 | 4·128 | | |
| | | | | | conic | | | |
| | | | | | 52·72 | | | 3d Satellite too much mixed |
| | | | | | 73 | | | up with stars to be observed |
| | | | | | 73 | | | |
| | | | | | 70 | | | |
| | | | | | 52·720 | | | |
| Mars | | | | | | | | Too much blurred for observation |
| Sirius | | | | | | | | Companion not visible. |
| | | | | | | Δ ∝ cos δ | | |
| W VIII 1526 | 7 | 12 | | | 76·32 | | GMS | Pos. circ. 170° 35′ |
| and | | 13 | | | 35 | | | |
| | | 13·8 | | | 39 | | | |
| Mnemosyne | | 14·4 | | | 46 | | | Planet follows |
| | | 14·9 | | | 37 | | | Mic. head s |
| | 7 | 13·6 | | | 76·378 | +2·361 | | |
| | | 19·1 | | | 75·87 | | | Star on wire b. Pos. circle 260° 35′ |
| | | 19·5 | | | 76 | Δδ | | |
| | | 20·0 | | | 79 | | | Coincidence with e. |
| | | 20·3 | | | 44 | | | |
| | | 20·5 | | | 43 | | | Planet north |
| | | 21·5 | | | 79 | | | |
| | | 21·9 | | | 45 | | | |
| | | 22·0 | | | 83 | | | |
| | 7 | 20·6 | | | 75782 | be −2·957 | = 42·037 | |
| | | 29 | | | 80·45 | | | |
| | | 29·9 | | | 49 | | | |
| | | 30·6 | | | 34 | | | Mic. head w. |
| | | 31 | | | 47 | | | |
| | | 31·5 | | | 48 | | | |
| | 7 | 30·4 | | | 80·446 | +1·707 | | |
| | | | | | conic | | | |
| | | | | | 78·78 | | | |
| | | | | | 40 | | | |
| | | | | | 71 | | | |
| | | | | | 78·74 | | | |
| | | | | | 79 | | | |
| | | | | | 74 | | | |
| | | | | | 76 | | | |
| | mean of 7 conic. | | | | 78·739 | | | |
| ω Leonis | | | | | | | | Cannot separate. Power no 3. |

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1867 Feb 1 Friday

8

Cluster of Σ 844

| | | | | | | |
|---|---|---|---|---|---|---|
| Close companion | | | 241 45 | | | J W |
| | | | 241 15 | | | |
| | | | 241 50. | | | |
| | mean | | 241 37 | | | |
| Double dist. | | | | 51·28 | 0·31 | |
| | | | | 50·66 | | |
| | | 3h 55m | | 51·30 | 0·305 | |
| | | | | 50·69 | | |
| | | | | 50·225 | 0·268 | |
| | | | | 49·69 | | |
| | mean | | | ~~0·288~~ | | |
| | | | | | 0·294 | |
| Faint companion | | | 53 15 | | | |
| | | | 54 32 | | | |
| | | | 53 15 | | | |
| | mean | | 53 41 | | | |
| | | | | 52·64 | | |
| | | | | 59 | | |
| | | | | 64 | | |
| | | | | 62 | | |
| | | | | 66 | | |
| | | | | 68 | | |
| | mean | | | 52·638 | 1·636 | |
| | | | | coinc | | |
| | | | | 51·01 | | |
| | | | | 50·96 | | |
| | | | | 51·02 | | |
| | | | | 00 | | |
| Double star | | | 216 50 | | | |
| | | | 216 30 | | | |
| found by J W | mean | | 216 40 | | | |
| 6h 3m.5 +5° 30′ | | 4h 50m | | 51·95 | 0·948 | S M S |
| | | | | 51·00 | | |
| | | | 90+ | | | |
| | | | 128 20 | | | |
| | mean of all | | 217 13 | | | |
| Star b 39·5 -28° 35′ | | | 262 0 | | | |
| | | | 263 45 | | | |
| | | | 265 0 | | | |
| | mean | | 263 35 | | | |
| | | | | 51·80 | | |
| | | | | 82 | | |
| | mean | | | ~~51·81~~ | | |
| | | | | coinc. | | |
| | | | | 51·00 | | |
| | | | | 00 | | |

Following component (i.e close companion) 1M.5 fainter than the other. Faint comp. not more than 11th mag.

One wire coarse, the other fine. (½ wt)

Both the same size

S.

b ••a Σ844 N

a = close comp

b = faint "

No other star following, in the vicinity. (S M S)

The close comp. is Σ's B but the faint one is not in Σ. (C.S.S. 1867 Nov 30)

10 mag; comp. very faint, following; estimated dist. 8″

Note June 17, 1881. Mean of coincidences 51.002 used in reduction.

Mags.

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| | | | | | | |
|---|---|---|---|---|---|---|
| Star | | | | | | |
| $6^h\ 0^m + 5^\circ\ 1'$ | | 46 45 | 52.60 | 1.598 | JW | Companion preceding |
| | | 45 0 | 51.03 | | | Mags. 10 & 11 or less if anything |
| | mean | 45 52 | | 1.598 | | Note June 17, 1881. Mean of coincidences 51.002 used in reduction. |
| Zodiacal light | $5^h\ 10^m$ | | | | | Fainter than usual, owing to haze. (J M S) |
| $\zeta$ Cancri | | 304 2 | | | | Quite unsteady. Smaller star (i.e. distant component) also appears |
| close pair | | 304 50 | | | | double. |
| | | 304 50 | | | | |
| | mean | 304 34 | | | | |
| | $5^h\ 30^m$ | | double disk. | | | |
| Distant comp. | | 116 15 | 49.38 | 0.60 | | Note June 23, 1881. See original; the position angle probably requires a correction of 90°. |
| from mean of | | 116 20 | 50.58 | | | |
| | | 115 25 | | | | |
| close pair | | 116 30 | 50.68 | 0.625 | | Seeing bad. |
| | | 116 30 | 49.43 | | | |
| | mean | 116 12 | | 0.612 | | |
| | | | doub. dist. | | | |
| Double star | | 327 20 | 49.27 | | | Companion following |
| $7^h 9^m.5 - 9^\circ\ 1'$ | $6^h\ 50^m$ | 327 5 | 35 | | | |
| | | 327 50 | 285 | | | |
| ($\Sigma$ 1060) | | | 30 | | | |
| | mean | 327 25 | 49.301 | 0.724 | | |
| | | | 50.735 | | | |
| | | | 75 | | | |
| | | | 735 | | | |
| | | | 77 | | | |
| | | | 50.748 | | | |
| Sirius | | | | | | Companion seen occasionally |
| | | [273 0] | | | | Not a good measure (better reject) |
| Star | | | | | | |
| $6^h\ 39^m.5 - 20^\circ 35'$ | | 262 0 | 51.80 | | | Mags 10 & 11 |
| | | 263 45 | 82 | | | Comp. foll. |
| | | 265 0 | | | | Note June 19, 1881. Zero of position 350° 42'; hence $p = 87°.1$ |
| | mean | 263 35 | 51.81 | 0.808 | | |
| | | | 51.00 | | | |
| | | | 00 | | | |
| Mean of 9 (10 ?) conic. | | | 51.002 | | | |

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1867 Feb 1 Friday

| | | | | | | |
|---|---|---|---|---|---|---|
| Star 6° 40' -20° 40' | | | | | JW | In a loose cluster. Very close if double at all. Direction about 100° N to E. independent estimate of W & S. |
| Star 6 44.5 -20° 45' | | | 4 2<br>0 15<br>2 15 | 51.81 | | Mags. 9 & 10.5<br>Companion north |
| | mean | | 2 11 | 51.81<br>50.80 | 1.01 | Very good measure |
| | | | | double dist. | | |
| Σ 1104 | | | 32 35<br>34 45<br>35 3<br>35 5<br>36 15 | 49.535<br>50.18<br>49.54<br>50.14 | 0.322<br>0.30 | 4th angle better than the preceding ones |
| | | | | 49.52<br>50.11 | 0.295 | |
| | mean | | 34 45 | | 0.306 | |
| Σ 1216 | | 7h 55m | 208<br>231 | | | ½ wt.<br>Better measured |
| | mean | | 223 | | | |
| | | | | double dist. | | |
| Schjellerup no 12 | | | 358 40<br>359 5 | 49.545<br>50.13 | 0.292 | Companion north. |
| AN LXII p 333 | | | 1 30 (½ wt) | | | Components nearly equal. |
| | | | 359 45<br>357 25 | 49.57<br>50.095 | 0.262 | 3d angle carelessly measured. |
| | | | | 49.68<br>50.07 | 0.195 | Last distance the best. |
| | | | | 49.61<br>50.14 | 0.265 | |
| | | | | 49.07<br>49.585 | 0.258 | |
| | mean | | 359 8 | | 0.254 | |

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Feb 1. Friday ~~xxx~~ 4 Monday and 5 Tuesday

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 Sextantis | | | | | | JW | Can see that it is double but cannot be sure of direction |
| | | | 265 (½ wl) | | | | Prevailing direction (Power 1200) |
| | | | 260 0 | | | | Power 800. Star extremely unsteady, though well separated. |
| | | | 258 40 | | | | |
| | mean | | 260 28 | | | | |
| w Leonis | | | | | | | See it double |
| | | | 241 15 | | | | Prevailing direction |
| | | | 225 | | | SMS | |
| | mean | | 233 | | | | |
| Star observed by mistake for Schjellerup no 14. | | | 89 15 | 47.84 | 1.46 | | Components nearly equal } Power of 800 |
| | | | 89 55 | 49.30 | | | Companion preceding } (No 6) |
| | | | 91 45 | | | | |
| | | | | 51.935 | | | |
| | | | | 935 | | | |
| | | | | 865 | | | Power no 3 |
| which last = W X 242 | | | | 91 | | | |
| | mean of all | | 90 18 | 51.911 | 1.545 | | |
| | | | | corrn 50. 33 | | | |
| | | | | 35 | | | |
| | | | | 35 | | | |
| | | | | 35 | | | |
| | | | Feb 4 Monday | 345 | | | |
| 95 Ceti | | 2h 50m | 271 20 | wt 4 | | JW | Seeing magnificent. Power no 5. |
| | | | 264 15 | poor 2 | | | Companion following. |
| | | | 262 50 | power yet 1 | | | |
| | mean | | 268 6 | | | | |
| | | | | | | | Too faint for further measures. Set for Z 1037, but clouds closed over. |
| | | | Feb 5. Tuesday. | | | | |
| Sirius | | 7h 20m | | | | JW | Companion seen occasionally, but seeing quite poor. Clouds prevented farther work. |

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1867 Feb 6 Wednesday

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 42 Lyncis | | H 38 | 210 17 | 49·49 | | GMS | B.A. C |
| AB | | | 215 0 | 50 | | | Seeing very good |
| | | | 214 30 | 48 | | | Stars parallel to eyes. |
| | | | 213 43 | 50 | | | |
| | | | 213 35 | 50 | | | |
| | mean | | 213 25 | 49·494 | 0·166 | | |
| AC | | | 45 22 | 48·47 | | | |
| | | | 45 31 | 39 | | | 3d dist. the best. |
| | | | 45 50 | 43 | | | |
| | | | 45 28 | 45 | | | |
| | | | 46 1 | 44 | | | |
| | mean | | 45 38 | 48·436 | 0·892 | | |
| | | | | conc | | | |
| | | | | 49·32 | | | |
| | | | | 33 | | | |
| | | | | 33 | | | |
| | | | | 34 | | | |
| | | | | 31 | | | |
| | | | | 34 | | | |
| | | | | 49·328 | | | |
| | | | | double dist. | | | |
| Σ 1037 | | | 217 28 | 50·49 | 0·19 | JW | |
| | | | 219 10 | 11 | | | |
| | | | 214 45 | | | | |
| | | | 218 15 | 50·51 | 0·208 | | |
| | | | 218 20 | 095 | | | |
| | mean | | 218 12 | 50·525 | 0·210 | | |
| | | | | 105 | | | |
| | mean | | | | 0·203 | | |
| Uranus | | | | | | | } Seeing too poor for measures or drawing. |
| Mars | | | | | | | |
| | | 5 48·8 | 22· | 22·80 | | | |
| | | (49·2) | | 23·09 | | | |
| Star compared | | (49·6) | | 23·04 | | | |
| with Arg. Z. | | 50·0 | | 23·00 | | | Star south preceding |
| +15° No 331, for | | 51·0 | | 22·88 | | | |
| planet 91 | mean | | | 22·962 | −2·288 | | |
| | | | | conc | | | |
| | | | | 25·25 | | | |
| | | | | 26 | | | |
| | | | | 24 | | | |
| | | | | 25·250 | | | |
| | | 54·6 | | 56·42 | | | |
| | | 55 | | 27 | | | |
| | | 55·4 | | 25 | | | |
| | | 55·7 | | 20 | | | |
| | | 56·0 | | 35 | | | |
| | | 56·3 | | 17 | | | |
| | | 56·6 | | 23 | | | |
| | mean | | | 56·270 | −31·020 | | |
| | | 59·4 | | 23·15 | | | |
| | | 59·8 | | 22·99 | | | |
| | | 6 h. c | | ·94 | | | |
| | mean | | | 23·027 | −2·223 | | Region charted |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sirius | | $6^h$ $55^m$ | 94 25 | | | SMS | Images perfect but tremulous |
| | | | 98 47 | | | | |
| | | | 96 14 | | | | |
| | mean | | 96 29 | | | | companion no longer visible |
| W VI 109 | | 7 39 | | | | | J W thought it separated with power of 600 (No 5) could not be measured. S. could not separate it. |
| W VI 1291 | | 7 46 | 52°.5 | | | GMS | rough measure. |
| | | | 44 | | | | Companion following. |
| | | | 49.5 | | | | Both this and the preceding star identified by comparison with the neighboring ones, in Weisse Catal. |
| | mean | | 48°.7 | | | | |
| Schjellerup | | 8 25 | 342 13 | 75.29 | 0.09 | GMS | Stars pers. to eyes. Companion |
| No 14 = | | | 344 50 | 20 | | | south. |
| W X 242 | | | 341 28 | | | | |
| | | | 341 13 | | | | |
| | | | 344 15 | | | | |
| | mean | | 342 48 | | 0.09 | | |
| | | | | | | | Distance estimated, wires not on the stars. |
| | | 8 38 | 178 25 | 75.29 | 0.11 | GMS | |
| | | | 175 45 | 18 | | | Companion (slightly fainter) north. |
| | | | 176 58 | | | | Distance estimated. |
| Schjellerup | | | 178 47 | | | | |
| No 12 | | | 177 59 | | | | |
| | | | 177 35 | | 0.11 | | |
| Schjellerup | | 8 47 | 90+ | | | GMS | |
| No 13 | | | 179 30 | 75.92 | | | Components nearly equal |
| | | | 180 28 | 75.96 | | | Preceding very little fainter. |
| | | | 180 44 | 75.89 | | | |
| | mean | | 270 14 | 75.923 | 0.749 | | |
| | | | | coinc | | | |
| | | | 92 10 | 75.19 | | | |
| | | | 93 13 | 17 | | | |
| | | | 92 28 | 17 | | | |
| | | | | 17 | | | |
| | mean | | 92 37 | 17 | | | |
| | | | | 75.174 | | | |

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1867 Feb. 6. Wednesday

| | | | | | | |
|---|---|---|---|---|---|---|
| ζ Cancri close pair | | $9^h$ $0^m$ | 290 25<br>292 5<br>291 15 | | | GMS<br>Seeing not good enough for more measures. |
| Distant comp. from mean of close pair | | | ·90+<br>123 15<br>123 0<br>125 18<br>125 40 | 49·60<br>60<br>63<br>60 | | |
| | mean | | 214 18 | 49·608 | 0·582 | |
| | | | | conc | | |
| | | | 35 25 | 50·18 | | |
| | | | 35 13 | 19 | | |
| | | | 34 12 | 20 | | |
| | | | | 19 | | |
| | mean | | 34 57 | 50·190 | | |
| ω Leonis | | | | | | WBS Could not separate. |
| " for zero of position circle | | | 80 46<br>260 46<br>80 46<br>260 46<br>80 45<br>260 45 | | | |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Moon | | $3^h\ 35^m$ | | | | | JW | Remarkably bright spot on dark portion about ½ the field of power no. 2. from apparent lower limb. Train, in following direction. Dark portion generally unusually bright (unequally so of course) but this spot much more brilliant than any other. |
| (Second Catal.) | | | | | | | | |
| W II 328 & | | 4 49 9·5 | | | | | GMS | |
| planet (91) | | 14·6 | | | | | | Star of last night still in place. |
| | | 23·1 | | | | | | One of the charted stars gone. |
| | | 26·5 | | | | | | |
| | | 57 21·9 | +2 | 12·4 | | | | |
| | | 27·1 | | 12·5 | | | | |
| | | 35·3 | | 12·2 | | | | Pos. circle 170° 45' |
| | | 38·7 | | 12·2 | | | | |
| | | 52 6·6 | | | | | | |
| | | 11·8 | | | | | | |
| | | 20·1 | | | | | | Planet following |
| | | 23·6 | | | | | | |
| | | 54 19·1 | | 12·5 | | | | |
| | | 24·2 | | 12·4 | | | | |
| | | 32·8 | | 12·7 | | | | |
| | | 36·3 | | 12·7 | | | | |
| | mean | 4 53 0 | +2 | 12·45 | | | | |
| | | 5 0·6 | | | 41·28 | | | Rattle on chronograph at times. |
| | | 4·4 | | | 41·46 | | | Good measures. |
| | | 8·2 | | | 41·52 | | | Planet south |
| | mean | 5 4·40 | | | 41·420 | −33·780 | | |
| | | | | | coinc. | | | |
| | | 5 17 45·1 | | | 75·19 | | | |
| | | 51·0 | | | 21 | | | |
| | | 58·8 | | | 18 | | | |
| | | 18 2·1 | | | 22 | | | |
| | | | | | 20 | | | |
| | | 19 59·2 | +2 | 14·1 | 75·200 | | | |
| | | 20 5·0 | | 14·0 | | | | |
| | | 12·8 | | 14·0 | | | | |
| | | 16·2 | | 14·1 | | | | |
| | | 21 43·4 | | | | | | |
| | | 49·1 | | | | | | |
| | | 57·2 | | | | | | |
| | | 0·6 | | | | | | |
| | | 23 57·9 | | 14·5 | | | | |
| | | 24 3·3 | | 14·2 | | | | |
| | | 11·2 | | 14·0 | | | | |
| | | 14·9 | | 14·3 | | | | |
| | mean | 5 22 7 | +2 | 14·15 | | | | |

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1867phae.proj..320W



1867 Feb 7 Thursday

Correction of chronometer 46$^s$; dew p.0

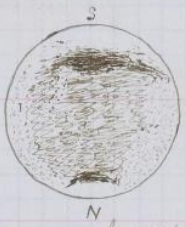
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Chron | 23h | 90+ | | | | |
| Uranus | 6 | 10·2 | 89 | 15 | 53·64 | | GMS Power no 4. |
| 3d Satellite | | 11·9 | 90 | 58 | 68 | | |
| nearly north | | 13·0 | 90 | 55 | 64 | | |
| | | 13·6 | 90 | 10 | 58 | | Satellites faint, but seeing excellent. |
| | | 14·5 | 89 | 45 | 65 | | |
| | 6 | 12·64 | 180 | 13 | 53·638 | 3·440 | |
| | | | | | conc. | | |
| | | | | | 50·17 | | |
| | | | | | 20 | | |
| | | | | | 20 | | |
| | | | 90+ | | | | |
| 4th Satellite | | 17·5 | 219 | 15 | 46·05 | | |
| south preceding | | 19·4 | 220 | 5 | 45·98 | | |
| | | 20·3 | 218 | 45 | 46·01 | | |
| | | 21·3 | 219 | 10 | 46·09 | | |
| | | 23·1 | 218 | 45 | 45·90 | | |
| | 6 | 20·32 | 309 | 12 | 46·006 | 4·192 | |
| | | | | | conc. | | Disc of planet admirably defined |
| | | | | | 50·20 | | |
| | | | | | ·22 | | |
| mean of 5 | | | | | 50·198 | | |
| Diameter in direction of meridian (pos. circle 260 45) | | | | | 49·79 | | |
| | | | | | 77 | | |
| | | | | | 80 | | |
| | | | | | 78 | | |
| | | | | | 78 | | |
| | mean | | | | 49·784 | 0·414 | |
| | | | | | 50·64 | | |
| | | | | | 65 | | |
| | | | | | 58 | | |
| | | | | | 61 | | |
| | | | | | 66 | | |
| | mean | | | | 50·628 | 0·430 | |
| Diameter in direction of parallel (pos circle 170 45) | | | | | 50·66 | | |
| | | | | | 65 | | |
| | | | | | 63 | | |
| | | | | | 62 | | |
| | | | | | 63 | | This diameter appears larger to the eye than the other. |
| | mean | | | | 50·638 | 0·440 | |
| | | | | | 49·70 | | |
| | | | | | 74 | | |
| | | | | | 79 | | |
| | | | | | 74 | | |
| | | | | | 71 | | |
| | | | | | 76 | | |
| | mean | | | | 49·740 | 0·458 | |

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Mars 7h 40m GMS




South pole light green
Limb yellow
Centre dusky red
North pole nearly white, very brilliant, and seems even to protrude.

90+

Sirius 7 55 GMS

| | | | | |
|---|---|---|---|---|
| | 189 30 | 48·11 | | |
| | 184 50 | 08 | | |
| | 185 50 | 06 | | |
| | 187 10 | 06 | | |
| | 186 53 | 10 | | |
| | | 10 | | |
| mean | 276 51 | 48·085 | 1·112 | |

corrc
49·20
19
·20

49·197

| | |
|---|---|
| 98 | 20 |
| 98 | 16 |
| 99 | 42 |
| 98 | 8 |
| mean 98 | 36 |

Σ 1216 GMS Identified by comparison with Arg. Zone.

Examined very carefully with powers 4 5, 8 6.
Could detect no duplicity. Possibly a very close companion n. p. for which circle reads about 216°.

216°

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1867 Feb 10 Sunday ~~11~~ 12 Tuesday & 15 Friday.

| | | | | | | |
|---|---|---|---|---|---|---|
| Moon<br>Bright spot on dark portion observed Feb 7. | $4^h\ 30^m$ | 214 20 | 21.55<br>conc<br>50.29 | 28.74 | JW | Power. no 1.<br>Wire tangent to dark limb at point nearest to spot<br>Diameter of spot about 2 rev.<br>Train seen Feb 7 not visible, but spot bright enough to be seen easily with illuminated wires. Very decidedly brighter than when seen on Dec. 15 |
| Σ 622 | $4^h\ 50^m$ | | | | | Seeing too bad for measures even with power no 2.<br>High wind. |
| Σ 1104 | $7^h\ 50^m$ | | | | | Seeing still too poor for measures. |

Feb 12 Tuesday

Occultation of Aldebaran &c obscured by clouds.

Feb 15 Friday

| | | | | | | |
|---|---|---|---|---|---|---|
| Moon | $5^h$ | | | | W & S | Crater Linné appears white and bright, without definite edges.<br>Aristarchus just appears on edge of bright part. Is probably the bright spot observed on Feb 7 & 10 but exhibits no remarkable appearance. |
| α Geminorum | | | | | | Double image. Not worth while to measure. |
| Σ 1037 | $7^h\ 45^m$ | | | | | Seeing too poor for measures.<br>Flying clouds & haze all the evening. |

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| | by Chron 236 | Corr. to Chron | True sid. t. Mean time | | |
|---|---|---|---|---|---|
| Immersion of ξ Leonis | 6 21 22.7 ± 0.13 | +39.7 | $6^h\ 22^m\ 2^s.4$ | 8 31 52.9 GMS | Dark limb |
| Emersion | 7 21 6 ± 0.5 | +39.7 | $7^h\ 21^m\ 45^s.7$ | 9 31 26.4 | Bright limb. |
| Moon | 7 55 | | | GMS | |
| Aristarchus and Kepler | | 140 0 | | | Kepler s. f. |
| Aristarchus and Copernicus | | 100 48 | | | Power no 1. |

A little preceding the centre of the apparent ellipse of the crater of Aristarchus is an intensely bright, very small, point.

| | | | |
|---|---|---|---|
| Distance of bright point from following edge of crater | 51.01<br>01<br>conc<br>50.10<br>11 | 0.905 | Position circle 170° 45′<br>Northern edge of crater dark comparatively, and ill defined. Southern edge also ill defined, though much better than the northern. Preceding edge straight and as well defined as northern. Following edge bright and very well defined. |
| Preceding edge | 175 15<br>177 45 | | |

There is a bright line s. f. Aristarchus, pointing directly toward the bright central point, and tangent to a small crater (Herodotus), quite near to Aristarchus.

| | | | |
|---|---|---|---|
| Bright line from central point | 212 40<br>212 17 | | |
| Distance point of tangency to central point | 52.96<br>50.68 | 2.88 | |
| Distance beginning of bright line to central point | 51.76<br>92<br>88<br>51.85<br>50.10 | 1.75 | |

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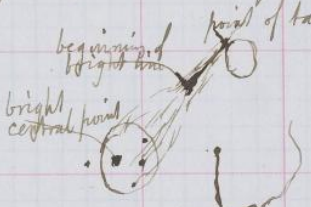
1867phae.proj..320W



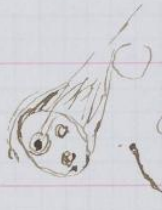
1867 Feb 17 Sunday & 18 Monday

Moon JW

Three bright points within the crater of Aristarchus and several smaller ones. Bright streams running from two of the points within the crater to the crater (Herodotus) above, and also from a bright point out of the crater.




Copy of drawing by GMS



Copy of drawing by JW.

The "bright streams" are as distinct as most of the bright lines represented in Madler's Chart. (They are not represented there.)

Σ 1216

Seeing not good enough to obtain an elongation of it.

Feb 18 Monday

Moon 5h 30m GMS

A bright stream from cone (b.) (nearly following the principal cone (a)) in Aristarchus; not noticed last night. (2 1/2)

Aristarchus to Kepler 138°

Cone (a) to (b) 74°

} Rough measures
Air very wavy.
Clouds soon afterward came on.

Bright line, in which the streams united last night, hardly so conspicuous; but the air is hazy.

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—

α Geminorum 6h 0m GMS Seeing two poor for measures.
Σ 1037

Tried several times on the moon, but found too much haze.

Feb 22 Friday

Sirius 7h 40m GMS Air clear, and seeing good though unsteady, perhaps owing to wind. Companion not certainly discernible. Power no. 3.

Correction of chronometer +35s; see p. 0.
Chron 236

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | 90+ | | | |
| Uranus | | 8 12 | 260 | 53 | 45·87 | |
| 4th Sat. | | 8 18 | 262 | 25 | 45·82 | |
| (south) | mean | 8 15 | 351 | 39 | 45·845 | 4·260 |
| | | | | | coinc. 50·11 | |
| | | | | | 10 | |
| | | | 90+ | | | |
| 3d Sat. | | 8 26 | 350 | 18 | 53·21 | |
| (foll.) | | 29 | 350 | 20 | 53·33 | |
| | mean | 8 28 | 80 | 19 | 53·270 | 3·165 |
| | | | | | coinc. 50·10 | |

Observations made with great difficulty owing to faintness of satellites. Moon just rising.

Stars parallel to eyes.

Σ 1037

| | | | |
|---|---|---|---|
| 23 | 32 | | |
| 31 | 31 | | |
| 29 | 30 | | |
| 30 | 28 | | |
| 30 | 5 | | |
| 31 | 1 | | |
| mean | | 50·00 | |
| | | coinc. (unchanged) 50·11 | |
| mean of 4 coinc. | | 50·105 | |

Power no 4.

Stars parallel to eyes.

Distance estimated; wires not on stars.

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Feb. 22. Friday.

Σ 1338 (157 Lyncis.) — $9^h\ 20^m$

| | | | | |
|---|---|---|---|---|
| | 201 15 | | | GMS } Perp. to eyes |
| | 202 48 | | | |
| | 201 45 | | | |
| | 202 47 | | | } Par. to eyes. Position very uncomfortable. Star near zenith. |
| | 206 25 | | | |
| | | 50·27 | | |
| | | 29 | | |
| | | 28 | | |
| mean | 203 0 | 50·280 | 6·200 | |
| | | corrc. | | |
| | | 50·09 | | |
| | | 08 | | |
| | | 07 | | |
| | | 08 | | |
| | | 50·080 | | |

42 Cornae

Cannot separate it well enough to measure.

Σ 1595 — $10^h\ 15^m$

Identified by comp. with Arg. Z. Two stars in the place.

| | | | |
|---|---|---|---|
| 21 15 | | | |
| 21 5 | | | Nebler appears double, but seeing much poorer than at first. |
| | 52·99 | | |
| 90+ | | | |
| 293 15 | 53·02 | | |
| | corrc. same as before | | |
| mean 21 52 | 53·005 | 2·925 | |

Moon.

Seeing abominable owing probably to heat of house, nearly over which Jo is.

Σ 1457 — $10^h\ 50^m$

Identified by comp. with Arg. Z. Cannot separate well enough to measure. Seeing not very good, even on the meridian.

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ν Leonis. GMS Can see the companion, about following, with powers 4° & 2; but the seeing is too poor for measures.

Moon $11^h\ 25^m$ GMS Bright streams seem to run a little inside the edge of Herodotus. There is a bright point in them on the edge and the three cones of Aristarchus have nearly the configuration represented. Air still too wavy for accurate drawing or measures.

Aristarchus




Linné appears as a simple white spot, in marked contrast to Bessel and the many other well marked craters near by.

Moon $12^h\ 30^m$




Space ab purple, (perhaps only complementary to the slightly yellow light of the crater. Outer limit well defined however.

Decided notch in the brightness of the crater as represented at c.

Crater Herodotus purple inside, except on the side opposite the bright streams. A fourth cone or nucleus seems to be in Aristarchus as represented, (probably these four are the same seen by GMS Feb 17) and also another in the bright streams farther from Aristarchus than the one previously observed.

In the drawings dark stands for bright, and light for dark.

See original note book for other poorer ones.

Seeing better than earlier but not so good as last Sunday. (Feb 17)

Cannot trace any lines in the bright streams, leading to the cones or elsewhere.

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1867 Feb 24 Sunday
& 25 Monday

Immersion of η Librae lost on account of thin clouds. Star not visible.

Aristarchus SMS very brilliant, though not distinctly visible owing to clouds. Same six bright points as on Feb. 22. The part (a) of the edge of Herodotus remarkably bright also, especially at one point. Point (c) of Aristarchus brighter than any other.
There seems to be a bright line db.

Feb 25 Monday

Mars $6^h\ 30^m$ SMS




Enclosed figure formed by dark lines ABCD pretty well seen; lines AB and CD the darkest; especially angle B. Planet sensibly gibbous, as represented.

Sirius SMS Companion unusually distinct. Perhaps better seen than ever before.

| | | | | | |
|---|---|---|---|---|---|
| | | 276 | 16 | | |
| | | 276 | 22 | | |
| | | 277 | 13 | | |
| | | 277 | 24 | | |
| | | 278 | 30 | | |
| mean of S | | 277 | 9 | | |
| | 90+ | | | | |
| | 189 | 18 | | 45·03 | |
| | 187 | 10 | | 45·12 | |
| | | | | 45·19 | |
| | | | | coinc | |
| | | | | 43·95 | |
| | | | | 91 | |
| | | | | 91 | |
| | | | | 90 | |
| | | | | 92 | |
| | | | | 93 | |
| | | | | 45·12 | Mean blark |
| | | | | 03 | |
| | | | | 03 | |
| | | 279 | 0 | | |
| | | | / | | |
| | 90+ | | | | |
| | 187 | 8 | | 45·05 | S |
| mean of S | 90+ | 187 | 52 | 45·095 | 1·179 |
| mean of C | | 279 | 0 | 45·060 | 1·144 |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | coinc | | |
| | | | | | 43·91 | | |
| | | | | | 90 | | |
| | | | | | 91 | | |
| mean of 9 coinc. | | | | | 43·916 | | |

Correction of chronometer +32$^s$; see p. 0.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Uranus | | Chron 236 | | | | | |
| 4th Sat fill. | | 9$^h$ | 27$^m$ | 66 | 28 | | |
| | | | 32 | 66 | 58 | | |
| | | | 34 | 68 | 0 | | |
| | mean | 9 | 31 | 67 | 9 | | |
| 3d "north | | 9 | 37 | 207 | 14 | | |
| | | | 39 | 206 | 16 | | |
| | | | 41 | 205 | 33 | | |
| | mean | 9 | 39 | 206 | 21 | | |
| 4th | | | | 90+ | | | |
| | | 9 | 43 | 338 | 30 | 48·26 | |
| | | | 47 | 336 | 0 | 18 | |
| | | | 50 | 337 | 55 | 19 | |
| | mean | 9 | 47 | 67 | 28 | 48·210 | 4·266 |
| 3d | | | | 90+ | | | |
| | | 9 | 52 | 120 | 28 | 40·61 | |
| | | | 55 | 119 | 30 | 54 | |
| | | | 57 | 120 | 10 | 69 | |
| | mean | 9 | 55 | 210 | 3 | 40·613 | 3·331 |

| | |
|---|---|
| coinc. (unchanged) | |
| 43·93 | |
| 95 | |
| 92 | |
| 95 | |
| 95 | |
| 95 | |
| 96 | |
| 43·944 | |

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1867 Feb 25 Monday

Σ 1457

| | | |
|---|---|---|
| 38 | 34 | |
| 32 | 45 | |
| 38 | 18 | |
| 36 | 20 | |
| 32 | 16 | |
| mean 35 | 39 | |

GMS Well separated. Power no 4, fainter star precedes.

43·01 0·07
42·94

Estimate of distance by placing the wires at one side

ω Leonis

Cannot be sure of separation
Too many images.
Star occasionally appears single

υ Leonis 11h 15m

| | |
|---|---|
| 91 | 12 |
| 94 | 2 |
| 94 | 14 |
| 94 | 45 |
| 98 | 0 |
| mean 94 | 27 |

Companion follows.
Poor measures. Double image.

Moon 17h 15m

Drawing of Aristarchus made with chalk on black board.




Three dark spots (represented in the annexed drawing by white ones) very conspicuous, about in the places of the bright spots of yesterday. No very definite bright points. Brightest part of the crater about at the point marked ×. Other maxima at a, b, & c.

Appearance of mottled brightness outside the crater on the preceding side and a rather conspicuous point near d, it is thought; but of this, it being put in from memory afterward, observer does not feel confident.

Brightness of part e of limb of Herodotus, and bright line running from it, noticed as last night.

Power no. 2. seeing not being good enough for a higher.

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5h 45m

Zodiacal light conspicuous.
Base about due W.
Vertex midway between Aldebaran and the Pleiades.

| | | | | | | |
|---|---|---|---|---|---|---|
| Σ 3037 | | 312 52 | 42·63 | | GMS | Companion south preceding. |
| | | 312 27 | 61 | | | Rather unsteady owing to wind. |
| | | 312 28 | 68 | | | |
| | | 312 47 | 67 | | | Power no 3. |
| | | 312 47 | 42·648 | | | |
| | mean | 312 40 | double dist. | 0·304 | | Stars perpendicular to eyes. |
| | | | 43·27 | | | |
| | | | 23 | | | |
| | | | 27 | | | |
| | | | 43·257 | | | |
| | | | coinc. | | | |
| | | | 42·94 | | | |
| | | | 93 | | | |
| | | | 93 | | | |
| | | 315 35 | | | WMD | |
| | | 314 15 | | | | |
| | | 314 50 | | | | |
| | | 314 55 | | | | |
| | | 315 0 | | | | |
| | mean | 314 55 | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Transits over wire of finder | | by chron 236 | | | | Also a 9th mag. a little preceding 15' south. |
| Σ 3037 | | 6 56 10 | | | | (This agreeing with Arg. Z. in which |
| 9th mag 10' South | | 57 17 | | | | Σ 3037 = Arg. Z. +59° No 2769, there |
| 7th mag 30' South | | 59 12 | | | | can be no doubt of the identity of the |
| | | | | | | star, though the position is not consistent with those of Struve & Madler.) |

| | | | | | | |
|---|---|---|---|---|---|---|
| η Cassiopeae | | 40 30 | | | GMS | Stars parallel to eyes. |
| | | 40 52 | | | | Companion south following. |
| | | 41 0 | | | | |
| | | 40 10 | | | | |
| | | 40 31 | | | | |
| | mean | 40 37 | | | | |
| | | 90+ | | | | |
| | | 309 0 | 42·29 | | | |
| | | 316 3 | 25 | | | |
| | | 309 55 | 28 | | | |
| | | | 27 | | | |
| | mean | 39 39 | 42·272 | 0·668 | | |
| | | | coinc | | | |
| | | | 42·95 | | | |
| | | | 95 | | | |
| | mean of 5 coinc. | | 42·940 | | | |

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1867 Feb 26 Tuesday

Sirius — 105 4 — WMD could not see it afterward

SMS Companion seen, but not well enough for measuring; much fainter than last night. No haze perceptible.

W VI 1291 — Companion not visible.

Mars — Seeing quite poor

Seeing too poor for a drawing

Uranus — Correction of chronometer +31$^s$; see p. 0.

4th Sat. foll. — Chron 236 — 90 +

| | | | | | | |
|---|---|---|---|---|---|---|
| | 8 | 56·4 | 3 | 58 | 52·38 | |
| | | 57·8 | 4 | 50 | 27 | |
| | 9 | 0·4 | 4 | 58 | 26 | |
| | | 1·5 | 6 | 5 | 48 | |
| | | 3·1 | 4 | 45 | 32 | |
| | | 4·4 | 4 | 45 | 50 | |
| | | 5·6 | 5 | 0 | ·21 | |
| mean | 9 | 1·3 | 94 | 54 | 52·346 | 4·105 |

Stars perf. to eyes.

Power no. 4.

conic.
48 22
22
26
26
24

90 +

3d Sat. prec.

| | | | | | | |
|---|---|---|---|---|---|---|
| | 9 | 10·5 | 159 | 50 | 45·14 | |
| | | 11·7 | 158 | 50 | 06 | |
| | | 12·8 | 157 | 33 | 05 | |
| | | 20·4 | 159 | 30 | 11 | |
| | | 21·6 | 166 | 23 | ·10 | |
| mean | 9 | 15·4 | 249 | 13 | 45·092 | 3·149 |

conic.
48·24
25

mean of 7 conic. — 48·241

ε Hydrae — Companion south.

| | | | |
|---|---|---|---|
| 309 | 46 | 48·58 | |
| 309 | 16 | 58 | |
| 309 | 38 | 58 | |
| 316 | 38 | | |
| 309 | 37 | 48·581 | |
| | | double dist. | |
| 309 | 47 | 47·93 | 0·326 |
| | | 94 | |
| | | 91 | |
| | | 47·927 | |

∴ Principal star looks elongated thus; but as companion occasionally looks the same, it is probably owing to double image.

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ε Hydrae for zero of pos. circle

| | |
|---|---|
| 260 | 51 |
| 80 | 52 |
| 260 | 30 |
| 80 | 30 |
| 260 | 41 |

mean

Aristarchus $15^h\ 30^m$




Bower no. 3.

Black spots of yesterday united and considerably larger; somewhat mottled, especially in lower part.

Maxima of brightness not so well marked as before, except perhaps the principal one.

Bright spot d and general mottling outside on preceding side noticed again. Various faint patches of light on dark part of moon, but nothing specially conspicuous.

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1867 Feb 27 Wednesday

5h 50m

GMS Zodiacal light about the same as last night. Vertex nearer to the Pleiades than to Aldebaran.

Σ 412 208°

Configuration in 412 finder.

Rough setting without Micro Power no 2. Not so much appearance of elongation with No 4.
Identified from Arg. Zones.

Search for Stephan's comet.

Sirius

| | | | |
|---|---|---|---|
| 90+ | | | |
| 6 | 58 | 49·28 | |
| 6 | 12 | 31 | |
| 5 | 43 | 23 | |
| | | 28 | |
| | | 35 | |
| | | 49·290 | |
| | | come | |
| 97 | 47 | 48·26 | |
| 97 | 52 | 26 | |
| | | 26 | |
| mean | 96 | 54 | 1·030 |

Seeing poor and becoming worse; star blurring and very unsteady.

Σ 1104 8h 15m

| | | | |
|---|---|---|---|
| 39 | 3 | | |
| 46 | 33 | | |
| 39 | 28 | | |
| 90+ | | | |
| 309 | 14 | 47·03 | |
| 310 | 45 | 05 | |
| mean | 39 | 49 | 47·040 0·238 |
| | | come | |
| | | 47·28 | |
| | | 26 | |
| | | 28 | |
| | | 29 | |
| | | 28 | |
| | | 47·278 | |

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1867 Feb 27 Wednesday
and 28 Thursday

Correction of chronometer +30$^s$; see p. o.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Uranus | | Chron 236 | | 90+ | | | |
| 4th Sat. foll. | | 8 | 43 | 34 | 12 | 52·62 | Stars perp. to eyes |
| | | | 47 | 33 | 20 | ·51 | |
| | | | 48 | 33 | 33 | ·49 | |
| | mean | 8 | 46 | 123 | 42 | 52·540 | 4·287 |
| 3d Sat. pr. | | 8 | 55 | 201 | 15 | 44·98 | |
| | | | 56 | 200 | 16 | 45·05 | " |
| | | 9 | 0 | 201 | 16 | ·03 | |
| | mean | 8 | 57 | 290 | 56 | 45·020 | 3·233 |
| | | | | | | conic | |
| | | | | | | 48·25 | |
| | | | | | | 26 | |
| | | | | | | 25 | |
| | | | | | | 48·253 | |
| ε Hydrae | | | | 311 | 5 | | |
| | | | | 314 | 16 | | |
| | | | | 312 | 17 | | |
| | | | | 308 | 0 | | |
| | mean | | | 311 | 24 | | Seeing wretched. Too bad for more measures. |

Yellow color of principal star very remarkable; noticed also last night.

Mars — The usual appearances indistinctly seen.

Feb 28 Thursday

| | | | | | | |
|---|---|---|---|---|---|---|
| W VIII 1066 | Chron 236 | | Δα cos δ | | | |
| and Mnemosyne / Star a | 10 | 49·0 | 17·37 | −30·91 | GMS | a b Stars a & b both 10' south of 1066 and precede it. |
| | | 50·5 | ·31 | | | |
| Star b | | 52·5 | 20·28 | −27·97 | | |

1066

Clouds came on before more measures could be made.

Coincidence with wire d, unchanged from last night, about 48·25

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52

1867 Mar. 2. Saturday
and 5 Tuesday

Comet 1867 I.
and W IV 108

chron 236

| | | Δα cos δ | |
|---|---|---|---|
| 9 43 | | 44·16 | |
| 44·2 | | 43·71 | |
| 45·9 | | 43·30 | |
| 46·5 | | 43·66 | |
| 47·3 | | 43·38 | |
| 9 45·38 | | 43·642 | −4·654 |
| | | Δδ | |
| 9 50·8 | | 59·59 | |
| 52·2 | | 59·13 | |
| 53·1 | | 58·28 | |
| 53·8 | | 58·06 | |
| 54·3 | | 58·16 | |
| 9 52·84 | | 58·644 | +30·357 |
| | | Δα cos δ | |
| 9 57·8 | | 44·80 | −3·496 |
| | | comc. with d | |
| | | 48·28 | |
| | | 30 | |
| | | 30 | |
| | | 29 | |
| | | 31 | |
| | | 48·296 d | |
| | | 28·287 b | |

JW

Coincidence with d.
Comet precedes.

Coincidence with b
d b used = 20·009
see 1866 Dec 14
Comet north.

faint,
Comet about 40″ in diam.
Definite nucleus about
equal to a star of 10th mag.

Circles redd for comet
α 4h 7m.5
δ +29° 37′

Transits by chronometer

| | | | |
|---|---|---|---|
| Comp. star | 10 | 2 | 44.5 |
| Another about 8′ north | | 3 | 37.5 |
| " " " " | | 3 | 53.5 |

Mar 5 Tuesday

by chron 236

Comet 1867 I.

| | | | | | |
|---|---|---|---|---|---|
| Set in mid. field at | 9 | 43 | 120 | 30 | 14 |
| | 9 | 44 27 | 5 | 28 | 40 |
| | 9 | 52 | 120 | 30 | 44 |
| | " | " | 5 | 36 | 18 |
| | 10 | 9·5 | | | |
| Star (A Z +30° no 651?) | 10 | 13 | 26·5 | | |
| Comet | 10 | 16 | 45 | | |
| ι Aurigae | | | 122 | 59 | 4 |
| | 10 | 24 | 33 | 5 | 36 0 |

vernier of dec circle
" " hour "

76·44

JW Using the corrections to the instrumental results deduced from ι Aurigae below, we have

| sid. t. | ≤ α | ≤ δ |
|---|---|---|
| 9h 48m | 4h 15m 32s | +30° 28′.5 |

GMS { Mic. wire on (Arg Z +30° no 651?)
Mean of c & d on comet. Comet south-

Comet not seen; clouds; place as remembered.

JW Corr. to instrumental dec. = −2′ 0″
" " instrumental & chron. α = −12s

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Tried for comet at $6^h\ 30^m$ and at $9^h$; but found the haze too thick to see it.

| | | | | double dist. | | | |
|---|---|---|---|---|---|---|---|
| Σ 1037 | | $10^h\ 5^m$ | 30 25 | 47.45 | 0.175 | JW | Stellar focus very much out; |
| | | | 32 14 | 47.10 | | | adjusted it to read 29.25 |
| | | | 30 45 | | | | |
| | | | 31 0 | 47.42 | 0.160 | | |
| | | | 32 30 | 47.10 | | | |
| | mean | | 31 23 | | 0.168 | | |
| | | | | | | | Haze prevented further measures. |
| | | Chron 236 | | | Δ α cos δ | | |
| Mnemosyne | | 11 32.0 | | 41.34 | | SMS | Planet preceding, on wire b. |
| and W VIII 978 | | 36.8 | | 41.34 | | | |
| | mean | 11 34.4 | | 41.340 | −13.032 | | |
| | | | | | Δ δ | | |
| | | 11 40.4 | | 36.76 | | | Planet north, on wire e. |
| | | 41.5 | | 75 | | | |
| | | 42.5 | | 70 | | | |
| | | 44.0 | | 58 | | | |
| | mean | 11 42.1 | | 36.748 | +36.526 | | |
| | | | | | Δ α cos δ | | |
| | | 11 57.0 | | 14.74 | | | Comp. star on wire b. |
| | | 58.0 | | .59 | | | |
| | mean | 11 57.5 | | 14.665 | −13.643 | | |
| Mnemosyne | | 11 28.7 | | 54.69 | Δ α cos δ | | Planet preceding, on wire b. |
| and W VIII 983 | | 35.5 | | 54.88 | | | |
| | mean | 11 32.1 | | 54.785 | −26.477 | | |
| | | | | | Δ δ | | Planet north. Comp. star on e. |
| | | 11 46.5 | | 79.84 | | | |
| | | 48.0 | | 79.94 | | | |
| | | 48.8 | | 80.00 | | | |
| | | 49.6 | | 80.08 | | | |
| | mean | 11 48.2 | | 79.965 | +6.691 | | |
| | | | | | Δ α cos δ | | |
| | | 12 0.5 | | 1.27 | | | Comp. star on wire b. |
| | | 1.7 | | 1.26 | | | |
| | mean | 12 1.1 | | 1.265 | −27.043 | | |
| | | | | coinc with b | | | |
| | | | | 28.31 | | | |
| | | | | 29 | coinc with e | | |
| | | | | 29 | 73.30 | | |
| | | | | 31 | 25 | | |
| | | | | 33 | 27 | | |
| | | | | 32 | 28 | | |
| | | | | | 27 | | |
| | | | | 28.308 | 73.274 | | |
| | | | | | | | Seeing not good however. |
| α Leonis | | | | | | | Could make nothing of it. Power no 4. |

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1867 Mar. 11 Monday ~~14~~ 14 Thursday and 18 Monday

Micrometer removed to have an approximate position circle cut.

Moon — JW Linne and Aristarchus both on dark part of moon, neither visible. Air not very clear.

Mar 14. Thursday

Moon — 7h — JW Linné a small dull white spot, edges indefinite. Aristarchus just discernible (on dark part.)

Search for Comet 1867 I. — 7h 30m

Mar. 18. Monday

Filar micrometer replaced. Stellar focus adjusted to read 28.9

Sirius — JW. Companion visible, but stars much too unsteady for measures.

ε Hydrae — " " "

Moon — 10h — JW Streams from Aristarchus to Herodotus, ~~at least~~ much fainter than at last lunation. At least as bright as those about Copernicus, however. Light of crater not much less than before. JW.



Drawing by GMS

GMS Edge of crater distinctly visible all round. Crater egg-shaped as represented above. Crêpe in distinctly marked, above Herodotus, somewhat resembling a crater. Shadow very distinct on preceding side of Aristarchus.

Linné not decidedly different from the other small craters in the Mare Serenitatis, except Bessel, which shows a distinct outline. JW.

Seeing still much too poor for measures.

Σ 1457

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| | | | | | | |
|---|---|---|---|---|---|---|
| Sirius | | 7h 30m | 102·8 | 47·725 | J W. | Seeing good. Wires parallel |
| | | | 100·2 | 734 | | |
| | | | 101·8 | 675 | | to eyes. |
| Position circle reads to tenths of a degree. | | | 103·6 | 83 | not so well seen as in the first two | |
| | | | 101·5 | 825 | | |
| | | seeing getting worse rapidly | 103·5 | 715 | better | companion much more distinct |
| | | | 102·5 | 753 | " | |
| | | | | 755 | | with power no 4 than with no. 3. |
| | mean | | 102·27 | 77 | | |
| | | | | 70 | | |
| | mean | | | 47·748 | 1·160 | |
| | | | | conc. | | |
| | | | | 46·595 | | |
| | | | | 592 | | |
| | | | | 59 | | |
| | | | | 58 | | |
| | | | | 585 | | |
| | | | | 46·588 | | |
| Σ 1216 | | | 36 suspected | | | Pretty decided elongation between |
| | | | 28 | | | three directions. Power of 1243. |
| ε Hydrae | | 8 35 | | double dist. | | |
| | | | 139·3 | 47·03 | 0·41 | companion preceding. |
| | | | 143·5 | 46·21 | | |
| | | | 144·2 | | | |
| | | | 139·2 | 46·97 | 0·378 | |
| | | | 145·1 | 46·215 | | |
| | | | 140·0 | | | |
| | | | | 47·02 | 0·418 | |
| | mean | | 141·88 | 46·185 | | |
| | | | | 46·97 | 0·380 | |
| | | | | 46·21 | | |
| | mean | | | | 0·399 | |
| 157 Leyncis | | 12 15 | 26·5 | 46·84 | | |
| | | | 28·3 | 36 | 0·24 | |
| | | | 30·2 | | | |
| | | | 29·4 | 86 | | |
| | | | 28·6 | 36 | ·25 | |
| | | | 31·0 | | | |
| | | | 28·6 | 87 | ·25 | |
| | | | | 37 | | |
| | mean | | 29·94 | | | |
| | | | | 84 | ·235 | |
| | | | | 37 | | |
| | mean | | | | 0·244 | |
| γ Leonis | | | 59·8 | 47·02 | 0·42 | |
| | | | 66·6 | 46·18 | | |
| | | | 61·8 | | | |
| | | | 63·5 very unsteady | 46·97 | 385 | |
| | | | 61·5 | 20 | | |
| | | | 63·5 | | | |
| | | | | 47·01 | 37 | |
| | mean | | 62·78 | 27 | | |
| | | | | 46·92 | 32 | |
| | | | | 28 | | |
| | | | | 46·93 | 328 | |
| | | | | 275 | | |
| | | | | 46·97 | 33 | |

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1867 Mar 19 Tuesday

| | | | | double dist. | | | |
|---|---|---|---|---|---|---|---|
| | Leonis | | 97·3 | 46·95 | 0·33 | JW | Stars parallel to eyes |
| | | | 97·2 | 29 | | | |
| | | | 98·0 | | | | |
| | | | 98·0 | 94 | 335 | | |
| | | | 98·8 | 27 | | | |
| | | | 95·5 | | | | |
| | | | | 94 | 31 | | |
| | | mean | 97·47 | 32 | | | |
| | | | | 92 | 305 | | |
| | | | | 31 | | | |
| | | mean | | | 0·320 | | |
| | ξ Urs. Maj. | | 280·2 | 45·27 | 0·295 | | Distance cannot be measured well. |
| | | | 278·9 | 36 | | | Stars perp. to eyes. |
| | | | 279·7 | | | | |
| | | | 278·2 | | | | |
| | | | 278·2 | | | | |
| | | mean | 279·02 | | | | |

| | | vernier of old circle | new circle | | | |
|---|---|---|---|---|---|---|
| | Star for zero of position circle | 84° 30′ | 84·55 | | GMS | Power no 3. |
| | | 20 | ·30 | | | |
| | | 27 | ·50 | | | |
| | mean | 84 26 | 84·45 | | | |

by chron 236

| | | | | | |
|---|---|---|---|---|---|
| Lunar eclipse | | | | | |
| begins | 14 | 19 | 55 | JW | |
| | 14 | 28 | | | Eclipsed portion bluish gray; sky adjoining purplish, or drab. |
| Occultation of | 14 | 39 | 17 | GMS | (Possibly 84 38 17) Northern and fainter of the two. |
| stars (immersions) | 14 | 39 | 41 | | Stars about 1′ apart. |
| | 14 | 46 | | JW | Limb eclipsed begins to be red; bluish gray on preceding part. Aristarchus in penumbra; streams no longer visible, except as a mass. |
| | 14 | 57 | | | Aristarchus in shadow; visible in finder though no other point is. |

Note Nov. 29, 1880. See page 10 for correction of chronometer; +19ˢ·6 at 16ʰ 0ᵐ mean time or 15ʰ 3/4 sid. time; rate gaining 1ˢ·8 a day; large correction at time of occultation +19ˢ·7

The parallax will be about −11″·5, −38′; the place of the moon's centre about 11ʰ 53ᵐ 14ˢ·6 +0° 22′, after correction.

W. XI 927 (1867) 11ʰ 54ᵐ 38ˢ·6 +0° 22′·5
W. XI 924 " " 11 54 32·3 +0 21·6

Probably these were the stars occulted.



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by chron 236
15 15

JW Principal crater of Aristarchus remains complete; the streams have almost faded away; and Herodotus entirely so.
Liriné in edge of shadow; seen with difficulty, not unlike many other specks on surface.
Edge of moon in deepest shadow, copper color; sky adjacent dark green near moon, lighter farther from it.

Mar 20 Wednesday

Sirius 7h JW. Companion not visible owing to haze.

Search for Comet 1867 I.

| | | | | | | |
|---|---|---|---|---|---|---|
| 11 Monocerotis | AB | 7h 40m | 43·5 | 47·27 | | JW. Power no 4. |
| | B. | | 45·2 | 31 | | |
| | A. | | 41·8 | 275 | | |
| | | | 42·5 | 34 | | |
| | | | 44·2 | 34 | | |
| | | | 44·2 | | | |
| | mean | | 43·57 | 47·307 | 0·708 | |
| | | | | coink | | |
| | | | | 46·56 | | |
| | | | | 62 | | |
| | | | | 615 | | |
| | | | | 615 | | |
| | | | | 58 | | Stars blazing |
| | | | | 605 | | |
| | | | | 60 | | |
| | | | | 46·599 | | |
| | BC | | 71·4 | 46·84 | 0·25 | |
| | | | 71·2 | 46·34 | | |
| | | | 68·8 | | | |
| | | | 68·8 | 46·83 | 0·235 | |
| | | | 70·5 | 36 | | |
| | | | 42·5 | | | |
| | | | | 46·865 | 0·245 | |
| | mean | | 70·53 | 375 | 0·243 | |

Seeing became too poor for further measures. Double image.
Haze, and halo round moon.

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1867 Mar 21 Thursday

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Mic head below | | | |
| Obsns. for zero of position & middle of field | | 84 43 | 51.54 | | G.M.S | Star on mic. wire; nearly on meridian. |
| | | 29 | 53 | | | |
| | | 30 | 61 | | | |
| | mean | 84 34 | 51.56 | | | |
| | | Mic head above | | | | |
| | | 84 21 | 51.76 | | | |
| | | 24 | 76 | | | |
| | | 13 | 72 | | | |
| | mean | 84 19 | 51.75 | | | |
| | mean of both positions | 84 27 | 51.65 | | | |
| | | | double dist. | | | |
| ε Hydrae | 9h 45m | 313.8 | 51.30 | 0.325 | | Stars perp. to eyes. |
| | | 314.2 | 51.95 | | | |
| | | 313.0 | | | | |
| | | 311.4 | 51.30 | .34 | | |
| | | 311.7 | 51.98 | | | |
| | | | 51.28 | .36 | | |
| | | | 52.00 | | | |
| | | | 51.28 | .34 | | |
| | | | 51.96 | | | |
| | | | 51.26 | .36 | | |
| | | | 51.98 | | | |
| | mean | 312.82 | | 0.345 | | |
| ω Leonis | Tried powers 4 5 7. and 8, but could not elongate it. Seeing pretty good, through stars are faint through haze. | | | | | |
| Σ 1457 | Too faint through haze to do anything with it. | | | | | |
| | | | Double dist. | | | |
| ζ Cancri | | 39.5 | 51.25 | | | cannot separate AB. |
| $\frac{A+B}{2}$. C | | 39.3 | 22 | | | Stars parallel to eyes |
| | | 39.0 | 23 | | | |
| | | 40.3 | 23 | | | |
| | | 38.6 | 20 | | | |
| | mean | 39.34 | 51.226 | 0.591 | | |
| | | | 50.05 | | | |
| | | | 03 | | | |
| | | | 04 | | | |
| | | | 06 | | | |
| | | | 04 | | | |
| | | | 50.044 | | | |
| | | | Corrc | | | |
| | | | 50.64 | | | |
| | | | 66 | | | |
| | | | 64 | | | |
| | | | 66 | | | |
| | | | 65 | | | |

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| | | | | | | |
|---|---|---|---|---|---|---|
| ι Leonis | | $11^h\ 20^m$ | 101·0 | 50·37 | GMS | Stars parallel to eyes |
| | | | 100·0 | 37 | | |
| | | | 100·2 | 36 | | |
| | | | 103·3 | 35 | | |
| | | | 103·8 | 35 | | |
| | | mean | 101·66 | 50·360 | 0·284 | |
| | | | | 50·92 | | |
| | | | | 94 | | |
| | | | | 90 | | |
| | | | | 94 | | |
| | | | | 94 | | |
| | | | | 50·928 | | |
| | | | | conc | | |
| | | | | 50·65 | | |
| | | | | 64 | | |
| | | | | 65 | | |
| | | | | 65 | | |
| | | | | 65 | | |
| | | mean of 10 conic. | | 50·649 | | |
| γ Leonis | | 11 46 | 64·7 | 51·99 | | Stars parallel to eyes |
| | | | 66·1 | 98 | | |
| | | | 65·9 | 99 | | |
| | | | 67·0 | | | |
| | | | 66·6 | | | |
| | | mean | 66·06 | 51·987 | 0·354 | |
| | | | | 51·27 | | |
| | | | | 29 | | |
| | | | | 28 | | |
| | | | | 51·280 | | |

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1867 Mar. 26 Tuesday

Sirius — JW — Companion not well enough seen ~~for~~ to measure.

Mr. Clark's new double near Procyon — 348° — Rough setting without illum.

| | | | | | | |
|---|---|---|---|---|---|---|
| | by chron 236 | | $\Delta\delta$ | $\Delta\delta$ | | |
| Comet 1867 I. and small star near by. | $8^h\ 29^m$ | | 54.52<br>51.74 coinc. | − 2.78 | JW | Comet south, extremely faint, bears no illumination. $\Delta\alpha \overset{\cos\delta}{\wedge}$ nearly = $\Delta\delta$. Comet following. |
| | 8 34.8 | 230.5 | 56.68 | 4.98 | | Same coincidence (51.70 used) Set without illum. Distance from memory, field being necessarily illuminated to set the wires) but error will not exceed 5″ |
| | 8 44.5 | 252 | 58.97 | 7.27 | SMS | " " " |
| Comparison star and Arg Z. 1063 | 8 55 | | | $\Delta\alpha \cos\delta$ | | Comparison star s. f. |
| | | | 34.75<br>69<br>64<br>72<br>81<br>68<br>62<br>70 | | | |
| | | | 34.701 | − 16.997 | | |
| | | | 37.75<br>78<br>86<br>81<br>86 | $\Delta\delta$ | | |
| | | | 37.812 | − 13.886 | | |
| | | | 51.78<br>70<br>68<br>70<br>71<br>65<br>68<br>69<br>69 | | | |
| | | | 51.698 | | | |

The positions and distances measured above give

| | | $\Delta\alpha \cos\delta$ | $\Delta\delta$ |
|---|---|---|---|
| 8 | 34.8 | + 4.13 | − 2.78 |
| 8 | 44.5 | + 7.10 | − 1.57 |
| mean 8 | 39.6 | + 5.62 | − 2.18 |

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Correction of chronometer +6$^s$; see f. o.

| | | | | 90° + | 90° + | | | |
|---|---|---|---|---|---|---|---|---|
| Uranus | | | | | | | | |
| Sat. no 4. | | 10 | 16·3 | 38·8 | 35·86 | | G.M.S | |
| | | | 20·5 | 38·5 | 35·81 | | | ½ wt. |
| n. f. | mean | 10 | 17·7 | 128·70 | 35·843 | 4·208 | | |
| | | | | | conc. | | | 3$^d$ Sat. too faint to observe |
| | | | | | 31·63 | | | |
| | | | | | 64 | | | |
| | | | | | 63 | | | |
| | | | | | 64 | | | |
| | | | | | 31·635 | | | J W could only see 3$^d$ Sat. by glimpses; could not measure it. |
| Mr Clark's | | 10 | 30 | 20° | | | G.M.S | Rough setting without illum. |
| star again | | | | | | | | (very doubtful) |
| | | | | | double dist. | | | Stellar focus adjusted. |
| ε Hydrae | | 10 | 55 | 321·5 | 52·09 | 0·405 | J W | |
| | | | | 317·6 | 51·28 | | | |
| | | | | 317·0 | | | | |
| | | | | 320·6 | 52·08 | 0·385 | | |
| | | | | 321·0 | 51·31 | | | |
| | | | | | 52·05 | 0·375 | | |
| | | | | | 51·30 | | | |
| | mean | | | 319·54 | | 0·388 | | |
| | | | | | 51·95 | 0·305 | | |
| ι Leonis | | 11 | 20 | 98·1 | 51·34 | | | |
| | | | | 100·5 | | | | |
| | | | | 100·5 | 52·01 | 0·300 | | |
| | | | | 100·5 | 51·41 | | | |
| | | | | 96·0 | | | | |
| | | | | 95·2 | 51·97 | 0·295 | | |
| | | | | | 51·38 | | | |
| | mean | | | 98·47 | | 0·300 | | |
| | | | | | 51·94 | | | |
| | | | | | 51·28 | 0·330 | | |
| γ Leonis | | 11 | 40 | 63·2 | | | | |
| | | | | 63·0 | 51·93 | | | |
| | | | | 64·0 | 51·30 | 0·315 | | |
| | | | | 62·8 | | | | |
| | | | | 63·3 | 51·97 | 0·325 | | |
| | | | | | 51·32 | | | |
| | mean | | | 63·26 | | 0·323 | | |
| 157 Lyncis | | 12 | 5 | 29·4 | 51·88 | 0·220 | | |
| | | | | 31·0 | 51·44 | | | Unsatisfactory measures. |
| | | | | 28·6 | | | | |
| | | | | 33·2 | 51·85 | 0·220 | | |
| | | | | 32·8 | 51·41 | | | |
| | | | | | 51·88 | 0·230 | | |
| | | | | | 51·42 | | | |
| | mean | | | 31·00 | | 0·223 | | |

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1867 Mar. 28 Thursday

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Sirius | | | | | | WBS | Companion not well enough seen for measures. Somewhat hazy. |
| Mr Clark's star near Procyon | | $8^h$ $10^m$ | 353·9<br>348·3<br>348·0<br>350·0<br>354·8 | | about 0″·5 | JW | Rather too close to measure distance. Star neatly divided Power no 3. Seeing good. |
| | mean | | 351·00 | | | | |
| | | Huron 236 | 90+ | | | | |
| Comet 1867 I | | 8 48·3 | 326·6 | 49·09 | 22·453 | JW | Comp. star on wire a. |
| and W II. V 749 | | 50·8 | 330·5 | | | | Comet s. f. |
| | | 55·0 | | 50·00 | 23·363 | | |
| | | 59 | 61 | 53·85 | 22·840 | SMS | Comp-star on e. |
| | | 9 9 | 65·3 | on wire d. | 24·985 | | best measure. |
| | | | | coinc. with d<br>51·71<br>70 | | | Values of ad, de, as given Vol. 3. p 67. |
| | mean | 8 56·8 | 60°·85 | 51·705 | | | |
| | mean | 8 57·8 | | | 23·410 | | |
| | | | | | Δα cos δ | | |
| | | 10 10·5 | | 42·29 | | SMS | Comet follows. Covers a |
| | | 12·5 | | 43 | | | 12 mag. star. |
| | | 15·0 | | 08 | | | |
| | mean | 10 12·67 | | 42·267 | +34·473 | | Comp. star on e. |
| | | 19·0 | | 46·20 | Δδ | | |
| | | 20·8 | | 46·11 | | | |
| | | 22·5 | | 45·71 | | | Comet south; comp. star on d. |
| | | 24·5 | | 45·95 | | | |
| | mean | 10 21·70 | | 45·992 | −5·773 | | |
| | | 28·5 | | 40·16 | | | The measure of pos. angle and |
| | | 29·5 | | 39·82 | | | distance, above, gives |
| | | 31·0 | | 39·73 | | | |
| | mean | 10 29·67 | | 39·903 | +36·837 | | $8^h$ $57^m.3$ Δα cos δ +21·45 Δδ −9·37 |
| | | | | coinc. with d.<br>51·76<br>78<br>76<br>76<br>51·765 | | | |
| | | | | with e<br>76·73<br>74<br>75 | | | |

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1867phae.proj..320W



157 Lyncis 12h 20m 208·4 GMS
209·0
208·9
208·5
207·6

mean 208·48

double dist.
51·85
85
84

mean 51·847 0·175'

51·48
51
50

51·497

coinc
51·71
69
67

mean 51·690

Star on merid. 84 27
for zero point 84 27

γ Virginis 190·1
190·5
191·9
191·4
190·6

mean 190·84

52·10
12
15
12
11
12

52·120 0·458

51·23
21
22
16
22
19

51·205

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Mar. 29 Friday

by Chron 236

Comet 1867 I.
and $W_{II}$ V 880

| | | | | | | |
|---|---|---|---|---|---|---|
| | 8 | 57.8 | [40.62] | Δα cos δ | SMS | Rev. doubtful |
| | | 58.8 | 41.27 | | | Comp. star on a. |
| | 9 | 0.5 | 41.56 | | | Comet follows. |
| | | 2.0 | 42.31 | | | |
| | | 3.5 | 42.36 | | | |
| mean | 9 | 1.20 | 41.875 | + 15.247 | | |
| | | 6.0 | 56.70 | Δ δ | | |
| | | 7.8 | 56.47 | | | Comp. star on b. |
| | | 9.5 | 56.66 | | | comet north |
| | | 10.7 | 56.61 | | | |
| mean | 9 | 8.50 | 56.610 | +24.928 | | |
| | | 17.4 | 44.82 | Δα cos δ | | |
| | | 18.2 | 44.84 | | | |
| mean | 9 | 17.80 | 44.830 | + 18.202 | | |

coinc.
b
31.71
67
67
68

31.682

a
26.64
61
62
64

26.628

ι Leonis 11 45

| | | | | |
|---|---|---|---|---|
| | 98.0 | | | Stars ' parallel to eyes. |
| | 98.7 | | | |
| | 102.0 | | | |
| | 99.6 | | | |
| | 100.0 | | | |
| mean | 99.66 | double dist. | | |
| | | 51.33 | | |
| | | 44 | | |
| | | 39 | | |
| | | 43 | | |
| mean | | 51.398 | 0.27447 | |
| | | 51.95 | | |
| | | 92 | | |
| | | 98 | | |
| | | 93 | | |
| mean | | 51.945 | | |

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1867phae.proj..326W



Σ 1595

26·0
26·2
25·8

mean 26·00

Two stars in its place; region identified from Arg. Z.; only one given there.

53·44
44
50
43

mean 53·452 2·785

Stars about equal in magnitude. Neither separable with power no 4.

coinc.
50·66
67
67

50·667

Stars parallel to eyes.

Σ 1593

155·5
159·7

154·9
152·9

mean 155·75

Power no 4
Perpendicular to eyes.

Power no 5
Too close to measure distance; perhaps 0″.7

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1867phae.proj..320W

66

1867 Mar 30 Saturday

| | | | | | |
|---|---|---|---|---|---|
| Sirius | | 280·1 | | JW | Companion well seen at first; never better. |
| | | 283 | | | Twilight |
| | | 282·3 | | | |
| | | 280·1 | | | |
| | | 283·5 | | | |
| | | 101·2 | | | Gas illumination |
| | mean | 281·70 | 53·05 | | |
| | | | 53·085 | | |
| | | | 52·86 | | |
| | | | 53·05 | | |
| | | | 52·94 | | |
| | | | 91 | | |
| | | | 86 | | |
| | | | 86 | | |
| | | | 94 | | } good |
| | | | 915 | | |
| | mean | | 52·947 | 1·228 | |
| | | | conc. | | |
| | | | [51·65] | | |
| | | | 71 | | |
| | | | 43 | | |
| | | | 435 | | |
| | | | 70 | | |
| | | | 51·719 | | |
| Star near Procyon following Mr. Clark's star | | 37·2 | | | |
| | | 36·3 | | | |
| | | 34·2 | | | |
| | | 30 3 | | | |
| | | 32·0 | | | Parallel to eyes. |
| | mean | 34·00 | | | |
| | | | 51·87 | | |
| | | | 86 | | |
| | | | 84 | | |
| | mean | | 51·857 | 0·180 | |
| | | | 51·68 | | |
| | | | 68 | | |
| | | | 67 | | |
| | | | 51·677 | | |

Clouded suddenly

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| | | | | |
|---|---|---|---|---|
| | by Argo 236 | | | |
| Comet 1867 I. | 10 40·0 | 37·94 | Δα cos δ GMS | Comp. star on d. Comet precedes |
| and W II V 1047 | " " | 56·78 | Δδ | " " " b. Comet north. |
| | | | | Comet a little preceding a small star (the following one of a pair) and about on its parallel. Position of star measured for Δδ; place remembered for Δα, illumination putting out the comet. |
| | 10 48·5 | | | Comet apparently covers this small star (10 mag.) producing a slight nebulosity round it. Probably it is about 2" north of it, being on its parallel at 10h 40m |
| Position of star | | 39·11 | | |
| | | 17 | | |
| | | 39·140 | − 12·527 | |
| | | 56·58 | | |
| | | ·59 | | |
| mean of 3 | | 56·650 | + 24·987 | (Use + 25·20 for the comet.) |
| | | coinc. d. | | |
| | | 51·65 | | |
| | | 70 | | |
| | | 65 | | |
| | | 67 | | |
| | | 51·667 | | |
| | | coinc b | | |
| | | 31·66 | | |
| | | ·65 | | |
| | | ·68 | | |
| | | 31·663 | | |
| | 11 5 | | | Comet well seen following this small star, but of the last degree of faintness. |
| | | | | Cannot see Arg. Z. 1209, which should be 18'·7 north of comp. star |

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1867 Mar 30 Saturday

ζ Cancri

GMS Seeing two poor for measures.
A B not separable. Power no 4.

υ Leonis

100·3
101·1
100·8
100·0
101·0

mean 100·64

Parallel to eyes.

double dist.

51·95
93
96

51·947 0·282

51·38
41
36

51·383

γ Leonis 11h 50m

63·8
63·3
62·6

90 +

333·0 51·34
34
332·0 34

mean 62·94 51·340 0·340

52·02
01
03

52·020

coinc. (slightly changed inadvertently)

51·68
67
67

51·673

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J W. saw companion of Sirius before star could be seen with naked eye.

by sid. clock

Comet 1867 I.
and Lal. 10683

10 23 19·6
28·8
32·7

GMS Comet follows

Transits over three wires

| | | | | | | |
|---|---|---|---|---|---|---|
| | 10 | 26 | 6·1 | + 2 | 46·5 | |
| | | | 15·7 | | 46·9 | |
| | | | 19·1 | | 46·4 | |
| mean | 10 | 26 | 16 | + 2 | 46·60 | |
| | 10 | | 30·2 | | | 45·06 |
| | | | 39·1 | | | 44·67 |
| | | | | | | 44·93 |
| mean | 10 | | 34·65 | | | 44·887 — 6·828 |

Comet south.
Comp. star on wire d.

conic. with d

51·72
71
51·715

Comet much more diffuse than last night.

Some more transits were taken, but the record was illegible.

No star in place of Arg. Z. 1209
A triple star about 6' north of Lal. 10683. Brightest component about 11 mag.

• Lal. 10683
• 10 mag
• 10 mag.
∴ Triple star

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1867phae.proj..320W



1867 Apr 2 Tuesday

| | | | | | | |
|---|---|---|---|---|---|---|
| Sirius | | 7h 45m | | 52·93 | JW | Seeing excellent |
| | | | | 90 | | |
| | | | | 95 | | |
| | | | | 93 | | |
| | | | | 92 | | |
| | | | | 93 | | |
| | | | | 85 | | Obviously a small measure by the sights |
| | | | | 86 | | |
| | | | | 95 | | |
| | | | | 93 | | Measures made by twilight |
| | mean | | | 52·915 | 1·223 | |
| | | | | coinc. (with d) | | |
| | | | | 51·69 | | |
| | | | | 70 | | |
| | | | | 74 | | |
| | | | | 66 | | |
| | | | | 67 | | |
| | | | | 69 | | |
| | | | | 51·692 | | |
| | | | 97·2 | | | |
| | | | 102·0 | | | Companion as clear and |
| | | | 101·2 | | | persistent as any star in the |
| | | | 99·8 | | | heavens. |
| | | | 101·4 | | | |
| | | | 100·6 | | | |
| | | | 100·2 | | | |
| | | | 99·6 | | | |
| | | | 100·5 | | | |
| | | | 99·4 | | | |
| | mean | | 100·19 | | | |
| Mr. Clark's star near Procyon | | | | | | Not seen well enough to measure. |
| Comet 1867 I. | | 8h 30m·5 | | | Δα cos δ 0·00 | |
| Comparison with a small star (a) | | | | 45·30 | −5·394 | Coincidence with c. Comet south. |
| | | | | log 2·1262 | | |
| | | 8 47·0 | | | | Comet on line ab. |
| Comet from (a) | | 8 54·6 | 187°·6 | 58·07 | 6·378 | Coinc. with d. |

These measures gave

| | | Δα cos δ | Δδ |
|---|---|---|---|
| | 8 30·5 | 0·00 | −5·39 |
| | 8 54·6 | +1·45 | −6·21 |
| mean | 8 42·5 | +0·72 | −5·80 |

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1867phae.proj..320W



Sirius 8h 0m GMS Companion not visible with certainty. Power no 4

Not Separable. " " "

Mr Clark's star near Procyon

Stars rather tremulous.

Transits of by sid. clock

Comet 1867 I 10 38 26·0 −1 44·8 Comet precedes.

8 29·5 45·5

34·5 45·6

mean 10 38 30 −1 45·30

W II V 1539 40 10·8

15·0

20·1

Δ8

44 16 19·32 Comet north, on wire a.

47 38 18·65

50 20 18·39

54 20 18·98

mean 10 49 8 18·835 +7·869

Coinc. with a

10 58 10·3

16·2 26·72

20·6 72

68

10 59 34·0 −1 42·1 69

39·8 42·7 71

43·8 42·5

mean 10 59 39 −1 42·43 26·704

11 1 16·1

22·5

26·3

Comp. star (a) of last night & W II V 1539 11 11 12·9 −5 10·9

17·0 10·6

23·0 10·7

32·0 11·0

33·1 10·5

11 16 23·8

27·6

33·7

43·0

43·6

11 19 30 47·92 Star (a) on wire a } Telescope moved from (a) to W II V 1539 without waiting

21 15 48·00 W II V 1539 on mic. wire

24 40 47·89

mean 11 21 48 47·937 −21·233

11 28 30 47·93 −21·226 Waited for W II V 1539 in this measure.

11 35 12·1 −5 11·0

16·2 10·9

11 26·5 11·3

31·4 11·2

32·3 11·1

40 23·1

27·1

~~31·7~~

37·8

42·6

43·4

mean 11 23 25 −5 10·92

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1867 Apr 3 Wednesday

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Eunomia & Oëltz. 11817 | | 12 | 30 | 30·4 | −1 | 14·0 | | GMS Planet precedes. |
| | | | | 33·9 | | 14·1 | | |
| | | | | 42·8 | | 14·0 | | |
| | | | | 47·0 | | 13·9 | | |
| | | | | 47·7 | | 13·9 | | |
| | | | | | −1 | 13·98 | | |
| | | | 31 | 44·4 | | | | |
| | | | | 48·0 | | | | |
| | | | | 56·8 | | | | |
| | | | 32 | 0·9 | | | | |
| | | | | 1·6 | | | | |
| | | | | | | | Δ8 | |
| | | | 34 | 19 | | | 59·88 | Planet on e, north |
| | | | 36 | 26 | | | 59·98 | |
| | | | 38 | 25 | | | 60·03 | |
| | mean | 12 | 36 | 23 | | | 59·963 | +16·754 |
| | | | 43 | 10·3 | −1 | 14·7 | corne. | |
| | | | | 14·0 | | 14·4 | 76·72 | |
| | | | | 26·6 | | 14·7 | 70 | |
| | | | | 27·5 | | 14·6 | 73 | |
| | | | | 33·1 | | 14·9 | 76·717 | |
| | | | | | −1 | 14·66 | | |
| | | | 44 | 25·0 | | | | |
| | | | | 28·4 | | | | |
| | | | | 41·3 | | | | |
| | | | | 42·1 | | | | |
| | | | | 48·0 | | | | |
| | mean | 12 | 37 | 40 | −1 | 14·32 | | |
| Regulus | | $13^h$ | $0^m$ | | about | 5° | | JW Green color nearly on northern limb; perhaps a companion. |

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Sirius

GMS Companion not visible with certainty; seeing very poor.

| | | | | | | |
|---|---|---|---|---|---|---|
| Comp. star of Mar 26 and $W_{II}$ V 581 | 9 | 10 | 59·8 | −42·2 | | Star of Mar. 26 precedes |
| | | 11 | 3·9 | 42·0 | | |
| | | | 10·4 | 42·3 | | |
| | | 11 | 42·0 | | | |
| | | | 45·9 | | | |
| | | | 52·7 | | | |
| | | 12 | 16·0 | −42·5 | | |
| | | | 20·5 | 42·1 | | |
| | | | 27·0 | 42·2 | | |
| | | | 58·5 | | | |
| | | | 2·6 | | | |
| | | 13 | 9 2 | | | |
| | | 13 | 29·7 | − 42·2 | | |
| | | | 33·9 | 42·1 | | |
| | | | 40·1 | 42·5 | | |
| | | 14 | 11·9 | | | |
| | | | 16·0 | | | |
| | | | 22·6 | | | |
| | 9 | 11 | 59 | −42·23 | | |
| Comp. star of Mar 26 & $W_{II}$ V 525 | 9 | 15 | 59·8 | | | Star of Mar 26 follows |
| | | 16 | 3·8 | | | |
| | | | 10·7 | | | |
| | | | 57·2 | +57·4 | | |
| | | 17 | 1·6 | 57·8 | | |
| | | | 8·0 | 57·3 | | |
| | | 17 | 19·7 | | | |
| | | | 23·7 | | | |
| | | | 30·5 | | | |
| | | 18 | 17·0 | +57·3 | | |
| | | | 21·1 | +57·4 | | |
| | | | 27·9 | +57·4 | | |
| | mean | 9 | 17 | 40 | +57·43 | |
| | | | 20 | 51 | 67·44 | Star of Mar. 26 north |
| | | | 22 | 26 | 67 50 | |
| | | | 24 | 0 | 67 36 | Comp. star on a |
| | mean | 9 | 22 | 26 | 67·433 +40·733 | |
| Comp. star of Mar 26 & $W_{II}$ V 581 | | | 28 | 10 | 34·02 | Star of Mar 26 north on e. |
| | | | [30 | 50] | 34·24 | |
| | | | 33 | 35 | 34·64 | |
| | | | 35 | 0 | 34·11 | |
| | mean | 9 | 31 | 54 | 34·252 +42·501 | |
| | | | | | with conc. a | Clouds prevented further work. |
| | | | | | 26·69 | |
| | | | | | 69 | |
| | | | | | 72 | |
| | mean | | | | 26·700 | Assume ae = 50·053 from 1866 Dec 14 |

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7.4 1867 Apr 5 Friday

γ Virginis

SMS Double image. Seeing much too poor for measures.

by chron 236

| | | | | | |
|---|---|---|---|---|---|
| W II 826 ~~825~~ & Isis | | 14 | 33.5 | 30.57 | Δα cos δ |
| | | | 34.8 | 43 | |
| | | | 35.4 | 56 | Planet s. f. |
| | | | 35.8 | 59 | |
| | | | 36.3 | 52 | Comp. star on wire e. |
| | mean | 14 | 35.16 | 30.544 | +46.183 |
| | | | 39.2 | 46.94 | |
| | | | 39.8 | 47.09 | |
| | | | 40.2 | 08 | Δδ |
| | | | 40.7 | 10 | |
| | | | 41.0 | 08 | |
| | mean | 14 | 40.18 | 47.058 | −29.669 |
| | | | 43.2 | 31.13 | |
| | | | 44.2 | 15 | Δα cos δ |
| | | | 44.7 | 13 | |
| | | | 44.9 | 13 | |
| | | | 45.2 | 19 | |
| | mean | 14 | 44.44 | 31.146 | +45.581 |
| | | | | conc. | |
| | | | | 76.73 | |
| | | | | 73 | |
| | | | | 72 | |
| | | | | 76.727 | |

W XII 852 for zero of pos. circle

84 37
26
23
84 29

~~P~~ XIII 127

Seeing altogether too bad to measure

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by Aaron 236

Comet 1867 I. & Arg Z. +35° No 1328

| | | | | | | |
|---|---|---|---|---|---|---|
| | q | 38·0 | 68·25 | | GMS | Comet precedes. |
| | | 40·5 | 66·80 | $\Delta\alpha \cos\delta$ | | Comp. star on d. |
| | | 41·5 | 66·75 | | | |
| | | 42·5 | 67·43 | | | |
| | | 43·8 | 66·19 | | | |
| mean | q | 41·26 | 67·084 | −15·356 | | |
| | q | 46·0 | 61·97 | | | Comet north |
| | | 47·5 | 60·97 | | | |
| | | 49·0 | 61·31 | | | |
| | | 50·2 | 61·97 | $\Delta\delta$ | | |
| | | 50·8 | 62·20 | | | |
| mean | q | 48·70 | 61·684 | +9·956 | | |
| | q | 53·5 | 64·19 | | | |
| | | 54·3 | 65·30 | | | |
| | | 55·0 | 64·88 | | | |
| | | 56·0 | 64·68 | $\Delta\alpha \cos\delta$ | | |
| | | 56·7 | 64·46 | | | |
| mean | q | 55·10 | 64·702 | −12·974 | | |
| | | | corrc | | | |
| | | | 51·75 | | | |
| | | | 75 | | | |
| | | | 71 | | | |
| | | | 71 | | | |
| | | | 72 | | | |
| | | | 51·728 | | | |

W II 826 & Isis

| | | | | | | |
|---|---|---|---|---|---|---|
| | 12 | 31·3 | 64·84 | | | Comp. star on wire b. |
| | | 31·9 | 65·04 | $\Delta\alpha \cos\delta$ | | db assumed = 20·009 (sec. 1866 Dec 14) |
| | | 32·8 | 65·23 | | | |
| | | 34·2 | 64·78 | | | |
| mean | 12 | 32·55 | 64·972 | −33·253 | | Planet precedes |
| | | | | | | Diaphragm screw inadvertently turned. |
| | 12 | 37·9 | 74·33 | | | Comp. star on wire e. |
| | | 38·5 | 39 | $\Delta\delta$ | | Planet south. |
| | | 38·8 | 16 | | | |
| | | 39·3 | 23 | | | |
| | | 39·7 | 26 | | | |
| mean | 12 | 38·98 | 74·214 | −2·781 | | |
| | | | corrc | | | |
| | | | 77·00 | | | |
| | | | 77·00 | | | |
| | | | 76·96 | | | |
| | | | 76·98 | | | |
| | | | 77·03 | | | |
| | | | 77·00 | | | |
| | | | 76·995 | | | |

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1867 Apr 8 Monday and 9 Tuesday

Occultation of B A C 1526 lost through clouds.

1867 Apr 9 Tuesday

Sirius GMS Power no 3. Companion not visible, or barely so. Seeing wretched. Star a mere ball at the best focus.

| | by chron | 236 | Corr. to chr. Sid. t | Mean t. | | | |
|---|---|---|---|---|---|---|---|
| Immersion of a small star | 8 | 26 33·2 | −17·4 | 8 26 15·8 | 7 | 15 14·7 | Angle 43° N to E. approx. |

on dark part of moon

JW Aristarchus pretty well seen.

Train also visible, toward Herodotus. Spot also, about equal to the train in brilliancy, nearly north of Aristarchus, for which circle reads 6°; distance 55·46 − 51·53 = 3·93. Spot nearly half as large as Aristarchus, but fainter. Dark part of moon easily visible to naked eye. Aristarchus not visible in finder.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| " | 10 | 13 51·1 | −17·5 | 10 13 33·6 | 9 | 2 14·9 | GMS |
| " n.p. of a star B A C 1930 | 10 | 31 14·5 | −17·5 | 10 13 57·0 | 9 | 2 38·3 | " |
| " of B A C 1930 | 10 | 31 28·5 | −17·5 | 10 31 11·0 | 9 | 19 49·4 | " |

Note Nov. 29, 1880. The sid. and mean times are probably to be corrected to conform with the observed time; 10 30 57·0, and 9 19 35·5

Emersion " lost through faintness of star and waviness of limb. Star seen when some 10° out at 11 30 35 approx.

All the immersions quite well observed.

W XII 385 & Sappho

| | | | | | |
|---|---|---|---|---|---|
| | 13 | 6·8 | 61·75 | Δα cos δ | GMS Comp. star on a. |
| | | 7·1 | 73 | | |
| | | 7·5 | 64 | | Planet n. f. |
| | | 8·0 | 67 | | |
| mean | 13 | 7·35 | 61·698 | +34·728 | |
| | | 10·9 | 37·38 | Δδ | Comp. star on a |
| | | 11·4 | 25 | | |
| | | 11·5 | 44 | | |
| | | 11·8 | 34 | | |
| | | 12·0 | 44 | | |
| mean | 13 | 11·52 | 37·370 | +10·400 | |
| | | 14·0 | 61·30 | Δα cos δ | |
| | | 14·4 | 31 | | Conc. with a 26·98 |
| | | 14·8 | 22 | | 99 |
| | | 15·0 | 22 | | 96 |
| | | 15·2 | 34 | | 96 |
| | | | | | 96 |
| mean | 13 | 14·68 | 61·278 | +34·308 | mean 26·970 |

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1867phae.proj..320W



Moon 7h 45m GMS Crater Censorinus (Mädlers Mart) remarkably luminous. Linné very ill defined and quite faint.

ζ Cancri 8 0 Power no 3. Seeing too poor for measures.

Moon 8 30 JW. Power no 3. Linné shows a well defined ring, though surrounded by ill defined brightness. Ring not visible with power no 1. (Confirmed by GMS.)
Aristarchus barely visible. Whole dark edge of moon very distinct.

ζ Cancri 11 10 JW. Seeing still too poor for measures.

Chron 236

| | | | | | |
|---|---|---|---|---|---|
| Eunomia & | 11 | 27.3 | 40.90 | " | Planet follows. |
| Oeltz. 11722 | | 28.3 | 85 | | Comp. star on b. |
| | | 28.8 | 84 | | |
| | | 29.1 | 75 | | |
| | | 29.5 | 88 | | |
| | | 30.2 | 70 | | |
| | mean 11 | 28.87 | 40.820 | +8.770 | |
| | 11 | 33.8 | 85.72 | | Planet north. |
| | | 34.4 | 86.00 | | |
| | | 35.2 | 85.86 | | Comp. star on b. |
| | | 35.8 | 86.00 | | |
| | | 36.2 | 85.95 | | |
| | | 36.7 | 86.00 | | |
| | mean 11 | 35.35 | 85.922 | +53.872 | |
| | 11 | 39.0 | 60.22 | | Comp. star on d. |
| | | 39.9 | 09 | | |
| | | 40.3 | 25 | | |
| | | 40.6 | 20 | | |
| | | 41.0 | 14 | | |
| | | 41.3 | 06 | | |
| | mean 11 | 40.35 | 60.160 | +8.120 | |

Set for Isis, but found the expected comp. star W XII 750 (7 mag.) not to be in the heavens. Note Nov. 29, 1880. The errata to Weiss (p. 251) explain this circumstance.

conic, with b

32.07
05
05
03
05
32.050 with d.
52.04
04
04
04
52.040

} measured next day by GMS

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1867 Apr 13 Saturday

GMS

Transits of B.A.C. 2420 and four stars 2420 s. p. named (in order of α) a b c d.

a 11 mag
b 13 "
c 9 "
d 10 "

c = Oeltz. Arg. No 6580.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| c | 9 | 33 | 25·5 | −30·0 | | | |
| | | | 29·1 | −30·2 | | | |
| | | | 33·7 | −30·0 | | | |
| | 2420 | | 55·5 | | | | |
| | | | 59·3 | | | | |
| | | 34 | 3·7 | | | | |
| a | | 34 | 51·3 | −47·5 | | | |
| | | | 55·3 | −47·0 | | | |
| | | | 59·9 | −46·7 | | | |
| c | | | 8·3 | −30·5 | | | |
| | | | 12·2 | −30·1 | | | |
| | | | 16·6 | −30·0 | | | |
| d | | | 19·7 | −19·1 | | | |
| | | | 23·4 | −18·9 | | | |
| | | | 27·8 | −18·8 | | | |
| | 2420 | | 38·8 | | | | |
| | | | 42·3 | | | | |
| | | | 46·6 | | | | |
| a | | 36 | 30·8 | −46·9 | | | |
| | | | 34·4 | −46·9 | | | |
| | | | 38·9 | −46·9 | | | |
| c | | | 47·3 | −30·4 | | | |
| | | | 51·5 | −29·8 | | | |
| | | | 55·9 | −29·9 | | | |
| d | | | 59·0 | −18·7 | | | |
| | | | 2·7 | −18·6 | | | |
| | | | 7·2 | −18·6 | | | |
| | 2420 | | 17·7 | | | | |
| | | | 21·3 | | | | |
| | | | 25·8 | | | | |
| b | | 39 | 8·0 | −40·1 | | | |
| | | | 11·7 | −40·3 | | | |
| | | | 16·0 | −40·2 | | | |
| c | | | 18·2 | −29·9 | | | |
| | | | 22·2 | −29·8 | | | |
| | | | 26·3 | −29·9 | | | |
| | 2420 | | 48·1 | | | | |
| | | | 52·0 | | | | |
| | | | 56·2 | | | | |

| | | | | | Δδ | | |
|---|---|---|---|---|---|---|---|
| a | 9 | 43 | 44 | | 35·00 | −42·034 | B A C 2420 on wire e. |
| | | 49 | 23 | | 34·83 | −42·204 | |
| b | 9 | 45 | 20 ? | | 41·20 | −35·834 | Coinc with e assumed } 77·034 |
| | | 51 | 22 | | 40·96 | −36·074 | |
| c | 9 | 46 | 56 ? | | 25·74 | −57·294 | |
| | | 52 | 33 | | 26·15 | −50·884 | |
| d | 9 | 48 | 23 | | 28·86 | −48·174 | |
| | | 53 | 22 | | 28·43 | −48·604 | |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Δ δ | |
| W II V 1554 | | 10 | 20 | 0 | | 60·77 | +8·700 | W II V 1554 on wire d. |
| and Arg. Z. | | | 35 | 0 | | 60·44 | +8·370 | Rattle at time of setting on it. |
| +35° No 1328 | mean | 10 | 27 | 30 | | | +8·535 | |
| (comp. star for | | 10 | 44 | 8·1 | | | | |
| comet Apr. 6) | | | | 21·2 | | | | |
| | | | | 28·3 | | | | |
| | | | | 29·0 | | | | |
| | | | | 44·2 | | | | |
| | | | | 48·1 | | | | |
| | | | 52 | 23·1 | +7 | 15·0 | | |
| | | | | 36·5 | | 15·3 | | |
| | | | | 43·2 | | 14·9 | | |
| | | | | 44·0 | | 15·0 | | |
| | | | | 59·1 | | 14·9 | | |
| | | | | 3·3 | | 15·2 | | |
| | mean | 10 | 51 | 45 | +7 | 15·05 | | |
| | | | | | | | coinc with d | |
| | | | | | | | 52·07 | |
| | | | | | | | 08 | |
| | | | | | | | 08 | |
| | | | | | | | 07 | |
| | | | | | | | 05 | |
| | | | | | | | 52·070 | |
| Oeltz. 11690-1 | | 11 | 57 | 14 | | 66·68 | Δ δ | WMD |
| & Euronia | | | 59 | 35 | | 66·47 | | Comp. star on b. Planet north. |
| | | 12 | 2 | 8 | | 66·53 | | |
| | mean | 11 | 59 | 39 | | 66·560 | +34·505 | |
| | | 12 | 5 | 5·8 | | | coinc b. | |
| | | | | 6·7 | | | | |
| | | | | 16·1 | | | 32·06 | |
| | | | | 23·4 | | | 10 | |
| | | | | | | | 01 | |
| | | | | | | | 05 | |
| | | | 6 | 27·5 | +1 | 21·7 | 08 | |
| | | | | 28·3 | | 21·6 | 03 | |
| | | | | 38·1 | | 22·0 | | |
| | | | | 45·3 | | 21·9 | 32·055 | |
| | | | 7 | 27·1 | | | | Planet follows. |
| | | | | 39·8 | | | | |
| | | | | 46·4 | | | | |
| | | | | 50·3 | | | | |
| | | | | 57·8 | | | | |
| | | | 8 | 49·0 | +1 | 21·9 | | |
| | | | 9 | 1·4 | | 21·6 | | |
| | | | | 2·0 | | 21·6 | | |
| | | | | 12·1 | | 21·8 | | |
| | | | | 19·2 | | 21·4 | | |
| | mean | 12 | 7 | 58· | +1 | 21·72 | | |

Moon 12 30 . Power no 3. G M S & W M D could not be sure of any distinct ring in Linné. Seeing not very good.

γ Virginis. 12 40 Multiple image. Measures quite impossible.

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1867 Apr 18 Thursday

| | | | | | | |
|---|---|---|---|---|---|---|
| Σ 1496 | | $10^h\ 30^m$ | | | GMS | Identified by comparison with Argelander's Zones. No companion within 3' of arc. Moonlight in field. |
| | | | See note of Apr 21. | | | |
| ι Leonis | | 11 30 | | | | Seeing too poor for double star measures. |
| W XII 262 | | Chron 236 | | | JW | |
| and Sappho | | | | Δ α cos δ | | |
| | | 12 12·8 | 77·71 | | | Comp. star on d. |
| | | 13·7 | 62 | | | Planet follows |
| | | 14·2 | 58 | | | |
| | | 14·4 | 40 | | | |
| | | 14·9 | 56 | | | |
| | | 15·2 | 56 | | | |
| | mean | 12 14·20 | 77·575 | +25·457 | | |
| | | 12 18·2 | 91·61 | Δ δ | | Comp. star on d |
| | | 18·9 | 62 | | | Planet south |
| | | 19·3 | 56 | | | |
| | | 19·8 | 40 | | | |
| | | 20·1 | 51 | | | |
| | | 20·4 | 52 | | | |
| | mean | 12 19·45 | 91·537 | −39·419 | | |
| | | 12 24·5 | 77·08 | Δ α cos δ | | |
| | | 25·4 | 76·80 | | | |
| | | 26·0 | 85 | | | |
| | | 26·5 | 50 | | | |
| | | 27·3 | 74 | | | |
| | | 28·0 | 76·68 | | | |
| | mean | 12 26·28 | 76·775 | +24·657 | | |
| | | | conc. | | | |
| | | | 52·11 | | | |
| | | | 13 | | | |
| | | | 09 | | | |
| | | | 14 | | | |
| | mean | | 52·118 | | | |

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W XII 591 and Isis Transits

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 13 | 1 | 51·3 | | | JW | Planet follows |
| | | 2 | 4·8 | | | | |
| | | | 8·0 | | | | |
| | | 3 | 14·2 | +1 | 22·9 | | |
| | | | 27·8 | | 23·0 | | |
| | | | 31·1 | | 23·1 | | |
| | | 4 | 2·9 | | | | |
| | | | 15·5 | | | | |
| | | | 18·8 | | | | |
| | | 5 | 24·8 | | 22·9 | | |
| | | | 38·1 | | 22·6 | | |
| | | | 41·5 | +1 | 22·7 | | |
| mean | 13 | 4 | 30 | +1 | 22·87 | | |

| | | | | | |
|---|---|---|---|---|---|
| | chron 236 | | Δ S | | Comp. star on a. Planet north. |
| | 13 15·5 | | 79·40 | | |
| | 17·9 | | 79·30 | | |
| mean | 13 16·70 | | 79·350 | +52·300 | ad assumed = 25·068 |

Immersion of 96 Virginis

by clock
13 23 52·1

Note Nov. 29, 1880.
Clock 39.5 fast
by book D19.

SMS Recorded on chronograph
Star faint and moon's limb blazing
observation perhaps 5 or 6 seconds
too soon.

JW Aristarchus brilliant but not distinct
Streams visible " " "
Spot nearly north, but not conspicuously
bright. (See Apr 9)

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82

1867 Apr. 19 Friday

Star a few' of arc. n. f. Regulus found by companion nearly following.

JW to have a very faint

76
82

Very rough

3" Estimated distance

86·5 GMS

90° +
174·2

Pretty good

52·46
49
52·475 0·405

Rough

mean

conc
52·07
07

mean 82°2

Σ 1457

39·5
36·3
36·1
35·0
36·5

JW

mean 36·68

double dist.

52·25 0·187
51·875

52·19 0·145
51·90

52·22 0·152
51·915

mean 0·161

Σ 1496

15" (See note of Apr 21)

No companion visible. Power no 3. in this & the preceding obsns.

Powers of 600 & 800 tried but without certain result. Thought to be a close companion about north.

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| | | | | | | |
|---|---|---|---|---|---|---|
| Σ 1593 | | $12^h\ 14^m$ | | | JW | Could not separate it at first. |
| | | | 90 + 61° | | | Seeing poor |
| | | | 337.5 | | | |
| | | | 341. | | | |
| | mean | | 336.50 | | | |
| γ Virginis | | 12 35 | 11.2 | | | |
| | | | 10.5 | | | |
| | | | 9.4 | | | |
| | | | 9.0 | | | |
| | | | 9.9 | | | |
| | mean | | 10.00 | double diet. | | |
| | | | | 50.56 | 0.390 | |
| | | | | 51.34 | | |
| | | | | 50.49 | 0.460 | Star blazing very much |
| | | | | 51.41 | | |
| | | | | 51.48 | 0.495 | GMS good |
| | | | | 50.49 | | |
| | mean | | | | 0.448 | |

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'84

1867 Apr. 21 Sunday

| | | | | | | |
|---|---|---|---|---|---|---|
| Sirius | | | 53·065 | | JW. | |
| | | | 150 | | | |
| | | | 110 | | | |
| | | | 165 | | | |
| | | | 065 | | | |
| | mean | | 53·111 | 1·106 | | |
| | | | corne | | | |
| | | | 52·020 | | | |
| | | | 005 | | | |
| | | | 020 | | | |
| | | | 52·000 | | | |
| | | | 51·980 | | | |
| | mean | | 52·005 | | | |
| | | 286·5 | | | | |
| | | 104·5 | | | | |
| | | 100·9 | | | | |
| | | 101·5 | | | | |
| | mean | 103·35 | | | | |
| | | | 2 dist. | | | |
| Mr. Clark's | | | 50·885 | 0·105 | JW | Seeing good |
| star near | | | 51·095 | | | |
| Procyon | | | 50·885 | 0·098 | | |
| | | | 51·080 | | | |
| | | | 50·872 | 0·111 | | |
| | | | 51·095 | | | |
| Star following | | | 52·150 | 0·168 | JW | |
| this one | | | 51·815 | | | |
| | | | 52·135 | 0·142 | | |
| | | | 51·852 | | | |
| | | | 52·170 | 0·148 | | |
| | | | 51·875 | | | |
| | | | 52·146 | 0·146 | | |
| | | | 51·855 | | | |
| Cape of G. Hope. | | 45·2 | | | | |
| Catal. 4311 | | 44·4 | | | JW | |
| | | 45·5 | | | | |
| | | 43·6 | | | | |
| | | 43·8 | | | | |
| | mean | 44·50 | | | | |
| | | | 52·44 | 0·385 | | |
| | | | 51·67 | | | |
| | | | 52·40 | 0·380 | | |
| | | | 51·64 | | | |
| | | | 52·44 | 0·365 | | |
| | | | 51·71 | | | |

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Σ 1593

[332.3]
338.7
334.5
337.6
[334.5] extreme lower limit
337.5
337.07

JW Easily separated. Power no 3 used in this and the previous observations

50.83 0.148
51.125

50.857 0.164
51.185

50.849 0.160
51.168

Seeing very good

Σ 1496

(Mädler's declination for this star is entirely wrong, being that of Sorg. Σ. +10° No 2227, which has consequently been observed for Σ 1496 on Apr 18 & 19 as well as tonight. GMS.)

JW No companion whatever. Star about 13 revolutions north just visible, like one of the satellites of Uranus.

γ Virginis

JW.

14.1
12.5
11.6
13.3
14.5
13.2
13.20 mean

2 dist.
50.59
54
61
53
52
50.558 0.448

51.465
45
445
51
41
45
51.455

GMS

189.2
189.5
188.8
189.2
189.0
189.14

8.8
10.0
8.2
10.0
8.8
9.16

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1867 Apr. 21 Sunday

"

Virginis (continued)

2 dist.

51·41
44
42
43
46

mean 51·432 0·461

50·51
52
50
51
51

50·510

90° + 97·8
97·0
98·0
98·8
97·5

mean 7·82

P XIII 127 115·0
113·6
113·8
113·9
113·0

mean 113·86 50·78
78
81

mean 50·790 0·201

GMS Companion follows.
Beautifully separated.

51·19
19
205

51·1925

coinc
51·00
01
00

51·003

Σ 1819 12h 50m 141·4
140·1
142·2
140·5
141·9

mean 141·22

GMS Stars parallel to eyes.
Finely separated.

50·90
91

mean 50·905 0·090

51·08
09

51·085

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Σ 1734

161·3
159·8
159·3
157·8

mean 159·55

52·07
07
06

mean 52·067 0·083

conc.
51·97
52·00
51·99
99
97

51·984

GMS

Star for zero of pos. circle 84·5 or 84° 26′
84·5 or 84° 33′ (½ rot.)

mean 84° 28′

Σ 1832

56 or greater

JW

Too hazy to be sure of measures. Observer thought he saw a faint close companion preceding Arg Z. +4° No 2844. (= W. XIV 175). (Σ 1832 = W. XIV 200). Haze too thick to measure it.

Σ 1879

ξ Bootis 14h 0m

55·3
56·2
55·9
56·3
57·0

mean 56·14

2 diel.

50·46
44
40
42
48

50·440 0·576

51·59
62
58
60
57

51·592

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1867 Apr 21 Sunday

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| γ Coronae | | | 323·3 | | | JW | Beautifully separated. Magnitudes equal. |
| | | | 321·2 | | | | |
| | | | 322·1 | | | | |
| | | | 320·2 | | | | |
| | | | 320·3 | | | | |
| | mean | | 321·42 | | | | |
| | | | | 49·87 | | | |
| | | | | 86 | | | |
| | | | | 85 | | | |
| | | | | 86 | | | |
| | mean | | | 49·860 | 0·139 | | |
| | | | | 50·14 | | | |
| | | | | 13 | | | |
| | | | | 15 | | | |
| | | | | 13 | | | |
| | | | | 50·138 | | | |
| γ Coronae | | | 166·5 | | | JW | Companion preceding |
| | | | 155·5 | | | | |
| | | | 142 | | | GMS | " Note July 8, 1881. " The original looks rather as if the remark "companion preceding" applied only to the observation of G.M.S. |
| ξ Librae | | | | | | | Seeing not good enough to measure A B. |
| Moon | | | | | | | |
| Direction & dist. | | | 67·5 | | | JW | |
| of spot near | | | | | | | |
| Posidonius | | | | 42·23 | 12·24 | | Spot on γ. |
| marked γ on | | | | 49·00 | | | Conc. with c. |
| Mädler's map, | | | | | | | be assumed = 19·01 |
| from Linné | | | | | | | This spot much resembles Linné as has been noticed before. No crater visible in Linné |
| | Chron. 236 | | Corr. to Chron. | True sid. t. | True mean. t. | | |
| Immersion of 24 Scorpii | 16 | 15 15·5 | −53·4 | 16 | 14 22·1 | 14 14 53·5 | GMS Somewhat doubtful; thought to be within 0s5 |
| Emersion lost | | | | | | | |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ξ Bootis | | 14 | 0 | 54·0 | | GMS | Stars perp. to eyes. |
| | | | | 54·6 | | | Power no 3. |
| | | | | 54·3 | | | |
| | | | | 54·1 | | | |
| | | | | 54·9 | | | |
| | mean | | | 54·36 | 2 det. | | |
| | | | | | 50·55 | | |
| | | | | | 48 | | |
| | | | | | 53 | | |
| | | | | | 53 | | |
| | | | | | 49 | | |
| | mean | | | | 50·516 | 0·567 | |
| | | | | | 49·39 | | |
| | | | | | 39 | | |
| | | | | | 36 | | |
| | | | | | 37 | | |
| | | | | | 40 | | |
| | mean | | | | 49·382 | | |
| σ Coronae | | 14 | 15 | 344·5 | | | Stars parallel to eyes |
| | | | | 344·7 | | | |
| | | | | 343·8 | | | |
| | | | | 344·5 | | | |
| | | | | 343·3 (½ wt) | | | Stars ill defined on account of wind |
| | mean | | | 344·26 | | | |
| | | | | | 50·31 | | Stars very " " " " " " " |
| | | | | | 35 | | |
| | | | | | 50 330 | 0·340 | |
| | | | | | 49·98 | | |
| | | | | | 50·00 | | |
| | | | | | 49·99 | | |
| | | | | | 99 | | |
| | | | | | 99 | | |
| | | | | | 49·990 | | |
| | | | | | 50·29 | | Stars much better defined |
| | | 15 | 0 | | 30 | | |
| | | | | | 30 | | |
| | | | | | 28 | | |
| | | | | | 29 | | |
| | | | | | 50·292 | 0·321 | |
| | | | | | 49·66 | | |
| | | | | | 67 | | |
| | | | | | 62 | | |
| | | | | | 65 | | |
| | | | | | 65 | | |
| | | | | | 49·650 | | |
| | mean | | | | | 0·327 | |

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1867 Apr 22 Monday

Ophiuchi 15 20 GMS Power no 4

321·0
323·9
324·2
323·0
322·5

mean 322·92

50·09
07

50·08 0·126

conc
49·93
96
97
96
95

49·954

Estimated distances, wires not on stars; stars too unsteady for a real measure.

49 Serpentis

27·1
26·1
25·4
26·2
25·1

mean 25·98

Stars perp. to eyes. Power no 3.

2 dist.

50·35
36
37
38
36

50·364 0·416

49·51
54
54
52
55

49·532

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Companion of Regulus — $10^h\ 15^m$ — J.W. Faint companion found Apr. 19 not visible.

ζ 1431 — W&S Observed by mistake for 49 Leonis. Seeing very poor. Images very diffuse, two ill defined for measures. Star appears in finder to both observers about 1 mag. fainter than 44 Leonis, which precedes it.

49 Leonis — W&S. Afterward found, but seeing still too poor for measures. Star perhaps ½ mag. less than 48 Leonis.

Isis & W. — Planet precedes
XII 578

| | | | | |
|---|---|---|---|---|
| 13 | 2 | 57.3 | −1 | 55.1 |
| | 3 | 6.0 | | 55.4 |
| | | 13.9 | | 55.2 |
| | 4 | 52.4 | | |
| | | 1.4 | | |
| | | 9.1 | | |
| | 6 | 21.7 | −1 | 55.8 |
| | | 31.0 | | 55.3 |
| | | 38.9 | | 55.1 |
| | 8 | 17.5 | | |
| | | 26.3 | | |
| | | 34.0 | | |
| | 9 | 6.4 | −1 | 55.6 |
| | | 15.5 | | 55.5 |
| | | 23.2 | | 55.6 |
| | 11 | 2.0 | | |
| | | 11.0 | | |
| | | 18.8 | | |
| mean | $13^h$ | $6^m$ | $17^s$ | −1 55.40 |

Rattle at times of Δδ

Planet north on b

| | | | | |
|---|---|---|---|---|
| 13 | 14.1 | | 64.18 | |
| | 17.4 | | 20 | |
| | 19.4 | | 17 | |
| | 20.2 | | 37 | |
| | [21.5] | | 49 | |
| | 22.7 | | 35 | |
| | 23.9 | | 27 | |
| mean | 13 | 19.89 | 64.290 | +34.353 |

coinc. b
29.93
97
94
90
94
95
93

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1867 Apr 25 Thursday

| | | | | | | |
|---|---|---|---|---|---|---|
| Companion of Regulus | | $10^h\ 45^m$ | | | JW | Power no 3. After long watching observer thought he saw steadily the faint star of Apr 19 |
| | | | 90 + | | | |
| | | | 343 | | | |
| | | | 355 | | GMS | Rough setting without illum. |
| | | $11^h\ 0^m$ | 88°.2 | | | Illumination |
| 49 Leonis | | | 12·8 | 50·215 | JW | Power no 3. |
| | | | 12·3 | 265 | | Both stars bluish white |
| | | | 11·6 | 21 | | |
| | | | 9·5 | 215 | | |
| | | | 11·7 | 27 | | |
| | | | | 22 | | |
| | mean | | 11·58 | 50·232 | 0·264 | |
| | | | | 49·67 | | |
| | | | | 71 | | |
| | | | | 73 | | |
| | | | | 70 best | | |
| | | | | 71 | | |
| | | | | 49·704 | | |
| Σ 1496 | | 11 50 | 3·2 | 47·95 | | Power no 1. |
| | | | 3·3 | 84 | | |
| | | | 3·0 | 48·01 | | |
| | | | 4·2 | 47·95 | | |
| | | | | 94 | | |
| | mean | | 3·42 | 47·938 | 2·008 | |
| | | | | 51·99 | | |
| | | | | 95 | | |
| | | | | 52·00 | | |
| | | | | 51·94 | | |
| | | | | 89 | | |
| | | | | 51·954 | | |
| Σ 1593 | | 12 20 | 153·5 | 50·070 | GMS | Stars persp. to eyes |
| | | | 153·9 | 069 | | |
| | | | 153·9 | 056 | | |
| | | | 154·0 | 038 | | |
| | | careless ½ wt. | 150·0 | 050 | | |
| | | | 153·9 | 049 | | |
| | | | 152·7 | | | |
| | mean | | 153·37 | 50·055 | 0·115 | |
| | | | | 49·827 | | |
| | | | | 830 | | |
| | | | | 824 | | |
| | | | | 826 | | |
| | | | | 817 | | |
| | | | | 49·825 | | |
| | | | 334·6 | | JW | |
| | | | 337·0 | | | |
| | | | 337·4 | | | |
| | | | 337·8 | | | |
| | | | 337·0 | | | |
| | mean | | 336·76 | | | |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Σ 1595 | | | | | | | Two stars in the place as before. Neither of them separable. Power no 3. |
| γ Virginis | | 13 | 0 | 9·7 | 49·45 | | JW. |
| | | | | 7·0 | 46 | | |
| | | | | 7·5 | 435 | | |
| | | | | 4·4 | 47 | | |
| | | | | 8·5 | 49 | | |
| | mean | | | 8·02 | 49·461 | 0·480 | Better than any previous set of measures on this star by JW both in distance and angle. |
| | | | | | 50·38 | | |
| | | | | | 40 | | |
| | | | | | 425 | | |
| | | | | | 46 | | |
| | | | | | 44 | | |
| | | | | | 50·421 | | |
| η Coronae | | | | 319·5 | 50·071 | | GMS Parallel to eyes |
| | | | | 316·3 | 040 | | |
| | | | | 317·5 | 052 | | |
| | | | | 320·4 | 051 | | |
| | | | | 318 8 | 045 | | |
| | mean | | | 31 8·50 | 50·052 | 0·104 | |
| | | | | | 49·840 | | |
| | | | | | 830 | | |
| | | | | | 841 | | |
| | | | | | 853 | | |
| | | | | | 859 | | |
| | | | | | 49·845 | | |
| γ Coronae | | | | 335·5 | | | GMS |
| | | | | [222·5] | | | JW Double image of principal star |
| | | | | 329·8 | | | |
| | | | | 339·5 | | | Power no 4. |
| σ Coronae | | | | 339·6 | 49·27 | | JW Parallel to eyes |
| | | | | 340·5 | 28 | | |
| | | | | 338·5 | 27 | | |
| | | | | 339·5 | 22 | | |
| | | | | 339·6 | 27 | | |
| | mean | | | 339·54 | 49·262 | 0·301 | |
| | | | | | 48·69 | | |
| | | | | | 64 | | |
| | | | | | 67 | | |
| | | | | | 64 | | |
| | | | | | 48·660 | | |

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1867 Apr. 25 Thursday

| | | | | | |
|---|---|---|---|---|---|
| Corona | | | | JW | About = Arg Z +26° No 2761 (in finder) |
| | | | | GMS | > 2761 = mean of 2761 & 2763 No peculiar appearance in large telescope. |
| ζ Herculis | | | | GMS | Not separable. Seeing not very good. |
| 167 Herculis | | 335·0<br>334·0 | | GMS | Companion south. Numerous false images, but real companion occasionally seen well. |
| | mean | 334·5 | about 0″·5 | | |

Arg Z. + 28° no 2627 not in sky. A star of about 10·5 mag. 10 seconds preceding its place.

49 Serpentis — Too many images. Power no 3.

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Measures of interval cd of diaphragm

SMS Power of 15.61.

| Rot | d + | c | c − | d | c | d | c | d |
|---|---|---|---|---|---|---|---|---|
| | 24·994 | 24·005 | 049 | 030 | 24·795 | ·798 | 837 | 834 |
| | 998 | 009 | 038 | 030 | 798 | 794 | 839 | 838 |
| | 994 | ·001 | 037 | 034 | 795 | 791 | 833 | 842 |
| | 990 | 996 | | | | | | |
| | 991 | 001 | | | | | | |
| mean | ·993 | ·002 | 041 | 031 | 796 | 794 | 836 | 838 |
| cd | ·991 | | ·990 | | 998 | | 1·002 | |
| backlash | 038 | ·039 | | | 040 | | 042 | |
| | 25·100 | 091 | 132 | 131 | 910 | 899 | 930 | 935 |
| | 100 | 102 | 127 | 131 | 901 | 899 | 938 | 934 |
| | 093 | 109 | 134 | 130 | 903 | 900 | 938 | 939 |
| | ·098 | 101 | 131 | 131 | 905 | 899 | 935 | 936 |
| | ·997 | | 1·000 | | 994 | | 1·001 | |
| | ·033 | ·030 | | | 030 | | 037 | |
| | 25·209 | 213 | 255 | 240 | 48·994 | 990 | 049 | 052 |
| | 208 | 213 | 248 | 237 | 000 | 990 | 045 | 046 |
| | 203 | 205 | 250 | 237 | 006 | 990 | 050 | 043 |
| | 207 | 210 | 251 | 238 | 000 | 990 | 048 | 047 |
| | ·997 | | ·987 | | 990 | | 999 | |
| | 031 | ·041 | | | 048 | | 057 | |
| | 25·310 | 304 | 340 | 340 | 49·000 | 090 | 142 | 144 |
| | 302 | 310 | 329 | 338 | 104 | 100 | 140 | 150 |
| | 299 | 301 | 335 | 340 | 101 | 099 | 147 | 144 |
| | 25·304 | 305 | 335 | 339 | ·102 | 096 | 143 | 146 |
| | ·999 | | 1·004 | | 994 | | 1·003 | |
| | ·035 | 030 | | | 041 | | 050 | |
| | d | c | d | c | | | | |
| | 25·400 | 409 | 430 | 441 | 201 | 204 | 250 | 252 |
| | 400 | 407 | 429 | 449 | 203 | 198 | 254 | 247 |
| | 395 | 403 | 440 | 439 | 209 | 205 | 249 | 259 |
| | 398 | 406 | 433 | 443 | 204 | 202 | 251 | 253 |
| | ·992 | | ·990 | | 998 | | 1·002 | |
| | 035 | | ·037 | | 047 | | 051 | |
| | c | d | c | d | | | | |
| | 24·502 | 489 | 543 | 540 | 312 | 301 | 351 | 352 |
| | 501 | 493 | 540 | 538 | 310 | 294 | 351 | 348 |
| | 506 | 493 | 545 | 536 | 310 | 300 | 346 | 346 |
| | 503 | 492 | 543 | 538 | 311 | 298 | 349 | 349 |
| | 997 | | ·995 | | 987 | | 1·000 | |
| | 040 | | ·046 | | 038 | | 051 | |
| | 24·606 | 605 | 640 | 645 | 391 | 390 | 433 | 427 |
| | 608 | 600 | 649 | 650 | 390 | 390 | 434 | 426 |
| | 605 | 594 | 647 | 650 | 395 | 393 | 433 | 430 |
| | 606 | 600 | 645 | 648 | 392 | 391 | 433 | 428 |
| | 994 | | 1·003 | | 999 | | 995 | |
| | 039 | | 048 | | 041 | | 037 | |
| | 24·713 | 708 | 748 | 746 | 497 | 500 | 536 | 537 |
| | 701 | 700 | 750 | 745 | 505 | 493 | 539 | 533 |
| | 707 | 700 | 745 | 751 | 504 | 501 | 541 | 537 |
| | ·707 | ·703 | 748 | 747 | 503 | 498 | 539 | 536 |
| | 996 | | 999 | | 995 | | 997 | |
| | ·041 | | ·044 | | 036 | | 038 | |

All the Obs equations in the following order

3 measures on d by + rotation
" " " c " + "
" " " c " − "
" " " d " − "

order changed in this copy.

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1867 Apr 26 Friday

| Wire Rot. | c + | d | c − | d | c | d | c | d |
|---|---|---|---|---|---|---|---|---|
| | 49·600 | 600 | 642 | 646 | 64·508 | 511 | 550 | 541 |
| | 602 | 605 | 650 | 648 | 518 | 511 | 540 | 540 |
| | 600 | 608 | 643 | 641 | 515 | 510 | 545 | 546 |
| mean | 601 | 604 | 645 | 645 | 64·514 | 511 | 545 | 542 |
| cd | 1·003 | | 1·000 | | ·997 | | ·997 | |
| backlash | 044 | | | 041 | 031 | | | 031 |
| | 693 | 694 | 741 | 748 | 600 | 600 | 640 | 643 |
| | 707 | 699 | 743 | 745 | 610 | 594 | 637 | 639 |
| | 698 | 699 | 750 | 740 | 602 | 603 | 640 | 635 |
| | 699 | 697 | 745 | 744 | 604 | 597 | 639 | 639 |
| | ·998 | | ·999 | | 995 | | 1·000 | |
| | 046 | | | 047 | 035 | | | 040 |
| | 811 | 810 | 853 | 851 | 704 | 703 | 741 | 735 |
| | 810 | 803 | 855 | 850 | 704 | 708 | 739 | 733 |
| | 811 | 804 | 852 | 850 | 704 | 700 | 730 | 737 |
| | 811 | 806 | 853 | 850 | 704 | 704 | 737 | 735 |
| | 042 ·995 | | ·997 | 044 | 1·000 | | ·998 | |
| | 915 | 916 | 961 | 959 | 033 | 800 | 841 | 031 |
| | 908 | 919 | 957 | 959 | 810 | 808 | 846 | 840 |
| | 916 | 911 | 950 | 954 | 809 | 810 | 838 | 838 |
| | 913 | 915 | 956 | 957 | 810 | 806 | 842 | 839 |
| | 1·002 | | 1·001 | | 996 | | 997 | |
| | 043 | | | 042 | 032 | | | 033 |
| | | | | | 897 | 898 | 932 | 922 |
| | | | | | 895 | 898 | 928 | 930 |
| | | | | | 900 | 895 | 929 | 930 |
| | 64·005 | 005 | 040 | 032 | 897 | 897 | 930 | 927 |
| | 006 | 005 | 041 | 034 | 1·000 | | ·997 | |
| | 995 | 007 | 040 | 035 | 033 | | | 030 |
| | 002 | 006 | 040 | 034 | | | | |
| | 1·004 | | ·994 | | | | | |
| | 038 | | | 028 | | | | |
| | 093 | 090 | 131 | 132 | | | | |
| | 090 | 088 | 124 | 128 | | | | |
| | 100 | 092 | 129 | 122 | | | | |
| | 095 | 090 | 128 | 127 | | | | |
| | 033 ·995 | | ·999 | 031 | | | | |
| | 208 | 201 | 247 | 243 | | | | |
| | 210 | 198 | 242 | 245 | | | | |
| | 210 | 210 | 242 | 244 | | | | |
| | 209 | 203 | 244 | 244 | | | | |
| | ·994 | | 1·000 | | | | | |
| | ·035 | | | 041 | | | | |
| | 305 | 309 | 351 | 347 | | | | |
| | 308 | 306 | 339 | 340 | | | | |
| | 315 | 302 | 343 | 347 | | | | |
| | 309 | 306 | 344 | 345 | | | | |
| | 997 | | 1·001 | | | | | |
| | 035 | | | 039 | | | | |
| | 400 | 399 | 434 | 438 | | | | |
| | 406 | 395 | 441 | 440 | | | | |
| | 408 | 393 | 441 | 434 | | | | |
| | 405 | 396 | 439 | 437 | | | | |
| | 991 | | 998 | | | | | |
| | 034 | | | 041 | | | | |

## Results.

### Interval cd.

| Reading of mic. + | c at | 24 rev. + | 49 rev. Rotation | 64 rev. | mean | 24 rev. − | 49 rev. Rotation | 64 rev. | mean | mean +& − |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | ·991 | ·990 | 1·004 | ·995 | 990 | 999 | 994 | 994 | 994 |
| head. | ·1 | 997 | 994 | 995 | ·995 | 1·000 | 1·003 | 999 | 1·001 | 998 |
| | ·2 | 997 | 998 | 994 | ·996 | 987 | 1·002 | 1·000 | 996 | 996 |
| Rot. | ·3 | 999 | 987 | 997 | ·994 | 1·004 | 1·000 | 1·001 | 1·002 | 998 |
| | ·4 | 992 | 999 | 991 | ·994 | 990 | 995 | 998 | 994 | 994 |
| | ·5 | 989 | 995 | 997 | ·994 | 995 | 997 | 997 | 996 | 995 |
| | ·6 | 994 | 1·003 | 995 | ·997 | 1·003 | 1·000 | 1·000 | 1·001 | 999 |
| | ·7 | 996 | 998 | 1·000 | ·998 | 999 | 999 | 998 | 999 | 998 |
| | ·8 | 998 | 995 | 996 | ·996 | 1·002 | 997 | 997 | 999 | 998 |
| | ·9 | 994 | 1·002 | 1·000 | ·999 | 1·001 | 1·001 | 997 | 1·000 | 1·000 |
| | mean | 995 | ·996 | ·996 | ·996 | 997 | 999 | ·998 | ·998 | ·997 |

### Backlash.

| Reading of mic. | | c | Wire mean | mean | c | d | mean | c | d | mean | mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| head | 0 | 39 | 38 | 38 | 48 | 57 | 52 | 38 | 28 | 33 | ·041 |
| + | ·1 | 30 | 33 | 32 | 41 | 50 | 46 | 33 | 37 | 35 | ·041 |
| Rot. | ·2 | 41 | 31 | 36 | 47 | 51 | 49 | 31 | 41 | 36 | ·040 |
| | ·3 | 30 | 35 | 32 | 38 | 51 | 44 | 36 | 39 | 38 | ·038 |
| | ·4 | 37 | 35 | 36 | 41 | 37 | 39 | 34 | 41 | 38 | ·038 |
| | ·5 | 40 | 46 | 43 | 36 | 38 | 37 | 31 | 31 | 31 | ·037 |
| | ·6 | 39 | 48 | 44 | 44 | 41 | 42 | 35 | 40 | 38 | ·041 |
| | ·7 | 41 | 44 | 42 | 46 | 47 | 46 | 33 | 31 | 32 | ·040 |
| | ·8 | 40 | 44 | 42 | 42 | 44 | 43 | 32 | 33 | 32 | ·039 |
| | ·9 | 30 | 37 | 34 | 43 | 42 | 42 | 33 | 30 | 32 | ·037 |
| | | | 38 | | | | 44 | | | ·324 | ·039 |

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| | | | | | |
|---|---|---|---|---|---|
| w Leonis | $10^h\ 20^m$ | 144·0 | JW | Power no 5. | |
| | | 141·5 | | Companion north | |
| | | 147·0 | | Elongation almost amounting to | |
| | | 150·0 | | separation. | |
| | | 147·0 | | | |
| | | 140·5 | GMS | | |
| | | 141·5 | JW | Power of 861. Star entirely separated | |
| | mean of JW | 145·17 | | | |
| 42 Comae | | 156·2 | JW | Power of 1243. | |
| | | 150·9 | | | |
| | | 149·2 best | | | |
| | | 156·0 | | | |
| | mean | 153·08 | | | |
| | | 161·8 | GMS | | |
| | | 159·6 | | | |
| | | 145·0 | | | |
| | | 143·2 | | | |
| | | 139·6 not so good | | | |
| | mean | 149·84 | | Distance of neither of the above | |
| | | | | > the diameter of one of the webs. | |
| 35 Comae | 11 30 | 124·5 | 50·81 | JW | |
| A B. | | 120·1 | 805 | | |
| | | 125·0 | 785 | | |
| | | 119·5 | 805 | | |
| | | 118·2 | 790 | | |
| | | 120·5 | | | |
| | | 121·30 | 50·799 | 0·118 | |
| | | | 51 03 | | |
| | | | 025 | | |
| | | | 025 | | |
| | | | 060 | | |
| | | | 035 | | |
| | | | 51·035 | | |
| γ Coronae | | | GMS | Could not separate it. Star faint | |
| | | | | through haze. | |
| η Coronae | | | | Star too faint for measurement. | |

mean
-&-
994
998
996
998
994
995
999
998
998
·000
997

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# Index to Vol. 4.

## Double stars observed

| | Name | Σ No. | α 1867 | δ | Dates, observers and pages |
|---|---|---|---|---|---|
| | γ Cassiopeae | 60 | 0 40 58 | +57 7 | Feb 26 S 47 |
| | 95 Ceti | | 3 11 34 | −1 25 | Feb 4 W 31 |
| | 7 Tauri | 412 | 3 26 34 | +24 1 | Feb 27 S 50 |
| N | Found by J W | | 3 40 | −16 53 | Jan 29 W 22 |
| N | " " | | 3 55 | −16 10 | Jan 28 W 17 |
| N | " " | | 4 1 | −16 10 | Jan 28 W 17 |
| N | | 622 | 4 51 12 | +1 28 | Jan 18 W S 5 Jan 19 W 6, 7, Feb 10 W 38 |
| N | θ Orionis | 748 | 5 28 49 | −5 30 | Jan 23 W 11, Jan 27 S 16, Jan 28 W 20, Jan 29 D 23, S 24.25 |
| N | Found by J W | | 6 0 | +5 1 | Feb 1 W 29 |
| N | | 850 | 6 0 45 | −3 59 | Jan 19 W 7 |
| N | | 848 | 6 0 57 | +13 59 | Jan 29 S 22, Jan 30 W S 26, Feb 1 W 28 |
| N | Found by J W | | 6 3 | +5 30 | Feb 1 W S 28 |
| N | W VI 109 | | 6 5 10 | −4 38 | Feb 6 W 33 |
| N | | 901 | 6 17 39 | +10 35 | Jan 18 W 5 |
| N | 11 Monocerotis | 919 | 6 22 22 | −6 57 | Mar 20 W 57 |
| N | 12 Lyncis | 948 | 6 34 29 | +59 34 | Jan 24 W 12 Feb 6 S 32 |
| | Sirius | | 6 39 17 | −16 32 | Jan 23 W 10", Jan 24 S 13, Jan 25 S 14, Jan 27 S 16, Jan 28 W 19 Jan 29 D S 24, Jan 30 S 27, Feb 1 W 29, Feb 5 W 31, Feb 6 S 33 Feb 7 S 37 Feb 22 S 41, Feb 25 S C 44, Feb 26 D S 48, Feb 27 S 50 Mar 18 W 54, Mar 19 W 55, Mar 20 W 57, Mar 26 W 60, Mar 28 W S 62 |
| N | Found by J W | | 6 39 | −20 35 | Feb 1 W 29 Mar 30 W 66, Apr 2 W 70, Apr 3 S 71 Apr 4 S 73 Apr 9 S 76, Apr 21 W 84 |
| N | " " | | 6 40 | −20 40 | Feb 1 W 30 |
| N | W VI 1291 | | 6 42 56 | −15 0 | Feb 6 S 33, Feb 26 S 48 |
| N | Found by J W | | 6 44 | −20 45 | Feb 1 W 30 |
| N | | 1037 | 7 4 33 | +27 27 | Jan 28 W 18, Feb 6 W 32 Feb 15 W S 38, Feb 19 S 41, Feb 22 S 41 Mar 8 W 53 |
| N | | 1060 | 7 9 45 | −9 2 | Feb 1 W 29 |
| N | | 1104 | 7 23 19 | −14 43 | Jan 29 S D W 25 Feb 1 W 30 Feb 10 W 38 Feb 27 S 50 |
| N | Castor | 1110 | 7 26 7 | +32 11 | Feb 15 W S 38 Feb 19 S 41 |
| N | W VII 990 near Procyon | | 7 32 42 | +5 35 | Mar 26 W 60 S 61 Mar 28 W 62 Apr 2 W 70 Apr 3 S 71 Apr 21 W 84 |
| | Found by Mr. Clark | | | | |
| N | Lal. 19927 | | 7 33 4 | +5 32 | Mar 30 W 66 Apr 21 W 84 |
| N | ζ Cancri | 1196 | 8 4 35 | +18 3 | Jan 24 S 13 Jan 28 W S 21 Feb 1 W 29 Feb 6 S 34 Mar 21 S 58 Mar 30 S 68 Apr 11 W 77 |
| N | | 1216 | 8 14 35 | −1 11 | Jan 28 W 21 Feb 1 W 30 Feb 7 S 37 Feb 17 S 40 Mar 19 W 55 |
| N | ε Hydrae | 1273 | 8 39 44 | +6 54 | Feb 26 S 48 Feb 27 S 51 Mar 18 W 54 Mar 19 W 55 Mar 21 S 58 Mar 26 W 61 |
| | Schjellerup No 12 | | 8 45 28 | −10 38 | Feb 1 W 30 Feb 6 S 33 |
| | A N XLII p 333 | | | | |
| | " " 13 | | 9 0 56 | +0 20 | Feb 6 S 33 |
| N | 157 Lyncis | 1338 | 9 12 39 | +38 45 | Feb 22 S 42 Mar 19 W 55 Mar 26 W 61 Mar 28 S 63 |
| N | ω Leonis | 1356 | 9 21 20 | +9 38 | Jan 28 W 21 Jan 30 S 27 Feb 1 W 31 Feb 6 W S 34 Feb 25 S 46 Mar 21 W S 58 Apr 26 W S 97 |
| N | 8 Sextantis | | 9 45 55 | +2 31 | Feb 1 W 31 |
| N | W IX 1296 near Regulus | | 10 1 7 | +12 39 | Apr 19 W S 82 Apr 23 W 91 Apr 25 W S 92 |
| | found by J W | | | | |
| | Regulus | | | | |

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## Double stars observed.

| | Name | Z No | α 1867 | | | δ | | Dates, observers, and pages. |
|---|---|---|---|---|---|---|---|---|
| N | γ Leonis | 1424 | 10 | 12 | 37 | +20 | 31 | Mar 19 w 55 Mar 21 S 59 Mar 26 w 61 Mar 30 S 68 |
| | Schjellerup No 14 | | 10 | 15 | 7 | −9 | 5 | Feb 6 S 33 |
| | Star observed for " | | | | | | | Feb 1 S 31 |
| N | C. of G.H. Catal. 4311 = W-X 274 | | 10 | 16 | 48 | −12 | 42 | Apr 21 w 84 |
| N | | 1431 | 10 | 18 | 35 | +9 | 27 | Apr 23 w S 91 |
| N | 49 Leonis | 1450 | 10 | 28 | 4 | +9 | 20 | Apr 23 w S 91 Apr 25 w 92 |
| N | | 1457 | 10 | 31 | 47 | +6 | 25 | Feb 22 S 42 Feb 25 S 46 Mar 18 w 54 Mar 21 S 58 Apr 19 w 82 |
| N | | 1496 | 10 | 51 | 18 | +13 | 59 | Apr 21 w 85 Apr 25 w 92 |
| N | Star observed for " = Arg Z. +10°,2227 | | 10 | 51 | 18 | +10 | 24 | Apr 18 S 80 Apr 19 w 82 |
| N | ξ Urs. Maj. | 1523 | 11 | 11 | 6 | +32 | 17 | Jan 29 w 25 Mar 19 w 56 |
| N | ι Leonis | 1536 | 11 | 16 | 59 | +11 | 16 | Feb 22 S 43 Feb 25 S 46 Mar 19 w 56 Mar 21 S 59 Mar 26 w 61 Mar 29 S 64 Apr 30 S 68 Apr 18 S 80 |
| N | | 1593 | 11 | 56 | 43 | −1 | 42 | Mar 29 S 65 Apr 19 w 83 Apr 21 w 85 Apr 25 S w 92 |
| N | | 1595 | 11 | 57 | 30 | +8 | 8 | Feb 22 S 42 Mar 29 S 65 Apr 25 w 93 |
| | γ Virginis | 1670 | 12 | 34 | 57 | −0 | 43 | Mar 28 S 63 Apr 5 S 74 Apr 13 S 79 Apr 19 w S 83 Apr 21 w S 85 86 Apr 25 w 93 |
| N | 35 Comae | 1687 | 12 | 46 | 45 | +21 | 58 | Apr 26 w 97 |
| N | 42 Comae | 1728 | 13 | 3 | 33 | +18 | 14 | Feb 22 S 42 Apr 26 w S 97 |
| N | | 1734 | 13 | 13 | 57 | +3 | 39 | Apr 21 S 87 |
| N | P XIII 127 | 1757 | 13 | 27 | 30 | +0 | 22 | Apr 5 S 74 Apr 21 S 86 |
| N | | 1819 | 14 | 8 | 39 | +3 | 45 | Apr 21 S 86 |
| N | | 1832 | 14 | 12 | 12 | +4 | 31 | Apr 21 w 87 |
| N | | 1879 | 14 | 39 | 46 | +10 | 13 | Apr 21 w 87 |
| | ξ Bootis | 1888 | 14 | 45 | 15 | +19 | 39 | Apr 21 w 87 Apr 22 S 89 |
| | η Coronae | 1937 | 15 | 17 | 42 | +30 | 46 | Apr 21 w 88 Apr 25 S 93 Apr 26 S 97 |
| N | γ Coronae | 1967 | 15 | 37 | 10 | +26 | 43 | Apr 21 w S 88 Apr 25 S w 93 Apr 26 S 97 |
| | ξ Librae | 1998 | 15 | 57 | 4 | −11 | 0 | Apr 21 S 88 |
| | 49 Serpentis | 2021 | 16 | 7 | 6 | +13 | 53 | Apr 22 S 90 Apr 25 S 94 |
| | σ Coronae | 2032 | 16 | 9 | 42 | +34 | 12 | Apr 22 S 89 Apr 25 w 93 |
| | λ Ophiuchi | 2055 | 16 | 24 | 19 | +2 | 17 | Apr 22 S 90 |
| | ζ Herculis | 2084 | 16 | 36 | 18 | +31 | 50 | Apr 25 S 94 |
| | 167 Herculis | 2107 | 16 | 46 | 35 | +28 | 53 | Apr 25 S 94 |
| | | 3037 | 23 | 39 | 25 | +59 | 44 | Feb 26 S D 47 |

## Variable star

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| T Coronae | | 15 | 53 | 56 | +26 | 18 | Apr 25 w S 94 |

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## Planets observed

| | | |
|---|---|---|
| Uranus system | | Jan 23 S 9 Jan 27 S 15 Jan 28 W 17 18 Jan 29 S 23 Jan 30 S 27 Feb 6 W 32<br>Feb 7 S 36 Feb 22 S 41 Feb 25 S 45 Feb 26 S 48 Feb 27 S 51 Mar 26 S 61 |
| Mars | | Jan 27 S 16 Jan 28 W 19 Jan 29 S 23 Jan 30 S 27 Feb 6 W 32 Feb 7 S 37<br>Feb 25 S 44 Feb 26 S 48 Feb 27 S 51 |
| | No | |
| Eunomia | 15 | Apr 3 S 72 Apr 11 W 77 Apr 13 D 79 |
| Ios | 42 | Apr 5 S 74 Apr 6 S 75 Apr 18 W 81 Apr 23 W 91 |
| Mnemosyne | 57 | Jan 30 S 27 Feb 28 S 51 Mar 8 S 53 |
| Sappho | 80 | Apr 9 S 76 Apr 18 W 80 |
| | 91 | Feb 7 S 35 |
| Search for | " | Jan 19 W 6 Jan 23 W 9 Feb 6 W 32 |
| Moon | | Feb 7 W 35 Feb 10 W 38 Feb 15 W S 38 Feb 17 S 39, 40, Feb 18 S 40 Feb 22 S 42, 43<br>Feb 24 S 44 Feb 25 S 46 Feb 26 S 49 Mar 11 W 54 Mar 17 W 54 Apr 9 W 76 Apr 11 S W 77<br>Apr 13 S D 79 Apr 21 W 88 Apr 18 W 81 Mar 18 W S 54 |
| Comet 1867 I | | Mar 2 W 52 Mar 5 W 52 Mar 26 W S 60 Mar 28 W 62 Mar 29 S 64 Mar 30 S 67 Mar 31 S 69<br>Apr 2 W 70 Apr 3 S 71 Apr 6 S 75 |
| Search for " | | Feb 27 S 50 Mar 8 W S 53 Mar 14 W 54 Mar 20 W S 57 |

## Miscellaneous.

| | |
|---|---|
| Occultations | Jan 16 W S 3 Feb 12 W S 38 Feb 17 S 39 Feb 24 S 44 Mar 19 S 56 Apr 8 S 76 Apr 9 S 76<br>Apr 18 S 81 Apr 21 S 88 |
| Lunar eclipse | Mar 19 W 56 57 |
| Comp. star of Mar 26 | Apr 4 S 73 |
| " " " Apr 2 | Apr 3 S 71 |
| " " " Apr 6 | Apr 13 S 79 |
| Stars near BAC 2420 | Apr 13 S 78 |
| Zero of position circle | Jan 19 W 7 Jan 29 S 25 Feb 6 S 34 Feb 26 S 49 Mar 19 S 56 Mar 21 S 58 Mar 28 S 63<br>Apr 5 S 74 Apr 21 S 87 |
| Measures of interval c d of diaphragm | Apr 26 S 95 96 |
| Transits for value of screw revolution | Jan 14 S 1,2 Jan 16 S 3,4. Jan 19 W 7,8 |

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June 15, 1877. This book checked except for double stars.

Note May 28, 1880. See note of this date in book N 36, 99. Coincidences occur more frequently in groups, but each case will have to be treated separately, as before.

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Zero of pos. circle.

To Mar 8 inclusive  170° or 350°, 42'

S

After Mar. 8  354° 27' = 354°.45

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