

KG
11365
300

N 17

Original
E. Equatorial Observations

Vol 17
1869 Oct 24 - 1876 May 17

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1869phae.proj..300P

Nov. 12 15^h mean time
 1969 3 meteors, small, with trains lasting about a second each near α Boötis; direction from γ Leonis towards Betelgeuse; one other near the same region; direction parallel with α & γ Leonis, moving south.

7^h 13^m sid. time small meteor between Regulus & α Hydrae, from Perseus.

7^h 26^m; one near α Argus; from Sirius.

7^h 29^m; one started close to α Argus; direction from α Hydrae to α Argus. All these very small, and paths only from five to ten degrees.

7^h 43^m; one from near γ Leonis to a little north of α Leonis towards Perseus.

7^h 46^m; one from north of Perseus towards α Argus.

7^h 51^m; one south of line from α Hydrae to α Argus.

7^h 56^m; one near α Leonis on line from γ Leonis to Betelgeuse; brighter than the former one; path about 10 degrees; last from Perseus, towards α Argus.

8^h 0^m; two near α Hydrae; last from Perseus, towards α Argus.

8^h 6^m; one from near β Leonis to south of α Argus; rather bright; last from Perseus, towards α Argus.

8^h 11^m; very small one south of α Argus; from γ Leonis towards α Argus.

8^h 16^m; bright one beginning south of α Argus; ending east of Betelgeuse; train lasted five seconds.

8^h 18^m; one starting near β Argus; ending near γ Leonis.

8^h 22^m; very small one near α Argus; from γ Leonis towards α Argus.

8^h 30^m; rather bright one near γ Argus; direction from γ Argus to α Argus.

9^h 0^m; small one near α Argus; direction from γ Argus to α Argus.

9^h 9^m; one a little north of α Argus; direction from γ Argus to α Argus.

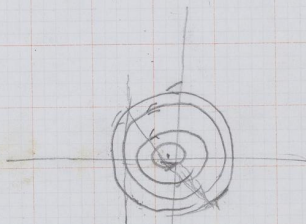
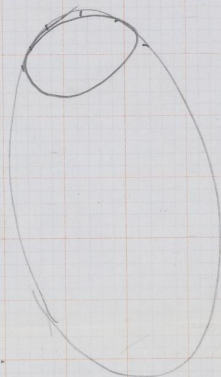
9^h 25^m; one somewhat between α Argus & α Argus; direction from γ Argus to α Argus.

Supernova 10^h 25^m

Chronometer A 424 must sidered times within a few seconds 5.4.11

104.7
107.0
106.2

17.9
106.0
78.5
27.5
117.5
243.2



Keplerian	395	(69)	0	40	5	+	4	30
Mercury	302	(14)	1	10	13	-	6	50
Elpis	379	(59)	1	11	12	+	2	32

W 0	556	9	0	37	33	+	4	34
	644	8	0	38	0		4	34
	647	8	0	38	21		4	28

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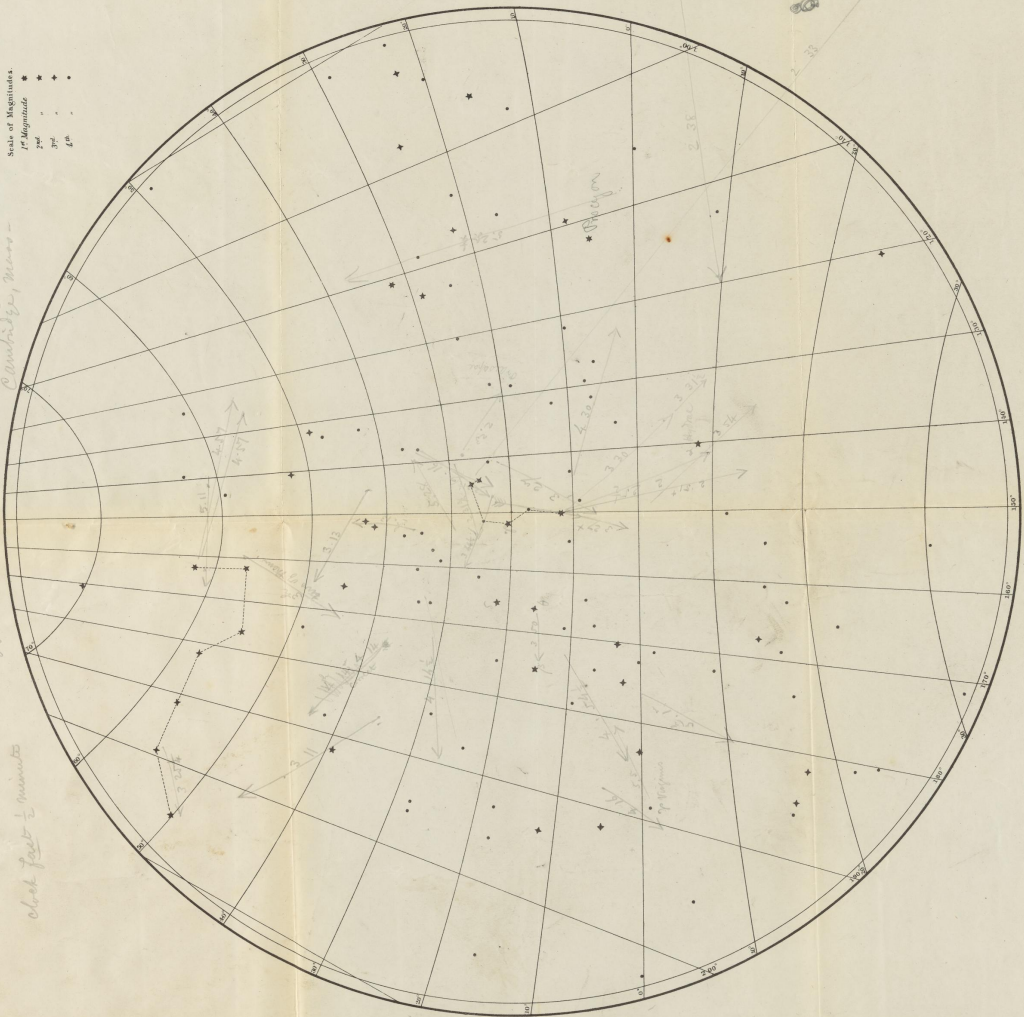
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1869

METEORS OF NOVEMBER
 14th & 15th
 Observed at ~~Harvard Observatory~~
 Cambridge, Mass.

clock face 1 minute

Scale of Magnitude
 1st Magnitude
 2nd -
 3rd -
 4th -



Sirius

1869

Nov 14 M.L.

Weather - 12th 45 - Since 12 o'clock more or less
 Cloudy - Heavy cum - in the East - Zenith
 Clearer - Calm & Pollus I did not ~~observe~~ ^{see} most of the time
 visible - Macdonell Sky Watch.
 Clearing in the West.

Nov 15 2 A.M. - Entirely Clear in the West & South
 & Zenith - Cloudy in North East -
 Sickle clearly visible

2:50 A.M. Well cleared - Some stratus about
 the horizon -

3 A.M. Clouding in the West

3 30 A.M. - Clouding in the East

Station, North 100 Approximate Time	Approximate Type	Where from	Track	Where the disappeared	Remarks
14 12 ⁵ 53	Small				
14 5 2 13	Small	13 to 14 miles	S. E. through deep		Small boat seen at 10:15 no reference to disappearance
5 2 16	10 mi with trail	α deep	through the middle	when it disappeared	
5 2 21 ¹	Small	α deep	through α deep		
5 2 23	Small	κ deep	through α deep		
5 2 25 ¹	Small	α deep	2° S. E. α deep		
5 2 31 ¹	Small	Washed little with 4 small to m	α deep		
5 2 33	Small	10° E. some - 1° S. Oregon	20° S. E. α deep		
5 2 38	Small	between 2 and 5	α deep		
5 2 51	10 mi	α deep	50° S. E. α deep		
5 2 54+	10 mi	α deep	50° S. E. α deep		
5 3 13	3 mi	little end of 13 mi	40° S. E. α deep		
5 3 11	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 13	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 14	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 20	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 22	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 23	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 25 ¹	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 27	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 30	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 31	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 31 ¹	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 40 ¹	3 mi	50° S. E. α deep	40° S. E. α deep		
5 3 41 ¹	3 mi	50° S. E. α deep	40° S. E. α deep		

Asteroids 1, 2, 3

W's 3, 4, 5, 6

Wels and Spectr 4, 8, 24, 32, 38, 52, 53, 54

Low Light 8

Meteors 8, 10

H 18, 30, 32, 36

Doubles 58

New 17, 26, 27, 28, 29, 33, 34, 44, 45, 47, 48, 49, 63, 65, 67, 71

Places of New Doubles 20, 21, 22, 23

Red Star 23

New Neb 24

Instrumental Constants 40

⊙ 46, 50, 60, 61, 62, 64, 65, 66, 68, 69, 70, 71

Sirius 47, 50, 52, 55, 56, 57, 58, 59

⊙ 60, 68

♂ 68

Oct 24th 1869E. P. ed swept over the region of
Libra 81 to get a map of
the starslooked for β Heronia 72H
2. 2. 2. 2. 2.

2

Oct 25 1869

See note (book N. 16, p. 79)
on coincidence.

Went over the same place for
Lepidobare not finding it
went over an additional
space to the southward.

Heronius
(72) 342
+ 12 342
(72) 0 1 *

27	26.5	0 38	79.11
	27.3		78.77
	26.3		78.95
	27.8		78.81
33	26.2	0 42	78.78
	27.1		
46	26.0		
	26.8		
	27.1		
	26.0		
51	27.5		
	26.7		

0.4 is to be subtracted from these times

Note Dec. 27, 1880. The right-hand
column 79.11 etc. is apparently a series of settings
for $\Delta\delta$.

Oct 27 1869

looked for Telescopium
& Winnecke's Comet
not finding either

Oct 31

1869

Coincidence 52.651

E P d Zero of Pos Coincid

77.5	52.648
77.8	667
77.9	646
77.5	654
77.6	640
77.7	52.651

Corr of Chronometer 0.50

*h
H 4909

B d belong E & W Pgr B in all
another Neb. E P r about 3' S
resembles large one
no spectrum visible

*h 105

no spectrum seen by G. S. P. or E. P. d
J W thinks there is some light

Search after E. Missnecke
found h 353 which is about the
faintest object visible owing to
brightness of sky

*Note July 24, 1877. The symbol h is used here and frequently elsewhere in these books to denote Sir John Herschel's Catalogue for 1860. There could apparently be no h 4909 in the proper sense; see Phil. Trans. Vol. 154, Part I, p. 7. h 105 must be taken to mean the same nebula called more correctly h 44 in book N 36, page 16.

Nov

487

1869

Coincidence 52,753

EPA

Zero of Pos

72.1	52 758
72.9	750
78.0	753
72.0	753
72.9	752
<u>72.58</u>	<u>52 753</u>

Weather too thick for observations

Sunday Nov 7 1869
 EPA Looked for α Winnicke but
 could not see anything
 though the atmosphere appears
 to be tolerably clear

Monday Nov 8th 1869

EPA Opened dome but clouds
came up and increased
so as to prevent observations

Wednesday Nov 10

I made a long and careful search for
Minnick's ~~or~~ led to the con-
clusion that it was too faint
to be seen

Thursday

Nov

11

1869

Coincidence

52.716 C.B.P.

"Mean"

52.709 C.B.P.

52.712

36 Androm

65 Dabo * T 00

Zero of Pos Council

251.2

52.72

70

72

73

71

716

Pos

172.0

173.3

170.2

171.5

173.1

172.0

Dist

52.82

wide

82.5

82

52.822

82

72

10

52.53

55

53

52.537

716

537

118

.106

179

242

391

.130

1128

1360

680

52.85

80

82

52.823

823

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EPA 06

See very bad

Pos

170.6

172.0

173.0

171.5

172.5

172.5

Dist

52.565

.53

493

493

493

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Coun EPA 06

52.703

702

68

725

702

708

52.7090

Nov. 12, 13, 14, 1869

Friday Nov 12

1869

E P A

Zodiacal

251.5

251.8

251.8

251.2

251.7

251.6

For meteor observations, Nov. 12 to 14 inclusive,
see two pages beyond.

Zodiacal light, Nov. 14, very distinctly
about 16^h mean time. Observed carefully with the
Browning hand-spectroscope, by J. J. W., who saw
a continuous spectrum, but no bright lines: a result
at variance with Argström's observations.
The light presented the form of a
triangle, the base of which extended (approximately)
from Arcturus to Spica (~~and~~ or rather between the
points on the horizon where these stars rose. Its
apex was not far from Regulus. Its sides seemed
to be concave towards the south, towards which side
it appeared to lean.

2.0
1.78

1869 Nov 15 Monday

Coincidence Nov. 11
52.712Androm 259 C.S.P. 56
= $\Sigma 228$ Nov separated $\Sigma 375$

Stars very dim

4th Power

Comp n/h

Stars 100

Seeing extremely
bad

Pos

204.5

204.3

~~197.0~~ ref

201.7

204.1

207.0

204.26

Dirb

52.93

89

95

Good considering

Comp invisible

Nov. 14, 1869. (See also three pages back.)

Observers for meteors, J. Winlock, E. S. Austin Arthur Searle; J. Bradford recorded observations: the chronograph was connected with a breakcircuit key in the dome, held by one, or another of the observers, who made a rattle on being notified to do so by another, or when he himself saw a meteor. After the rattle signifying that a meteor had been seen, three rattles close together were sometimes made to show that the observation was thought close enough to use for parallax. The three observers were sometimes stationed one on each balcony of the dome; at other times two were on the east or west balcony and none on the northern one.

The night was cloudy until about 14^h mean time: for remarks on weather see end of observations.

The time is given in the record to the nearest minute by Mr. Bradford's watch, set before observations to agree with the East Clock which was fast about 30 seconds.

The statement "no record" has no reference to the chronograph rattles and means only that no remarks were made on direction, etc. "Conformable" means appearing to radiate from γ Leonis or that vicinity.

No. of observation	Mean Time of observation	Mag. of meteor and length of its course	Points of		Other remarks.
			Beginning.	Ending.	
1	12 ^h 53 ^m	Small			S. E. through β Lepus.
2	12 ^h 13	Small	β Leon. Min.		Between λ & μ Urs. Maj.
3	16	1 st (with trail)	α Lynx	In the Sickle	(where it faded out.)
4	21 ^{1/2}	Small	α Lynx		Through μ Leonis.
5	23	Small	κ Leonis		Through Praesepe.
6	25 ^{1/2}	Small	α Leonis		Passed (or ended?) 2° S. E. of α Hydrae
7	31 ^{3/4}	Small	West of Sickle		North parallel to μ β Leonis.
8	33	Small	{ A little west of β Leon. }		Passed (or ended?) 3° S. of Sirius.
9	38	Small	10° E. of Sirius		" " 15° S. of Procyon.
10	51				{ Between ϵ & δ Cassiopeae & a little below to the N. W. of β Cephei }
11	51	1 st	α Leon.		Passed (or ended?) 5° S. E. of Hydrae
12	15 0	3 rd	{ A little east of β Urs. Maj. }	{ Between χ & ν Urs. Maj. }	
13	0	3 rd			
14	11	3 rd	5° W. of α Can. Ven.		Directed towards Betelnash: ended 5° from that
15	13	3 rd	5°		{ Appeared between Castor & Betelnash: direction from Castor towards Betelnash }

Nov. 14 1869 continued: meteors observed.

Mean Time of obs.	Magn. of meteor	Length of course	Other remarks.
15 ^h 14 ^m			Here there was an erroneous setting on chronograph.
17 20	Faint		Rapid: & Leon. to & Urs. Maj.
18 22			No record.
19 23	Faint	12°	β Urs. Min. towards β Cassiop.
20 25 ¹ / ₄			Alcor & Benetnasch: not conformable.
21 25 ¹ / ₄			No record.
22 27			λ Leonis: 2° S. of Regulus.
23 27			From middle of sickle through Regulus: 3 extra rattles.
24 30			From & Leonis to 5° N.W. of & Hydrae.
25 31	Faint	5°	Direction; Meizan through ε & υ Drae.
26 31 ¹ / ₂			Like meteor observed 15 ^h 30 ^m
27 40 ¹ / ₂			From zenith to Regulus: not conformable.
28 41 ¹ / ₂			From zenith towards Praesepe.
29 44 ¹ / ₂			Centre of sickle: by ξ (ξ?) Leonis.
30 45			No record.
31 45			From & Persei: through β Androm: 3 extra rattles.
32 50	3 ^d	10°	From υ to β Leonis
33 54			From υ Leonis: centre of its course a little S. of & Hydrae.
34 55			From γ through Jupiter & ξ Ceti: 3 extra rattles.
35 55 ¹ / ₂			No record.
36 55 ¹ / ₂			No record.
37 56 ¹ / ₂			No record.
38 59			From ε Persei through & Arietis.
39 59			No record.
40 16 ^h 1 ¹ / ₂			Parallel to course of meteor observed 15 ^h 59 ^m
41 3 ¹ / ₂			No record.
42 5 ¹ / ₂			No record.
43 8	2 ¹ / ₂		South of Benetnasch towards & Draconis.
44 14			Appeared 10° N. of Coma Ber. Direction from γ Leon to Benetnasch.
45 14 ¹ / ₂			No record.
46 14 ¹ / ₂	2 ^d		Centre Leon. Min. to Coma Ber.
47 15 ¹ / ₂	3 ^d	20°	Procyon through belt of Orion.
48 16	4 ¹ / ₂		From 5° N. of γ Virg. to a little E. of γ Virg.
49 22 ¹ / ₂			} No record: seen in West: all approximately conformable.
50 22 ¹ / ₂			
51 22 ³ / ₄			
52 23 ¹ / ₂			
53 28 ¹ / ₂	Small		Unconformable. Conformable: seen in N.W.

Meteors observed Nov. 14, 1869 continued.

Mean Time of obs. Mag. of meteor Length of course

Other remarks.

54	16 ^h	28 ¹ / ₂			Just N. of & Can. Ven. Extended to star of 3 ^d mag. E. of Betelgeuse.
55		28 ³ / ₄			No record.
56		30	5 th		From & Leonis through head of Hydra.
57		34 ¹ / ₄			Conformable: in W.
58		34 ¹ / ₂			Erroneous rattle on chronograph: followed by long rattle to mark it.
59		35			Conformable: in W.
60		35 ¹ / ₄			Conformable: in W.
61		37 ¹ / ₄			Unconformable: in E.
62		37 ¹ / ₂			Conformable.
63		38 ³ / ₄			Conformable: in W.
64		40 ¹ / ₂	Very small		Conformable: in W.
65		44			Unconformable: in W.
66		43 ¹ / ₂			Unconformable: in W.
67		44 ¹ / ₄			Conformable: in W. direction W. from Aldebaran.
68		54 ¹ / ₂	3 ^d	14°	Appeared about midway between & Leonis & & Virg. Direction from & to & together.
69		55	2 ^d		Between Betelgeuse & Bellatrix towards Rigel.
70		57			} Nearly together: in Urs. Maj.: radiating from Dubhe: direction Easterly.
71		57			
72	17 ^h	1	4 th	10°	& Virginis towards Corvus
73		1 ¹ / ₂	Small		
74		1 ³ / ₄	Small		
75		2			2° S. of Capella: conformable.
76		3			Unconformable.
77		5	5 th	7°	Close to & Virginis: conformable.
78		9 ¹ / ₂	3 ^d		Unconformable: towards & Leonis.
79		11	2 ^d		Started a little N. of Urs. Maj.: (passed between & & Urs. Maj.: 1°) of the way from & to &. Ended 10° close by. Three extra rattles.
80		12			Unconformable. In the E.
81		17	3 ^d		Unconformable. Half way between Sirius & belt of Orion.
82		25 ¹ / ₄	1 st (with trail)		Started 10° S.E. of Procyon; ended 5° N.E. of Castor; 3 extra rattles.
83		28	4 th		(On the prolongation of the line through & & & Leonis.) direction Easterly.
84		29	3 ^d		Unconformable.
85		35	5 th		South of & Hydrae.
86		36	4 th		Southern horizon 15° altitude: direction E. Parallel to horizon: motion slow.

& Leonis noted as being a radiant point for several meteors.

84 meteors in all: two erroneous rattles.

34 of these were laid down on a chart by Mr. Bradford: the time of each stated on the chart. These plottings were made from the descriptions above.

Remarks on weather on next page

4
 Meteor observations Nov. 14 1869 continued.

Remarks on Weather.

Mean Time
 12^h 45^m

Since 12^h more or less cloudy: heavy
 cumuli in the E. Zenith clearer. Castor,
 Pollux, Sirius, visible most of the time:
 marked sky overhead: clearing in the W.

12^h 0^m

Entirely clear W., S., & Zenith. Cloudy in
 N.E. Theickle clearly visible.

12^h 50^m

Well cleared: some stratus about horizon.

15^h 0^m

Clouding in the W.

15^h 30^m

Clouding in the E.

16^h 0^m

Quite clear all round: some few clouds
 in the Eastern & Northern horizon.

17^h 0^m

Clear: a few clouds in the Western horizon.

18^h 0^m

Well clouded over: only a small clear spot
 in the S.E.

18^h 0^m

Observations discontinued.

For observations on zodiacal light
 see 6 pages back.

Nov. 15 1869.
 For observations of this date see 5 pages back.

1869 Mar 17th Wed

Opened dome but it
suddenly clouded up again
owing to the change of temperature
the telescope and every thing in
the dome was covered with moisture

Meteor observations Nov. 14 1869 continued.

Remarks on Weather.

Mean Time
12^h 45^m

Since 12^h more or less cloudy: heavy cumuli in the E. Zenith clearer. Castor, Pollux, Sirius, visible most of the time: mackerel sky overhead: clearing in the W.

12^h 0^m

Entirely clear W., S., & Zenith. Cloudy in N.E. The sickle clearly visible.

12^h 50^m

Well cleared: some stratus about horizon.

15^h 0^m

Clouding in the W.

15^h 30^m

Clouding in the E.

16^h 0^m

Quite clear all round: some few clouds in the Eastern & Northern horizon.

17^h 0^m

Clear: a few clouds in the Western horizon.

18^h 0^m

Well clouded over: only a small clear spot in the S.E.

18^h 0^m

Observations discontinued.

For observations on zodiacal light see 6 pages back.

Nov. 15 1869.
For observations of this date see 5 pages back.

1869 Mar 17th Wed

Opened dome but it
suddenly clouded up again
owing to the change of temperature
the telescope and everything in
the dome was covered with moisture

Thursday Nov 18 1869

Coincidence Nov. 19
52.738-

1 Manguli 4th Power
6 Oct * 11 B

Seeing not good

0 00
267.7
268.2
267.0
267.6
267.7
267.64

Dist
43.045
1.8 rej
07
0.2
0.5
0.6
0.49

1.4.00
3.0 1.8
7.25 3.40 8.0
3.33

Friday Nov 19 1869

Coincidence
52.735

65 Piscium 4th Power
E.P.A. obs
L Min

Pos
224.8
~~226.0~~

Dist

E.P.A. obs
Q x 11 00

226.0
228.5
~~228.4~~
224.6

± 278 ?

~~4th~~ 5 11 00
C.S.P. obs
* slightly
Elongated

94.3
85.0
87.6
85.6
88.7
88.2

Dist

Cassiope x 5 11 00
C.S.P. obs

A + B
75.6 comp pos
73.9
75.7
74.6
73.9
74.74

52.94
59.89
91
93
88
52.91

* 5 11 00
rather diff
to obs on acct
of other *

A & B
52.7
52.8
52.2
52.0
52.3
52.4

53.49 too close
50 too close
54 better
49 close
52
53.5-1

Coincid

52.735
73
73.5
73.3
74
73.5

B + C
58.0
58.7
57.5
57.5
58.1
57.96

53.67 vij
645 vij
71 vij
78 vij
74.5 too close vij
64 vij
69 vij
72 close
73
53.735

Clouded up suddenly
preventing further obs.

According to Pos. angles and other
two distances dist of A & B should

Nov. ~~12~~²⁰ continued 1869

Coincidence
Nov 19
52.735

~~Cassiopea~~ J. H. O. O.

Jupiter

4

G. S. P. O. O.

Distance from
Pz limb of
planet to
preceding
edge of pre-
ceding cyclone

P. as

180.0 miles

Pep to belt

53.43

180.1 other

53.48

measure

53.47

.47

at

1^h 12^m

Sid time

to other cyclone

54.22

or edge

slight cloud passing over
made all the appearances
more distinct great
improvement in seeing

Another spot

56.69

56.53

1^h 20^m

Equatorial
Diameter

57.75

65

Polar Diam

57.47 wide

57.44 close

Dist of N band
to S pole 4

55.88

to N edge of
middle band

55.39 Poor

Nov 22 1869

25-1.6
16-1.6
130.8

Double distances; coincidence not required.

* 2 21 59 J W also
d-2 42 * 4 + 06

Pos

128.1
131.4
132.1
129.2
133.2
130.80
161.6
29.8

Comp or
9 4 10

Dist

53.08 73.5 345
52.38 70 355
70 3.5
53.01 60 2.75
52.41 3.25
0.60 3.0
53.06 03.5
52.42 30 0.64
64 32
53.07 335
52.40 best 3.26 0.67
67

mean 3.26
24
26
06
09

Oct 22773 J W also
* 2 11 06
Comp fol

239.2
238.5
239.6
238.4
238.5
238.84
148.1

8 4 10

4th Power

238.84
241.6
102.8

53.32
52.17
1.15 5.75
53.34
52.23
1.11 5.55

5.65 mean

53.325
52.23
1.095 5.47
5.59 mean

6 rounded up suddenly

1.15
1.11
1.095
55
1.118
559
5.48

70
60
64
67
1
6.52
6.89
3.26
3.19

Nov 24 1869 Wed.

coincidence
52.741

Pass Dist
bar of Chron OS.

W O 802 C. I P cannot
separate it

* 2 0ⁿ 42 not found.
✓ + 2 23

O at 531

Mag 8.8 11.

~~8.8~~ Obs.
3rd P. comp

284.6 rough

290.3

282.2

281.7

283.6

283.4

281.9

282.56

(23)

53.99

.93

.96

Poor made?

quite close
unit may
be wrong

large star
reddish yellow
small white

S preced.

x large

moving v much

large star looks
larger, should not ex-
pect it to be double.

Belzen 751

2 8th obs.

Mag 9 + 10^{1/2}

Comp nf

3rd P. Stars 1100

276.8

7.3

7.2

280.0

277.5

277.36

53.54

64

65

59

58

Stars v.
diffuse

Seules * 9^{1/2} 11 17^{1/2}

OS P obs

1 46 59.5

0 3 11

2 1 43 38.5 ✓ + 1 55
2

too faint to measure
Circle 88° 5' 0"

other *

1 57 28.5

87° 25' 0"

0 10 32

2 35

for comp

1 46 46.5

Nov 24 1869

* 2 1 44 * 3 1 06
 0-1 16 Comp or

134.8
 134.8
 130.4
 137.2
 133.8
 134.6

53.76 rough
 .95

greenish white
 circle

2 12 13 271° 13' 20"
 0 29 50.5 - 2
 2 1 42 225 ✓ = -1 15

Star disc by
 P.W. 186 of Jan 29
 3h 40m - 16° 53'

EP 1 ch
 8" P * 1100

225.8
 221.3
 221.8
 224.0
 223.5
 223.28

55.16
 01
 08
 10
 00

Time 2h 50m 21.3
 RA 3 40 22

Dec. By large circle 16° 54' (Corr of -2 applied)

52.11
 23
 24
 24
 25
 25
 52.11

* 2 3 55 39 P 1100
 0-16 10 * 1100
 comp
 * faint

215.4
 213.5
 217.8
 215.8
 215.6
 215.6

53.75
 73
 69
 73

3 2 2 46 3 24 18
 23 26 16 23 27 42
 2 3 56 30 3 56 30

Nov 24 1869

* 4 1 6 5 P obs
-16 10 * H 06 3dp
Comp R

elg 9.7-10.

259.0

258.1

259.0

258.9

262.5 rej

259.5

258.9

5-1/2 72

.55

too close

.70

.79

.57

3 20 19.5

20.5

23 19 24

d 4 0 55

Nov

25

1869

Coincidence
52.739

EPA on

AZ + 2° 32' Red star C.S.P. & EPA

~~H.C. (29)~~ No. 9
Triple of S

Place

Stop Watch 627

Triple

0 00.0

AZ + 2° 32'

0 20.3

Triple S of AZ + 2° 32' by 3'

This is not that star but another.The true C9
foundBright * 12^m 8others 15^m perhaps only 14^m

Sf AZ + 2° 32'

A & B 5^m. p.A & C 25^m. np 45°.

AZ + 2° 32'	0 00.0
C9	17.7
	0 17.7

Diff dec 2 1/2'

Stop Watch

R

in 4^m went 3 59.5Corr. +01 for 1^m

Coincidence S P obs

52.76

75

75

71.5

72

73.9

Zero of Pos * trembling 71.6

6 15.	t	/	35	32	
		/	20	1	66 20 0
2	a	15	31	-23	40

C26

C24

Duplicate not detected, seeing four & clock in 4^m 30^s
Comp sf. Dist 20" May 13.

1869 Nov 28

Nebula

1	44	19
1	12	
0	32	19

p B.S.R. gmb M.

2	1	0
1	28	
0	33	

2 22

29 20

0 33

Note June 11, 1880. The first observation on this page seems to be one of G.C. 103. The second description, recorded on the lower half of the page, is presumably to be preferred. Perhaps the first observation may be one of G.C. 91 or 98, but in any case it is probably not one of any fourth nebula.

3 Nebulae. 1st follows $\frac{1}{2} + \frac{1}{2}$ and is 5 or 6 n. 1st
 2nd following $\frac{1}{2} + \frac{1}{2}$ 84 by 6. and 1 n.
 2nd = foll by 3 and 5.5

1 † f, p, s, r, p s c h f i l = * h 91

2 † p h, p s, r, v s m h M = * h 98.

3 † f, s, r, g p m h M = * h 103

* Note July 24, 1877. The numbers 91, 98, 103, refer to the Catalogue for 1866, (Phil. Trans. Vol. 154, Part I), not to Sir John Herschel's previous catalogues, to which the symbol h properly applies. This appears from the reference above to the Durchmusterung. See also note in book N 36, page 16.

† Note July 24, 1877. These descriptions were probably dictated by the observer (presumably C. S. Peirce) at the telescope, and recorded by Mr. Alden or some one else who did not understand the distinctions between the small and large letters in Sir John Herschel's system of abbreviations. They should apparently read F p S R p o m b M; p B p S R v s m b M; F, S, R g p m b M.

Dec 8 1869

Coincid.

52.75-

76

75-

75-

74

52.750

Don't *

Dec 7 1869

Star K 2 21 14^s comp S dist 50"

2 1 35
d 0 19 39

$\delta + 37'$

another double ful $\frac{3}{4}$ of $9'$
same declination

2 23 59^s
1 55 57
0 28 2

Dec 8 1869.

Star by E.P.A.

Follows a $6\frac{1}{2}$ mag star $18'$

S. of 66 Ceti $\frac{3}{4}$ of a degree

2 5 38

& following it one minute

Mags $10\frac{1}{2}$ & 12 dist $10''$ comp foll.

Another ^{$10'$ n.f.} follows same $6\frac{1}{2}$ mag

10 & 12 mag. dist $15''$ comp foll.

E.P.A. obs.

Foll 66 Ceti $15'$ is another double
comp s.f. - dist $40''$ mag 11 & 13

28

Dec

10

1869

Coincidence
52.746.

C. S. P. obs.

Az + 4° 25' found to be double

Coincid

52.75

3d Power

77

76

73

72

.746

Dec

11.18 1869

15-1 37
28. 23

Coincidence 52.760

Dome opened 7 30

E.P. Oct. obs

A 3^h 11^m 38

0 0^h 32^m 32

2 2^h 48^m (31)

28° 23'

very pretty double star 7^m - 8^m on
comp of 3-4 dist

2 2^h 48^m 0 - 28° 23'

several wide doubles in the vicinity
~~Closed~~ 11^h

Coincid 3d power 52 77

74

76 7

76

765

2

52.760

Closed 11^h

look for a star 3 1/2^m
preceding this V 6^m S
H 35-35-

1869 Dec 31.

Jupiter

Appearance seems to J.W. very remarkable and different from anything he has ever seen before. The equatorial band is of a brick red colour mottled with bright spots over the middle & bounded by an irregular dark line on ~~both~~ either edge. There is another narrow reddish band to the north distant from the large band by about $\frac{1}{3}$ the width of the latter and at the same distance to the south the surface begins to be mottled like the moon seen through a very small telescope. That mottling covers the whole of the remaining portion of the southern hemisphere.

C. S. P. Would call the colour of the bands rather pink than brick red.

1870 June 21

O. J. S. S.

1870

1870 Jan 3.

Orionis

C.S.P. sees distinctly the black streaks heretofore observed by him. Comet seeking equinox.

Jupiter

Appears much as on the 31st ultimo.

1809phae:proj.:3008

1870 Jan 9 Sunday

CSP obs.

* fol min 62½ 13³ 2 5' 8

on other double

New Double R.A. without corr. chron 2^h 40^m 56^s
Dec same as Ceph 2 40 13 A
E

Star Double

4	14	58
4	19	31
4	34	29

105° 58

-15 58 C

Alps 11 11
Dip of off little 5
Dist 10"

3	55	27
3	55	23

 2

Min 79

4	17	45
4	22	11
3	55	34
3	55	30

 2

106° 8'

-16 8 C

1870 Feb 12

Double discovered by C.S.P. R.A. $6^h 40^m 31^s$
 $-20^\circ 30'$

in a cluster mag 8 9×10
 dist $4''$ preceding

$2'$ dist from principal star of cluster of.
 This cluster is h 1454.

Another double by C.S.P. Preceding last $3^m 35^s \frac{1}{2}'$ n.
 This * agrees in pos angle with Win 90 but comes 1^m sooner
 probable mistake in mag 9 & 11 Pos. 225° Dist $6''$

Another double by C.S.P. Following last $2^m 35^s 2' S$
 This in Win 91 p & f. $10''$

Dec. of first of these by Freeland $20^\circ 35'$

Another $\delta - 20^\circ 42'$
 $RA = 7^h 19^m 34^s$

* 7^m dist $2'$ comp n f

M F last about $20'$ another 8^m red *

comp 9^m blue dist $10'$ S P

N of this first $10'$ a little pr * 9^m

comp = M F SP nearly N & S
 $10''$ white

red * $\delta - 20^\circ 38'$

$7 \begin{array}{r} 51 \\ 0 \end{array} \begin{array}{r} 28 \\ 31 \\ 20 \end{array} \begin{array}{r} 165 \\ 12 \end{array}$

other * $\delta - 20^\circ 42'$

$7 \begin{array}{r} 52 \\ 0 \end{array} \begin{array}{r} 41 \\ 33 \\ 19 \end{array} \begin{array}{r} 16 \\ 25 \end{array}$

1870 Feb 13th Sunday

C. S. Pol.

Diff about 5' N of double in cluster 1st of
last night dist 10"

α 6^h 25^m 29^s δ -20 35

} Note July 30, 1881.
This is h 2321

chp δ -20° 24' α 6^h 54^m 40^s

1870 Feb 16

Coincidence 52.7560 (5 settings)
 " 52.7234 (10 ")
 Mean 52.734

Jupiter.

A.S. Obs.

To naked eye as red as a ~~orange~~
 Equatorial belt wider than usual.
 Afterwards A.S. thought Jupiter reddish white
 not so red at 8^h mean time as at 7^h. Spins looked less
 blue than usual: the colors may be only atmospheric effects.

C.S.P. thinks Jupiter the colour of Capella i.e. clear
 yellow.

A.S. Obs. 3rd P.

Eyes perf. to belts

Lines parallel to belts.

Position 271.8
 271.0
 272.4
 271.6
 272.2
 ———
 271.80

Diameter of planet

48.99
 97
 94
 88
 91
 ———
 938

S of planet from S of equatorial belt

51.36
 535
 50
 53
 36
 ———
 51.457

Width of equatorial belt

53.49
 .42
 54
 39
 50
 ———
 53.468

1890 Feb. 16

Vogel's α & β Belt.

54.33

41

26

42

52

54.388

1870 Feb 20

M42 Neb
in Orion

E P + Obs.

Edges not so sharply defined as in Bond's drawing
 Nebular ^{place} up in belt away from any bright star.

1870 Feb 21 Mon 4th mp 10^o

blowing a gale from NW

observations to determine true
value of Micrometer
micrometer reads 65.00

on a star whose Declination
is $-13^{\circ} 22'$ $1.66 \ 38'$
 $13 \ 25$ by finder

3d Panel

Feb. 22 1870 Tues.

Name α τ θ
 Observations to determine the
 instrumental constants of the
 Great Refractor
 Observer C S Pierce Recorder E P Austin
 1st Power. Telescope E of Pier

B46 2109 I $327^{\circ} 39' 59''$ 6 36 22.8 23 58 18.3
 III 39 59

B46 2147 I $327^{\circ} 57' 17''$ 6 41 17.8 23 57 58.0
 III 56 20
~~147 56 20~~

B46 2183 I $327^{\circ} 51' 14''$ 6 47 14.0 23 59 35.5
 not the $\times$ III 50 17 *Painted about 3' too far S*

A 22⁺ 1604 I 0 $36' 7''$ 6 56 28.0 0 0 40. 2 S of 1
 40.8 3 S of 2
 52.9

Az -0 1457 7 1 22.6 23 58 53
 $\times$ ful 1 48.0
 59.2 *low*

Telescope reversed

-0 1571 28.4 22.6 7 11 22.6 23 59 36
 5.8 45.2

31.5 22.4 12 44.1 0 0 57.5
 9.1 13 6.5
 15.6

-0 1630

7 19 23.0 23 59 52
 28.8
 45.0

1635.0 P the
 star really observed

last

low

3 min
 now read
 44.4

Feb. 22, 1870

-0 1630

7 20 31.1 4 4 49.
 37.0
 53.5

GA 62399 III 30 23 0
 II 120.22 54
 IV 300 24 30

7 24 26.0 23 39 28.

B 2443 III 32 15 18
 II 15 16
 IV 13 54

7 33 2.9 0^h 1^m 10^s 02 of 2

* III 31 28 58
 II 29 56
 IV 28 28

7 37 41.5 23 58 52.8 drift in taken
 3" to fur
 or

* II 49 29 18

7 38 20.0 0 2 7.5
 45.0
 48.4

+ 42 ~~1780~~
~~1819~~

75 47° 38' 13" 8 19 9 23 48 27.5

+ 43 1815

Wednesday Feb 23 1870

Name

α

τ

θ

Fr black 6ⁿ 3^m 0^s = B43 236 6ⁿ 15^m 56.5^s

Continuation of obs to determine
Instrumental errors.
Telescope W of Pier

B46 2109 III 32 25 0"
II 122 24 52
IV 302 23 28

6 38 10.0 0 0 7.5

B46 2447 III 31 51 13/
II 124 51 0
IV 301 49 44

6 43 7.5 0 0 39. 4" too fine on

B46 2483 III 32 9 2
II 122 8 54
IV 302 2 30

6 48 6.7 0 0 30.5

+0 1604

6 55 23.6 23 59 31.

+0 1604

56 6.5 0 0 44

-0 1487

7 3 47.5 0 1 14

Telescope reversed

-0 1571

7 12 40.0 0 0 54.

-0 1630

7 19 20.2 23 59 23.5

B46 2399

7 27 32.8 0 0 52

not there

B46 ~~2445~~ 238 29 46
I 328 29 50
III 148 29 6

7 37 42.0 23 59 6.5

Feb 23, 1870.

II 310 30 2 7 56 5-48 OK 10 19.
 I 40 31 20
 III 220 30 41

Thrid Feb 25 1870

Double * $8\frac{1}{2}$ 12 comp at n of $10''$

157 20 τ 6 5 25
 δ - 22 40 θ 0 40 40 α 5 23 25
 δ 5 24 45
 τ 1 20

following this about $25'$ of arc and $.2'$
 3 is a 9th mag * with an exceedingly
 faint companion.

triple * δ - 13 52 $\pm$

τ 7 1 40.5 n n 3
 δ 0 10 21. α 6 50 9

166 10
 - 13 50

B pr $1''$ C N $4''$ $6.7\frac{1}{2}.9.$

* measured to right by mistake
 for 3 hrs elay

δ 68 13
 21 47

τ 9 43 49.
 δ 9 42 29
 θ 22 24 48
 11 47 41

τ 9 44 40.
 δ 9 43 20
 22 25 39
 11 17 41

March 3 1870

Min 84 ifound $\alpha = 5^h 59^m 52^s$
 $\delta = +5^\circ 1'5''$

Pos about 304° mag 9 + 11 Dist 10
probable mistake of 100° in previous
measure of position

new double by C.S.P.

$+5^\circ 28''$

$7 \quad 26 \quad 36$
 $1 \quad 25 \quad 10$
 $6^h \quad 1^m \quad 26^s$

mag 11 & 11 Pos 26° Dist $12''$ $3'$ N of a
loose cluster. $5' 5''$ and pos $3'$ is an
other dup. Mag 10 + 12 Dist $8''$ Pos 85°
south of a brighter star in a loose cluster
min 86 not seen

March 9 1870

Sun at ~~21~~^h $21\frac{1}{2}$ m. to. with
 * Quincy comet seeker
 groups of spots as in diagram. Spot at a
 large.

S.
 A obs.



Preceding
 port

* Note Aug. 18, 1877. The telescope used in these observations was really the old finder of the East Equatorial, mounted on the old stand of the Bowditch comet seeker, and afterwards lent to Prof. Leavering. It was called the Quincy comet-seeker in this place by mistake.

March 9 1870

Observer E P et. Examined Sirius very carefully companion very well seen clearly a reddish star and fainter than last night a much greater difference than can be explained by the change in the atmosphere.

Examined carefully on all sides of Sirius, by bringing the star just outside of the field of view there is evidently no other companion within one or two magnitudes of as bright as the shown one unless much nearer the principal star.

On further examination of other stars observed last night am not sure but the increased motion of atmosphere may account for the diminished brightness of the companion.

Double * found by J W γ 9^h 26^m 0^s 156° 11'
 δ 1. 20 0 - 23. 49
 δ 8 6 0
 δ - 1 32
 δ 8 4 28 corrected 2

Note Aug. 5, 1881.
 Oc. 8136-8 near
 this place, but
 apparently 0.7
 farther north.

2d double * dist $1\frac{1}{2}''$ pos angle app reading 20°
 mag 9.11.

9 48 0 151 34
 1 8 0 - 28 26

Note Aug. 5, 1881
 Oc. 8913?

comp S Pr dist $5'' + 7\frac{1}{2}''$ 10
 9 58 0 158 31
 0 54 0 - 21 29
 9 4 0
 9 - 1 32

Oc. 9368?

March 9 1870

saunders
by J.W.

comp nearly = $8\frac{1}{2}$ $8\frac{1}{2}$ fol

10	7	18	170	55
0	55	20	-9	5
9	11	58		
	-1	32		

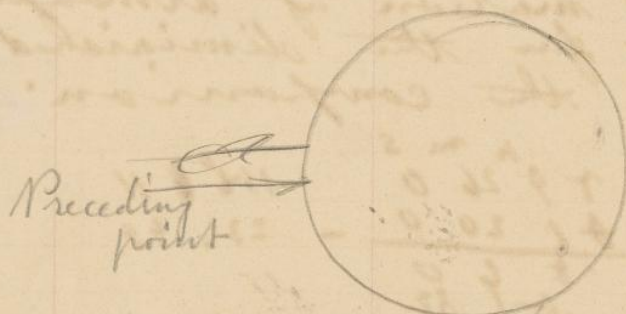
{ Note Aug. 5, 1881
Possibly
Sol. 18325

A.S. obs. at 22^h sun spots scarcely changed since yesterday. Spot following a larger.

March 10 11 12 cloudy,

March 13 at 23^h 45^m

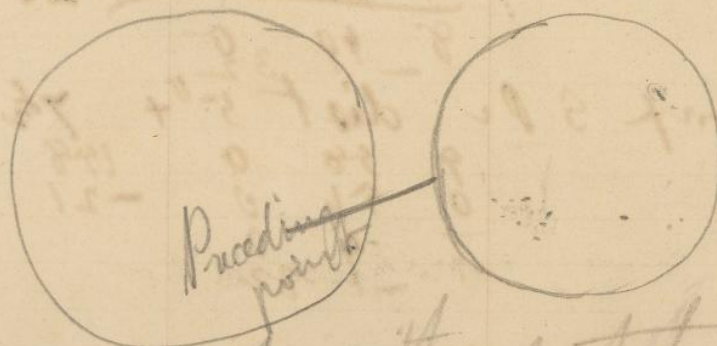
A.S. obs.



Large group of spots visible without telescope.

March 14 at 23^h

A.S. obs.



Large group without telescope looks larger but fainter than yesterday

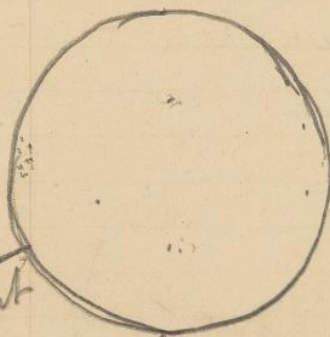
March 14 1870

Double * $19^h 25^m 14$ $84 \quad 21$
 From $42 \quad 34 \quad 32$ $-5 \quad 39 \quad \checkmark$
 E. P. A. $46 \quad 50 \quad 42$
 $\quad \quad -2 \quad 55$
 $26 \quad 47 \quad 47$

& Con Min $10^h 17^m 3$
 $2 \quad 41 \quad 38$
 $7 \quad 40 \quad 25$
 $7 \quad 32 \quad 30$
 $10 \quad 18 \quad 2$
 $\quad \quad 42 \quad 38$
 $17 \quad 40 \quad 24$

 $10 \quad 19 \quad 54$
 $2 \quad 44 \quad 29$
 $7 \quad 32 \quad 30$
 $10 \quad 16 \quad 59$
 $\quad \quad 2 \quad 55$

A 5 obs. March 19 1870
 Sun spots at $0^h 5^m$



Preceding
 point
 none very conspicuous.

March 19

1870

Observer G. P. A.

Sirius examined with powers
 1 to 5 1st power no companion seen
 2^d power comp very well seen clearly
 reddish and quite small about 9^m
 with 3^d and 4th powers seen somewhat
 better. with 5th power not seen at all
 it would seem that the light is intrinsically
 less than on March 8 and 9 though the
 seeing is as good as on the 8 and
 better than the

Obs. A. S.

March 21 1870

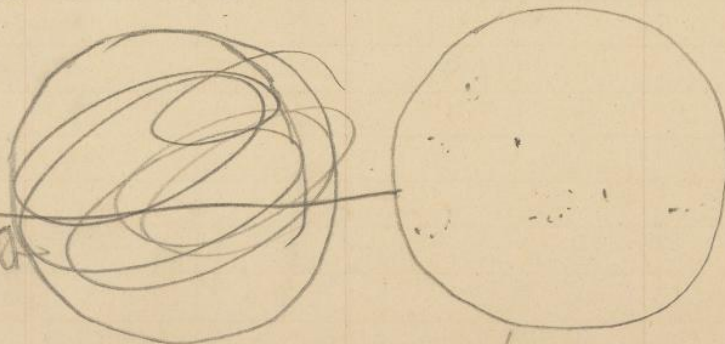
at 22^h

sun spots

all small

Preceding
point

March 22 1870
 sun spots at 22^h

Preceding
point

none large

March 23 1870

Asob.

Sun spots at 22^h

~~Preceding~~
Point



The groups coming on
seem important

~~March 2~~

52)

March

24

1870

Coincidence March 25
52.685

E P A observer Examined Sirius with the
powers 2 to 5 but the seeing was
so bad that the companion could not
be seen.

h 1672 P.F.S. somewhat brush shaped
SB ~~at~~ or f side terminates at a $\times$ 9 m
bright $\times$ 6 1/2 mag or f 4' dist pos. 45°

4.0 40 .645 epoch A 6 1/2 mag $\times$

.75
14
15
11
1.7 9.5
40.359

Ad S
9.8
9.5

neb for

h 1721 seen
1725 seen

Ad S
33.0
32.2

Note Sept. 15, 1880.
52.685 9.8
40.359 9.5
12.326 9.2
247 9.7
120.79 9.55
 $\Delta S 120.79$ $\Delta \alpha 9.55$

Star is Delta 8686-7
1870 8 27 33.0 15 40.3
neb. 1870 8 27 23.4 15 42 3.8
neb. 1860 8 26 55.7 15 40 3.2

S
33.0
32.0
mean 32.55

1721 P.B., v.S., R, some ball in but 2x for brighter
1725 F.S., A, 2x ball.

1870 March 24

✓ 2

	m_1	m_2	m_3	m_4
h 1721	9 ^h 3 ^m 0.2	3 ^m 7.8	5 2.0	5 7.8
1726	* 3 56.5	3.0	57.8	4.0
1727	4 10.1	16.0	11.3	17.0
	22.0	29.0	23.3	29.5

1726 $\mu F, S, R$, small n
1727 $\mu F, S, R$, small n. nucleus

Note Sept. 15, 1880.			
Star f G.C. 1721	G.C. 1726 f G.C. 1721	G.C. 1727 f G.C. 1721	G.C. 1727 f G.C. 1721
56.3	69.9	81.8	81.8
55.2	68.2	81.2	81.2
55.8	69.3	81.3	81.3
56.2	69.2	81.7	81.7
Mean 55.88	Mean 69.15	Mean 81.50	Mean 81.50

1730 1726 4.80 54.5
1730 5.80 5.2 not 1730 dup x
19 10.7 neb ?

double x but appears to be nebulous also

1726	480	540
1730	20.0	25.5
	32.0	31.5
	11.0	17.0
	42.5	48.0
	31.5	31.4

1730 $\mu F, S, R$ esp - n f 45°, pcholla

1743 not there.

Slight aurora and sky rather bright.

1744 = 3 little stars.

1740 $\mu F, S, R$ pcholla.

1721 - 1725 40

84.06
83.25
83.15
67
44

March 24 continued

E P A Ols

Neb h 1992

pB pL R gcBM

Neb h 1998

FSR mBM N

Neb h 1994

Suspected

Neb h

New Neb.

Preceding Neb h 1998 Perhaps a nebulous star
 np h 1998 450 Dist 2'
 Half way between 1998 & 11 mag*

Neb h 2012

iF suspicion of a cloud. L iR rgv/bM *6's r

Neb h 2159

pB pL IE sp & nf smBM

Neb h 2160

pB pL iR glBM

Neb h 2161

pF pS E n as little sfnp. scBM

Neb h 2162

little nebulous

New Neb.

8's 3' h 2161. vF pL iR gr/bM *1' np neb.

Neb h 2163

sq h 2161. F pS iR v/bM

New Neb

S'n of h 2163 nebulous star

Neb h 2157

F pL iR gr/bM

2156

Not seen

2155

eF S IE sp & nf

2139

pB pL E p & f. glBM

2174

vF L iR not bM

2355

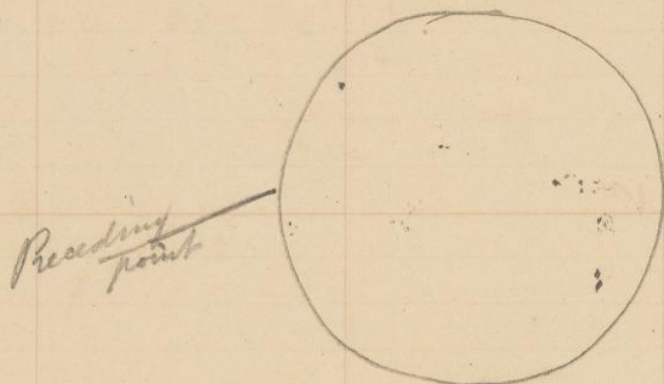
Not seen Not there

2361

Seen. Red right

A.S. obs.

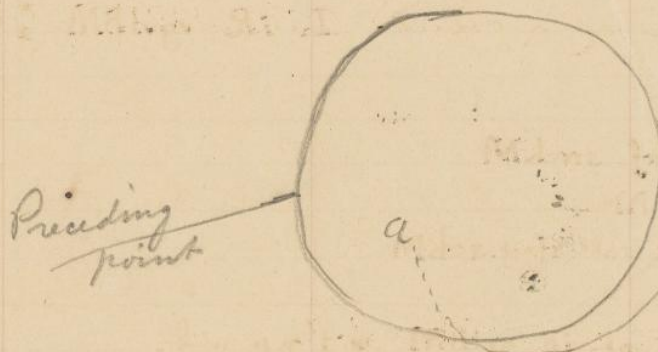
March 24 1870
Sun spots at 22 h.



Little change
since
yesterday

A.S. obs.

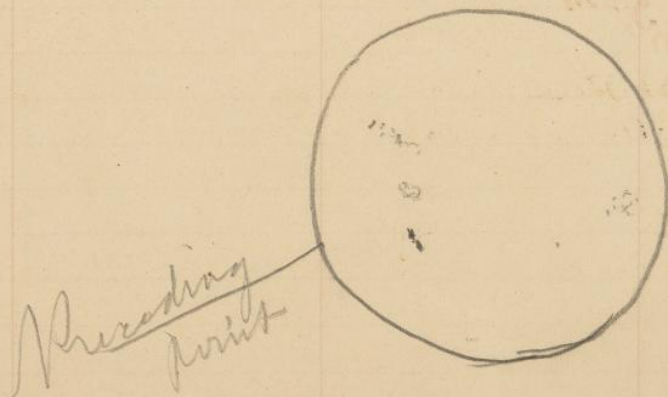
March 25 1870
Sun spots at 23 $\frac{1}{2}$ h.



No spots near a
where there were
some yesterday.

A.S. obs.

March 30 1870
Sun spots at 22 h.



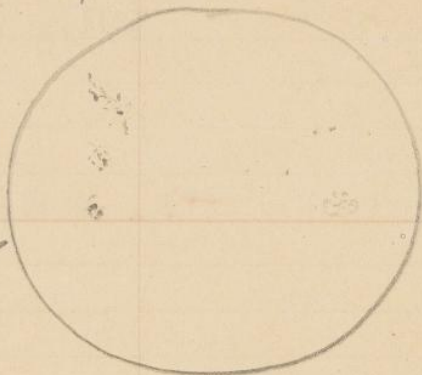
Not much
change in
the chief spots.

56

March 31 1870
Sun spots at 22^h

A.S. obs.

~~Preceding point~~



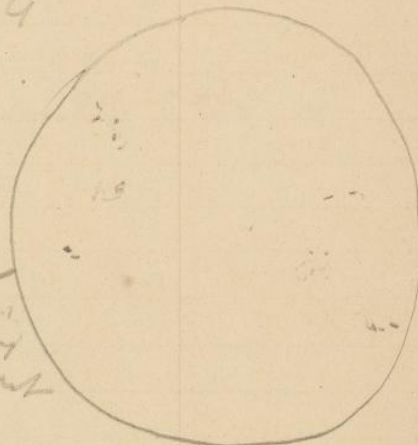
March as yesterday

April 1 1870^h
Sun spots at 21^{3/4}

A.S. obs.



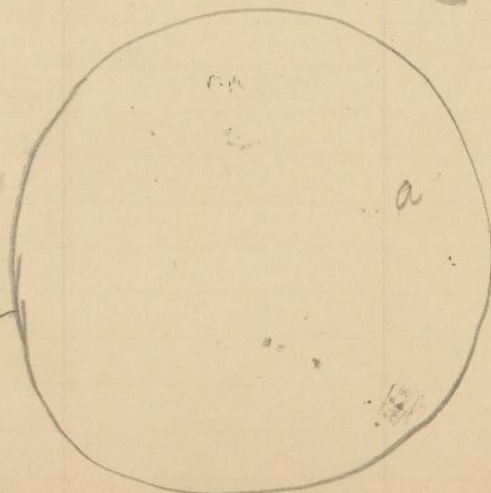
~~Preceding point~~



April 4 1870^h
Sun spots at 23^{1/2}

A.S. obs.

~~Preceding point~~

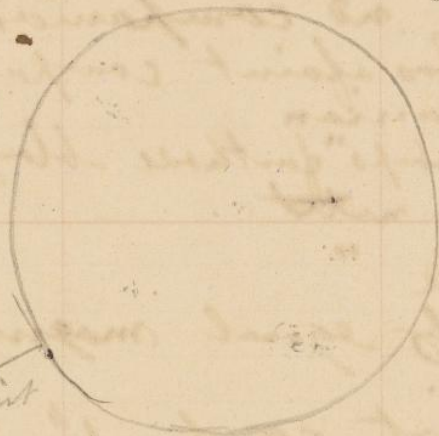


a seems to be
a group
faded out
since the 1st

April 7. 1870.

4.5. obs.

Sun spots at $22\frac{1}{2}$



Preceding point

[Signature]

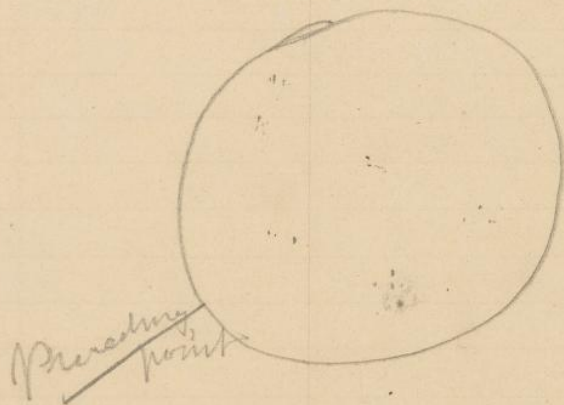
58

1870 April 8.

Y.W. & C.S.P. obs.

- 3 Corvi examined, no companion seen
 1 " " has a faint companion 20"
 7 " no companion
 * fcl 11 Corvi perhaps "fantasie elonga" N of
 8 Corvi nothing noted.
 E " "
 2 " not double "
 5 " 2 stars nearly equal magnitudes
 fcl * elongated.
 m * has faint comp 1" 2 mgs smaller

AS, obs. Sun spots April 8 at 22 $\frac{1}{4}$ h.



Sun spots April 9 at 22h

AS, obs.



April 10 22^h

Clouds too thick to make out sun spots

April 12 1870.

N.S.S. obs. Moon

OC

The valley running from Hershey opens into the crater.
 The gap across the wall being perfectly clear. Webb represents
 the crater base as forming a barrier across the valley. Looked for
 the line of craters in the Mare Serenitas but illumination not good.

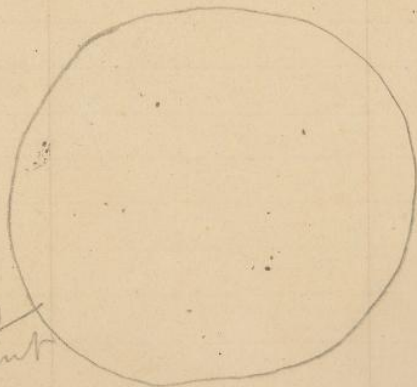
A.S. obs.

Sun spots at 22^h_{1/2}

No large spots

April 13. 1870

A.S. obs.

Sun spots at 22^h_{1/4}

~~Preceding~~
~~point~~

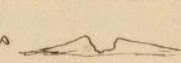
April 13, 1870

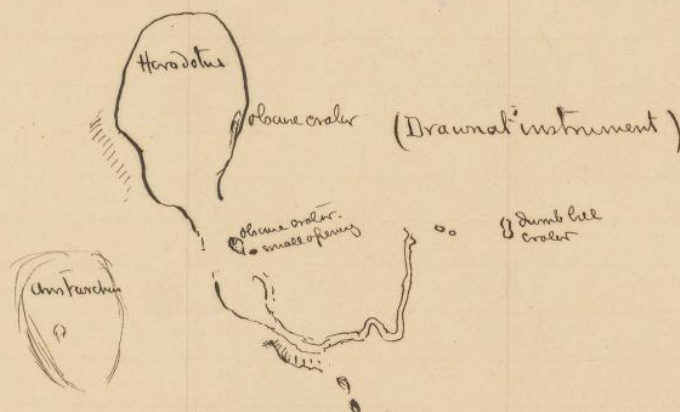
8.30 P.M. seeing good steady

N.S.S. obs.

Herodotus seen twenty four hours after onset of last night shows the Channel or "sill" separated by a ridge from the crater. There is however a clear indication that the valley once extended into the crater and has been filled in some way by a sort of Dam across it. There is a very small crater on this Dam from which may have flowed the material which built the barrier across the channel.

N.S.S. Dam of small crater
erecting
(not draught instrument)

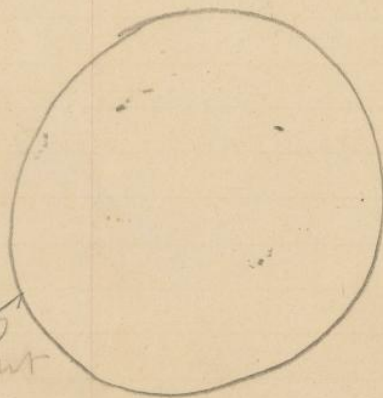
It seems to me that the sill is the centre of an old lavastream which has fallen in a section and be like this 
This is a very common form in terrestrial lava streams.



April 14 1870

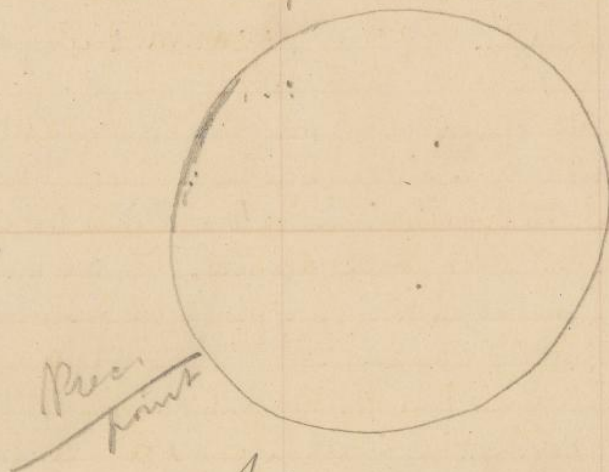
A.S. obs.

Sun spots

22 $\frac{1}{4}$ Pneumatic
print

April 15 1870
Sun spots at $22^{\frac{1}{2}}$

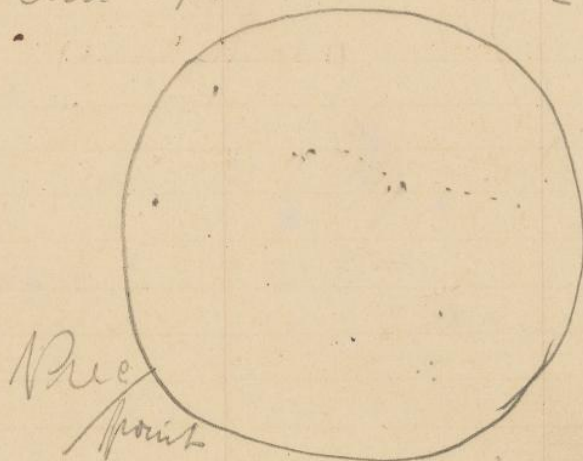
A. S. obs.



April 21 1870

Sun spots at $22^{\frac{1}{2}}$

A. S. obs.

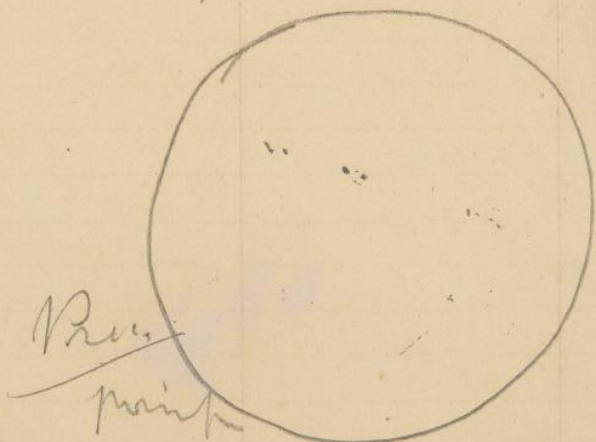


All very small

Pencil point

Sun spots at $22^{\frac{1}{2}}$ April 22 1870

A. S. obs.



Pencil point

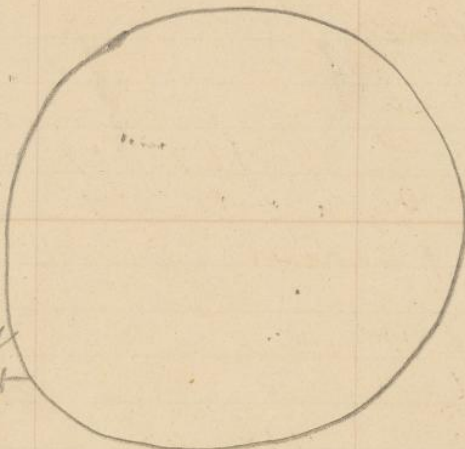
62

April 23 1870

Sun spots at $22\frac{1}{2}$

A.S. obs.

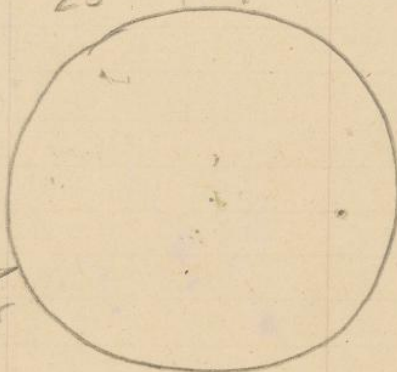
~~Preceding
point~~



A.S. obs.

April 25 1870 sun spots at $22\frac{1}{4}$

~~Pre.
point~~



April 26 1870

* found by C P A.

$$\begin{array}{r} \text{h} \quad \text{m} \quad \text{s} \\ \text{T} \quad 10 \quad 36 \quad 26 \\ \text{+} \quad 0 \quad 19 \quad 20 \\ \hline \text{2} \quad 10 \quad 17 \quad 06 \end{array}$$

$$\begin{array}{r} 167^{\circ} 19' \\ -12 \quad 41' \\ \hline \end{array}$$

in h

* 7 11 comp S f dist 5"

* found by J M

$$\begin{array}{r} \text{h} \quad \text{m} \quad \text{s} \\ \text{11} \quad 2 \quad 16 \\ \text{+} \quad 1 \quad 2 \quad 0 \\ \hline 10 \quad 4 \quad 16 \end{array}$$

$$\begin{array}{r} 149 \quad 48 \\ -30 \quad 12 \\ \hline \end{array}$$

circle
Pasa 295⁰
comp ex f
dlegs 6⁰ 12 dist 6"

* found by J M

$$\begin{array}{r} 11 \quad 12 \quad 14 \\ \text{+} \quad 1 \quad 8 \quad 9 \\ \hline 10 \quad 4 \quad 1 \end{array}$$

same as comp in
last dlegs 10-13 dist 8"

at 9^h a meteor of 9^m passed SW very rapidly

time 11 50 22 die 160 29' double star E P. A.
 height 1 11 20 - 19 31 8 1/2 10 Comp n.f. dist 12"

$$\begin{array}{r} 10 \quad 35 \quad 2 \\ \hline \end{array}$$

* found by B. P. A.

$$\begin{array}{r} 12 \quad 3 \quad 46 \\ \text{+} \quad 1 \quad 24 \quad 0 \\ \hline 10 \quad 39 \quad 46 \end{array}$$

$$\begin{array}{r} 161 \quad 2 \\ -18 \quad 58 \\ \hline \end{array}$$

comp P. 1 1/2⁰ as less
9.10

12 22 10

$$\begin{array}{r} 1 \quad 40 \quad 40 \\ \text{+} \quad 10 \quad 41 \quad 30 \\ \hline \end{array}$$

$$\begin{array}{r} 165 \quad 28 \\ -14 \quad 32 \\ \hline \end{array}$$

≤ 1474

* found by J M

$$\begin{array}{r} 12 \quad 38 \quad 42 \\ \text{+} \quad 1 \quad 20 \quad 0 \\ \hline 11 \quad 18 \quad 42 \end{array}$$

$$\begin{array}{r} 163 \quad 4 \\ -16 \quad 56 \\ \hline \end{array}$$

3-9 dist 3"
comp f.
almost due E.

Grater is T 12 53 19^s

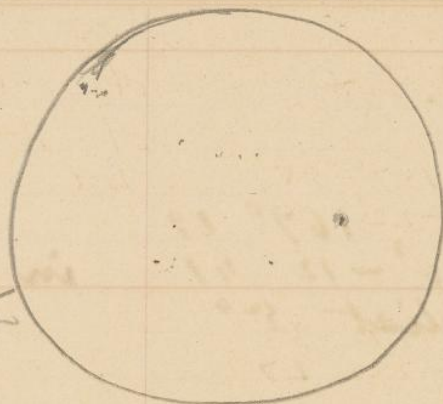
$$\begin{array}{r} \text{+} \quad 1 \quad 40 \quad 15 \\ 11 \quad 12 \quad 54 \\ \hline 12 \quad 53 \quad 8 \end{array}$$

64

A.S. obs.

April 26 1870 Sun spots at $22^{\frac{hr}{2}}$

Preceding
point



April 27 1870

double * triple E. P. A
 T 10 23 57
 A 0 28 32
 L 9 55 25
 157° 55'
 -22° 5'

A 7 h 9 c 11 N f
 A-B 12"
 B-C 50"
 *B *C
 *A

double
 T 10 35 40
 0 34 37
 10 0 49
 157 33
 -22 27

N 10° p 8 11
 dist 15"

10 46 57
 0 32 11
 10 14 40
 157 4
 -22 56

S 30° p 8 11
 dist 25"

A. S. obs.

Sun spots at 22 $\frac{1}{4}$

Preceding
point

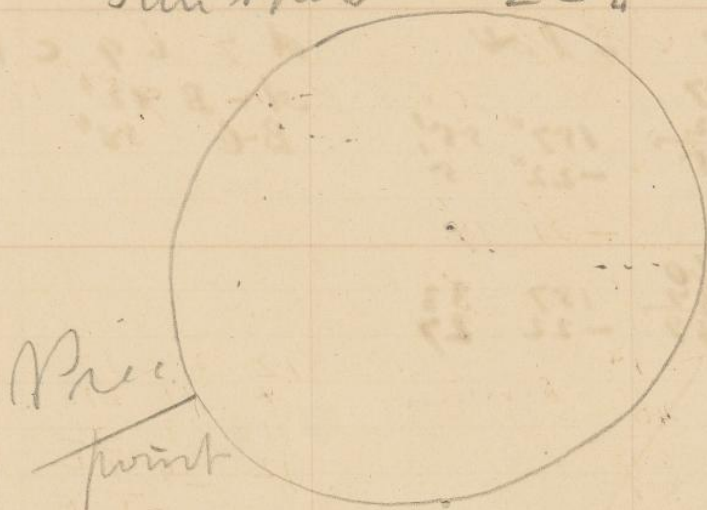
April 28 22^h

A. S. obs.

Sun under
clouds
& spots
indistinctly
seen

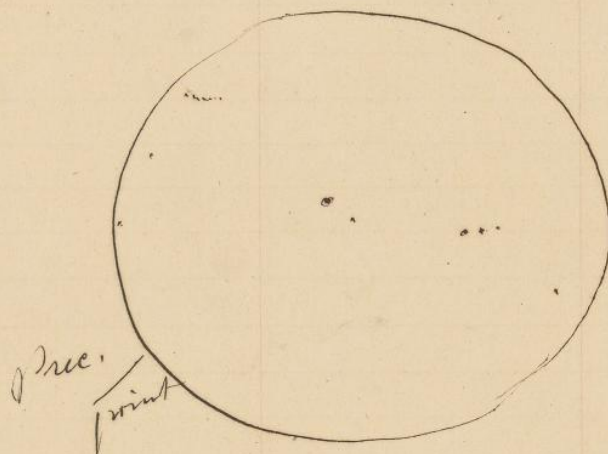
66

April 29 1870
Sun spot 22 $\frac{1}{4}$



A.S. obs.

April 30 1870 22 $\frac{1}{4}$



May 1st 1870

* found By GSD
 fal of 2 x 0

camp no 9^{am} 12^m 7^s

$$\begin{array}{r} T \quad 12 \quad 3 \quad 55 \\ 0 \quad 58 \quad 50 \\ \hline 11 \quad 5 \quad 5 \end{array} \quad - 21^{\circ} 19'$$

Chrom - hour angle

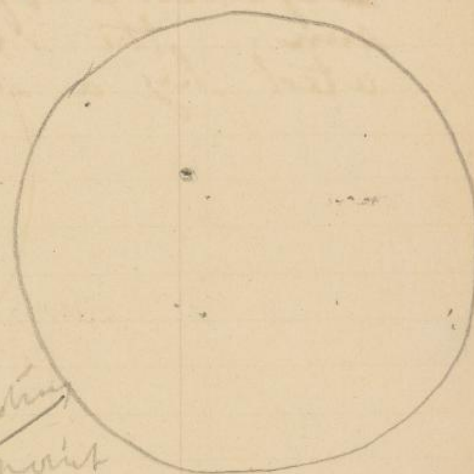
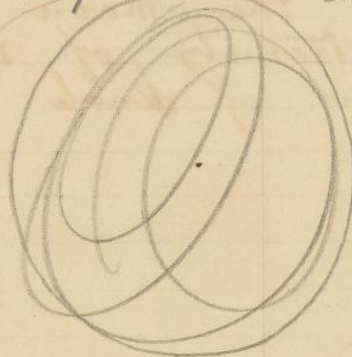
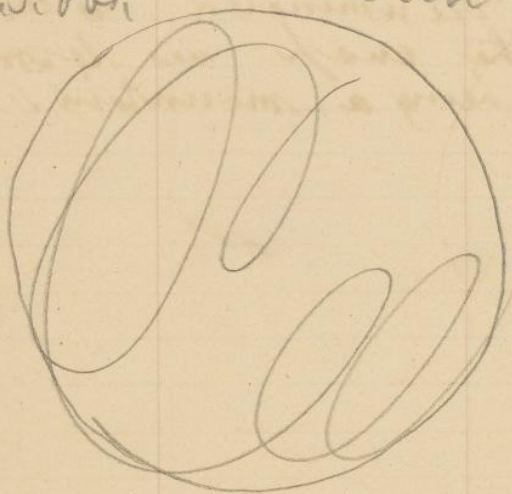
12 ^h	16 ^h	15
1	32	40
10	43	21
11	12	51
29		30

8 Craters

12	24	17
1	11	21
11	12	51
12	24	12
45		

Adobe

Sun spots at 22^h 1/2



Measuring
 point

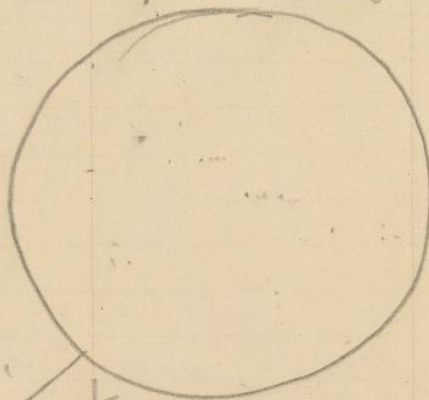
May 2^d 1870

§ E.P.A. observer from gibbous @ some traces of a darker part as indicated in the figure but the planet too unsteady to see it except by glimpses also noticed by J.W.

§ a very narrow crescent of light looking for a 6^m * which was expected to be occulted a bright point was noticed at some distance from the extreme end of the southern cusp and at least 10° to 15° distant which was at first taken to be the star but as the night came on it was found to be a portion of the moon illuminated by the sun. the extremity of the cusp was terminated by a sort of knob being a mountain.

A.S. obs.

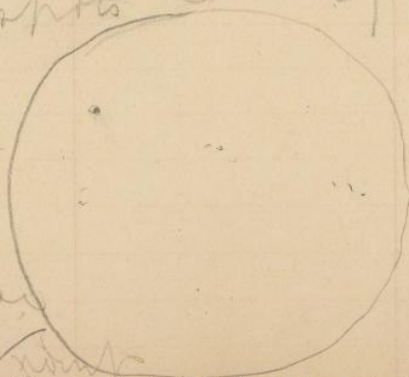
Sun spots at 22^h



Prec.
Point

A.S. obs.

Sun spots May 3 at 22^h₄



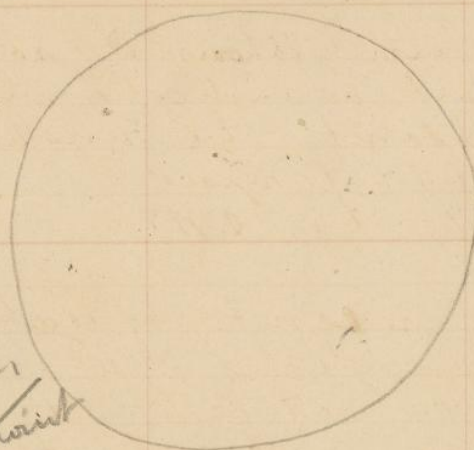
Prec.
Point

Sun under
thin clouds.

May 4 1870 Sun spots at $22^{\frac{1}{2}}$ ^h

A. S. obs.

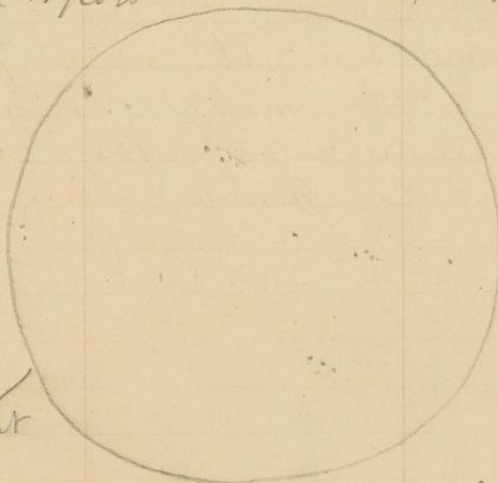
Base
point



A. S. obs.

Sun spots at $22^{\frac{1}{4}}$ ^h May 5 1870

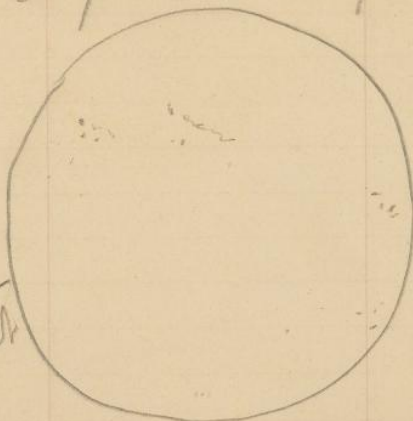
Preceding
point



May 6 1870 $22^{\frac{1}{2}}$ ^h cloudy

May 14 1870 $23^{\frac{1}{2}}$ ^h

Pre
point

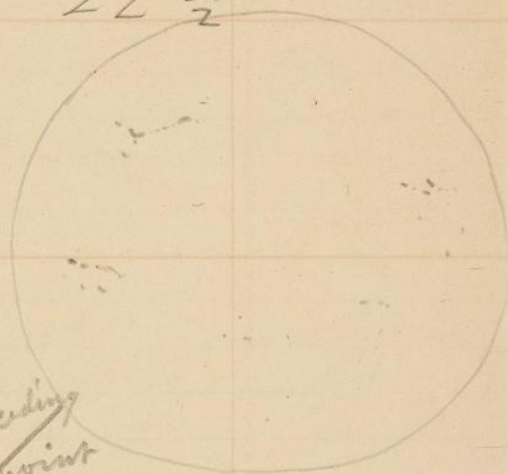
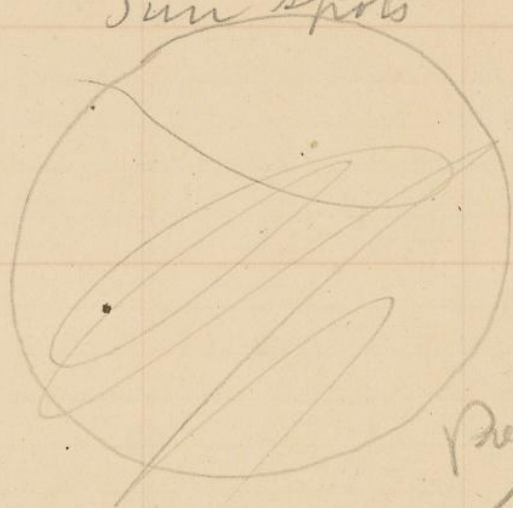


70

May 15 1870
Sun spots

22 $\frac{1}{2}$

A. S. obs.



Receding
point

1870 May 17

Double

9x10

1800 54

CSP 06

Dec - 17° 25'

R.A. 13^h 20^m 54^s

Double

CSP 06

7^h 7^m

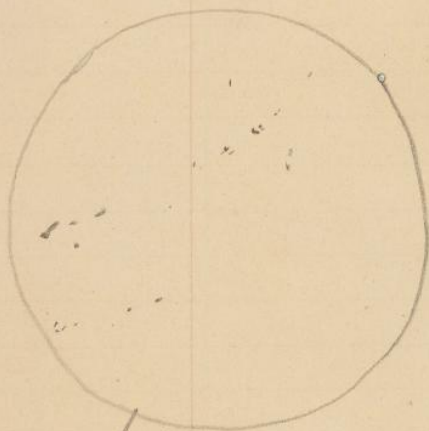
10" Post 150°

R.A. 14^h 15^m 29^s

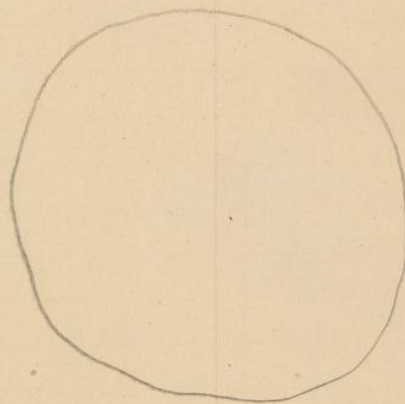
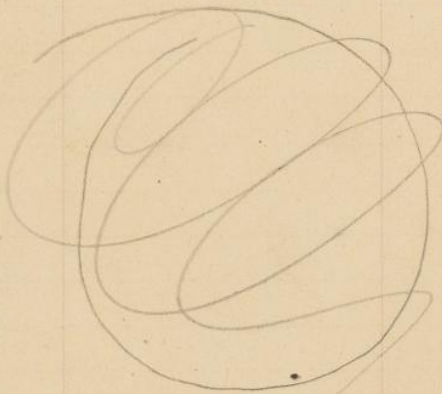
- 7° 10'

62 Virginis old -
Libra

h₁
Sun spots 2 1/2



Pre.
point



June 29, 1877. This book indexed except for double stars.

