

1860phae.proj., 1860

KG
11365
186

H.32

Equatorial
Jan. 31st - 1860-
to.
March 14 1860

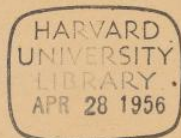
Sold by T. Groom & Co., Stationers, India Building, 82 State St., Boston.

KG-11365.186

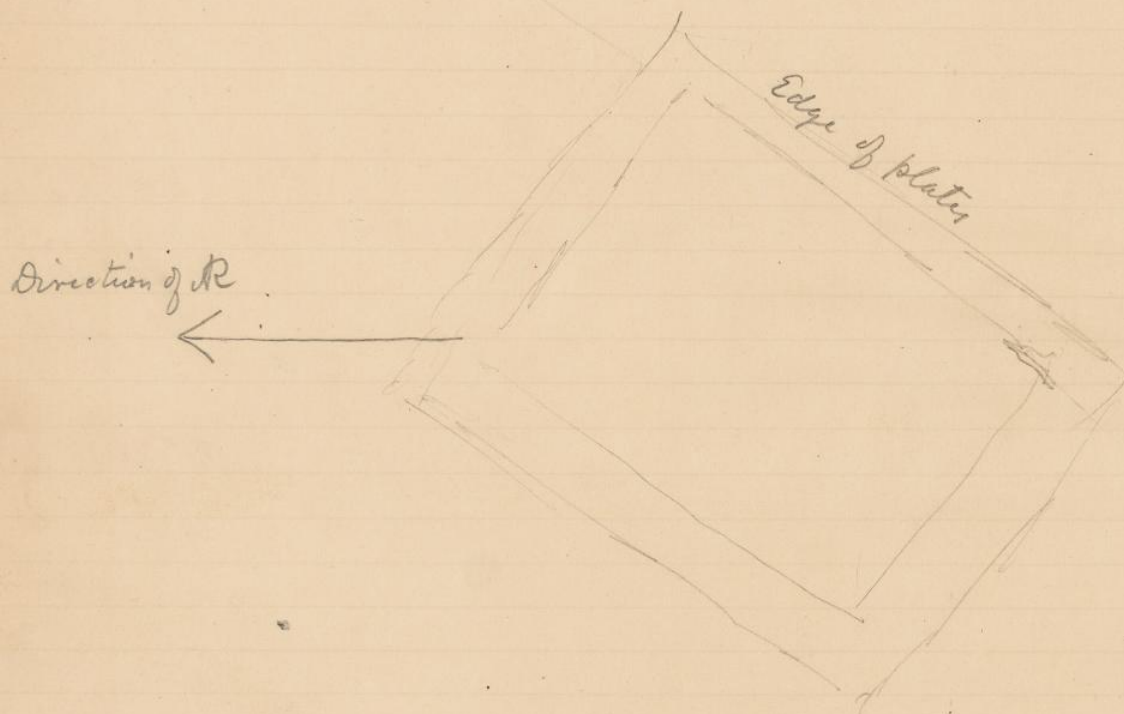




1860phae.proj.:.186B



Photography Sun.

1860. Feb. 7. At 12^h meridAperture $\frac{3}{8}$ inch Exposure 0.^s2

Clouded up ~~off~~ before getting a satisfactory image.
 The spots however appeared very quick (even before the
 edge of Sun developed ??) Stopped a plate in act of
 developing but there were clouds on Sun.

Photography

1860 Feb 7 Began 10^h 10^mOn part of group where
bright stars were thickest.1st Plate Daguerreotype of Pleiades skyExposure 6^m

Find no trace

2nd Collodion Photograph Pleiades1st Exp. 1^m moved in Dec & Exp. 7^m

Beats of Eq. Clock

3rd
Jupiter Exp. 64 beats Collodion

0.5

4.0

12.0

~~4.0~~~~8.0~~~~16.0~~~~32.0~~~~64.0~~~~128.0~~

128

A satellite just
emerging from disc

Eq. belt beginning.

4th Jupiter

64 beats

Daguerreotypes

0.5

4.0

12.0

128.0

Only two
imperfect
images117 beats = 60^s

About equal intervals of time between plates.

Photography

5 Jupiter

64 beats E, Clock

4
8
16
128

0

Stopped Development soon after 64 appeared-

6 Jupiter

Daguerreotype

64 beats

3
8
16
~~32~~
300

Stopped in Developing -

Two images only and
not satisfactory

Moon

7 Collodion Moon 16 beats

8 Daguerreotype 20 beats

9 Collodion 20

10 Daguerreotype 30

11 Collodion 40

Stopped in Developing-

Jupiter plate 3 64 beats is a black negative - no light can be seen through it. & only a few craters on Moon Plate VII in 16 beats are equally intense
99/100 of Moon area is lit bright by nearly 1/2 : $\frac{6}{4} = \frac{64}{2 \times 16} = 2 ?$

Photography

Moon -

12 Daguerreotype 50' beats

13 Photograph 30 "

14 Daguerreotype 70

15 Photograph 25 very good

16 Daguerreotype 40 12 27 m.s.t.

17 Photograph 20 Best. 12^h 25^m18 Photograph 22 12^h 39^m

19 Daguerreotype 60

20 Daguerreotype 50 12 47

21 Photograph 16 Best

22 Photograph 12 Best 13^h 05^m

alt 55°

10^h 13^m 30^s

Used for stereoscope with April 6 $v = 164^\circ$
 G. Elong $v = 166^\circ$

Photography

Feb 7/1860 A slow developer - used

It is probable that the trials on Jupiter (near
meridian) & those on Pleiades were subject
to effect of thin clouds or haze. But latter
ly with the Moon the sky was quite clear.
The 16^{beats} and 12^{beats} were particularly
fine.

After 12 PM clear calm & fine.

We attended carefully this viz to the appearance
of the image as it first came in sight under the ac-
tion of the developer & both the artists & myself were
perfectly agreed that ^{on the Collodion plates} the lunar image appeared
first at the circumference and Jupiter near the
centre.

Both artists were also confident that the
appearance of ~~Jupiter~~ ^{indicated} the image of Jupiter both on
the collodion and on the daguerrotype plates indicated
that its light was most intense ~~at the~~ in the central
regions.

Sun Photography

Feb 8th 1860

Began Photography at 1 P.M.

Some thin cirri in sky. Used the ap-
 erture of $\frac{3}{8}$ inch. ^{U. 462? vide April 12} Exposure about 0.2.

Were satisfied ^{that} the sun developed strongest
 & first in central regions.

Some of plates were stopped half developed
 or as soon as decided traces of action ap-
 peared - Very beautiful photograph showing spots - faculae
 and the convoluted surface.

Afterwards at 4 P.M. Took photograph of
 cannon ball 3 in diam - painted white & exposed
 to sun so as to represent the Moon within
 about 1 day of full. & tried developing -
 found no marked difference exposure too long.

Then we enclosed ball in a piece
 of old stove pipe to cut off reflected & diffused
 light & it was illuminated only by direct
 rays of light from sun nearly in direction of
 the camera representing a 1 day past full
 phase easily detected. Other parts of limb well defined - perhaps most intense
 towards center but not certain.

Photography of Jupiter

Feb. 8th 1860 (Cont.)

This plate was marked thus —  it seemed to take not far from evenly, but the exposure was still too long, as it began to develop somewhat quicker than ~~with~~ the Sun & Moon.

I think it resembled the Moon much more than the Sun in its rate of developing but had the exposure been shorter that is 0.1 in stead of 0.2 it would have been more satisfactory —

C. P. B.

Feb. 9th & P.M. about

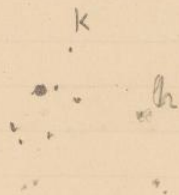
Jupiter

belt
bright & bluish —

Orion

1860 Feb 12

Under good definitions saw the
small star K but could not see h



Though by glimpses
a bright-aur in nebula
possibly a star could be

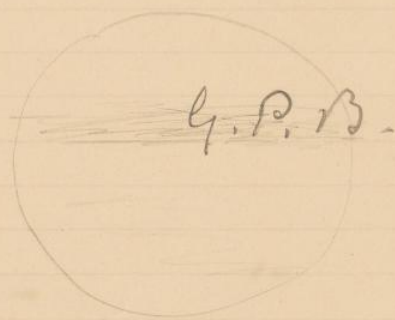
pretty frequently suspected

G. P. B.

Jupiter - ~~Eclipse~~ Transit Sat. I1860 Feb 12th

Saw Satellite I enter on disc - appearing as a very bright spot on margin of principal southern belt - It was so bright almost sparkling that it was not easy to believe that it could be lost sight of ~~on the~~ as it approached the centre. This however it did occur when it had scarcely transited $\frac{1}{5}$ of disc - Air disturbed Satellite projected on darkest belt could not be discerned at 11^h 30^m m. s. t.

Shadow entered disc dark & distinct.
Belts cannot be traced to edge -



The inclination of the ^{dark} belt led me to surmise that the satellite advanced further upon it as it entered the disc. There were two or three dusky spots on the belt one of which may have been the satellite when near centre of transit. Satellite as it neared the limb diminished much in brightness.

Orion

Feb 12th 1860

Mr Clark

12 in. object-glass.



Jupiter.

Feb. 12 1860

Compared light of Sirius & Jupiter at 7 P.M.
 Sirius: light more brilliant but ^{decidedly} less in quantity than
 that of the planet. so that the impression on the eye was
 directed to a point half way between the two objects -
 was that the planet was certainly the more con-
 spicuous object of the two.

Venus was far brighter than either
 Compare Seidel's experiments A. N. 1193.

G. P. B.

Search for Refugia

1860. Feb. 14

El. 2 36 5.4
236 2 37 1/4

a 8 16 57.2
17 2.1

type a in house ~~XI~~ 60
66.

b 17 41.8
46.9 47.7

b. in wine XI. 54.

c 19 25.8
30.3

c is north about 1' of a and in (say) 11.12 mag.

b. 8 26 58.4
27 3.6

c. 28 42.1 43.8
28 47.5

At 8 37 45 about) by 236 began to let for by Sp. 1/2

Stars 7 a. - c. - d

d is no. prec. c about - 2.8 + 36"

At 8 45 22
9 41

Ayleja

Feb. 14. 1860.

④ by Ephemeris in Notices no. 15.

At 10^h 40^m Camb. 166° 38' 4" + 9° 2' 8"11^h 6^m 34^s

(Stellar) Rev. to M. G. 1860.0

H. M. Int.

- 1.58 + 9.5

Stars near. (M. G. 1860.0)

BAL 3837	11 ^h 6 ^m 45 ^s	+ 8° 49' 6"	+ 2.75 - 16.9
9 ^h W. XI 40	11 ^h 4 ^m 6 ^s	+ 9° 1.8	}
9 ^h W. XI 54	11 ^h 4 ^m 50 ^s	+ 8° 57.1	
d. 54-40	+ 43.9	- 4.37"	

El.	h	m	v					
	8	39	36.3	41.2	* 2			
		41	17.4	22.8	* 5	d-2	1 41.1	41.6
			20.3	25.3	* 5	d-2	1 46.0	46.1
8	42	11.0	16.0		* 2			
	43	52.3	57.1		* 2	d-2	1 41.3	41.1
		55.0	59.8		* 5	d-2	1 46.0	46.8
	44	28.0	33.1		* 2			
	46	9.6	14.4		* 2	d-2	1 41.6	41.3
		11.9	17.3		* 5	d-2	1 43.9	44.2

* c-d 1
At 8 44 + 2.567

Place of 5 at 11^h 44^m 11^s

11 4 52.75

1 41.33

11 6 34.

Handwritten signature

Handwritten signature

9	13	32.3	38.4	2
	15	16.7	19.8	2
		17.4	22.4	2
9	15	53.0	58.2	8
	17	24.3	39.0	C
		37.0	42.2	2

Photography.

Feb. 16 1860

Yesterday was advised by Prof. W M Rogers and Prof. Cook. To try most rapid developer for getting small granulation of silver - the slower the larger the crystals.

N.B To photograph Aurora & see if it has not strong chemical energy - this I should anticipate by analogy from chemical self-luminosity of Jupiter if his light be auroral & same as of earth we might expect natural light of earth to be strongly active.

P.
Prof Rogers says that aurora shows fluorescence & so does stratified light in tubes of rarified gases in Rumkoff's apparatus which has decided auroral character & belongs to end of spectrum next the chemical or dark rays
G.P.B.

Feb. 14th At meeting of Am. Acad. ~~just~~ self.
initiated chemical rays of Jupiter

Jupiter

1860 Feb 17

Looked at Jupiter at 6^h 15^m and at
 6^h 45^m m.s.t. But could not see the 2nd Satellite
 on disc. The definition exceedingly bad.
 Could dimly distinguish the great S. Equatorial
 Belt. & North of Equator seems a brilliant
 region

G. B. B.

Jupiter

1860 Feb 20thAt 5^h 40^m 5^s

Bad definition

By full daylight.

Very
brilliant
undisturbed with
dusty streaks
Order of Brightness
1st Sat

3 4 2 1
• ○ • •

Very
bright

Satellites ~~diminished~~ by regular gradations of brightness
from 1 to 4.

G.P.B.

At 236 7^h 7^m 4th Satellite totally eclipsed

Clouds & imperfect definition -

The bright zone & conspicuous southern
belts are the prominent features -

At 12 P.M. Saw Emission of 1st Satellite through Clouds.

Bright zone on Jupiter striated with two faint bands is the
remarkable feature

2 2 1
○ • •
1st Sat 2nd 3rd

Very



Bright

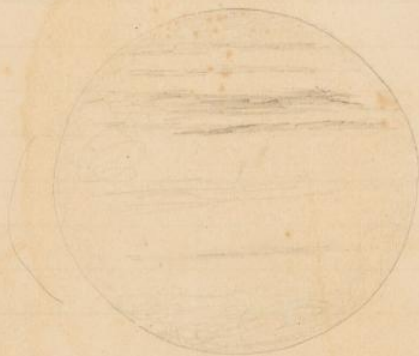
Jupiter

Feb. 21st 1860

Tolerably good definition

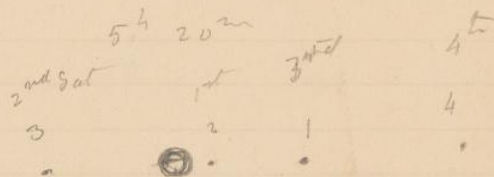
5^h 8^m m.s.t.

Very bright zone striated



S pole

South pole is more evenly shaded than the North
There are



3 is not greatly inferior to 2. But both
are ^{plainly} much less than 1

Recalling the aspect of Jupiter in 1850 I think
that it is now less conspicuously diversified

At 5^h 30^m 2 is decidedly brighter than 3

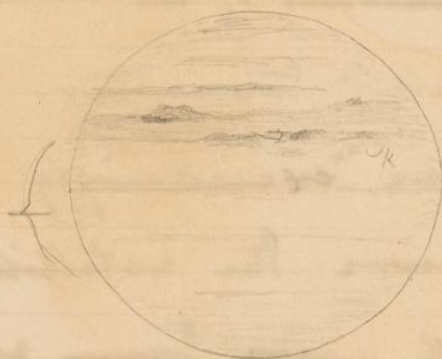
236 3^h 37^m 10^s

1st Satellite was 375 beats = 187° in entering disc
= breadth of diameter with Power No 3 Good definition
Entered as a sparkling disc far brighter than margin
of ball

236 4^h 28^m

near K is a bright spot not well defined

very bright



1st Satellite enters
very faint streaks
" "

236 5^h 44 I ~~think~~ suspect

that the satellite is barely distinguishable brighter than dark
belt but not as bright as the regions contiguous - it is 1/6
of diam - dist from limb -

236 4^h 50^m Satellite cannot be seen under fine
definition although it is projected on one of the dar-
kest belts

Jupiter

With high power No 4 discs of the Sat-
ellites are well shown. The 2nd is very small
not more than $\frac{1}{3}$ as large as the 3rd. The 4th
is comparatively dimmer but larger than 2nd.

The shadow of 1st Sat when $\frac{1}{6}$ on disc projected
on dark belt was very decided if not quite black whereas
the disk of the satellite which I thought I recognised
as a faint dusky spot could barely be distinguished
from the inequalities of the Northern edge of the Southern
Belt on which it transited. Some parts of
the planet were exceedingly bright so much so
that I am sure the satellite if it had passed over
there would have been seen quite dark. But
it is to be noticed that the brightest regions
of Jupiter are now in the North temperate zone
and are not traversed by the satellites.

G. D. B.

Not only the upper & lower edges of the ~~constituting~~ the
Great Southern Belt are the darkest parts of the disc but the whole
ground on which they are projected has a dusky brown or
reddish tint contrasting with the bluish white of the bright regions
N of them.

Orion

27th February 18606^h sid. t. +

Vision tolerable

k + reddish



Drawn rapidly at instrument. k was
seen at first certainly - afterward by glimmers as
was h now and then suspected a star
at or near x. k is reddish. h is
at or
whitish.

Could see nothing of h at 7^{PM} h just
discernible. The spiral whirl of the
nebula is readily distinguished when atten-
tion is once directed to this feature.

Photography Sun

To diminish intensity of Sun light use its image reflected from anterior side of glass prism. The other side reflecting off the light & heat incident on it.

Vide Dir. J. H. Cape Obs.

p. 437.

Orion

21st Feb. 6810 $\frac{1}{2}$ PM

+y

+k

+z

+

+

+

+h

+m

Moment of very good vision at 10

Jupiter

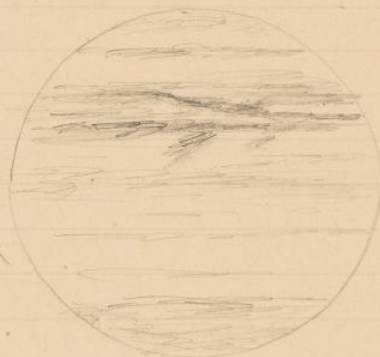
1860 Feb 21st Continued

Pretty well defined

Cannot convey to
drawing the beautifully
striated surface
of brighter regions

236 8^h 40^m

Bright





Search for Aglaya.

60 Feb. 24 (~~Copy~~) See H.P.I.'s comet book.

Search for the planet by the ephemeris in S. Vol. no. 15, and make a chart, to be found in H.P.I.'s book. H.P.I. also made a similar chart. Stars for comparison.

a W. X. 1006. 1860.0

9th mag. $10^h 56^m 26.2^s + 9^{\circ} 28' 58''$

Star 6 9.10 a + 5 5. a + 4 45 (estimated)

1860.0 11 1 31.2 9 33 43

Res. to appt. 2.6 - 14

11 1 33.8 9 33 29

c 12th c - 2 - 5. - 4 41 c is the planet

11 1 28.8 + 9 28 48

T.H.S. ephemeris (4.15^m) 11 1 36. - 9 28 12

C - 0 Planet - + 5.2 - 36"

The diff. R. are very poor.

J. H. Lubbock.

120 part

10.5
0.17

Uranus

1860 Feb. 21
(Copy)
Set I, Planet

Scale Reversed -a -2

El. mo. Sp. G. -a -2

		-5 34	+0.27	-1.0	9 ^h 58 ^m 55.6	61.1	-1 17.50	-126.55
	a	-6 1	+1.8	-	10 0 13.2	18.5	-0.35	
	b	-4 34			22.2	27.6	17.85	26.90
II.	Pl.	-6 54	+0.27	-0.59	10 2 39.4	44.7	-1 17.75	-126.45
	a	-7 21	+1.2		3 57.1	62.5	-0.23	
	b	-5 55			4 5.9	11.1	17.98	26.68
III.	Pl.	-4 55	+0.24	-0.58	5 33	8.6	-1 17.60	-126.35
	a	-5 19	+0.8		6 20.9	26.2	-0.15	
	b	-3 57			6 29.7	34.9	17.75	26.50
IV	Pl.	-4 54	+0.28	-0.59	10 45.3	49.1	-1 18.30	-126.90
	a	-5 22	-0.2		11 3.5	7.5	+0.04	
	b	-3 55			11 12.2	16.0	18.26	26.86
V	Pl.	-5 41	+0.26	-0.57	13.477	51.7	-1 18.25	-127.15
	a	-6 7	-0.8		15 6.1	10.0	+0.14	
	b	-4 44			15 14.9	18.8	18.21	27.01
VI.	Pl.	-6 12	+0.24	-0.59	16 14.0	18.0	-1 18.40	-127.00
	a	-6 36	-1.2		17 32.4	36.4	+0.23	
	b	-5 13			17 41.0	45.0	18.17	26.77
VII	Pl.				19 50.9	54.8	-1 18.40	-127.10
	a				21 9.3	13.2	+0.35	
	b				21 18.0	21.9	18.05	26.75
Mean			+0.263	-0.584			-1 18.04	-126.78

Mean

+0.263 -0.584

Planes reduced to 10^h 4^m 30^s

Sets I II III were taken (in R) on the micrometer wires, and are not so good as the remainder, which were taken on the scale-lines. The mean of times for declination of all the sets ~~sets~~ will be nearly equal to the mean of times of transit for sets I-VI. Sets I-III being taken first in declination and sets IV-VI in R.

Uranus (Stars of comparison)

1860 Feb. 21.

The stars a and b are from Harvard Zones 101.102.
 Their positions for 1855.0 taken from the M.S.S. Zones are

a 11 36 52.17 +0° 15' 6".4
 b 11 37 1.07 +0 26 32.2

There is reason to suppose these Δ 's to be each 1' too great.

- 1) They were each observed only once
- 2) A comparison made for identification gave

Star b 9 42 58.2 - 3' 4" } Chron. transit
 Star c' 45 22 - 8 20 } and calc. readings

Star c' is also in H.Z. 101.102, observed once, but in a less doubtful

part of the field. Its ^m place (1855.0) is
 Star c' is also in "Bonner Sternverzeichnisse" I^{te} section marked B.
 & 11 39 25.20 +0 20 20.9

Whence b is in $\Delta = 11 37 1.4 \Delta + 0 25 37$. On the other hand the relative
^{position}
~~places~~ of a and b is right, by previous observations.

In Zone 101 there are several instances of the mistakes supposed here to
 have been made.

3. The position of Uranus (roughly reduced) is

1860. Feb. 21 12^h 5^m 0 11^h 35^m 51.81 +0° 23' 42".6

if the Zones 101.102 be assumed to give right places for a and b.

But Günther's ephemeris lay 11 35 51.99 +0 22 37.7

Corania - Correcting Ephemeris

1860 Feb. 21.

By obs. made tonight the *Star of Günther's ephemeris*
(*Berlinor Jahrbuch* 1862 p. 397) is

C-O

$\Delta \alpha$ $\Delta \delta$

+1.⁵⁰
~~+1.78~~ -4."9

Reduction of Observation

1855.0 11 36 52.17 0° 24' 6."4

15.36 - 1 39.8

1860.0 11 37 7.53 0 22 26.6

11 37 1.07 - 0 25 32.2

15.36 - 1 39.8

1860.0 11 37 16.43 0 23 52.4

Red. to app's + 2.45 - 15.1

a (app) 11 37 9.98 0 22 11.5

Pl-a - 1 18.04 + 0 26.2 (Cor. for tempo)

Pl. app. 11 35 51.94 0 22 37.7

b (app) 11 37 18.88 0 22 37.3

- 1 26.78 - 0 58.2

11 35 52.10 0 22 39.1

El. 10 9 30

f. + 2 49

S.T. 10 6 41

22 3 20

12 3 21

1 58.5

12 1 22 C. de S.T.

Δ (Planet) Δ (Planet)
11 35.52.02 + 0 22 38.4

$\Delta \alpha$ 7.838

$\Delta \delta$ 9.001

13072

$\Delta \alpha$ 9.9978

$\Delta \alpha$ 66."07

$\Delta \delta$ 79.96

G 323 25

Δ 174° 18'

H 174° 18'

$\Delta \alpha$ 7.825

Δ (G-a) 9.8779

Δ 1 0216

Δ (G-a) 9.8691

$\Delta \alpha$ 0.0000

Δ (G-a) 9.9590

Δ + 1.2815

Δ (G-a) 9.6180

$\Delta \alpha$ 7.825

f. 19."41

Δ + 0.05

Δ + 17.40

Δ - 7.78

Δ - 0.05

Δ - 7.24

Jupiter

1860 Feb 21 Jupiter's light is less pungent than that
 of Sirius but I should say that in quantity it ex-
 ceeds the star in the ratio 5 to 3 5 to 3

7

Jupiter

1860 Feb 23

1. 3. 0. 2. 4.

1 is plainly largest - the others not greatly unequal
definition excusable.

Stars for Alpha and Gamma

Feb. 23.

Planets Place at 10^h 42^m lambing

According to Poulakis
T.H.S. $11^h 0^m 10^s + 9^{\circ} 36.6'$
 $10^h 59^m 58^s \quad 9^{\circ} 36.2'$

Star Weisse 10.1006 (a) $10^h 56^m 28.9^s + 9^{\circ} 28' 44''$

Star (b) of Feb. 21 $11^h 1^m 34^s + 9^{\circ} 33.5'$

Star (c) " " $11^h 1^m 29^s + 9^{\circ} 28.8'$

Weisse 10.1006. - Baily 21205

Rev. from Baily

$10^h 53^m 18.53^s + 9^{\circ} 48' 13.7''$
 $+ 3 \quad 7.97 \quad - 19 \quad 15.2$

$10^h 56^m 26.50^s + 9^{\circ} 28' 58.5''$
 $+ 0.03 \quad - 3.5$
 $10^h 56^m 26.53^s \quad 9^{\circ} 28' 55.0''$

to Bessel

From Weisse

$10^h 54^m 36.53^s + 9^{\circ} 40' 11.6''$
 $1 \quad 49.66 \quad - 11 \quad 14.3$
 $10^h 56^m 26.19^s \quad 9^{\circ} 28' 57.3''$

Wopphat $10^h 56^m 26.30^s + 9^{\circ} 28' 56.5''$
 $+ 2.67 \quad - 16.44$

to app 1 $10^h 56^m 28.97^s + 9^{\circ} 28' 42.1''$

to app 1

to app 1

to app 1

to app 1

to app 1

to app 1

to app 1

to app 1

to app 1

to app 1

Rev. to app 1
G $323 \quad 38 \quad 20 \quad 9.2228$
A $164 \quad 7 \quad 10 \quad 9.8980$
H $297 \quad 5 \quad 2 \quad 1.0253$
app 1 9.7869

$f + 19.62 \quad g + 6.49 \quad h + 0.0066$
 $5^{\circ} + 1.40 \quad 2' - 0.61 \quad 9.9916$
 $10^{\circ} + 18.96 \quad 1' - 7.26 \quad 1.2804$
 $- 9.2883$
 $+ 9.2165$

$\alpha^{\circ} \quad 10^h 54^m 52.6^s$
 $\alpha^{\circ} \quad 9^{\circ} 29'$

$h^{\circ} \quad 9^{\circ} 22.28$
 $h^{\circ} \quad 9^{\circ} 44.77$
 1.30226
 $a^{\circ} \quad -9.98223$

9.9728
 0.929

46.992

$\alpha^{\circ} \quad 10^h 55^m 31^s$
 $\delta^{\circ} \quad 9^{\circ} 34.8'$

$h^{\circ} \quad 9^{\circ} 22.73$
 $h^{\circ} \quad 9^{\circ} 44.35$
 1.3022
 $a^{\circ} \quad -9.9826$

46.0567
 0.94

Stars for Urania

Veto Feb. 23.

Planets Rare at 11^h 25^m Cambridge~~7. H. 1860~~

$$11^h 34^m .13^s + 0^{\circ} 31' 13''$$

Mass from H. Z. 101. 102 (Red + 0.6 - 1' 54")

$$\begin{array}{ll} (a) \quad 1055.0 (12) & 11 \ 37 \ 10 \quad 0^{\circ} 23' 18'' \\ (b) \quad (10) & 37 \ 19 \quad 24 \ 44 \end{array} \left. \vphantom{\begin{array}{l} (a) \\ (b) \end{array}} \right\} \begin{array}{l} - 1' ? \\ - 1' ? \end{array}$$

H. Z. 103. 105

3 4

$$\begin{array}{ll} (c) \quad (11) & 11 \ 30 \ 50 \quad 0^{\circ} 29' 46'' \\ & (12) \quad 31 \ 11 \quad 28 \ 42 \\ (d) \quad (12) & 31 \ 14 \quad 33 \ 12 \end{array} \left. \vphantom{\begin{array}{l} (c) \\ (d) \end{array}} \right\}$$

Star c

(also in Bessel's Sternverzeichnis marked B)

$$\begin{array}{ll} 11 \ 30 \ 32.19 & 0 \ 31 \ 40.2 \checkmark \\ & 15.36 \quad - 1.39.4 \\ M. P. 1860. & 11 \ 30 \ 47.55 \quad 0 \ 30 \ 0.8 \\ & + 2.51 \quad - 15.6 \\ A. P. & 11 \ 30 \ 50.06 \quad 0 \ 29 \ 45.2 \\ & 11 \ 30 \ 55.81 \quad 0 \ 35 \ 7.0 \checkmark \\ & 15.36 \quad - 1.39.4 \\ & 11 \ 31 \ 11.17 \quad 0 \ 33 \ 27.6 \\ & + 2.51 \quad - 15.6 \\ & 11 \ 31 \ 13.68 \quad 0 \ 33 \ 12.0 \end{array}$$

$$\begin{array}{ll} \alpha^{\circ} & 11 \ 30 \ 40^{\circ} \\ \delta^{\circ} & + 0^{\circ} 30' 8 \\ \log \alpha^{\circ} & 7.952 \\ \log \delta^{\circ} & 9.106 \\ & 11.2022 \\ & 9.9964 \end{array}$$

$$\begin{array}{ll} G & 323.38 \\ \alpha & 172.45 \\ H & 297.5 \end{array}$$

Star (c) by comp. with (a)

$$\begin{array}{ll} - B & 20.10 \quad + 7 \ 36.5 \\ 1860.0 & 11 \ 30 \ 47.42 \quad 0 \ 30 \ 3.1 \\ & 6 \ 28.80 \quad 6 \ 12.5 \\ 1860.0 & 11 \ 30 \ 47.63 \quad 0 \ 30 \ 4.9 \end{array}$$

$$\begin{array}{ll} \log \alpha & 7.95 \\ \log \delta & 9.81 \\ & 1.0253 \\ \log (H+2) & 9.8867 \\ \log H & 0.0000 \\ \log (H+2) & 9.9734 \\ \log H & 1.2804 \\ \log (H+2) & 9.53 \\ \log H & 7.95 \end{array}$$

$$\begin{array}{ll} f + 19.62 & g' - 8.17 \\ g^{\circ} + 0.06 & H - 0.06 \\ H^{\circ} + 17.94 & i' - 7.36 \end{array}$$

~~For~~ *Asplaja*

60 Feb. 23.4

Star a	9	10	20.3	24.2	- 6' 8"	(Scale Reversed)
b		15	24.5	28.6		

1. H. J.
observed

Star c of Feb 21 is gone.

10	59	17	9	36.8
3	24			8.1

~~9 22 29.6 23.6 - 7 (5?)~~

a	9	25	52.7	56.8	- 9' 8"
		16	7		

Star a con. with *Asplaja*

1. H. J. (E.C.)

Chr. S.	9	31	45.5		- 9' 16"
		35	14.2	no. 24.	1 4

9	34	3.5	7.5
	37	26.4	30.3

Star	9	36	32.8	(2 nd best.)	- 9' 45"
				Planet best	

Star	9	(42	00)		- 9' 46"
Planet					- 1 28

9	44	27.6	31.7
	47	50.3	54.3

Star	9	46	35	alt	- 10' 33"
Planet					- 2 16

9	48	55.9	59.8
	52	18.3	22.2

Star	9	51	37	alt	- 9' 54"
Planet					- 1 38

9	53	59.1	63.0
	57	21.4	25.1

Star					- 9' 53"
Planet					- 1 36"

9	58	44.5	48.6
10	2	6.6	10.7

Star (by Chr. obs)	10	1	47.8	51.9	- 10' 21"
Planet			(29.7)	(13.8)	- 2 2.5

~~10 6 34.3 38.2~~~~10 6.0~~

Star (Chr.)	10	11	37.4	41.2
Planet		14	58.7	62.8

Myloga

1860 Feb. 23. Reduction of Observations Motion in 10^m - 0.33 + 1.17

		Δd	Res.		$\Delta \delta$	
9 54.1	9 37.5	+ 3 22.85	- 0.48	27	+ 8' 12"	+ 8 14.4
44.5	57.9	22.85	0.14	51	8 18	16.7
49.0	52.3	22.40	+ 0.01	41	8 17	17.0
54.8	57.4	22.20	+ 0.18	38	8 16	15.1
58.8	10 2.1	22.10	+ 0.33	57	8 16.5	14.8
	7.5				8 19.	16.4

	μ $\sqrt$		
9 52.0	3 22.42		+ 8 16.1
Refr.			+ 0.2
Temp.			- 1.1

Planet - *

		+ 3 22.42		+ 8 15.2
		10 59 51.39		+ 9 36 57.3
9 52 0 El.	Par.	- 0.06		+ 2.1
+ 2 53 feet				

9 49 7 Sid. Time

22 11 13

11 37 54

- 1 54

11 36 0 M.S.T.

Comparison with ephemeris (Notice, no. 15)

11 36 0

- 23 42

- 18 28

10 53 50 Wash. m. t

2 20 44 32.6 6' 0" 1

8 66 72

2 36 26 11.1 4' 0" 1

12 8.9

14.7

	Comp.	Par.	Obs.	Comp.	Par.	Obs.
Com.	164 59 8.6			+ 9 36 23.8		
~~Obs.~~	164 57 50.0			59.4		
~~Obs.~~	+ 78.6			- 35.6		

Uranus.

1860 Feb. 23.

Reduction of obs. on following page.

Right Ascension Planet-a Right 11^h 5^m Planet-b Right 11^h 5^m

Mean $\pm 10. - 0.36 + 1.9$	10	55.8	+0	20.05	-0.33	19.72	7	2	56.25	2	55.92
	11	1.5	3	19.90	-0.13	.77	2		55.95		55.82
	11	6.5	3	19.85	+0.05	.90	16		55.75		55.80
	11	10.9	3	19.55	+0.21	.76	2		55.75		55.96
	11	15.8	3	19.40	+0.39	19.79	10				

11 5.0 $+3^m$ 19.79 ± 0.02 $+2^m$ 55.88
 ref. 0.00

Declination

11 1.5	7	1 42	+0.7	1 42.7	-1' 45"	-1' 44.3
6.5	1	45.2	-0.3	44.9	42.3	42.6
10.9	1	42.5	-1.1	41.4	42.5	44.6
15.8	1	46.5	-2.1	44.4		

$+1' 43.3 \pm 0.6$ $-1' 43.8$

ref. $+0.0$ $+0.0$
 temp. -0.2 $+0.2$

$+1 43.1$ $-1 43.6$

By Star c (app)

11 30	50.06	✓	0 29	45.2
+3	19.79		1	43.1
11 31	13.68	✓	0 33	12.0
+2	55.88		1	43.6

11 5 0 $\checkmark$ $11^m 51^s$ Planet's app place { 11 34 9.85 0 31 28.3
 22 11 13 9.56 28.4

12 53 47 51 40

-2 7

12 58 47 Land. m. s. t.

Günther (eph)
 $+1.0 - 3.0$

Urania.

1860 Feb. 23

T.H.S. } Compared with stars - and d.
observed

Set I.	c	- 8	31.5	10 10	52	26.8	30.7	
	d	4	50.6	50 35	52	50.6	54.5	
					55	46.8		+ 3 20.00 3 19.85

Set II.	c	7	32	10	58	9.1	13.1	
	d	4	5	alt 10	56	13.58	33.1	37.0
	Planet	5	50	11	1	29.1	32.9 + 3 19.90	3 19.95

Set III.	c	6	50	11	3	6.4	10.3	
	d	3	22.5			30.5	34.4	
	Planet	5	4.8	6	26.4	30.0 + 3 19.85	3 20.08	

Set IV.	c	6	25.5	11	7	33.3	37.3	
	d	2	59.5			57.0	61.2	
	Planet	4	43	10	52.8	56.9 + 3 19.55	3 19.93	

Set V.	c	2	39.5	11	12	23.8	27.5	
	Planet	(0 53)		15	43.1	47.0 + 3 19.40	3 19.95	
	a	10	16	18	43.8	47.7	3 19.95	
	b	- 8	52		52.6	56.3		

All obs. of Aphria and Urania made to-night were with
Plate Reversed. T.H.S.

Orion

23^d Febr. 1860

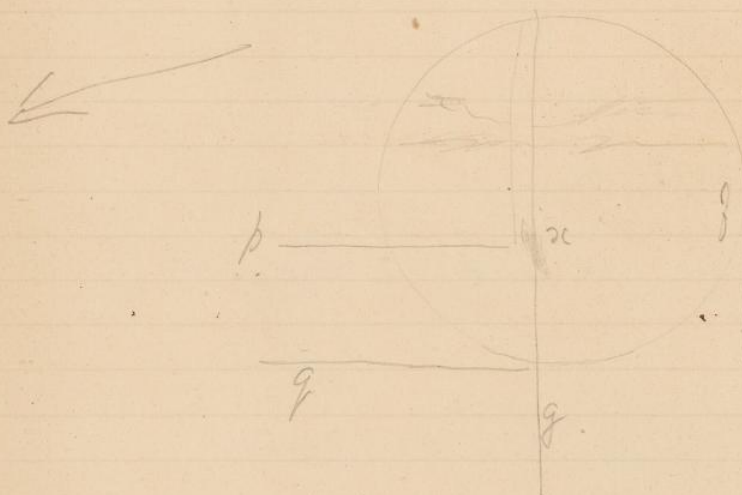
The only small stars near trapezium that
 are visible are K and m m is easily seen
 K is certainly seen ~~for~~ at moments for 4 or
 5 seconds readily — S.C.

Jupiter

Feb - 25 10 P.M.

236 = $7^h 47^m$ faintest region
of planetDefinition not
good -

Very Bright



Dir Jg

$7^h 47^m$
 R. 48.82 At $8^h 21^m 44^s$ of 236
 2 51.28 26 42
 2/3 46
 2.23
 1.73
 near middle of disc

Dir pg

50.63

 $8^h 35^m$

48.47

2/2 18

1.08

1 2 3

Only one of the belts is conspicuous
the rest narrow shadings or stripes.

Jupiter

Feb 25 1860

Continued



The Spot at x is
rather conspicuous
as it appears on a ~~very~~
narrow faint belt

which crosses a very bright region having
a bluish tint compared with the
redish brown of the Southern belt

The extreme S pole is brighter than it is in
the neighborhood of the principal belt

~~185~~ *Refugia* (47)

1858 Feb. 26

T. H. S. Observer.

dry Zero 263 42
263 30

9 39 27.1

7' +

9 47 7
47 36 in.
50 34.5

9 6
9 16
6 36

Planet (Jaint) 9 6
Star 6 36

9 57 37.2 41.1
10 1 4.9 9.4

58 5.7 9.4
1 33.8 37.7

Planet 7 14
Star 4 48

10 2 48.7 52.8

2 48.7 52.8
6 16.6 20.6

Planet 6 1
Star 2 32

8 10 16.4 20.3
11 44.6 48.4

Planet 7 35
Star 5 4

13 36.2 40.3
17 4.3 8.3

The star of comparison is from Weisse M. (1866.) $11^h 0^m 49^s$ Dec $9^{\circ} 46' 51''$

B. D. V.

12.5 30.2 R. 10 to 10 L. m

29 57.7 - 2 28.00 - 0.22 28.22
58.1 28.20 0.21 28.41
10 2.8 27.85 0.04 27.89
8.3 28.15 + 0.15 28.00
13.6 - 2 28.05 0.34 27.71
- 2 28.05

9 57.9 + 2 30 + 1.0 + 231.0
10 2.6 2 30 + 0.2 30.2
8.1 2 29 - 0.7 26.3
13.4 2 31 - 1.6 29.4
+ 2 29.7
- 0.4
Temp.

Sent for Doris. (48)

60 Feb 26.

H. Schermer

Chr. Jr.

~~3 2 10 36 58.8~~

Planet - Star

Star	3 2	10	42 22.7	26.6	
Planet?	10 7		43 32.0	35.9	1 9.30 -

Star	2 46		44 55.9	60.0	2 w. double
Planet?	lost		46 3 54.2	9.3	1 9.30

Star	2 47		48 13.5	17.3	
Planet?	9 54		49 22.5	26.6	1 9.15

Star	3 12.		50 6.8	10.8	
Planet?	10 18		51 15.7	19.6	1 8.85

Star	3 33		52 9.0	13.0	
Planet	10 40		53 17.8	21.8	1 8.80

Star	2 31		54 12.7	16.9	
Planet	9 39		55 21.5	25.4	1 8.65

Star	4 4		56 24.0	27.8	
Planet	11 2		(57 32.1 36.8)		Planet too far north to observe well

Star	3 10		58 23.3	27.0	
Planet	10 20		59 31.9	35.8	1 8.70

$\begin{matrix} & 7 \\ & \times \\ & * \\ * & 3 \\ & \times \\ & \times 6 \\ * & 5 \\ & \times 4 \end{matrix}$

The line is width 10.789.

10 42.4
 45.0
 48.3
 50.1
 52.2
 54.2
 10 56.4

Star is order of magnitudes

No. 1 is the star obs'd above for the planet

Dons

1860 Feb. 26

Reduction of Observation

Weisse X. 789.

1825.0	10 42	11.58	+ 3	38	16.8
	+ 1	48.42	.	- 11	2.8
	10 44	0.00	+ 3	27	14.0

Baily 20889	10 40	54.16	+ 3	47	15.2
	3	5.90		- 18	55.7
	10 44	0.06	+ 3	28	19.5

I am good here

Admitted, that Weiss is right
This agrees with Applanator

1860.0	10 44	0.00	+ 3	27	14.0
		+ 2.9			- 17.6
	1	8.9		+ 7	8.5
		+ 8.5			+ 31.1
4.1	10 45	11.8	+ 3	27	4.9

Weisse

α°	10 43 58	λ°	8.7925
δ°	3° 32' 8"	μ°	9.5176
			1.3022

Baily 10 42	27.2	9.9751
-------------	------	--------

+ 5 36.81

λ°	8.8044	0.4101
-----------------	--------	--------

μ°	9.5192	46.057
-------------	--------	--------

	1.30226	46.467
--	---------	--------

	9.97487	92.93
--	---------	-------

	46.475	15.49
--	--------	-------

		1.2773
--	--	--------

Bonnar Sternwarte

G	161.00	12.36
H	161.0	5.38

18 4

17

17 47

10.45 12.2

3 23 51

Hyloja - Reduction

60 El. 26.

1825.0	~~60~~ ^m 58	58.79	+9° 58' 8".6
	+ 1	49.58	- 11 18.0
1860.0	11	0	48.37
		+2.70	- 14.7
	11	0	51.07
	- 2	28.05	+ 9 46 35.9
			+ 2 29.3
Planet.	10	58	23.02
			+ 9 49 5.2
	^h _{pm}	- 0.04	+ 2.1

El. ^h 10 45.0 ^v
 + 2 59.
 10 1 1
22 23 3
 11 37 58 M.S.T

Rv. to app.

G 324.0
 2 165.12
 H 293.51
 $\log \delta$ 9.2365
 $\log(G+N) + 9.8893$
 $\log \delta$ 1.0306
 $\log(G+N) - 9.8007$

$\log \delta$ 0.0064
 $\log(H+N)$ 9.9946
 $\log \delta$ 1.2810
 $\log(H+N)$ - 9.1562
 $\log \delta$ 7.2301

$\log \delta$ + 19.93
 $\log \delta$ + 1.43
 $\log \delta$ + 19.14
 $\log \delta$ - 6.78
 $\log \delta$ - 0.51
 $\log \delta$ - 7.63

$2^{\circ} 164^{\circ} 58' 4$

$\delta^{\circ} + 9 52.5$

$\log \delta^{\circ}$ 9.24107

$\log \alpha^{\circ}$ 9.4137

1.3022

$\log \alpha^{\circ}$ 9.9849

46.057

0.905

46.962

93.924

15.654

1.2871

2.8312

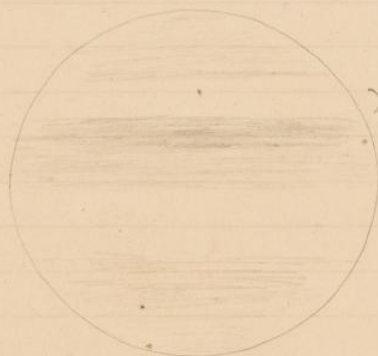
Comparison with Ephemeris

h. 37 58
 - 23 42
 h. - 14 26
 P. 55 50 ["] 746.5 2.6720 33.3
 1 42 ["] 8.6490
 240.6 2.3813 10.7

C. 164 22 89 9 48 279
 O. 164 20 447 9 49 73
 + 74.2 - 39.4

Jupiter

1860 Feb. 26th236 12^h 18^m = 2 PM12^h 20^mReddish
belt

 2 1 3


) narrow white streaks

) very white

1 much brightest

2 & 3 not very unequal

9 PM

Under very bad definitions - Only one belt is readily seen - the white zone however is quite as conspicuous & is a remarkable feature having a bluish tint while the dark belt and its neighbourhood is reddish.

Jupiter must have its belts less dark than in 1848-50 as I remember. Mr Clark remarks that it has fewest belts that he can recall ever having noticed.

Nebula

1960 Feb 26

236 12^h 30^m 8^s Dec. 69° 25'
 H W 2 37 18

8^h 9^m proceeds by 20^s and is 3'
 * South of Nebula



Diam. of Nebula 7-30" round.

Probably H. I 296 and h 659-

5 foot Equatorial

Feb. 27

P.M. 1^h 20^m m.s.t. Looked at the sun with powers 52-113;
saw a large number of spots, but ^{none} which had a
planetary aspect

H. T. J.

Look at the again at 4 P.M. saw the same spots

H. T. J.

Jupiter

860 Feb. 27

Not good definition

E.C. 4^h 23^m

3 0 2 4 1

two broad
bright streak

Gradation in brightness

pretty regular

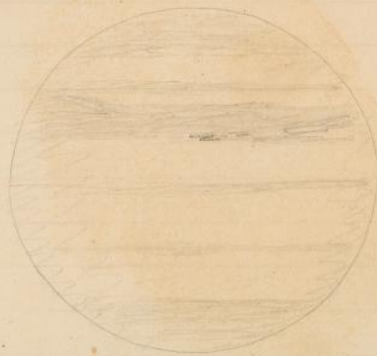
White zones not so con-
spicuous a feature as usual

C.P.B.

Not good definition

E.C. 5^h 15^m

3 0 2 4 1



bright streak

Jupiter

1860 Feb 27

Definition not good.

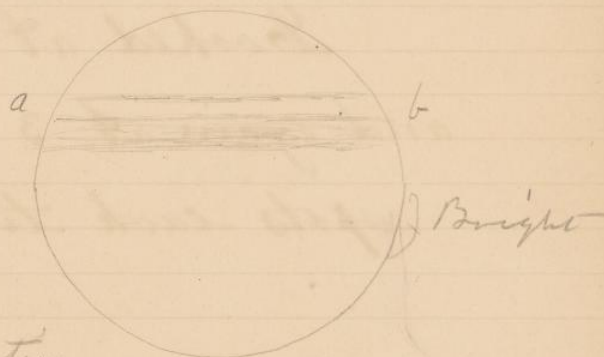
cc 7^h 24^mat 7^h 24^m sid.

The bright band

a b is conspicuous with
a very narrow but decided

belt above it. plainly the continuation

of the upper margin of principal belt at 4^h 23^m.



G. P. B. -

5 foot Equatorial

1860 March 2

Looked at the sun at 8-9-10-11 A.M.
and again at 3 P.M. Saw nothing but large
spots each time

H. P. G.

Jupiter Photometry

1860 March 2nd Friday

4 1/2 days before full

8 P.M. - 7 P.M.

Jupiter & Moon

Sky Clear

4 1 3 2 2

near meridian

and not above 5° from

each other & within

2° of same altitude.

Reject as
experimental error &
traceJupiter 2nd 00ⁱⁿ

Moon 2 5

~~Mare Crinum~~ 2 ft

3 7 above average

Perhaps Jupiter may have a very

Jupiter 3 00

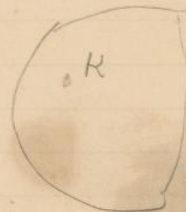
slight reddish tint in contrast with

Jupiter 3 6

Moon but this color is

almost the same.

Moon 3 10

average brightness at K
of brighter parts

Moon 4 4

Brightest part

Moon 3 4

dark Mare

Moon 4 6 =

Jupiter 3 8

Brightest part near Mare Crinum
a little north of it which
is as bright as any part
of the Moon.



3 8

11

Comparisons verified by two or three
observers viz. G.P.B., W.H.S. and A.H.

Moon Jupiter & Sirius

1860 March 2 continued

Sirius	3 ^h 00 ^m	in	Just Clear
..	3	6	

The above represent the distances from solar focus of a blue black screen 14 inches square when the images of ~~Jupiter~~ ^{circular} discs of Jupiter & Moon were just discernible by aperture in a brass plate served as a diaphragm placed at the solar focus - The aperture having a diameter equal to $\frac{5}{6}$ of Jupiter's Polar diameter - The same diaphragm was used for Jupiter - Moon & Sirius but the latter was wholly included of course - No eyepiece was intervened between object glass & screen.

The aperture I found to have a diameter of $\frac{5}{6}$ of the polar diameter of Jupiter by two good estimates. The time of transit over middle of ring by 1st satellite was also obtained.

It was evident to the eye that the area of Jupiter & of Moon included by the diaphragm presented nearly the same color & intensity when viewed with the power No 2 to which the diaphragm

Jupiter Photometry

March 2nd Continued.

was adjusted. But that confining the Comparisons to that region of the Moon in Selenographic longitude of Mare Crisium - That is about $\alpha \alpha \alpha$ - the general intensity of the Moon was larger than for the planet. But the brighter seas were nearly equal in intensity. ^{others were inferior to 4} We should notice however that



the side of Jupiter presented to us is that drawn Feb 27th at 4^h 23^m about α is its darkest hemisphere. The central regions of 4 were employed & $\frac{1}{2}$ of them were occupied by the large southern belt & its red-dusky background.

Unless otherwise stated the comparisons for the Moon were made on regions of average brightness of the meridian on the Moon corresponding to its Noon. For this the comparisons give

$$\frac{\text{Intensity of Jupiter's light central regions}}{\text{Intensity Moon average brightest parts}} = \left(\frac{3.5}{4.0} \right)^2 = \frac{49}{64}$$

If $A =$ whole area of Jupiter light from whole area of 4 diaphragm area

$$\text{Then } \frac{\text{Quantity of light of Sirius}}{\text{Quantity of light of Jupiter}} = \left(\frac{3.25}{3.50} \right)^2 \frac{A}{A} \quad \text{On next page } \frac{a}{A} = 0.84 \quad \text{we find}$$

$$3.25 = 0.5119$$

$$3.50 = 0.5441$$

$$9.9678$$

$$9.9356$$

$$0.84 \quad 9.9243$$

$$0.72 = 9.8599$$

$$\frac{\text{Quantity of light from Sirius}}{\text{Quantity of light from Jupiter}} = 0.72$$

$$\text{Quantity of light from Jupiter}$$

Jupiter Transit 2nd Satellite.The whole area of Jupiter is πab

That of diaphragm

$$\pi \left(\frac{5}{8} b^2\right)$$

$$\frac{\text{Diaphragm}}{\text{Jupiter}} = \left(\frac{5}{8}\right)^2 \frac{b}{a} = \frac{25}{36} \frac{b}{a}$$

20.0

$$\begin{array}{r} 1.2 \\ 6 \overline{) 18.8} \\ \underline{31} \\ 157 \\ \underline{314} \end{array}$$

$$\frac{b}{a} = \frac{18.8}{20.0} = \frac{47}{50} = 0.94$$

$$\frac{25}{470}$$

$$\frac{188}{36 \overline{) 2352} (0.65}$$

$$\frac{188}{216} \quad \frac{192}{192}$$

$$\frac{\text{Area of Diaphragm}}{\text{Area of Jupiter}} = 0.65$$

Diam of aperture 31.4 by estimate wt=2

36.9 by transit wt=1

Adopt

$$33.2 = 1.5211$$

$$37.6 = 1.5752$$

I estimate that the average

March 27 found diam 36.0

$$\frac{b}{a} = 0.94$$

Area of diaphragm to Jupiter

0.94

0.732

intensity of the central regions of Jupiter within area included by diaphragm is at least ~~twice~~ twice that of the excluded portion which is $1.00 - 0.73 = 0.27$. Hence part within diaphragm had $\frac{0.73}{0.73 + \frac{1}{2} 0.27} = \frac{0.73}{0.87} = 0.84$ of 2's light

Not as good a method as by above estimate

$$EC = 9^h$$

$$2.67 \cos 23^\circ = 2.46$$

$$\frac{15}{1230}$$

$$\frac{246}{36.90}$$

Diam ap-

$$36.90$$

$$1 \quad 50.0 - 53.0 \quad 3.0$$

$$2 \quad 8.9 - 11.5 \quad 2.6$$

$$18.9 - 21.6 \quad 2.7$$

$$31.5 - 34.3 \quad 2.8$$

$$3 \quad 6.1 - 8.8 \quad 2.7$$

$$14.9 - 17.6 \quad 2.7$$

$$28.3 - 31.0 \quad 2.7$$

$$41.9 - 44.5 \quad 2.6$$

$$4 \quad 7.9 - 10.6 \quad 2.7$$

$$29.3 - 31.8 \quad 2.5$$

$$47.9 - 50.4 \quad 2.5$$

$$5 \quad 5.0 - 7.7 \quad 2.7$$

$$21.5 - 24.2 \quad 2.7$$

$$34.6 - 27.1 \quad \underline{2.5}$$

$$\text{Mean } 2.67$$

Jupiter Photometry

1860 March 2 continued

I think the results obtained for the relative intensities of Moon & Jupiter are subject to no greater error than that arising from the unequal reflection power of Moon in different parts. But as care was taken to select regions of the average brilliancy upon the ~~meridian~~ of selenographic meridians passing through the Sun, which was considered to be the maximum in brightness & [probably] as bright as the average full moon surface - there can be no uncertainty of 1/5 part of whole amount. The colors of the two were quite similar & both were at same altitude. With regard to Sirius & Jupiter the former was a little past the meridian & being in Dec. -17° while Jupiter was in $+23^\circ$ its light may appear a little too weak - on the other hand it was so situated that - the camera showed it's light with somewhat more distinctness than Jupiter & there was in this respect a tendency to compensate for the low altitude.

$$\frac{\text{Intensity of average brightest part of Sirius}}{\text{Intensity of average whole disc of Jupiter}} = \frac{A}{a} \frac{64}{49} = \frac{100}{84} \frac{64}{49} = 1.55$$

$$\frac{\text{Light of Sirius}}{\text{Light of Jupiter}} = 0.72$$

C. P. B.

Jupiter Transit 2nd Satellite860 March 2nd

Power No 4

1st Contact

236

8^h 34^m 30^s2nd

"

"

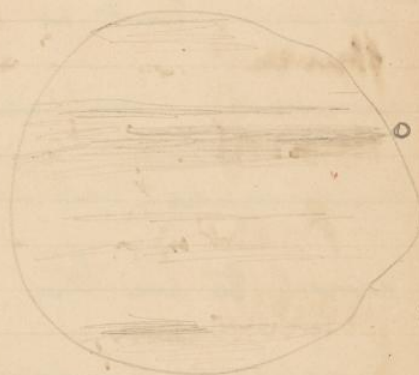
8 39 52

The satellite enters as a decided white spot quite small but with appreciable diameter.

It is just within the dark belt of Feb 27. Definition tolerably

good at ingress became bad soon after. - The satellite disappeared within 20^m or 30^m but being on

a darkish edge of the darkest belt on the Planet could not be distinguished as a dark spot.



Photometry

1860 March 3rd

From a few rough experiments on rough white paper it is very evident that the intensity of the illumination of an opaque object increases to a high value when it comes near to conjunction with the source of illumination & the surface is nearly tangent to direction of illumination. i.e. ray falls very obliquely.

There is in fact an approach to reflection as from a polished surface Hence Lambert's formula must be very far from truth especially for new Moon & planets much phased. & Seidel's results for Venus as computed not reliable if taken when much phased.

Vide Seidel's remarks on increase of obsd brightness of Venus near conjunction

Jupiter

1860 March 5 2^h 55^m Sid

Bad definition

4

3x

2

1

O

4 PB.

Jupiter.

6th March 1860

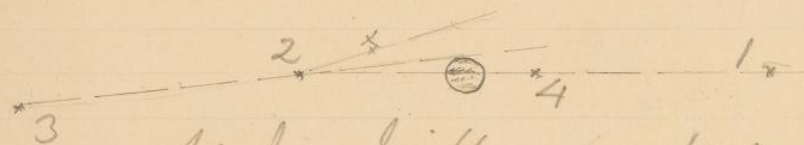
E. C.

$$\begin{array}{r} 7^h \quad 14^m \\ + 0^h \quad 11^m \\ \hline 7^h \quad 25^m \end{array}$$


Planet being 20 m east of meridian
drawing with great care though vision
is bad and sky hazy

The very faint caps on uniform and
seem as new. The edges as the others
except perhaps the middle one at δ where
I think I can follow it to the edge well
It seems now that it is exactly here that
the satellite will transit. The band β is
seen on the preceding tide as in drawing
The outline of disappearance at γ is convex

Jupiter continued



that it is doubtful

dots	EC not corr.
3	7 ^h 27 ^m 58 ^s 7
2	28. 10. 3
star	28 13. 3
dots	dots
1 st limb	28. 16. 3
2 ^d limb	19. 9
4	20. 8
1	29. 4
break	

At dots break dots $(7''^{h}_{45}, 25^s)$

Jupiter continued

data Breaks $(8^h 38^m 25^s)^9$

star sufficiently near to produce indentation
in Jupiter. or rather flattening with 400
and 140

$(8^h 41^m 35^s)$

d b d b } no contact but diving off of 4 the 

d $(8^h 43^m 50^s)$ indentation } or contact 4 is not
half as big as 3 and less than half as bright

d. then b x 4 ~~entirely~~ partly on planet  or indenta
ted $(8^h 46^m 20^s)$

d. b. 4 = star 12th mag $(\Sigma C 8^h 47^m 45^s)$

b. b. b 4 = $\frac{1}{4}$ m 3 $(\Sigma C 8^h 48^m 10^s)$

d $(8^h 49^m 0^s)$ 4 then  brighter than planet decidedly

b $(8^h 49^m 25^s)$ 4 is ~~fully~~ on planet as bright spot

$(8^h 52^m 35^s)$

d b d  4 seen as a white spot on belt

thus  the bad vision makes it
doubtful whether it has entered on planet
or whether it touches limb

Jupiter continued

b. b. b. ^(8^h 54.30^m) 4 is seen on belt as large as star
which I should put down in a zone as 13.14
b d b d b ^(8^h 57.0^m) I am certain that with 141
I get distinguish it as a white spot on
northern edge of belt then ~~it~~ it
equals a star of 15th Mag. — chain has
just given way in chain. and let me down

^(9^h 10.20^m) put on 400 had vision but I see
4 as a white spot north of belt ^{on zone} then

~~on~~ partly on and partly off very
small but brighter than bright zone
^(9^h 13.45^m) had vision but am certain of seeing 4
as a bright spot partly on belt but slightly
encroaching on zone

b d. ext th 30 ^(9^h 16^m)

b d. b d b d. b d ^(9^h 17.0^m) am sure I see ~~the~~ 4 as a
very faint bright spot but cannot say from last
vision where it is on zone or belt

Jupiter continued

($q_{11}^{h,w}$ 8.40) put on 140 see neither shadow
nor 4

b. d. 8 ($q_{11}^{h,w}$ 9.45) thought for 1 second so that I
saw a faint dusky spot between
zone and belt doubtful bad vision
b. d. 8 ($q_{11}^{h,w}$ 9.45) ($q_{12}^{h,w}$ 12.0) am certain that between belt
and zone I saw the faintest possible
trace of a white shadow I put no
shadow

dot ($q_{14}^{h,w}$ 9.55) can see nothing neither spot nor
shadow — hazy

b. d. 8 ($q_{16}^{h,w}$ 9.50) put on 140. hazy can see
nothing bad vision.

b. ($q_{17}^{h,w}$ 9.45) a moment of steady vision hazy
power 140 thought I could see 2
dusky spots one on the — — — double
d. b. d. ($q_{20}^{h,w}$ 9.20) power 400 hazy can see nothing very
pleasant very beautiful

d b d too hazy to see anything ($q_{24}^{h,w}$ 9.5)

Jupiter continued

long-dates power too hazy bad vision
 can see nothing neither spot nor shadow I
 thought I saw the dusky spots mentioned before
 and take them for the spots on the ^{belt} zone or
 the same spot elongated.

b very tremulous I am believe the spots to
 belong to belt do not see spot or shadow

b d b d b put on 140 had 10 seconds very clear
 steady vision somewhat hazy saw nothing
 neither spot nor shadow

b d b I think haze better definition see neither
 satellite nor shadow S.C. E.C. 16th 27th

E.C. 9th 30th (Record of this page lost March 16th 60)

3 2 0

E.P.B.

The belts of Jupiter are less pronounced this year than usual
 though I cannot speak with confidence with regard to
 its aspect since 1854 not having watched it so
 regularly as between that date & 1847
E.P.B.

Photometry

560 March 9thXY

Set up two screens of white paper in a room from which external light was excluded at at 1 foot
But $5\frac{2}{10}$ feet from lamp & found B fully 25 times
 less bright than A.

Then set a screen of paper of which X is a piece
 and another of which Y is a piece at 16" and
 $16" \times 5.2 = 83"$ and after trying various tints found
 that X at 16" was about equally white with Y at 83 inches
 looking alternately at them ranging nearly in same line
 with lamp and lamp the latter being shut off from eye.
 by an intervening shade. Hence X & Y represent the
 relative intensities of light & C & Jupiter if equally reflective
 N.B. Looked at both through a paper cone giving disc of 1° app
 angular diameter.

March 10

Laid a sheet of white paper
 on snow which fell yesterday
 could not discern which
 was whitest - paper
 possibly a tint of yellow &
 snow of blue but v. slight
 C. P. B.

March 6th 1860 Fine post Equatorial

Looked at the Sun at 9-10 and 12 A.M., and again at 1-2-3 and 4

P.M. About 3 o'clock I noticed a small round spot which I did not see at any previous time. At 4 P.M. the seeing ~~g~~ had got very bad and I could see the spot with much difficulty



If the spot had any motion it must have been very slow, for when first seen it was nearly at right angles to the spots a, b, and

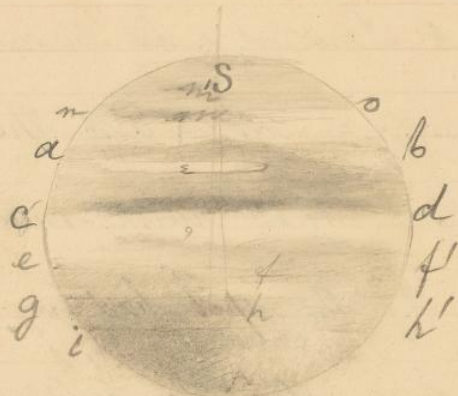
it appeared to be in the same position at 4 o'clock

H. P. T.

Jupiter

860 March 9thMean solar time $7\frac{3}{4}$

Maze



Very good definition for exactly sufficient
 time to draw the planet. As there are no
 very decided spots. Took about 15m.
 The line $c-d$ does not quite divide the planet through
 its centre. The northern half is uniformly
 dusky as far as $e-h$; there comes confusion
 back to the left a uniform band $g-h$ lost at h about $\frac{1}{2}$
 as dark as N then again, but also only seen cer-
 tainly on the preceding side $g-h$ excessively faint ^{belt egf} seen
 more from contrast with the bright zone
 $c-d$ than from any duskiness of its own.
 I thought all the belts with the exception
 of $efgh$ could be followed up to the limbs.

Jupiter continued

1860 March 9th

the band a b c d has a reddish tinge — the others have not. It is divided, ~~most~~ on the preceding side by a white zone ε , terminated distinctly on the right hand but with a less well defined edge to the left. Above it are a faint spot m and a very faint one m'. S is a very faint cap to ~~the~~ these regions seen with 141 — Upon applying power 400 I thought at first there was nothing but after examining it carefully I also saw it with this power certainly.

The greater part of m', m, ε and the dark part of c d precede the line S. What divides the planet into 2 equal halves. ~~the~~ b c d itself is of faint ~~as~~ all the other belts with the exception perhaps of it would escape detection if the seeing was not quite good there is a narrow band at g leading into the confusion between f h and f' h'd not to be drawn accurately.

S.C.

Jupiter

150 March 9th

Mean solar time

9 $\frac{1}{4}$ 

cleared off towards nine

There is a curious white spot at a seen white
on white zone a b the band c d is faintly
brighter than N though every thing is very firm-
decided except of a b and even here the
northern edge alone is well marked S is
uniform and now easily seen than previously
on the line of at m n are notches hard to
represent on this small scale but this

on the

L.C.

Jupiter

1860 March 9

Pretty fair definition

There are white spots

near a - below it & 1

passing some diagonal

wraps below it

brighter

9h 45^{min} a.m. 5th

G.P.B.

The large belt is by far the strongest
 the others are mere streaks of little intensity
 indeed the large belt is but faint

Saturn

1860phae.proj...1868
60 March 9th
vision deteriorating power 401

mean solar time $10\frac{1}{4}$ — 11

Either from not having examined the planet for some time and the eye not being familiar with it or from the vision ~~which~~ is deteriorating or from both combined, could not make out the various points concerning it with ease.

Ring A I can see this ring better on the preceding than on the following side. To the left I thought for a moment I saw something like the pencil line ^{in it} but am not sure of it. I could not make it out on the following side, at all.

Division of rings The south following part is the best defined. Here I could trace it up to following shadow with certainty. The north following could be followed for about $\frac{1}{3}$ of its 90 degrees and with ease. As for the preceding half of division I could follow it certainly from about $20^\circ \pm$ north of west point to 40 south of it. It required close attention to and the moments of best vision to see it across

Saturn Continued

the ball as a ^{fine} dusky line. The parts easily seen were much darker.

Ring B The inner shading extends over $2/3^{\text{ds}}$ of this ring and could be followed round. My eye is ~~to~~ out of practice with regard to this planet and I cannot decide whether there are any waves or divisions in this ~~the~~ dusky part.

Ring C This dark ring could be followed round the planet. Its inner edge seemed sharp.

Crescents The difference between them and the background of the sky did not strike me as being so well marked as I used to see it

The ball. The north pole is the ^{most} whitish-yellow ^{part} of the planet. It seemed to me to be as bright as outer third of ring B, It and I think brighter than equatorial zone.

The equatorial belt has a very faint reddish colour is narrow and pretty uniform.

Above it is a very ill defined belt very slightly darker than the background of

Saturn continued

ally as broad as equatorial belt, not quite its own breadth above it. The whole southern regions are darker than the northern though of every thing is very subdued.

The shadows I did not see any mark or trace of a shadow on the left hand side. To the right could see one very slightly curved to the planet more easily drawn than described.

the

The vision

as to make it very unsatisfactory work in trying to get exactly at its outline.



It was seen on
three rings

was such by this time

J. C.

Jupiter

1860 March 10

6^h 10^m Sid.

1/2	1/2	1	*		2
y	x	y	⊙		x

Bad definition

Procyon.

1860 March 10th

Ex. Ther 23.0

C C 7^h 44^m 00Position circle
from star near Procyonmica scale 0353.55 $\frac{1}{2}$

wires 353.36

D

14	3'	23
14	6	49 n.s.
12, 13	6	39 on 2 ^o scale
α	5	10 $\frac{1}{2}$
13	1	06
12	5	52
13, 14	3	34
9	3	22

B

7^h 54

24.8	28.7	
25.9	29.8	1.1
32.9	36.8	7.0
57.5	61.6	4.8
55	15.3 w.w.	
	19.6	23.7
	30.9	35.0 11.3
55	40.0	44.1 9.1

14	4	10 sec mil list
	6	23
	6	10 n.r.
α	5	47 $\frac{1}{2}$
13, 14	1	38
12	6	27
12, 13	4	08
9	3	57

56	25.9	—	0.8
	26.7	30.9	7.0
	33.9	37.9	4.7
	58.6	62.6	
57	12.4 w.w.		
	20.7	24.7	11.5
	32.2	36.2	9.0
	41.2	45.2	

D. B.

Procyon continued

1860 March 10

Star	12	2'	49"
α	1	25	
12	2	03	
- 0	11	ns	
- 0	23	Divine lot	

7 ^h 58 ^m	20.7	24.7
	45.3	49.3
59	7.3	11.3
	18.9	22.6
	27.8	—

Zero 10.00
Cloudy

Aglaja

1860 Nov. 10 J.H.S. obs.

Star a
Planet.?

6' 5"

10 40?

+16 20.6

Apr.

9 16 20.6

20 19.2

Star a

4 34

Bar seeing Planet very faint
4 34

9 29 32.5

Star a
Two Stars

3 6

7 53

6 46

9 39 14

43 —

43 —

lost

~~2 33~~~~7 29~~~~9 45 15~~

1 23

6 11

9 52 0

Moonlight bar.

1 52

Dir. lost.

9 56.8

John Bene. All this oil dropped from
the sweet-oil lamp in the telescope. J.H.S.

Time of transit by El.

9	41	42.5	46.6	
	45	38.5	42.5	3 55.95

9	54	20.5	24.3	
	58	15.7	19.7	3 55.30

9	59	16.7	20.8	
10	3	11.7	15.7	3 54.95

Star a is twice 10.757

Planet very faint

Approx. Reduction

Dec. 10 10 36 $10^h 46^m 35.0^s + 10^{\circ} 38' 27''$

C-D $+ 86'' - 39''$

1860phae

Urania.

1860 Jan. 10. T.H. Scherer

Draisse 11.317 = Star of Com.

Red. to
1825

(Gps)	Star	3' 18"	10	21	52.6	56.6				
	Pl.	8 30		22	16.2	19.9	5	23.65 + 5' 12"	5'	
									12.6	
	Star	1 29		23	11.9	15.9				
	Pl.	6 44			35.8	39.8	23.90	15		15.3
	Star	2 6		24	30.7	34.7				
	Pl.	7 19			54.5	58.5	23.60	17		13.0
	Star	2 33		25	37.8	41.6				
	Pl.	7 47		26	1.6	5.6	23.90	19		13.8
	Star	1 25		26	43.1	47.0				
	Pl.	6 39		27	6.8	10.8	23.75	14		12.6
	Star	5 11		29	18.1	22.0				
	Pl.	10 26		29	41.9	45.8	23.80	5.15		13.9
										13.7

Approx. Red. 11^h 5^m 4^s Lambert
 α 11^h 19^m 18.9^s
 δ +1° 53' 32"

March 11 Solar Spots H. P. I. Observer

(High wind, and many flying clouds)
 From 8 to 11 A.M. the sun was visible for only
 a few minutes at a time, and during its visibility
 I made a pretty accurate ^{drawing} of all the spots which I could
 see. There was several very small spots which
 were very difficult to see, and all of them were
 near larger spots. The seeing was bad when compared
 with previous days (Sunday)

Look again at 12^h 15^m and saw all of the old spots
 and no new ones

1^h 30^m Looked at the sun and found one new spot
 near the edge, - seeing better than in the forenoon

2^h 45^m The new spot is not a planet - nothing new

4^h 45^m Seeing good - nothing new

12 Sky cloudy all day

ll

c

3

7

Sketch for Poley

Feb. 14, 1868

T.H. obs.

$$a \ 12 \ 0 \ 52.0 + 8.52$$

Wm. records.

$$a \ 12 \ 3 \ 16.2 \ 20.3 \quad 7' 2''$$

$$x \quad + 9 \ 0'' \quad \checkmark \quad \text{Transits by H.}$$

$$12 \ 9 \ 56.0$$

$$y \quad 7 \ 50$$

$$10 \ 0.9$$

$$z \quad 10 \ 0 \quad \text{About } 12 \ 11 \text{ Chs.}$$

$$10 \ 2.2$$

$$8 \quad 5 \ 2$$

$$10 \ 41.2$$

$$y \quad 12 \ 9 \ 52.5$$

$$10 \ 0.9$$

$$8-9 \quad 41' \text{ alt.}$$

$$.4$$

$$x$$

$$z$$

x and z are very faint

$$\text{Reading of Pos. Circle } \left. \begin{array}{l} 353 \ 54' \\ 173 \ 56 \end{array} \right\} \begin{array}{l} \text{Not set. this} \\ \text{evening.} \end{array}$$

x is probably too placed.

$$8 \text{ is } \text{Worcester } 12.297 \quad ; \quad a \text{ is } \text{Taylor } 6578.$$

$$\text{Star } b \quad \text{app. place} \quad 12 \ 19 \ 49.3 - 6^\circ 33' 24''$$

$$x-8$$

$$- 45.2 + 3.53$$

$$\text{El. } 12 \ 9 \ 56$$

$$3. +$$

$$\text{Sid. Time } 12 \ 6. +$$

$$23 \ 32 -$$

$$x \quad 12 \ 18 \ 26.1 - 6^\circ 24' 31''$$

$$\text{Comp. place of } (49)$$

$$12 \ 18 \ 21.2 - 6 \ 28 \ 30$$

$$12 \ 18 \ 20.3 \quad 6 \ 26 \ 31$$

$$\text{Cam. m.t. } 12 \ 35$$

$$\text{Longit. } 5 \ 37$$

$$\text{Alt. } -22$$

$$17 \ 50$$

$$C-0 \text{ (if } x \text{ is pl.)} \quad + \ 2.9 \ + \ 1' \ 1''$$

$$(C-0) \text{ if } z \text{ is pl.}$$

$$4.5 \quad 0.0$$

Land for Hertie

1860 Feb. 14th5 = foot Equatorial

11

T. H. S.

Let the instrument be follows

236	10 49.20
W. side	9 40.52

Dec.	- 6° 38'
W. to Dec.	- 4
	- 6 42

with large ring micrometer (diam. of inner ring abt. 25')

The star ⁽³⁾ 10.11 is pretty nearly in the place indicated by Karlin's ephemeris

Let on a Virginis (some mistake here)

As 11 0 43	Dec. - 4 43
H. L. 9 59 11	

R. 13 2 45	Dec. - 4 47
------------	-------------

Aphra

600 Mch. 14. JMS

17 17.15

6 27

Shaw
Planet7 51.5
6 27?

ink finished here

S
D9 9
7 46S
P8 26
7 6

13

11	6.6	10.5
12	39.0	42.8

S
P8 1
6 40.

How is Rünter 3347 = N. 10.741.

~~7 19.5~~7 25
6 56 10.3
5 20.2
~~24 53.6 - 57.6~~
 26 25.4 29.2

28 24.6 28.7

Munna

1861 Nov. 14. I.H.S.

Munna	9 58	13	45 29.5	33.5	Interval	W.S.
79 down	3 56		47 1.5	5.5 + 1	32.00	
Planet	9 13		48 35.9	Mt.		
Star	3 8		50 8.1	12.1	1 32.2	
P.	9 59.5		54 —	36.1		
S.	3 56.		53 6.5	—	1 32.4	
P.	9 35.5					
Star	3 32.5					
P.	9 20.5					
Star	3 16.					

Pos. in 173.56.6

Various difficulties with Spring Government.

L

1960phoe.prj...186B