1881phae.proj.1313w

KG
11366
v.311

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1861phae.proj.issw

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June 26 1881

Comet b Bus. Mid. Obs.

Photometer Q

Portion of coma turned towards the Sun, midway between nucleus and edge.

q 47	12.4	15.8	P. obs.

Reject; dome interferes.

q 53	8.6	16.2	P. obs.
	9.4	16.1	
	10.1	15.7	
	28.1	48.0	19.9

~~1.7 28.9 46.0~~ 3.32

Transits 7.s0 diameter of Coma P. obs.

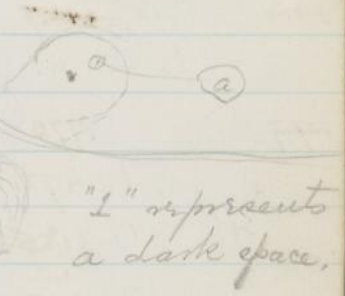
6.8 " " "

∴ Diameter of coma = about 1'

~~W. obs.~~ Same portion W obs.

q 58	9.5	17.4	
	10.0	18.2	
	9.5	18.0	
	29.0	53.6	

Sketch by W. as it appeared with #1 ring micrometer eye piece.



"1" represents a dark space.

24.6

4.10 5.76. 17.36

10 2	8.8	15.6	S. obs.
	7.3		Star gone behind the dome.

~~2.11 + 5 log 17 = 3.26~~ ~~+2.0 = 5.3~~ ∴ Coma = 5.3 mag. P. obs.

2.4 4.0/1 = 6.0

2.11 + 5 log 3.32 + 2.0 = ~~4.6~~ 6.7

4.10 ~~5.1~~ 7.2

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June 26, 1881.
Focault, 2 Mrs. Min. Probs
13.6
13.7
13.2
13.5

∴ Star 2' n of comet called a

B 236 Diaphr Phot. Q δ 56°.6

16		1.5	26.1	681	39.6	light	sky less than this	
16	39	5 a			~~39.6~~	~~-91.~~ -42.2		57°.922
~~5.83~~		22	1.5	26,1	681	39.6	74	-10.9 " equal to 1
		30	1.6	25,3	640	38.8	66	-8.9
		39	1.8	23.4	548	36.9	53	-7.2
		51	2.1	21.6	467	35.1	45	-6.1
~~4.1~~	40	5	4.1	15.6	243	29.1	31	-4.2 10.1
~~9.43~~		15	9.4	10.3	106	23.8	21	-2.8 9.2
~~223~~		25	~~22.3~~ 22.7		6.7	44.9	20.2	11 -1.5 8.2
		36	nucleus					
~~277~~			2770	Coma	1.9	361	15.4	
		51	47.2		4.6	21.2	8.1	+15 +2.0 7.4
	41	0	~~11.8~~		9.2	846	22.7	24 3.2 8.9
		12	~~4.2 11.7~~		15.5	240	29.0	36 4.9
		25	~~2.8~~		18.8	353	32.3	49 6.6
	"	35	1.7		24.1	581	37.6	59 8.0
	"	44	1.5		26.1	681	39.6	68 9.2 sky about equal to this

Da = -57°.3

Set I gives light a line nearly through nucleus +57°.3
Set II gives light a line at +58°.3

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1881phae.proj.1313W

June 26, 1881.

B 236 δ 57°.6

16 3 stars b, c, d.

c follows b 5ˢ, 3′ n.

d " b 32ˢ, 1′ S.

16 45 35	star	1′ S of	b			16 51 11	39.6	1.5		
46 3		39.6	26.1	1.5	+237	31.0	52	13	edge of tail	
17		39.6	26.1	1.5	223	29.2			indefinite	
35		37.8	24.3	1.7	205	26.9	52	39	star, 7 mags	
48		36.7	23.2	1.9	192	25.1			2′ n.	
47 1		34.8	21.3	2.2	179	23.4				
15		33.2	19.7	2.6	165	21.6				
26		31.3	17.8	3.2	154	20.1				
40		31.8	18.3	3.0	140	18.3				
53		30.9	17.4	3.3	127	16.6				
48 6		31.3	17.8	3.2	114	14.9				
17	b				103	13.5				
25		31.8	18.3	3.0	95	12.4				
37		34.4	20.9	2.3	83	10.8				
45	d				75	9.8				
53		35.2	21.7	2.1	67	8.7				
49 15		33.3	19.8	2.6	45	5.8				
28		31.9	18.4	2.9	+32	4.1				
37	star 2′ n				23	3.0				
53		36.3	22.8	1.9	−7	−0.9				
50 3		37.6	24.1	1.7	+3	+0.3			41 + 5h 26.1 = 11.2	
13		36.9	23.4	1.8	+13	1.7				
29		39.0	25.5	1.5	+29	3.8				
44	star 4′ n									
52		37.5	24.0	1.7	+52	6.8				
				1.5	+71	9.3				

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June 26. 1881.

179°.2 45'.0 W. obs.

45.0

224.2

Order = star, star, comet, comet.

17h ~~25m~~ ~~21.5~~ ~~58.0~~ 27m 18.0 28m 49.5

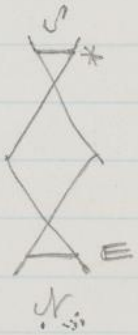
30.0 29m 4.0

30m 19.5 31m 48.0

29m 31.5 32m 8.5

32m 49.5

33m 2.0



Same comparison star as earlier in the evening.

Comp. star D.M. + 57° 922.

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1881phae.proj.1313w

June 28, 1881.

Comt. E. Equat. 2d Room Eyepiece
Wants. are square.

217.9
45
262.9

Comparison Stars D. M. 63° 630

Bolts in southern half. 1.7
1.5
of square. 17
Comp. stars O. A. 2.45 2 38

1st
6.5

~~3rd. Bolted down~~
~~4th~~
~~5th~~

1st & 2nd Eyes. D.M. 63° 630
3d " " 63° 634
4th 5th " Comp
2 min f DM 63 634 last.

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1881phae.proj.1313w

June 28th 1881

~~19h 38m 25s.4~~

Sid. 18 40 16.± star
41 1.3 comet

48 58.± star

217.9
45.
263.9

Comparison star 63°. 640
Comet in northern half of field. Star in southern half.

Sid. 18h 45m 45s.4 comet 18h 48m 47s.3 star
Mean time 12h 18m 47 05.5 49 53.9

50 24.4 images large 53 13.6
51 28.0 and blurry 54 25.9
not

Comp. star has another eye piece. Brightness 3 min S
3 magnifies. 3 " N

55 05.0 57 48.1
55 59.2 59 01.3

18 59 27.0 19 02 11.6
19 00 19.4 19 03 17.2

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1881phae.proj.1313W

June 28 1881

	19ʰ 04 57.0 comet	19 06 31.1 star
12ʰ 35ᵐ m.t.	04 55.0	~~47~~

5

08 53.2	11 19.6
09 21.9	12 31.9

Naked eye est. B tuneof nucleus
Midway between Polaris and β Ursæ maj.

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1881phae.proj.1313w

June 28 1881

Readings of coordinates of tail. P. 82

C.S.T.	Decl.	Dec.	H.A.		
19h 14.m3	13.5	62.°8	0.0	13h 18.m	-0.5 -.1 Nucleus
15.3	16.0	63.0	0.2	13	21.5 +2.0 +.2 Edge of Tail
16.0	13.0	62.9	0.1	13	19. -1.0 -.1 "
16.6	17.5	63.4	0.6	13	24. +3.5 +.4 "
17.0	12.5	63.4	0.6	13	19.5 -1.5 -.2 "
17.5	18.5	64.1	1.3	13	26. +4.5 +.5 "
17.9	12.0	64.1	1.3	13	20. -2.0 -.2 "
18.3	13.0	64.6	1.8	13	21.5 -1.0 -.1 5m star.
18.7	19.5	64.9	2.1	13	28. +5.5 +.6 Edge of Tail.
19.4	11.0	64.8	2.0	13	20.5 -3.0 -.3 "
20.3	19.5	65.4	2.6	13	30. +5.5 +.6 "
20.8	10.5	65.4	2.6	13	21.5 -3.5 -.4 "
21.2	19.0	65.9	3.1	13	32. +5.0 +.6 "
21.9	11.0	65.9	3.1	13	23. -3.0 -.3 "
23.2	27.5	66.7	3.9	13	40.5 +13.5 +1.5 "
24.7	-8.0	66.7	3.9	13	12.5 -6.0 -.7 " Diffuse Nucleus
26.0	14.0	62.9	0.1	13	20.

Comet tail extends about 0.3 way from nucleus to pole. or is 8° long.

Coma nearly defined now and more regular P. 81

B 236			B 374		
19	39	56.8	13	10	0.0
19	40	57.0		11	0.0

Bond 236 = 23.°1 fast

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June 28, 1881

Meridian Circle. Comet 26. G.

Did not find it.

June 29, 1881.

	Bond 236			Bond 394.	
6	39	45.5	0	8	0.0
6	40	45.7	0	9	0.0

Bond 236 = 23.5° fast.

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1881phae.proj.1313w

June 29. 1881.

Comet b. 1881.

6 6.5 +66.0

14 20.5

+8 24

17 5-0

+6

8 44

15 7+8

6 5

8 5-2

Setting on Comet.

$t = 15^h\ 1^m\ 18.4^s$

Hour Circle $= 9^h\ 0^m$

Decl " $= +64.9$

15 1

9 0

6 1

6

5

a star follows 65° 51′ (5.7 mag) by 2^m ± and south of it 5′

" " " " " " by 12⅝ sec. and north of it 7′

~~The latter is compⁿ star used~~ so not used

301.2

45

346.2 set at 346.2 comet in southern, star in northern half of ~~field~~ square.

order of Taps, Tap 1, star Tap 3, comet

" 2, star " 4, comet

$15^h\ 42^m\ 7.5$ compⁿ x thro centre, 6th set

compⁿ star used is 22′ ± north of other brighter star ~~a star~~ and a square here.

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June 29. 1881.

9 mag	15	48	16.2	Decl. 2 3/4	
Comp ×	7.8	48	41	" 1 1/2	= 66° 435
	9	48	50.2	" 0 3/4	
	9 1/2 -	48	55.0	" 4 1/2	
	9.4	48	59.5	" 0	

Setting on # 91 Scorpius.

16 02 — 09.1
16 08

16

Cloudy.

Bond 236.			Bond 394.		
16h	38m	23s.0	10h	5m	0.0
	39	23.2		6	0.0

∴ Bond 236 is 23.2s fast.
Comp. star D M. + 66° 435.

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June 30. 1881.

Bond 236 Mark at even min, on 1 clock wire 2.

14 23 40.2

Comet b 1881.

6h 11m 39s +68° 24' 30"

14 07

8 25

Zero 291.5 ~~Order~~

45

336.5

Order star, star, comet, comet.
star in Southern, comet in northern half of square

9h 38 m.s. 16 15. 48.5 comet middle of square 1st set not a cobbled star; reject

291.6

45.

336.6 comp^n clock 65°.441. one set.

Order, comet comet star star.
Comet in northern, star in southern half of Syllabic
Series of rattles follows first set on this star
352.2 series of rattles precedes 2d set on this star.
45. 1st set taken with 2d power going micrometer
Set at 307.2 eye piece folds sets with 1st power
for 2d & following sets In 2d & following sets, order same as in first set.

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June 30, 1881

In 2d & following sets, star in southern half ⊏ inside square; comet in northern half outside square.

Five complete sets. reject partial sets.

	Bond 236		Bond 394.		
17h	40	30.5	11	3	0.0
	41	30.9		4	0.0

∴ Bond 236 is 24.6 fast.

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July 1. 1881.

Comet b. 1881

6 2 ~ +70.4

14 3 8

+8 1 6

14 4 ✓ ~

6 2 ~

+8 2 3

14 ✓ ~

6 2 ~

8 20

Pos. 0 = 317.0 N. obs.

4 ✓

362.0

Set at 2.0

Order Comet, Star, Comet, Star.

10 17 Both in northern half of square.

Last transit on Star in ~~second set~~ fourth set ½ second too early.

In first four sets comet and star in northern half of square - afterwards both in southern half of square.

Order in both ~~halves~~ the same.

Six complete sets.

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July 1, 1881.

Bond 236.

17 21 37.5 = Minute on Chronograph
22 37.5 = " "

	Bond 236		Bond 394		
17	25	24.5	10^h	44^m	0.0
	26	24.5		45	0.0

∴ Bond 236 is 2v.2sec. fast.

t = 17 28 48
11 4
6 24

17 31 28.5
31 49
20.5

t = 17^h 32 14

Comparison Star = Dm +70° #406
Mag. 7.2

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July 1, 1881

First part of Nucleus Reject See below.

Coordinates of tail of Comet

t = 17 09 46.0

Coarse Hour = 11 14

Decl 70.2

~~Coordinates~~ Wdbs

Coordinates of tail of ☄ (Large finder)

t.	H. C.	Dec.	Remarks.
17h 39m 46s	11h 14m	+70.2	Nucleus.
4 23	21	70.1	Edge over nucleus.
46 14.7	23	70.20	
47 16.3	25	70.20	
50 13.4	29	71.00	
51 29.2	32	71.95	
53 21.4	35	72.95	

Same with small finder. Wdbs.

t	H C	Dec	Remarks
17 56 50.0	11 32	70.20	Nucleus
57 45.5	37	71.15	
58 48.8	41	71.95	
18 0 0.5	41	72.95	
1 56.8	44	74.00	
3 11.3	45	75.00	
5 14.5	48	76.50	
7 9.7	12 19.5	77.2	

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July 1, 1881.

Other side With small finder.

	t		H circle	Dec	Remarks
18	8	36.5	11h 45m	0.2	Nucleus.
	9	38.2	11 43	1.2	
	11	2.7	11 38	2.7	
	11	50.3	11 30	3.9	
	12	35.5	11 17.5	5.2	
	13	5.6	11 8.0	6.1	
	14	8.9	10 46.0	7.2	
	14	46.5	10 36.0	8.8	

Comps. Star + Urs. Min.

Coma 0.5 south of nucleus. P. obs.

~~+5.5~~

Outside	Inside focus.					
	15.3	8.9				A
11 46	14.2	9.6	18.5	Diff = 2.8	mag = ~~6.05~~	4.3
	Outside	Inside	295	110		6.6

Portion immediately north of nucleus.

16.4	5.3			B
47	16.7	7.2		
	33.1	20.6	125	Diff = 5.1 mag = ~~7.05~~ 6.5

Brightest portion of tail. +70.8 Dec.

Inside	Outside.			
4.8	19.8			
50	47	21.3	Diff = 7.9	~~8.60~~ = mag. 6.6
	Outside	Focus	31.6 − 7.9	+71.3 Dec.
	32.2	13.0		
53	30.4		Diff = 18.3	10.42 = mag. 10.6
	31.3			

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Zenith dist. of ○ = ~~for these obs.~~ = 67.0 obs. = 0.42
" " " & Uss Minn " " " = 47.9 " = 0.13
Diff. = 0.29

July 1. 1881.

Outside Focus. +71.9 Dec.

36.6 14.2
33.3
69.9
35.0

Diff = 20.8 ~~+71~~ mag. 2.2 ✓ ✓ 8.70 10.9

Outside. Focus. +72.2 Dec.

39.7 14.1
39.7

Diff = 25.6 9.2 2.2 11.4 ~~11.4~~ mag.

Comparison Star & Uss. Minn.

Outside ~~Focus~~ Outside. +73.2 Dec.

22.4 5.2
23.5 5.4
45.9 10.6
10.6
~~35.3~~ 35.3

Diff = ~~+17.6~~ = 8.8 6.83 4.3 11.1 ~~+11.14~~ ~~2.3~~ mag. ~~+8.84~~

+74.2

Outside. Focus.

25.6 14.3
26.6
26.1

Diff = 11.8 4.3 7.47 11.2 ~~mag~~ ~~2.3~~ ~~2.47~~ ~~+1.77~~

+75.2

Outside Focus. 4.3 8.86 13.2

38.3 15.6
37.7
38.0

Diff = 22.4 ~~+3.16~~ ~~2.3~~ ~~10.66 = mag.~~

Sky brighter near nucleus than near upper part of tail.

Sky near nucleus but outside of Coma.

Outside Focus. 4.3 8.24 12.5

32.8 16.9
35.1
33.1

Diff = 16.8 ~~10.24 = mag.~~ ~~2.3~~ ~~12.54~~

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Z.d. of ☉ = 67.0 Abs. = 0.47
" " ☽ Illum. min = 44.1 " = 0.10
0.32

July 1, 1881

	Limb ☉ (N)	Cusp (a)	Corner	Obs.
12 13	11.8	20.8		A All pointing with horns towards
	11.1	20.8		
	22.9	41.6		
		18.7	Diff = 17.4	7.44 mag. 6.9a 4.3 9.4
	Second pair Lamps			
12 16	11.9	3.8		A
	11.9	4.1		6.63 4.3 9.4
	23.8	15.9	7.9	Diff = 15.0 7.12 mag
		Lamps		
12 19	19.2	8.2		B 6.9a 4.3 11.3
	15.9			Diff 4.7 Diff = 9.4 6.94 mag
	35.1			
	17.6			
12 20	Nucleus at 70.5			
	Let at 71.0		A	6.47 4.3 12.8
12 22	26.3	7.5		
	26.0			Diff = 18.7 6.47 mag.
	26.2			
		71°5	A	6.64 4.3 12.9
12 23	29.9	8.0		
	26.5			Diff = 20.2 6.63 mag.
	56.4			
	28.2			
		72.5		
12 25	33.5	7.9		9.0a 4.3 13.4
	31.9			Diff = 24.8 11.48 mag.
	32.7			
		73.5		
12 30	39.8	7.9		9.61 4.3 13.9
	39.2			Diff = 31.6 11.61 mag.
	39.5			

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July 4, 1881

	74°.5		δ = Comp. Star.	
12 33	20.4	7.9	Diff = 10.3	7.17 / 4.3 / 11.5 ~~7.17 / 2.3 / 11.47~~ mag.
	16.0			
	18.2			
	75°.5		δ	
12 35	16.9	7.8	Diff. = 9.6.	7.07 / 4.3 / 11.3 ~~7.03 / 2.3 / 11.32~~ mag.
	17.8			
	17.4			

Sky near nucleus but outside of Comet.

	δ			
12 40	20.8	8.1	Diff 12.7	7.63 / 4.3 / 11.9 ~~7.63 / 2.3 / 11.93~~ mag.
	20.8			

12 43 Comet = α Ursæ Min. 5 β Ursæ Maj. Dubs
45 " α Bootis 6 α Ursæ Min. N.

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July 2. 1881.
Comet b. 1881.

6 38 R.A. +72° 3 Dec.
14 44
+8 13

8 45 β Urs. Min. 2 α Urs. Min. 1 obs.
ε Urs. Maj. 3 α Urs. Min.
α Urs. Min. 4 γ Cass.

Pos. 0 = 21 v. 2
45
Set at 260 0.2 W. obs.

Order Star, Star, Comet, Comet, Star in northern & Comet in southern half of Square

t = 15h 57m 8.9s
57 40.5

Cmp'r Star D. N. 72° 328

Bond 236.
t = 16h 3m 32s.7 = Minute on Chronograph

Another series of sets taken:
Order same as in previous sets.
Comet & star in same parts of square as previous sets.

Bond 236
16h 28m 33s.3 = Last minute on Chronograph

Two taps on star in 4th set. – True tap should follow second tap by 1 second.

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1881phae.proj.1313w

Z + 2.0 = 63.2 = Abr. = 0.34
" " * = K.A.F = " = 0.13
0.21

July 2. 1881.

Bond 236.			Bond 394.		
16	30	10.7	9	45	0.0
	31	10.5		46	0.0

∴ Bond 236 is 24.5 fast.

Comet. Heart of Light.
Phot. 2. Second power. P. obs.

First point about 0.5 distant from nucleus,
(Brighter portion of coma.)

	Outside	Inside.		
Prob. on	11.2	5.7		5.10
9 5.3 South side of nucleus.	10.0	5.6		2.2
	21.2	9.9	11.3	6.3

2.5 = Dif. ~~6.09~~ Mag.

Last direction of tail 0.5 from nucleus.

Prob. then	11.8	2.6		5.3.3
to North. 5.7	11.7	3.4		2.2
	23.5	17.5	6.0	7.5

4.4 = Dif. ~~7.33~~ Mag.

Decl. of nucleus +7 2.2 Set at +7 2.7

Outside	Focus.		
18.3	7.8		7.39
5.9 20.2			2.7
19.2	11.4 = Dif.	~~9.09~~ Mag.	9.6

Set at 73.2

Outside.	Focus.		
27.9	7.9		8.5.4
10 1 26.6			2.2
27.2	19.3 = Dif.	~~10.58~~ Mag. = ~~11.54~~	10.7

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1881phae.proj.1313w

July 2. 1881.

Set at +74.2

	Outside.	Focus.	
	33.4	6.8	9.20 / 2.2 / 11.K
10 3	32.7		
	33.0	26.2 = Dif.	~~4.21~~ Imag.

Sky near Comet.

	Outside.	Focus.	
5	32.6	8.4	8.92 / 2.2 / 11.2
	31.6		
	32.1	23.7 Dif.	~~11.98~~ Imag

6 Comet partly in Clouds

Az. 220.3 Alt. 28.7.6
Noted a bright cluster detected with Comet Lacks probably Cl. 1681

Became Cloudy.
Closed.

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1881phae.proj.1313W

July 3. 1881.

Comet 6. 1881.

6	41	+73.9
14	42	
+8	1	
15 6	1 41	
+8	20	

Bond 236.

14 ✓7 31.0 = Mean. on Chronograph.
✓9 31.0 = " " "

Comparison Star D.M. +74°.306 6h 41m 58s +74° 7.9

Zero. 197.3
48
Set at 2423

Three short rattles followed by a Lot at 15h 53m 7.3 Two 15 53 26.0 rattles and Lot at

Bond 236.
16 ✓3 31 = Last mean. on chron.

Bond 236. Bond 394.
16 ✓✓ 10.✓ . 10 6 0.0
✓6 10.8 7 0.0
Bond 236 is 24.s2 fast.

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1881phae.proj.1313w

July 3. 1881.

Five complete sets. ~~after~~
Order ∈ ∈ * *.
Comet in southern and star in northern half of square.

Coma much more marked on this side. Reading by diff. wheel will defined below. Phot. Vis. Small finder

Coordinates of tail of ☄

	t		H. C.		Dec	
	m	s	h	m	° ′	
17	3	15	10	21	73. 85	nucleus
17	5	2	10	27	75. 0	
	6	8	10	30	76. 0	
	8	9	10	34	76. 9	
	9	4	10	27	73. 9	other side nucleus
	9	35	10	25	75. 0	
	10	25	10	18½	76. 0	
	10	58	10	13	77. 0	
	11	55	9	59½	77. 9	
	13	0	9	36½	79. 0	

Comet measurements of Light
Phot. 2. Second Power W. obs.
Centre Star Polaris
Faint point 0.5 dist. fr. nucleus, opposite tail

	Outside	Inside	α
10h 38m	14.1	5.0	~~7.7~~ 7.6
	11.8	2.8	
	25.9 : 18.1	7.8 : 4.5 = Dif.	7.38 = Mag.

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1881phae.proj.1313w

Z.D. ○ = 63.° Alt. = 0.34
" " ☌ = 42.0 " = 0.13
0.21

July 3. 1881

direction of
0.5 fr. mclaus, in tail ☌

	Outside	Inside		
10h 40m	13.8	2.0	4.3	
	15.0	2.0		
	28.8	24.8	4.0	6.2 = Dif. ~~8.07 Mag.~~

0.5 fr. nucleus opp. tail ☌

	Outside	Inside		
10 43	14.1	3.8	7.6	
	12.7	4.7		
	26.8	18.3	8.5	4.6 = Dif. ~~7.42 Mag.~~

Decl. of Nucleus 73.° 9 Set at 74.° 5 ☌

	Outside	~~Inside~~ Focus		
10 45	26.8	7.9	10.5 ✓	
	24.2			
	25.5		17.6 = Dif.	10.34 Mag.

at Decl. 75.° 5 ☌

	Outside	Focus		
10 47	33.8	7.9	} rejected on acct of cloud	11.5
	38.0		28.9 = Dif.	11.35 Mag.
	35.9			

at 10 48½ comet almost covered by cloud

at Decl. ~~75.° 5~~ ~~76.° 5~~ again ☌

	Outside	Focus		
	33.5	8.2		11.2
	31.5		24.3 = Dif.	11.04 Mag.
	32.5			

at Decl. 76.° 5 } Comp.ⁿ Stars on the ♂ set, & the Nucleus.

	Outside	Focus		
11h 5m	18.0	8.8	11.3	= ~~9.2~~
	18.8		9.6 = Dif.	~~9.02~~ Mag. = 11.23
	18.4			

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1881phae.proj.1313W

July 3, 1881

Decl. 77.°5 S

	Outside	Focus		
11h 8m	22.1	8.4		11.9 Comp. star ~~9.8 prob. D Ken. Ken~~
	19.9			
	21.0	12.6 = Dif.	9.61 Imag.	

Brightness of sky in neighborhood of comet S

	Outside	Focus		
11h 11m	19.8	8.5		~~9.4~~ 11.6
	18.4			
	19.1	10.6 = Dif.	9.24 Imag.	

0.5 fr nucleus opp. tail, in coma. α

	Outside	Outside		
11h 28m	12.2	4.5		~~7.5~~ ~~9.7~~
	12.9	3.0		
	25.1 17.6	7.5	4.4 = Dif.	7.33 Imag.

0.5 from nucleus opp. tail in coma. α

	~~Outside~~	Focus.	Outside.		S. obs.
	3.0	8.0	12.0	~~7.6~~	~~9.7~~
11 38	3.5		12.4		
	6.5	17.9	24.4	4.5 = Dif.	7.38 Imag.

0.5 from nucleus opp. coma. α

	Outside	Focus.		
	14.2	7.8		~~8.1~~ ~~10.3~~
41	13.0			
	13.6	5.8 = Dif.	7.93 Imag.	

Dec. of nucleus 74.0 Set at 74.5

	Outside.	Focus.	α	
	18.8	8.0		~~9.5~~ ~~11.7~~
47	19.6			
	19.2	11.2 = Dif.	9.36 Imag.	

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1881phae.proj.1313W

July 3. 1881.

Set at 75.5

	Outside.	Focus.		
	30.8	8.0	~~11.7~~	~~13.3~~
11 46	32.2			
	31.5	23.5 = Dif.	10.96 Mag.	

Set at 76.5

	Outside.	Focus.		
	33.7	8.2	~~11.4~~	~~13.6~~
48	35.6			
	34.6	26.4 = Dif.	11.22 Mag.	

Set at 77.5

	~~Outside.~~	Focus.		
	~~38.5~~			
50	38.5	8.2	~~11.7~~	~~13.9~~
	38.6			
	38.6	30.4 = Dif.	11.52 Mag.	=

Set at 78.5

	Outside.	Focus.	Comp. Star	
	19.0	7.4	S Less. Limit.	
53	18.1		~~9.5~~	11.6
	18.6	11.2 = Dif.	~~9.36~~ Mag = 11.57	

Set at 79.5

	Outside.	Focus.		
	25.5	7.7	~~10.1~~	12.2
57	18.5			
	22.0	14.3 = Dif.	9.89 Mag.	

Sky at 79.5 on preceding side of tail.

	Outside.	Focus.		
	24.8	7.7	~~10.3~~	12.5
12 0	23.0			
	23.9	16.2 = Dif.	10.16 Mag.	

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1881phae.proj.1313w

July 3. 1881.

0.5 from nucleus opp. tail. & S. obs.

	Inside.	Outside.	Comp. Star	
	2.4	12.9	+ Wes. limit.	
12 6	2.6	12.9	7.9	
	5.0	20.8	25.8	5.2 = Dif. 7.6 Phag.

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1881phae.proj.1313w

July 4, 1881.

Comet at 6 49.5 +75° 22'

+ Dh +75° 285, 6h 49m 26s +75° 15'.3 | 8.4
281 6 44 44 26.0 | 6.8
283 6 46 37 15.8

+ Comp Star
Started at 14h 50m

Position zero 208.5
Set at 253.5
Comp. Star follows Comet about 3' south
Comet – Star

15 9 10 by B. 236; first signals on chronograph, P. obs.
Comet and star in southern half of Square. Order comet, star, comet, star; third and fourth signals close together.
In second set, comet, star, star, comet

Third set Chronograph failed.
Fourth by eye and ear with B. 236, P. obs.
15 21 3.5 comet 15 23 0.3 star S. rec.
24 0.4 " 23 48.0 "

Bond 236 is 23.5 fast.

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1881phae.proj.1313w

July 4, 1881.

Both in northern half of field

15	24	46.0	comet	15	24	33.0	star
	25	30.6	"		27	27.8	"
15	28	15.2	comet	15	27	57.3	star
	28	51.3	"		30	50.3	"

~~29 15~~

Square set at 208.5

15	57	39	bright star
		41	close companion of
	59	26½	star 10½ south of first star
16	1	47	comet about 4' south of first star
	2	18½	star about 10' south of first star

The last star appears to be that used as the comparison star in the preceding transits. The bright double star has one still brighter 10½ further north, and ~~precedes~~ within a second of the same right ascension. The double star is apparently Lal. +75° 281, and the northern star Lal. +75° 280; the combined light of the components of 281 may exceed that of 280.

Photometer Q Sky & head of comet, 8 Mir. Min.

9 40	24.5	7.0	focus
	clouds.		
9 45	28.5	7.3	focus
	25.2		
	26.8	19.5 = Dif.	10.56

12.9
12.7 cor.

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1881phae.proj.1313w

2.2.05 = 61.2 Abs. = 0.29
" " d = 62.2 " = 0.13
" " δ = 63.2 " = 0.10

July 4, 1881.

Coma south of nucleus, α Urs. Min.

9 50	2.9	11.9			7.7 ✓	
	2.4	12.8			7.5 ✓ cor. for ab.	
	5.8	18.9	24.7	4.7 = Dif.	7.47 Imag.	

Coma north of nucleus, α Urs. Min.

9 53	2.3	(7.6 focus)	13.6		✓	
	2.0		14.6		2.2	
	4.3	23.9	28.2	6.0 Dif.	2.0 cor.	
		23.7		5.9 Dif.	6.83 Imag.	

Decl. circle for nucleus 75.5
— " — 76.0, α Urs. Min.

9 57	24.3	8.3 focus			✓	
	24.1				10.3	
	24.2	15.9 = Dif.			10.1 cor.	
					10.11 Imag.	

Decl. circle 77.0, δ Urs. Min.

10 1	13.7	7.8 focus			✓	
	13.5				10.2	
	13.6	5.8 = Dif.			10.0 cor.	
					7.92 Imag. = 10.14	

Decl. circle 78.0, δ Urs. Min.

10 3	15.3	7.2 focus				
	13.9				10.7	
	14.6	7.4 = Dif.			10.5 cor.	
					8.46 Imag. = 10.67	

Decl. circle 79.0, δ Urs. Min.

10 7	16.8	6.7 focus.				
	16.6				11.4	
	16.7	10.0 = Dif.			11.2 cor.	
					9.11 Imag. = 11.32	

Decl. circle 80.0, δ Urs. Min.

10 9	16.3	7.8 focus				
	16.8				11.1	
	16.6	8.8 = Dif.			10.9 cor.	
					8.83 Imag. = 11.04	

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July 4, 1881

Decl. inde 81,0, ♂ Urs. Min.

10 13 20,5 7,5 focus 12.0
20.2 11.2 cor.
20.4 12.9 = Dif. ~~7.66~~ Imag. = 11.87

Sky rec. tail ♂ Urs. Min.

10 16 23.9 7.2 focus 12.4
22.18 12.2 cor.
23.4 16.2 = Dif. ~~10.16~~ Imag. = 12.37

Sky foll. head, ♂ Urs. Min.

10 ~~22~~ 22,5 7.8 focus 12.3
22.7 12.1 cor.
22.6 14.8 = Dif. ~~7.96~~ Imag = 12.17

Coma south of nucleus, ♂ Urs. Min.
Inside. Outside.

10 27 3.1 13.2 12.0
~~26~~ 2.1 13.6 ~~5.4 Diff.~~ 12.2 cor.
5.2 21.6 26.8 ~~2.9 = Dif.~~ ~~6.43 Imag.~~

Coma north of nucleus.
Inside Outside.
2.0 14.5 12.4
10 29 2.0 15.5 12.2 cor.
4.0 26.0 30.0 6.5 = Dif. 8.17 Imag.

10 30 3 Urs. Min. 2 ♂ Urs. Min. S. Obs.
2 Urs. Maj. 2 ♂ Urs. Min.
2 Urs. Min. 3 ♀ Cass.

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1881phae.proj.1313w

July 4. 1881.

Bond 236.

17 24 27.5 = Mean. our chron.
25 27.5 = " " "

Comet b. 1881. W. obs.

Pos. Zero. 234.2
45.
Set at 279.2

at 18h 30m 0s by Bond 236. taps on chronograph preceded and fol. by rattle.

at 19h 22m 0s by Bond 236. taps on chronograph preceded and fol. by rattle.

order * * = =
Star in northern and comet in southern half of square.
Five complete sets. First tap on comet in fifth set one second early.

Comp. star. D M. +75° 280.

Bond 236 = 23.4 fast.

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1881phae.proj.1313w

July 5. 1881.

Comet b. 1881.

7 5 +76°.6

14 45 15 2 15 21

+7 40 7 2 2 5

8 4 8 16

t = 15 26 47.2 = 561

27 43.3

t = 15 27 43.3 = 43.9

28 27.2

t = 15 40 28.5 = 44.9

41 13.4

Pos. 0 200.4 W. obs.

45.

Set at 27.4

15h 45m 43s.0 = taps on Chronograph.

Order Star, Star, Comet, Comet, both in northern of half of square.

8 55 β Urs. Min. 3 α Urs. Min. 1. obs.
ε Urs. Maj. 2 α Urs. Min.
α Urs. Min. 5 γ Cass.

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1881phae.proj.1313w

July 5, 1881.

15h 59m 50.0 = transit of star through middle of field

Comp. star D M. +76° 263 (9.1).

$t = 16^h\ 5^m\ 41.8^s$

$t = 16^h\ 38^m\ 26.5$ = tap on Chronograph

Bond 236.			Bond 394.		
16	42	58.2	9	46	0.0
	43	58.2		47	0.0

∴ Bond 236 is 22.1 secs. fast.

Coordinates of the tail.

Preceding Side

Time	ΔR	Decl	Prec. Side
16h 47m 52.5	9h 42m	+76.3	Nucleus
50 49.5	48.5	77.3	
51 49.5	51	78.5	W. obs.
52 33.	57	79.3	

Following Side

16 54 8	9	49.0	+76.3 Nucleus
54 50.0	9	43.5	77.3
55 34.5		34.5	78.3
56 22.5		26.0	79.3
57 9.0		11.0	80.3

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Z. d. E = 60°.0 Hor. = 0.26
Z. d. ℰ = 60°.1 " = 0.13 / 0.13

July 5, 1881.

Measures of light of Comet – Phot. Q

.v' from Nucleus opp. tail

	Inside Focus		Outside Focus	
17 9 Sid T	6.9		12.8	Comp. Star & Uns. Min.
	6.4		12.7	6.7 / 6.6 cor.
	~~F' from~~ 13.3	12.2	25.5	3.1 = Dif. ~~6.5 6.7 Imag.~~

.v' from Nucleus on same side as tail.

	Outside Focus		Inside Focus.	
M.T. 10 17	14.0		4.0	
	14.0		5.1	7.8 / 7.7 cor.
	29.0	19.9	9.1	5.0 = Dif ~~7.6 Imag.~~

Dec. of Nucleus +)6.v Set at +77.0

	Outside	Focus		
10 24.v	20.1	9.8	10.0 diff.	9.3 mag. 9.2 cor.
	19.v			
	19.8 v	10.0 = Dif.	~~9.11 Imag.~~	
	Set at +77.v			

	Outside	Focus.		
26	21.8	9.9	11.4	9.6 mag. 9.v cor.
	20.8			
	21.3 v	11.4 = Dif.	~~9.39 Imag.~~	
	Set at 78.0			

	Outside	Focus		
29.v	2v.2	9.8		10.3 mag. 10.2 cor.
	2v.8			
	25.5 v	15.7 v = Dif.		~~12.09 Imag.~~

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1881phae.proj.1313w

July 5, 1881

W. obs.

Set at 79.0

	Outside	Focus	
10h 31.5	31.8	10.2	10.9 mags.
	30.2		10.8 cor.
	31.0 ✓	20.8 ✓ = Dif.	~~10.74 mag~~

Set at 80.0

	Outside	Focus	
33.5	37.6 Reject	10.0	Wrong
35.5	30.1	10.0	
	32.0		
	31.0 ✓	21.0 ✓ = Dif.	~~10.72 mag~~

Reading on the Sky. 10.9 mags. 10.8 cor.

36.5	34.7	9.8	
	33.9		11.2 mags. 11.1 cor.
	34.3 ✓	24.5 ✓ = Dif.	~~11.06 mag.~~

All these measurements taken with 2 hrs. Min. as comparison Star.

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1881phae.proj.1313w

July 6. 1881.

Comet b 1881.

7 19 +77.7
14 52
+7 33

15 10 15 10 15 22
7 19 7 19 7 17
+7 51 7 54 8 5

15 25
5 07
7 58

Comparison Star = D M + 77° 288.

M. obs.

Pos 0 27 2.3
45
Set at 31 7.3 for transits

t = 15h 38m 21.3 = taps on Chronograph

Order Star, Star, Comet, Comet, Star in northern Comet in southern half of square

t = 16h 13m 28.8 = taps on Chronograph.

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July 6. 1881.

Bond 236.			Bond 394.		
16	15	49.6	9	15	0.0
	16	49.4		16	0.0

Bond 236 is 22.5 fast.

Co-ordinates of the tail.

Time	AR	Decl	
16h 46m 26s	9h 28m	77.7	P. obs.
47 7	26	78.7	
47 40	30	78.7	Seeing with great
47 45	28	79.7	difficulty owing
50 27	19	79.7	to ~~difficulty~~ moon-
51 26	23.5	80.5	light.
51 55	17	80.7	

Double H. C. 204.

19h 34m	−15°
17 4	
−2 30	

A double found

t = 17h 11m 0.4s

Coarse Hour = 9 27 W. obs.

" Decl. = −15.2

Mags. 8.8 & 10.5 Pos. 330° Dist 18"

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1881phae.proj.1313W

July 6. 1881.

Comet b 1881.

22 40 The nucleus of the comet last night presented a decidedly elongated appearance. This was more marked than when the comet was first observed, ~~which is taken occasion that~~ The ratio of the length to the breadth of the nucleus was approximately 2:1 a June 23. 1:1 July 1--5, 3:1 July 6. The direction of the elongation was approximately that of the tail or nearly opposite that of the Sun.

S. Ws.

Sent evening, at abt. 8h 42 C. Ms. T.

Noticed, that the ~~comet~~ comet appeared decidedly different from any previous night. A decided elongation in a north easterly direction. √ Have seemed to be a sharply pointed nucleus distinct from the rest in the south western part - then another part longer and opposite the coma proper which crossed the first bar at the same time with the nucleus.

It could not be due to refraction as it extended neither downwards nor upwards but laterally also, - nor to the effect of the bar as it was distinctly visible before it reached it, - nor to the coma as it was on the side opposite it and where the comet has usually been darkest. Also when it crossed the second bar it had the same inclination as before and did not lie along the second bar.

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1881phae.proj.1313w

July 6. 1881.

Remember also that before my first transit it occurred to me that it would be difficult to take transits owing to the increased size, but took the sharply defined and south preceding point. This sharply defined ~~and~~ point seemed distinct from the rest and about circular.

The longer axis of the whole phenomenon was to the shorter about as 3½ to 1.

W. obs.

July 8. 1881.

8h m. s. Recollect distinctly that the so called elongation, mentioned above, was tapering and expressed this to ~~him~~ Profs. Swift and Chandler last evening.

W. obs.

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1881phae.proj.1313W

July 8. 1881.

15h 0
7 59
7 10

+79 82

8 10 Comet found – twilight strong –
Did not search to any distance from comet to find any other part as the twilight was so strong – but a casual examination of the comet proper fails to reveal ~~any~~ any duplicity at present
W. obs.

8 12 Nucleus presents its usual appearance. No sign of duplicity detected twilight strong
R Pons

Pos 0 270.0
W
Set at 15h.3 for transits
W. obs.

t = 15h 50m 36.3s = taps on Chronograph

Order Comet, Comet, Star, Star, Comet in southern. Star in northern half of square

In fourth set use second close taps on Comet. (Second Corr.)

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1881phae.proj.1313w

July 8, 1881.

$t = 16^h\ 42^m\ 39.^s5$ = tap on Chronograph.

The bright nucleus is south following and then seems to be a south preceding portion which is fainter and separated a few seconds from the rest. ~~Nucleus.~~
This seems to be distinct ~~From the~~
from the coma. W. obs.

Civilian Messrs Lamp, A. G. Clark
and Langley

Comp. star for α = D M. +79° 267 (8.5)

	Bond 236.			Bond 394.	
19	30	12.5	17	21	0.0
	31	12.6		22	0.0

Bond 236 is 21.s3 fast.

12 33 Did not complete my record about as my boat was waiting.

The fainter phenomenon spoken of above was not steadily seen but thought to be quite certainly seen, and in about the opposite direction from that of Wednesday night last. ~~It~~ Should say that

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1881phae.proj.1313w

July 6. 1881.
the phenomenon of Wednesday night
was more strongly marked than that
of tonight.
W. obs.

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1881phae.proj.1313w

July 9, 1881.

Comet f. 1881.

8 7 +80.2
15 4
6 57

Pos. Zero. 300,9
45.
345,9

Comp. star: D M. +80°
Tap at 16h 0m 0.s4

9 0 β Urs. Min. 1 α Urs. Min. S. obs.
ε Urs. Maj. 3 α Urs. Min.
α Urs. Min. 4 γ Cas.
β Urs. Min. seems persistently fainter than usual; no clouds perceptible; moonlight strong.

Order Star Star Comet Comet.
Star in southern Comet in northern half of square. Five Sets.

t = 16h 41m 44.7s = tap on Chronograph

Comet appears about the same tonight as last night save that the south preceding portion is fainter if certainly seen. W. obs.

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1881phae.proj.1313w

July 9. 1881.

Bond 236.			Bond 394.		
18	0	44.3	9	48	0.0
	1	44.3		49	0.0

Measures on the moon.

Measures of ♄ "b" (Boscovich) N. obs.

10 ⅴ0	336.3	
	3ⅴⅴ.2	18.9
	1ⅴ1.2	
	164.4	17.6
		36.5

ⅴ2	1ⅴ4.9	S. obs.
	171.4	16.5
	332.8	23.4
	3ⅴ6.2	39.9

53	152.3	S. obs.
	171.8	19.5
	33ⅴ.3	15.9
	3ⅴ1.2	35.4

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1881phae.proj.1313w

July 9. 1881.

Measures of "x" (Hamilton.)

		157.4	S. obs.
10	56	169.0	11.6
		338.0	8.4
		346.4	20.0
	57	158.5	S. obs.
		167.5	9.0
		338.5	8.5
		347.0	17.5
		160.0	S. obs.
	58	166.2	Reject – down
		339.7	interferes.
		158.9	S. obs.
11	0	167.2	8.3
		339.7	
		348.0	8.3
			16.6

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1881phae.proj.1313W

July 9. 1881.

Measures of Z (Godiv.) S. obs.

11 12	156.3		
	167.8	11.5	
	327.0		
	342.0	15.0	
		26.5	
15	155.8		S. obs.
	170.0	14.2	
	335.4		
	350.1	14.7	
		28.9	
16	156.1		S. obs.
	169.1	13.0	
	334.8		
	350.6	15.8	
		28.8	
11 20	156.0		W. obs.
	168.3	12.3	
	334.1		
	348.4	14.3	
		26.6	
11 26	155.8		W. obs.
	167.1	11.3	
	335.1		
	348.0	12.9	
		24.2	

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1881phae.proj.1313w

July 9. 1881

Z continued

11 23	156.5	9.5	W. obs.
	166.0		
	337.9	9.9	
	347.8		
		19.4	

x (Manitius)

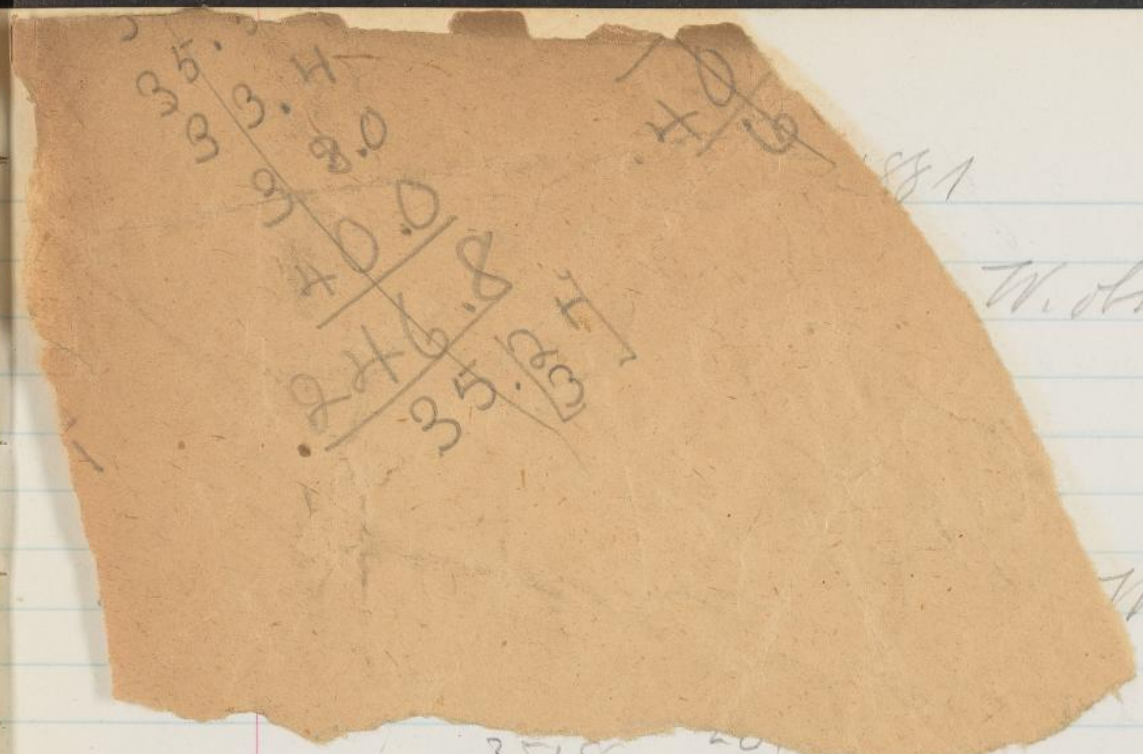
11 28	160.2	5.6	W. obs.
	165.8		
	337.6	6.2	
	343.8		
		11.8	
11 30	160.5	4.8	W. obs.
	165.3		
	338.5	7.5	
	346.0		
		12.3	
11 31	160.5	6.7	W. obs.
	167.2		
	337.3	6.7	
	344.0		
		13.4	

b (Bouvard)

11 35	154.5	16.5	W. obs.
	171.0		
	353.0	18.2	
	351.2		
		34.7	

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1881phae.proj.1313W



35.
33.4
3.0
40.0
246.8
35.23

W. obs.

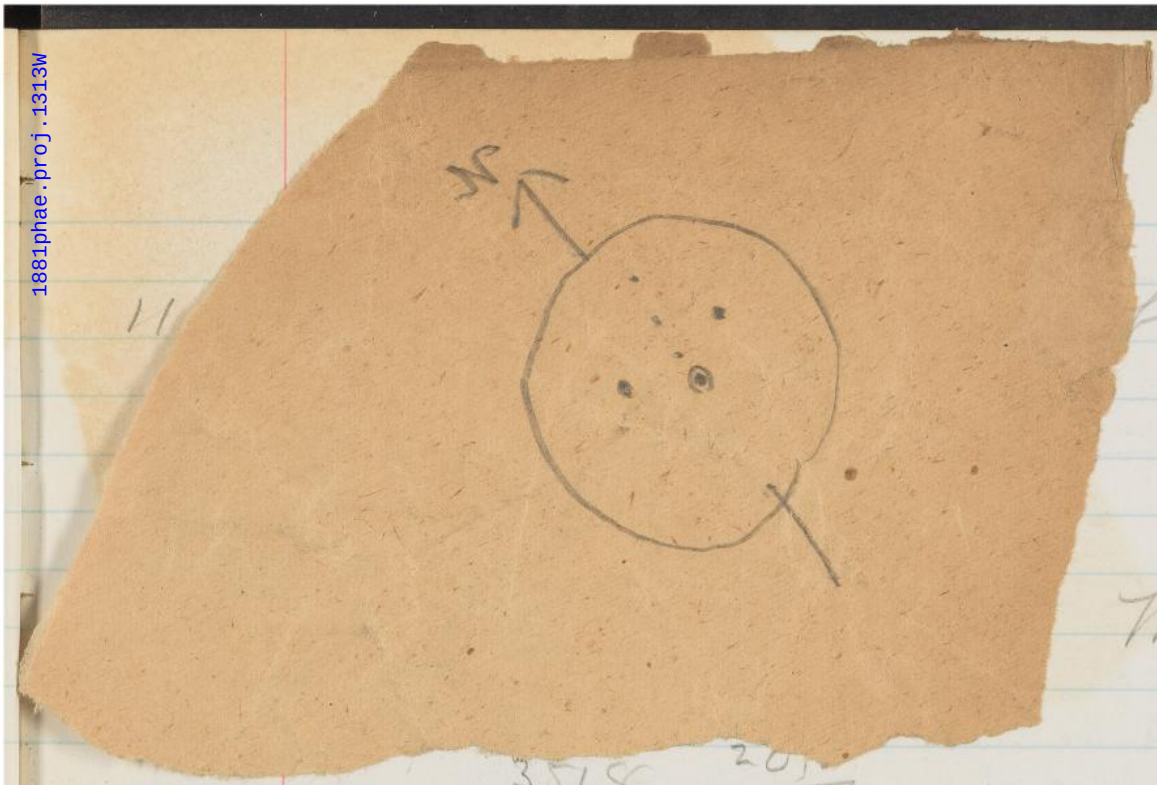
W. obs.

351.8

41.0

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1881phae.proj.1313w



11

W. obs.

351.8 20
41.0

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1881phae.proj.1313w

July 9, 1881

b continued

11 37			W. obs.
	152.2	16.6	
	170.8		
	334.0	15.1	
	349.1	31.7	
11 38			W. obs.
	152.5	20.2	
	172.7		
	331.0	20.8	
	351.8	41.0	

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1881phae.proj.1313w

July 12. 1881.

Comet b. 1881.

9 6 2
6 26

Pos. 1881. 9 12 24 +81° 43'
−4 2 +7

" 1855. 9 8 26 +81 50

9 12 12h 43m +81.7°
12 20 9 12
+6 8 6 31

12 55
2
8 55

16 12 5
6 51
9 21

16 18 46.8 16 15
7 11
9 3

16 23
6 14
7 29

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1881phae.proj.1313w

July 12, 1881

Pos 0 = 347.0
4 v. 0
Set at 303.0

W. obs.

t = 16h vvm 17.4s = tap on Chronograph.

t = 17h vom 39.1s = " " " "

t = 18 8 0,9 tap on Chron Second Sheet

Order on first sheet Star Star Comet Comet Both in northern half of sq.

Order on second sheet - Star Star Comet Comet Star in southern Comet in northern half of square.

t = 18h 41m 44.3s = tap on Chronog. 2d. sheet. near middle after some mo clarke. Ink made to flow more freely.

11 29 First tap on Star in fourth set (second sheet) half a second too early

39 In fifth set (Second Sheet) use record close tap on star. Reject first tap.

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1881phae.proj.1313w

July 12, 1881.

$t = 19^h\ 13^m\ 28^s.5$ = third & last tap on chronograph – Record sheet.

Five complete sets on Record sheet.
Only last one on first sheet good.

Comp. star D.M. +81° 28 (8.7 mag.)

Examined comet with three powers.
At times there seems to be a faint faintest and distinct from nucleus but it may be only the beginning of the coma.
Not very definitely marked. Tr. obs:

	Bond 236.		Bond 394.		
19	40	55.3	12	16	0.0
	41	55.3		17	0.0

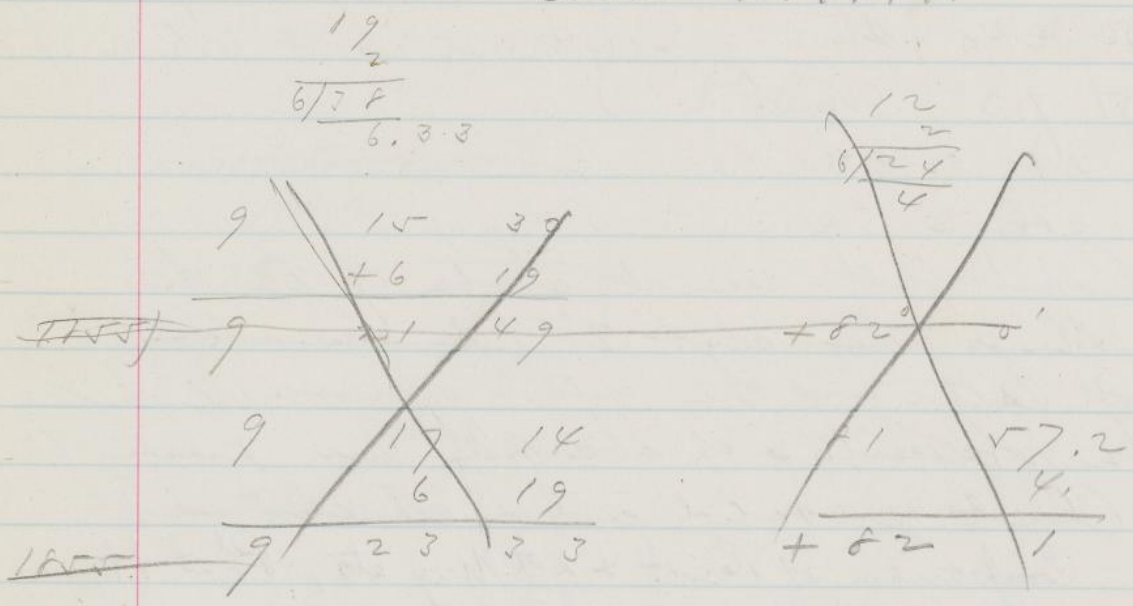
∴ Bond 236 is $18^s.7$ fast.

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1881phae.proj.1313W

July 13. 1881.

Comet b. 1881.



1855	9	17	14	+41° 7′
	16	30		
	+7	8		

W. obs.

Pos. 0 17.1

Set at $\frac{4\nu}{\nu 8.1}$ for Transit.

$17^h\ 11^m\ 8.^s\nu$ = first tap on Chron. for time.
18 1 8.0 = " " for time on second sheet

Order Star Comet Star Comet Both in northern half of square.

See page 59 for continuation.

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1881phae.proj.1313w

July 13, 1881.

B 236 P. Obs.

16 50 2.0 star } Comet about 0.5 m of star
57 7.3 comet }

Comet just seen at start of 1st then followed star abyt 2' but was outside of latter was the outside of coma so that no steadiness of absorption was practicable Clouds prevented earlier observations

Comparison of Comet & 4th Mag. star Phot. H.

9 44 33.2
68.5 35.3 S. Obs
204.8 46.9
251.7 42.2
~~2.1~~
2.1

52 30.4
70.3 39.9 P. Obs.
209.0
Clouds delay fourth readings.
249.2 40.2
~~40~~ 2.2

Images reversed.

58 17.9
84.3 66.4 P. Obs.
200.6 59.1
259.7 125.5
~~59~~ 1.1

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1881phae.proj.1313w

July 13, 1881.

10 1

21.2
86.6
~~19 v. Projet~~
198.9
252.v

6 v. x
v 3.6
119.0
1.2

P. ob.

10 5

21.8
71.0
208.2
2 v 3.v

49.2
4 v. 3
94 v
1.8

S. ob.

10 9

34.2
6 v. v
210.8
249. v

31.7
38.7
70.0
2.v

S. ob.

11

23.7
79.0
200.9
256.7

v v. 7
v v. 8
111.1
1.4

P. ob.

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1881phae.proj.1313w

July 13, 1881.

10 18

24.8
76.8 52.0
211.8 34.4
246.2 86.4
2.0

S. obs.

All the preceding through or among clouds.

37

28.2
71.8 43.6
211.1 34.8
245.9 78.4
2.2

S. obs.

Nearly clear.
Comet to left.

39

36.5
64.0 27.5
216.4 252.6
242.0 53.1
3.1

S. obs.

Comet to right.

41

35.1
65.1 30.0
213.6 32.5
246.1 62.5
2.8

S. obs

Comet to right.

44

30.5
68.0 37.5
209.4 37.9
247.3 65.4
2.7

S. obs. Comet to left

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1881phae.proj.1313w

July, 13, 1881.

Cont. from page 55

$18^h\ 30^m\ 48^s.8$ = second tap for time on second Chron. sheet.

Comps. star D M, +81° 302. Mag. 4.3

1st tap on comet in second set, second sheet, one second early

						W. obs.
	Bond 236.			Bond 394.		
18	51	42,8		11	23	0.0
	52	42,8			24	0.0

∴ Bond 236 is $18^s.4$ fast.

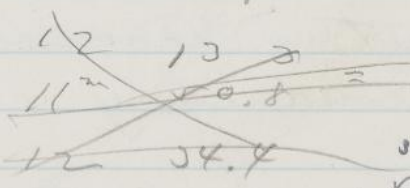
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1881phae.proj.1313w

July 14, 1881.

Examination of two doubtful cases in the old observations of double stars.

Star north preceding ζ Corvi. S. obs.



Estimated to be 1 magn. fainter than ζ Corvi; this agrees with the catalogues; suspected elongation.

{ B.A.C. 4149 nr ζ Corvi
{ Δα 22s.5 Δδ 2′ 28″.

Δα = 23s
Δδ = 2′.5

{ The stars are also Oeltzen 12089 & 12093;
{ Δα 22s.7 Δδ 2′ 24″.

B.A.C. 4154 = ζ Corvi α 1881 12 14.4 δ 1881 — 21° 33′.2

t = 16h 13m 49s B 236

Coarse hour Circ = 3h 49m α 12 14.8

" decl " = −21°.6

α Ophiuchi α 1881 17 29.4 δ 1881 +12 38.9

t = 16h 28m 40s B 236

Coarse Hour I — I α 17 29.7

" decl = +12.6

No companion seen S. obs.

α Herculis and other stars near examined.

Nothing seen like Bond's companion.

t = 16 42 15 B 236

h = 23 30 east δ +14°.6

α 17 5 45

At this place is a pair or 2 s, about 20″ to 30″ apart, magnitudes perhaps 7.5 and 10. Possibly this may be the object.

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1881phae.proj.1313w

July 14, 1881.

Bright planetary Nebula found with Comet seeker nearly in meridian
Alt. 203.8 P. Obs.
RA = 16h 40m Dec +30±
Probably GC 4234.

⊙
↓

Sweeping on West Balcony.
Telescope inclined about 2 hrs West
P. Obs.

Alt. of Pole Star 261.0
Clouds low in south-west horizon.

16h	1m	40s	Sweep.	
	2	40	4th Mag	181.0 -1.0
	3	"	3d "	214.0 +32.0
	"	"	2d "	261.2 +89.2 3 hrs. Min.
	4			277.8 95.8 " "
	6	8	Sweep.	
	9	2	IV type	202.0 +20.0
17	2	1	Sweep.	
	"	"	"	
	8	40	"	
	11	1	IV type susp.	184.0 +2.0
	11	30	Moon has risen.	

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1881phae.proj.1313w

July. 1K. 1881

Sweeping Continued P. obs.

$17^h\ 12^m\ 40^s$ 4th Mag 227.3 $+45.3$ Prob. β Bootis

Comet (b) 1881. S. obs.

Star runs on bar at 116.6
K.V.
Set at 161.6

$t = 17^h\ 7^m\ 2^s$
Hour Ang. $7^h\ 26^m.5$
Decl $+82.0$

Δ R.A. of 20 m class 11' diff dec.
1st class μ [illegible] Δ R.A. $= 3^m\ 14^s$

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1881phae.proj.1313w

July 14 1881

Comparison Star = DM +82° 285

9 33 32 +82 10.2

P. obs.

Transits

Name		AR		Dec	Mag
Comp. Star	17^h	$43^m 48^s.8$	$= 2^m 33^s$	v.v	9.4
DM. +82°		46 22.2		8	9.v
Comet		47 29.4		6.v	

Pos 0 116.1

4v.

Set at 161.1

Transits in northern half of square

17^h	v2^m	1.4	= Star
	v4	41.3	= "
	v6	3.3	= Comet
	v7	vv.3	= "

Same again

17	v9	38.9	= Star
18	2	18.2	= "
	3	48.4	= Comet
	v	3v.4	= "

Same again

	7	13.8	= Star
	9	v0.2	= "
	11	29.9	= Comet
	13	13.0	= Comet

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1881phae.proj.1313w

July 14. 1881

Transits in southern half of square.

18^h	14^m	$36^s.7$	= Star
16		4.7	= "
18		2.0	= Comet
20		29.5	= "

Same again.

18^h	22^m	$19^s.2$	= Star
23		47.5	= "
27		10.4	= Comet.
28		22.3	= "

	B 236			B 394	
19	20	43.0	11	48	0
19	25	43.5	11	51	0

∴ Bond 236 is 17.9 fast.

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1881phae.proj.1313w

July 15. 1881.

10 3 +δ 2°.1
15 40
+5 37

8 38 β Urs. Min. 3 α Urs. Min. S. obs.
ε Urs. Maj. 3 α Urs. Min.
α Urs. Min. 4 γ Cass.

B 236 W. obs.
8 59 16 34 58 time of 1st signal on chronograph.

Star runs on bar 167.2 ; set at 212.2
Order ; comet, star, comet, star.
Comet in N, star in S half of square.
Chronograph working badly.

B. 236
9 38 17 13 14 Signal in middle of series.

First taps on ∈ in second of last five sets one second early. - Last taps on ∈ in same set is double - ~~can mean to the two~~, use ~~last~~ second close taps of same.
First taps on star in fourth set is double, Use mean of same.
Five last complete sets to be used.

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1881phae.proj.1313w

Z. δ. = = ν 2.4 Abs. = 0.16
" " α = 47.8 " = 0.13
~~" " δ =~~ ~~0.03~~
" " δ = 46.1 " = 0.10
July 15. 18+1.
Bond 236.
17h 49 30 = last tap on chron for time.

Comet b. 1881.
Phot 2. + Eve. Min. Tr. obs.
0.5 from nucleus opp. tail.

	Inside.	Outside	
[10 20]	6.4	12.8	7.0 ✓
	5.8	13.0	
	12.2 13.6	25.8	3.4 ✓ = Diff. Mag = 6.77

0.5 from nucleus same side as tail.

	Inside.	Outside.	
	4.2	15.2	8.0 ✓
[10 24]	4.7	15.2	
	8.9 21.5	30.4	5.4 ✓ = Diff. Mag = 7.77

~~Dec. of~~ nucleus.

	Outside	Inside.	
	11.4	8.1	✓
	11.3	8.4	5.3 magn.
	22.7 ✓ 6.2 ✓	16.5 ✓	1.6 ✓ = Diff. ~~Mag. = 5.13~~

Dec. of Nucleus. 82.1
Set at 82.6

	Outside.	Focus.	
wrong.	~~33.2~~	9.7	
	26.8		✓
	25.9		10.4 magn.
	26.4 ✓	16.7 ✓ = Diff.	~~Mag = 11.22~~

Set at 87.1

	Outside	Focus.	
	33.2	10.0	✓
	35.9 ✓		11.3 magn.
	34.6	24.6 ✓ = Diff.	~~Mag = 11.06~~

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1881phae.proj.1313w

July 15, 1881.

Set at ∠ 3,6 Mass. mic. Tr. obs.

~~13~~ Outside. Inside.

17.9 4.6 9.4 magn.

14.2 4.5 9.7

2.8 .1 - 19.0 9.1 4.8 = Diff. ~~Mean = 9.75~~

Set at ∠ 4,1

Inside. Outside.

3.5 15.1

3.5 23.8 15.5 10.3 magn.

6.8 Sky. 30.6 6.0 = Diff. 10.2 ~~Mean = 10.25~~

~~Outside~~ Inside) Outside.

2.9 17.4

11 0 2.4 29.4 17.7 7.4 diff. 10.7 magn.

5.7 35.1 10.6

Preceding side.

Coördinates of tail. Tr. obs.

Time. H. A. Dec.

18 37 15 8 34 Nucleus. ∠ 2,0

38 56 8 30,5 ∠ 2,5

40 45 8 22 ∠ 2,9

43 6 8 6 ∠ 3,5

Fol. side.

18 ~~45~~ 45 30 8 42 Nucleus. ∠ 2,0

47 15 8 24 ∠ 2,5

48 25 8 9 ∠ 2,9

49 57 7 39,5 ∠ 3,5

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1881phae.proj.1313W

July 15, 1881.

1 30 Moon too high for photometric observations of comet. S. obs.

Examined several stars in the region of α Ophiuchi and α Herculis. Neither of these two stars or any of the others looked at shows a field like that represented in Bond's observation, book H.5, p. 415.

The star appears to be δ Herculis, which agrees fairly well in all respects with the drawing and description.

	B 236			B 394	
22	48	30.5	15	11	18
	51	35.0		14	22

∴ Bond 236 is 17.5 Fayt.

Photometer H; Jupiter III, IV S. obs.

23 5

79.0
200.4
80.8
202.0

23 9

78.0
203.0
∴ 80.7
201.2

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1881phae.proj.1313w

July 15, 1881.

23 12 84.8
200,0
81,6
201,2

Dès. sup. III. Phot. H. V. obs.

15	44	2,8
	23	41,1
16	7	43,9
15	34	0,0
	33	43,9
15	33	30,5
16	7	14,4

ap. cum eclipsi

15	38	16	76.0	
		34,0	202,6	
		56. 46.5	76,9	139.6
	39	16	204.2	
		32	77,2	
		49	201,4	
	40	7,5 8 5 7.6	80.2	139.6
		21	199.4	
		36	81.0	
		45,5 36	199.9	
		56	79.2	139.1
	41	6	196.3	

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1881phae.proj.1313w

July 1V. 1881.

1V	41	17	79.3	
		30	199.8	
		41.V 36	77.V	139.1
		V4	200.0	
	42	4	80.3	
		1V	199.8	
		30 23	78.8	119.7
		44	198.7	
	43	0,V	78.0	
		12.V	200.0	
moved diaphragm in field		V4 35	76.8	139.5
	44	10,V	203.2	
		42	74.8	
		VA	20V.0	
	45	18.V 89	77.V	140.2
		36	203.V	
		49	80.1	
	46	4	201.V	
		20 12	78.0	140.4
		37	202.0	
		V1	74.9	
	47	4,5	203.0	
		20 9	81.0	141.2
		37.V	20V.9	
		V6	79.4	
	48	37 33	200.2	
		42	80.7	145.8

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1881phae.proj.1313w

July 17, 18-21.

15.	44	56	203.0	
	49	9.5	60.0	
		25	200.0	
		49 38	70.0	140.0
	50	4.5	202.5	
		34.5	60.5	
	56	1.0	201.5	
		24.5 12	78.5	140.0
		42	199.3	
Moved major.				
	52	24	74.7	
		56	202.5	
	53	17 4	75.0	140.4
		05	205.5	
		51.5	75.5	
	54	7.5	201.5	
		25 31	76.6	139.6
		49	200.0	
	55	11.5	60.4	
		27.5	200.5	
		45 36	79.3	139.8
	56	0.5	199.0	
		15	74.4	
		32	203.2	
		46.5 39	79.5	140.9
	57	3.5	202.5	
		25	60.7	
	*	39.5	194.1	

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1881phae.proj.1313w

July 15, 1881.

15	57	53.5	47	82.5	140.1
	58	9		199.0	→
		19.5		77.0	
		02		197.5	
		40	38.4	85.5	138.0
		59		195.8	
	59	10.5		80.1	
		19.5	24	190.5	
		28		83.0	137.2
		37.5		191.6	
		47		84.1	
		55.5	0.0	194.0	
16	0	4		85.4	139.2
		11.5		193.5	
		20		84.0	
		29.5		191.6	
		37.5	34	89.5	141.1
		47		195.0	
		55.5		85.5	
1		4		190.0	
		13	9	84.0	138.2
		24		192.6	
		33.5		84.6	
		44		191.0	
		53.5	49	86.0	138.1
2		2.5		190.8	
		13.5		86.1	

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1881phae.proj.1313w

July 15, 1881

16	2	24	144.9	
		36 29	89.0	138.3
		44	129.0	
		56	84.0	—
	3	4.5	149.0	
		20 15	93.5	138.9
		35	188.7	—
		46	90.6	
	4	0	192.5	
		12 6	91.8	141.4
		24	190.8	—
		36	92.8	
		48	142.0	
		59 53	93.5	139.6
	5	10	190.0	—
		21.5	96.7	
		32	147.5	
		42.5	94.8	
		52	142.3	
	6	6	100.0	
		14.5	141.2	
		27	101.0	
		35	143.8	
		43	97.4	
		56.5	146.8	
	7	7	103.3	
		14.5	176.5	

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July 15, 18+1.

16	7	29.5	109.0
		47	17 5.5
		56	109.2
	8	8.5	175.2
		20.5	113.2
		33.5	172.0
		41.5	112.5
	9	5 Clouds.	
	10	41 Very slightly suspected,	

Limit of Vcs, Jup. IV.

12.	4		117.5
	20	25	169.3
	30		115.0
	44.5		179.5

143.0

Arnold + Dent, Copy. Bond 394.

~~16~~	32	30.5	~~16~~	33	0.0
5	33	30.5	5	34	0.0

∴ a-D 29.5 slow

Sat. used in comparison was the farthest from Jup. III of the other two satellites on same side.

Arnold + Dent			Bond 394.		
16	20	30.5	16	21	0.0
	21	30.7		22	0.0

∴ a-D 29.3 slow

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1991phae.proj.1313w

July 16, 1881.

Comet b 1881

Pos. 0 171.2 W. obs.

Set at 216.2 for Transits

$18^h\ 30^m\ 24^s.4$ = 1st tap on Chronograph for time

Order * = = *

Both in northern half of square.

Comp. star +82° 30 (8.9)

Clouds closed over

Schaeberle's new Comet.

20 27

14 42

14 38

21 2

17

1881phae.proj.1313w

July 16, 1881.

Schaeberle's New Comet.

$t = 3^h\ 49^m$ $\delta = 39.8$

$\theta = 21\ 40$

Pos. 0 = 86.2

4 – 0

Set at 131.2 for transits. W. obs.

Comp. Star = DM. +39° ~~#1471~~ #1471

$t = 22^h\ 4^m\ 14^s.3$ = 1st tip on Chronograph

Order Comet, Comet, Star, Star.
Comet in southern; Star in northern half of square.

2 3a In second set two close taps on second transit of star.
Use second one said taps.

$22^h\ 17^m\ 13^s.9$ = Middle taps on Chron.

A long rattle after middle taps. Force some more sets on comet $\underline{t}$ W. obs.

In first set on Comet $\underline{t}$, second sheet, probably neglected to make rattle before first tap therefore made one immediately after first tap

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1881phae.proj.1313w

July 16, 1881.

3 m. 7 8 Order Star Star Comet Comet - Both in northern half of square.

Comparison Star = Dm +82° #303
Mag! 9.3

Bond 236.			Bond 394.		
23	11	12.0	15	30	0.0
	12	12.0		31	0.0

∴ Bond 236 is 17.5° fast.

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1881phae.proj.1313w

July 17. 1881.

Comet b 1881. W. obs.

10 36 +82°3

15 56

+5 20

Pos. Zero. 86.0
Set at 131.0 for transits.

Comps. star D M. +82° 313 (8.9)

16h 23 40 by Boad 236 = first tap on chronograph for time.

order * = * =
Comet in northern and star in southern half of square.

9h 37m 17 21 55.5 2d tap for time on chronograph at end.

Coordinates of tail Prec side & foll. side W. obs.

		Decl	R.A.	
17h 25	15	82° 1'	6h 47	nucleus
30	55	83 2	6 18	Prec. side
32	30	83 0	6 3	foll. "
34	44	84 0	5 58	
45	30	84 0	2 48	

Last obsn not very good — Perhaps not to be at all relied on, as the position of the tail is such that this ~~end obs~~. last obs. necessitates a very large ~~epoten~~ correction in R. A. and so at which point the tail is crossed by

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1881phae.proj.1313w

Z.D. ○ = 50.6 Abs. = 0.16
" " ☿ = 44.1 " = 0.13
" " ☾ = 44.1 " = 0.03
" " = 0.10

July 17. 1881
Comet B 1881
Shot 2 - Comp^n Star Polaris . W obs.

Av. Brightness of Nucleus

Outside	Inside			
11.7	9.2	4.7		
11.5	9.2			
23.2 11.8	18.4	1.2 = Diff.	4.57 = Mag.	

0.5 fr. nucleus, opp. tail

Outside	Inside			
13.8	6.6	7.1		
13.8	6.7			
27.6 14.3	13.3	3.6 = Diff	6.89 = Mag.	

[9 44]

0.5 fr. nucleus towards tail

Outside	Inside			
15.5	4.8	7.9		
15.2	5.2			
30.7 20.7	18.0	5.2 = Diff	7.69 = Mag.	

9 52

Decl. of nucleus 82.2

Set at Decl. 82.7

Outside	Focus	
31.2	10.7	10.9 magn.
31.8		
31.5	20.8 = Diff.	10.70 = Mag.

Set at 83.2 Const^n Star & Use Micr.

Outside	Focus	
21.1	10.6	~~11.3~~ 11.4 magn. 11.3
19.8		
20.4	9.8 = Diff.	11.28 = Mag.

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1881phae.proj.1313w

July 17. 1881

Set at 83.7°

Outside	Focus	
23.0	10.4	11.6 magn.
21.4		11.7
22.2 ✓	11.8 ✓ = Diff.	11.68 = Mag.

Set at 84.2°

Outside	Focus	
27.0	10.8	12.4 magn.
27.1		12.3
27.0 ✓	16.2 ✓ = Diff.	12.37 = Mag.

Brightness of Sky

Outside	Focus	
10 460		
30.2	11.5	13.6 magn.
27.2		12.8
28.7 ✓	17.7 ✓ = Diff.	12.56 = Mag.

Comet c 1881.

✓	✓ 2	
21	27	
15	31	+40.0

6	42	
21	33	
17	✓1	
5	✓1	+40.0 = Pos. E

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1881phae.proj.1313w

July 17. 1881.

21h 58 10 by Bond 236 = last tap on chronograph for time.

Pos. Zero 30 s.2
45
35 7.2

22h 12m 13s.0 = 2d tap on chrono for time.

5 Sets of comps with 40°.1472 — Not a lettered star — reject.

Long path spreader. new set

23 10 27.2 tap on chrono for time.

new set of comps with D.M. 39°.1480

Order comet star comet star

comet in Northern star in Southern half of Square

23 25 20.7 = last tap for time on chrono.

	Bond 236.			Bond 394.	
23	30	10.1	15	45	0.0
	31	10.2		46	0.0

∴ Bond 236 is 16.1s fast.

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1881phae.proj.1313w

July 10. 1881

Comet b. 1881.

10 ν 2 +2.3
16 4
+ν 1 2

Pos. Zero. 308.0
4ν.
3ν3.0 M. obs.

$16^h\ 4\nu^m\ 46.^s9$ = first tap on Chron. on first sheet

9. 10 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. 2 α Urs. Min.
α Urs. Min. 4 γ Cass.

Comet b. 1881 continued.

Order Comet, Star, Comet, Star. Comet in southern Star in northern half of square

$17^h\ 42^m\ 10.^s3$ = ~~second~~ first tap for time on second sheet.

~~17 ν4 8.8~~

$17^h\ \nu\nu^m\ 11.^s3$ = Last and third taps on second sheet
Reject second taps on second sheet for time

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1881phaeproj.1313w

Z. D. 0≡ = Mr. 20.1A
" " A = " = 0.13
" " D = " = 0.10

July 16. 1881.

Comp. star D.M. + 82° 322. = Redhill 1628.

Photometer Q. 1 obs.

Coma & pr nucleus, & Urs. Min.

11 30	2.8	16.4			Distance from nucleus assumed	
	3.8	15,3	4.3		to be 0',5	
	6.6	31.7	4.2 ✓	6.3 = Diff.	8.11 = Mag.	
	6.6	25.1				

Coma nf nucleus, & Urs. Min.

11 36	2,3	18,2				
	2,1	17.4	4.4			
	4.4	35.6	4.7 ✓	7.8 = Diff.	8.57 = Mag.	
	4.4	31.2				

Nucleus in middle of field; decl. circle 82°.2

Decl. circle 82°.7; Tail, S Urs. Min.

11 43	3.7	15.3			10.1	
	3.7	14.7			~~10.0~~ mags, 10.0	
	7.4 ✓	30.0 ✓		5.6 ✓ = Diff.	~~10.06 = Mag.~~	
	7.4	22.6				

Passing clouds (may have been coming on during last set).

Sky, same decl., S Urs. Min.

11 50	25.1	9.8 focus			12.4 mags.	
	25.6			5.6 = Diff.	12.3 ~~12.39 = Mag.~~	
	50.7	25.4				

Moon risen above clouds in the east.

Decl. circle 83°.2; Tail, S Urs. Min.

11 55	20.5	9.4 focus			11.6 mags.	
	20.6				11.5 ✓	
	20.6 ✓		11.2 ✓ = Diff.		~~11.57 = Mag.~~	

Decl. circle 83°.7; Tail, S Urs. Min.

12 0	20.6	9.3 focus			11.5 mags.	
	19.1		10.5 ✓ = Diff.		~~11.43 = Mag.~~	
	19.1					

Clouds

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1881phae.proj.1313w

July 18. 1881.
Comet c. 1881.

5	5 3	+40.2
21	6	
1 5	1 3	

3	27.5
21	21.
17	5 3. 5
5	5 8. 5

B. 236
22 5 13 = tape on chronograph.

Star runs on bar 250.0
Set at 295.0
Comet compared with DM. +40° 1472.
Star star comet comet
Star in southern comet in northern part of field, both outside square.

DM. 40° 1472 compared with DM. +39° 1480.
Order 1472, 1472, 1480, 1480.
1472 in northern, 1480 in southern half of square

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1881phae.proj.1313w

July 18. 1881.

Arnold + Dent.			Bond 394.		
14	56	24.6	14	57	44.5 0.0
	57	24.6		58	0.0

+~~10~~ +19.9 +19.9

Dis. Jupiter I. Phot. R. V. obs.

14	59	21.1	
	23	41.1	
15	23	2.2	
14	57	0.0	
	26	2.2	
14	56	24.6	
15	22	26.8	app. time eclipse.

Sat. used for comparison is nearest one on opposite side. = Sat. II.

15	12.5	173.8
	13.0	269.8
	13.5	172.1
	14.0	270.0

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1881phae.proj.1313W

July 18. 1881.

15	14	39.0	171.3
		55.0	270.3
	15	12.5	171.7
moved maps in field >		24.0	272.3 —
	16	3.5	180.0
		25.5	269.1
		36.5	177.9
		47.0	268.0 —
		58.0	177.9
	17	10.0	267.0
		20.0	181.6
		30.0	267.7 —
		40.5	175.8
		51.0	269.0
	18	0.0	178.2
		10.5	269.0 —
		20.0	180.3
		31.5	269.0
		42.0	176.0
		54.0	265.2 —
	19	5.5	182.0
		16.0	269.2
		24.5	181.9
		35.0	265.0 —
		46.5	182.0
		57.0	265.7

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1881phae.proj.1313w

July 16, 1881.

15	20	8.0	181.1
		16.5	267.0
		26.0	181.2
		36.0	267.5
		44.0	181.2
		52.5	267.5
	21	1.5	181.2
		8.5	264.0
		17.0	181.5
		24.0	261.0
		29.5	191.5
		36.5	279.0
		42.5	196.5
		49.0	279.7
		55.0	191.2
	22	0.5	271.7
		10.0	197.0
		16.0	249.0
		20.5	197.0
		30.5	243.7
		36.5	200.2
		43.5	244.5
		49.5	200.1
		56.0	246.4
	23	2.5	202.5
		10.0	206.0
		20.5	211.5
		26.5	suspected.

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1881phae.proj.1313w

July 14, 1881.
Limit of Vcs.

1v	24.0	209.0
	24.v	203.2
	24.7	210.1
	24.8	237.2

Z d. ∝ = 67.°7 Abs. = 0.42
" " * = v7.3 " = 0.23
0.19

23	1v	
v	v4	
17	21	+40.2

Comet c = Comet 1881 IV.

Photometer Q

Comet 1881 c, α Aurigae. W. obs.
Central part of comet.

	Inside	Outside.	
15 38	5.6	15.4	v.v cor. ~~v.9 cor.~~
15 41	5.9	14.8	v.6v + wagon. ~~7.4v = Imag.~~
	11.5 18.7	30.2	4.7 = Diff.

Sky near comet, α Aurigae. W. obs.

15 42	4.8	17.0	~~6.3 cor.~~ v.9 cor.
15 43	5.0	15.6	6.07 wagon. ~~7.8v = Imag.~~
	9.8 22.8	32.6	5.7 = Diff.

Comet.

	Inside.	Outside.		
1v 4v	2.v	16.v		~~6.7 cor.~~ v. obs.
	2.7 27.9	16.6	7.0	6.v2 wagon. 6.3 cor.
	5.2 ~~5.6~~	33.1	~~6.3~~ = Diff.	~~6.11 = Imag.~~

Sky. v. obs.

	Outside.	Focus.		
1v 47	20.6	9.3		~~7.4 cor.~~
	21.0			7.v9 wagon. 7.4 cor.
	41.8	11.5	= Diff.	~~9.11 = Imag.~~

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July 18. 1881.

Comet. S. obs.

15 48 2.5 16.8

2.2 18.0

4.7 30.1 34.8 7.5 = Diff. 8.49 = Imag.

Arnold + Dent. 9 5 8. Bond 394.

15 56 2 5.0 15 57 44.5 0.0

57 26.2 58 0.0

19.5

18.3

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1881phae.proj.1313w

July 19. 1881.

Comet b 1881.

11 7 +82°.2
17 17
+4 0

16 2
11 7
+4 17

8 30 β Urs. Min. 3 α Urs. Min. S. obs.
ε Urs. Maj. 2 α Urs. Min.
α Urs. Min. 4 γ Cass.

Pos. 0. 169.4
4
Set at 21 4.4 for transits

~~16h 37m 32°.7 = first tap on chron. for time.~~

~~16h 17m 8°.5 = second tap on chronograph for time after new start.~~

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1881phae.proj.1313w

July 19. 1881.

17 20 15 = 2d 11 last tap on sheet for time.

2 taps on second star, first set — use mean.

17h 48 30 by Bond 236 = tap on sheet for time.

Order * * = =
Star in northern and comet in southern half of square.

18 33 45 = last taps on Arrow. for time.

Bond 236.			Bond 394.		
18	38	11.3	10	46	0.0
	39	11.3		47	0.0

∴ Bond 236 is 13.6 fast.

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1881phae.proj.1313w

Z.D. ∈ = −2°.1 Abs. = 0.16
" " ∠ = +7.7 " = 0.13
" " δ = +12.2 " = 0.10

July 19. 1881.

	Time			H.C.	Dec	
18h	−1	20	7h	41m	δ2.1	Nucleus.
	~~−3~~	~~−6~~	W.S.			
	−4	29		38	δ2.6	
	−5	14		23	δ2.6	
	−6	18	6	−1	δ3.1	
	−8	+8		1	δ3.1	
19	0	30		28	δ3.6	
	2	4	4	11.	δ3.8	Not very good.
	1	21	8	8	δ2.1	Nucleus.

owing to direction of tail a very long motion in a.R. is necessary which carries one to a very faint part of tail.

19h Phot. 2 [Comet b.1881] Nucleus. Comp. Star a Lns. Min.

	Inside	Outside		
11h 17m M.T.	9.3	11.2	4.3 mgn.	W obs
	9.2			
	9.2	~~2.0~~ 1.0 = Diff.	5.62 = mag.	

0.5' from Nucleus on side opposite tail.

	Inside	Outside		
19	8.0	12.9		W. obs. 6.4
	7.2	13.0	2.7 = Diff	6.27 = mag.
	15.2 10.7	25.9		

0.5' from Nucleus on same side as tail.

21	5.2	14.9		
	4.9	14.4	4.8 = Diff	W. obs 7.52 = mag. 7.7
	10.1 19.2	29.3		

Dec. of Nucleus δ2.1 Set at δ2.6

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1881phae.proj.1313w

July 19, 1881.

Comparison Star = 8 Hrs. Min.

		Outside	Focus	
				11.5 magn.
11	29	19.4	10.0	11.4 W. obs.
		21.8		
		20.6 ✓	10.6 ✓ = Diff.	~~11.45 = mag.~~
		Set at 83.1		
	32	22.9	10.4	W. obs.
		24.0		12.0 magn.
		23.4 ✓	13.0 ✓ = Diff.	11.9 11.89 = mag.
		Set at 83.6		
	34	27.2	10.5	W. obs.
		24.7		12.4 magn.
		26.0 ✓	15.5 ✓ = Diff.	12.3 ~~12.27 = mag.~~
		Set at 84.1		
	36	28.4	10.8	W. obs.
		30.9		12.8 magn.
		29.3 - 29.6 ✓	18.8 ✓ = Diff.	12.7 ~~12.69 = mag.~~
		Brightness of Sky.		
	37	(35.2 Wrong)	10.2	W. obs.
	40	25.1		12.2 magn.
		24.2		12.1
		24.6 ✓	14.4 ✓ = Diff.	~~12.11 = mag.~~

Probably ~~some of~~ this last measurements ~~are~~ is not much worthy as it is already somewhat cloudy in the vicinity of the pole star.

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1881phae.proj.1313W

July 19, 1881.

12 30 Too cloudy for further observations.

Comet c 1881.

⌐	⌐4	+40.4
22	12	
16	18	

22	30
⌐	⌐4
16	36

22	36
⌐	⌐4
16	42

Pos. Zero 111.2
45.
156.2

22 ⌐9 ⌐ = tap on chron. before transits.

Comet C. 1881. Phot 2. W, obs,

Inside. Outside
7.0 13.4
Cloudy.

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1881phae.proj.1313w

July 19. 1881.

Order * * ≡ ≡
Both in Southern half of square.

Comp. star 2 Lm. +40 #147 F (AH)

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1881phae.proj.1313w

July 21. 1881.

Comet b 1881.

11 34 +82.0
16 0
+4 26
13
+4 39

Pos 0 IV 1.7
4v-
Set at 196.7

17h 9m 17.6 = first tap on Chronograph for time.
Comet b. Phot. H. on comet seeker.

Photometer H on comet seeker
Comet and star near 5.0 hr
head, in opposite direction from tail
(star s/p comet).

q 15

9.6
84.2 — star disappears 74.4
193.3 93.8
287.1 168.2

Star to left of comet, too distant for reversal of images.

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1881phae.proj.1313W

July 21, 1881.

9 25 16.0 Star to left & above.
75.5 59.5
192.3 76.6
268.9 136.1

9 35 93.7 Star to left & above; the other pair
192.2 of images.
268.7 98.5
4.2 — star disappears. 95.5
194.0

9 45 112.2 Star to left.
166.2 54.0
271.5 73.3
341.8 127.3

Order Comet Star Comet Star
Comet in ~~Southern~~ Star in ~~northern~~ half
of square.

Comp. star for Comet $\overset{B}{C}_{\wedge}$ = D Lu. +82° 34 3. (P.P.)

$t =$ 17^h. ✓5 ✓3.2" = second tap for time

	Bond 236.		Bond 394.		
17	✓7	✓5.9	9	58	0.0
	✓9	✓5.9	10	0	0.0

∴ Bond 236 is $13.0^{s.c.}$ fast.

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1881phae.proj.1313w

Z. D. 0≡ = ν2°.2 Obs. = 0.16
" " Ast. Eq. 47.ν " = 0.13
" " δ true = 44.4 Judy = 0.10, 1881

Co-or. of tail. W. obs.

Time	aR	Decl	
~~18 18. 0 6 38~~		~~81.9~~	
18h 17m 0°	6h	38m	81.9 Nucleus.
18h 18m 30	6	4	82.9 Preced. side.
21 0	4	36	82.9 Fol. "
23 10	ν	0	83.9 Prec. "
31 0	ν	18	83.4 " "

Can get no farther nearer owing to position of tail necessitating a large motion in H. A.

Nucleus 82°.1
~~Set at 82°.1~~

10 40 12.3 8.0 W. obs. ~~Decl 82°~~
12.7 8.0 Comp. Star & Urs Min
25.0ν 9.0ν 16.0ν 2.2ν = Diff. 6.0 5.82 = mag.
ν minute from Nucleus on side opp. tail.

43 1ν.4 ν.4 W. obs. ~~Decl 82°~~
1ν.2 ν.8 Comp Star & Urs. Min
30.6ν 19.4ν 11.2ν 4.8ν = Diff. 7.7 7.52 = mag.
ν minute from Nucleus same side as tail.

Focus.
44 18.9 10.7 W. obs.
18.1 7.8ν = Diff. 8.57 = mag. Comp. Star & Urs. Min.
18.5ν ~~Set at~~ 82.6

ν9 20.4 2.7 W. obs. 11.3ν mags.
22.2 2.2 Comp. Star & Urs Min 11.2
42.6 37.7ν 4.9 9.4ν Diff. ~~11.19 = mag.~~

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N !! July 21, 1881

Set at 83.1
Focus

11 2 26.9 10.0 W. obs. 12.4 mags.
2 5.2 Comp. Star & Urs. Min.
26.3 16.3 = Diff. 12.38 = Mag.

Set at 83.6

26.8 10.8 W. obs. 12.4 mags.
1C 8 26.3 Comp. Star & Urs. Min. 12.3
26.6 15.8 = Diff. 12.31 = Mag.

Set at 84.1

14 32.0 10.8 W. obs. 12.9 mags.
30.2 Comp. Star & Urs. Min. 12.8
31.1 20.3 = Diff. 12,86 = Mag.

Light of Sky.

20 24.2 10.9 W. obs.
32.1 13.1 mags.
33.2 22.3 = Diff. 13.0 13.06 = Mag.

Nucleus & Urs. Min.

12 5 8.3 11.1 S. obs.
8.5 10.9 4.9 mags.
16.8 5.2 22.0 1.3 = Diff. ~~4.68 = Mag.~~

Coma, side opposite tail (0.5 from nucleus), & Urs. Min.

12 7 5.1 12.1 S. obs.
5.3 12.9 7.1 mags.
10.4 14.6 25.0 3.6 = Diff. ~~6.89 = Mag.~~

Coma, side towards tail (0.5 from nucleus), & Urs. Min.

12 12 3.6 16.1 5.1 mags. S. obs.
3.6 14.3
7.2 23.2 30.4 5.8 = Diff. ~~7.93 = Mag.~~

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July 21, 1881.

Reading of decl. circle for nucleus 82.1,
Tail, decl. circle 82.4, 8 Urs. Min.

12 23 | 2.7 | 16.0 | 8 obs.
| 2.1 | 15.8 | 10.6 magn.
| 4.8 | 27.0 | 31.8 | 6.8 = Diff. | 10.48 = Mag.

Reading of decl. circle 82.7, 8 Urs. Min.

12 27 | 18.0 | 9.3 revs. | 8 obs.
| 16.2 | 10.2 magn.
| ~~17.6~~ | ~~8.3~~ = Diff. | 10.7 | 10.92 = Mag.

Reading of decl. circle 82.9, 8 Urs. Min.

12 31 | 18.9 | 9.4 revs. | 8 obs.
| 16.0 | 10.9 magn.
| 17.4 | 8.0 = Diff. | 10.8 | 10.84 = Mag.

Reading of decl. circle 83.1, 8 Urs. Min.

12 35 | 21.4 | 10.1 revs. | 8 obs.
| 18.8 | 11.4 magn.
| 20.1 | 10.0 = Diff. | 11.3 | 11.32 = Mag.

Reading of decl. circle 83.6, 8 Urs. Min.

12 39 | 24.4 | 8.7 revs. | 8 obs.
| 23.9 | 12.4 magn.
| 24.2 | 15.6 = Diff. | 12.3 | 12.27 = Mag.

Reading of decl. circle 84.1 8 Urs. Min.

No perceptible cometary light here which can be pointed on in the finder!

Sky near comet, 8 Urs. Min.

12 47 | 26.1 | 9.6 revs. | 8 obs.
| 28.2 | 12.6 magn.
| 27.2 | 17.6 = Diff. | ~~12.55 = Mag.~~

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Z. d. ○ = 79°.6 Mb. 1.10
" " * = 61.6 " 0.29
0.21

July 21, 1881.

Comet c 1881, 2 Alcock.

13 55 3.4 11.6 Centre. S. obs.
3.0 15.6 ✓.1 ✓ cor. magn.
6.4 27.2 5.2 ✓ = Diff. ~~7.69 = Imag.~~ ✓.9 magn.
20.8

Coma 0.′5 from nucleus – foll. side.
Outside. Focus. S. obs.
14 8 25.1 9.9
30.8
28.0 ✓ 18.1 ✓ = Diff. ~~10.40 = Imag.~~ 8.6 ✓ magn. 7.8 cor.

Coma 0.′5 from nucleus – fol. side.
Outside. Focus. S. obs.
14 9 38.6 9.9
38.6
38.6 ✓ 28.7 ✓ = Diff. ~~11.40 = Imag.~~ 9.6 ✓ magn. 8.8 cor.

Nucleus. W. obs.
14 10 14.0 5.7
14.4 6.8
28.4 15.9 12.5 4.0 ✓ = Diff. ~~7.11 = Imag.~~ ✓.3 magn. 4.5 cor.

Coma 0.′5 from nucleus, p side.
14 13 31.2 10.0 focus W. obs.
33.5
32.4 ✓ 22.4 ✓ = Diff. ~~10.86 = Imag.~~ 9.0 magn. 8.2 cor.

Coma ~~0.′5 from~~ nucleus, f side.
14 14 37.5 10.2 foc W. obs.
38.1
37.8 ✓ 27.6 ✓ = Diff. ~~11.31 = Imag.~~ 9.5 ✓ magn. 8.7 cor.

Sketch from memory S. obs. ; slight tendency to form tail on p side; field of coma brighter to eye before measure.
W. thinks Coma brighter on p side.

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1881phae.proj.1313w

July 21, 1881

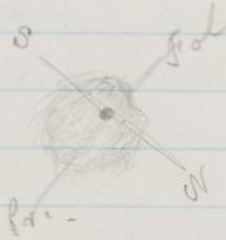
B 236; 22 19 44 taps on chronograph.

4	29	+1.2
22	30	
18	1	
12		
6	1	

Pos. Zero 21.5

4 r.

Set at 66.5 for transits.



Sketch made at telescope. W.

Nucleus decidedly eccentric. W.
Evident incipient tail.

Order = = * *
Comet in northern and star in southern half of square.

23 37 10 = last tap on chron.

Comp. star DM. +41° 1373. (8.8)

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1881phae.proj.1313w

21.

~~22~~

July ~~21.~~ 1881.

22 U

~~3 19~~ ~~+17.2~~

3. 18 +17.2

5 5 4

+2 3 6

7 5

3 18

3 4 7

5 5 7

3 18

2 3 9

6 20

3 18

3 2

Jupiter and Mars found. W. obs.

Clouds interfere with observation. Jupiter and Mars seen at times only. Mars looks much brighter than Jupiter (S. & W.) Does its color contrast better with the blue sky? The difference appears greater by day than it seemed last night (S.).

July 22. 1881

Comet b 1881

Pos 0 46.2 W obs.

4 5

Set at 91.2 for transits.

17h 42m 6.6 = first tap on chron. for time.

18 42

11 47

+81.9

6 5 6

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1881phae.proj.1313w

Z. d. ☌ = 69° 4 Obs. = 0.49
" " * = 69.5 " = 0.26
0.23

July 23. 1881.
Comet C. 1881.

Cloudy in north, low down —
waited until comet entirely above
same.

W. Obs.

6 4 + 42.3

22 50
16 46

Comp^n Star D.M. 42° 1502 { 6^h 7 14.5 / +42° 12.0 } 7.9

D.M. decl. of comp^n star appears to be + 1.0 ± too great

Phyth 2 Comp^n Star L Amiga

15 5	Inside 7.2	Outside 13.6	Mielens		5.1	4.9 cor.
	6.1	13.9		7.7		
	13.3	27.5	3.6 = Diff.	4.89 = Imag.		
	Outside	Screws				
15 10	23.0	10.0	South foll. side 0.5 fr. Mielens			
	23.8			7.9	7.7 cor.	
	23.4	13.4 = Diff.		9.40 = Imag.		
	20.2	10.0	South Rec. side 0.5 fr. Mielens			
15 12	18.2			7.1	6.9 cor.	
	19.2	9.2 = Diff.		8.90 = Imag.		
15 14	27.7	10.1	North foll. " 0.5 " "			
	27.1			8.5	8.3 cor.	
	27.4	17.3 = Diff.		10.80 = Imag.		
15 16	21.2	10.1	North Rec. " 0.5 fr. "			
	21.2			7.5	7.3 cor.	
	21.2	11.1 = Diff.		9.34 = Imag.		

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1881phae.proj.1313W

July 23, 1881

Zero 68.2
45.
Set at 23.2 for transits.
[≠ n. of × 6 3/4 @ 15h 31m

23 42 49 = 1st tab in chron. for trans

Order star comet star comet
Stars in southern comet in northern half
of sqrare.

Comet is brightest on south preceding side - bright portion also extending from south fol. to north preceding.
The bright portion around nucleus seems to have decidedly shifted since the obs. on 21st - having changed to south. W. obs.

Comp. star checked by three different stars near by. Comp. star differs by over 1' of arc from each of the others - said others agreeing among themselves ∴ Error in Dec. in position of comp. star in Dec. being about 1.5 too great. W.

Bond 236.			Bond 394.		
0	19	46.0	16	11	0.0

∴ Bond 236 = 10.7° fast.

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1881phae.proj.1313w

July 24. 1881.

Comet b 1881.

Pos. Zero 44.2
45.
Set at 89.2 for transits.

~~Broad~~
19h. 1m ν by Bond 236 = first tap on chron. for time.

19 23 40 = tap on chron. after new start after ink failed.

~~19 34 30 star~~
19 37 3 star. } approx. transit over mid-
19 41 57 Comet. } dle of square in mid. -
set.

20 2 3ν = last tap on chron. for time.

Five complete sets. Last ⊜ in last set 1sec. late.
Order * * ⊜ ⊜
Comet in northern and star in southern half of square.

Comp. star D M. +81° 393 (9.ν)

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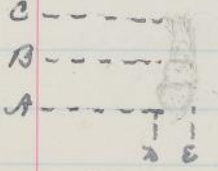
1881phae.proj.1313w

July 24. 1881.

There is a decided disturbance going on in Comet b. The nucleus is decidedly elongated. The north following part is a little the brightest and seems perhaps to be the nucleus proper, but there is also a south preceding part about equally bright which seems at times to be quite separated from the other - there is also another and somewhat fainter portion which forms a farther continuation in same direction and completes the elongation.

Examined with Nos. 1 + 2 ring micrometer, also achromatic of 400. - also Mars micrometer and No. 3 eye pieces.

Elongation marked with all. Most of them seem to show a faint division at intervals. The details are best seen with no. 1, and appear somewhat as in sketch. W.



Pos. Zero. 74.14
90.
16, 4. 14

Elongation in a south westerly direction.

Measures with Mars micrometer.

(AC) Total Elong. W. obs.				(AB) Elongation of nucleus W. obs.			
0	43.7	1	15.0	0	84.1	1	87.4
0	90.5	1	60.5	0	0.5	1	36.1 rej.
0	21.5	1	64.0	0	57.5	1	54.5
0	45.5	2	3.1	0	64.2	1	66.2
0	57.9	2	29.5	0	85.0	1	72.5
0	51.9	1	74.5	0	58.3	1	71.7

12 30 ±

Diff. 1" 22.6 = 11."8

Diff. 1.134 = 10."9

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1881phae.proj.1313w

July 24. 1881.

Width of nucleus. (D.E)

	0ʳ 17.8	0ʳ 91.2		W. obs.
	0 26.2	0 72.9		
12	0 5.8	0 46.8		
	0 5.8	0 54.9		
	0 65.9	1 36.9		
	0 24.3	0 80.7		
	Diff.	0.564	= 5.″4	

Measures somewhat difficult owing to lack of sharp borders, especially with this power. Watched the comet for over two hours. Phenomenon noticed at the first. W.

Comet C, 1881.

22 12 10 = 1st. tap on chron.

order * = * =.

= in southern and star in northern half of square.

Comp. star D M. + 42° 1509. (8.8)

22 35 0 = last tap on chron. for time. Six or seven sets after new start. reject second. W.

Too cloudy for photometric measures. Clouds increasing. W.

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1881phae.proj.1313w

July 25. 1881.

Comet b. 1881.

12 17 +81.4
16 40
+4 23

12 17
16 ν ν
4 28

12 12
12 17
4 ν ν

Comet watched for some two hours through thin places in clouds.
As near as one could judge there does not seem to be any disturbance in connection with nucleus as marked as last night - nucleus seems rather ~~shaf~~ sharp - possibly an appendage seen, but clouds do not admit of a very definite opinion.
Too cloudy for transits. Tr. obs.

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July 26. 1881.

Comet b 1881.

12 26 +41,2°
16 23
+3 +3

M. obs.

16h 54m 49s.1 = first tap on Chron. for time.

Order Star Star Comet Comet
Star in North. Comet in Southern
half of square.

8 45 Twilight strong, but D.M. +88° 4 easily visible in comet-seeker. Clouds in Southwest below Libra. P. obs. Comet-seeker on west balcony inclined about 2h to the west.

α Ursae Min. alt. 269.3

B 236 17h 5m 1st sweep.
6 30 3d Mag. ~~2 5 3.3~~ 2 5 3.3
6 55 Sweep.
8 40 4th Mag. 219.2
9 25 Sweep
11 50 "
14 25 "

{Clouds on α Librae
Sweep abandoned — Clouds & twilight

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1881phae.proj.1313w

July 26, 1881.

Comet b 1881.

$17^h\ 31^m\ 9^s.7$ = Second tap on Chron. or first tap after new start.

$18^h\ 0^m\ 47^s.9$ = last tap for time on Chronograph.

Comp. star D m. $+21° 397$ (8.5)

Comet carefully ~~exam~~ examined during the progress of transits with 2d power micrometer eyepiece - also subsequently with powers 1 + 3. although it was becoming somewhat hazy when seen with the ~~two~~ last two powers, yet there is certainly no such disturbance as on July 24 and the nucleus seems to have returned substantially to its normal condition.

Possibly the branching part of ~~tr. obs.~~ coma designated in diagram as "1" a little more strongly marked than usual, ~~but not very strongly so~~.

Tr. obs.

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1881phae.proj.1313w

July 26. 1881.

Comet C. 1881.—

6 12 +43.6 Wr. obs.

23 7

16 49

√ √

Pos. Zero 45.0

23 39 10 = 1st tap for time.

0h 1m 0s 2d " " "

order = = * *

Both in southern half of square.

Comps. star ZU +43° 15′ 27 (6.9)

Too cloudy for photometric measures.

Thick fog also coming up.

Fr. 1327. Bond 236.

19	9	0.0	19	f	31.3
	10	0.0		9	31.3

∴ Bond 236 = 7.5 fast.

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July 2 1881

050 - 136

12
16
+3

16
+3

Comp el

39.5
45
84°

Slip a

Orde
Star
half of

Uncle
its nor
brighte
south
night

SEARCHING REPORT

Heading (Check **one** box only)

- ☐ Identification guaranteed
- ☐ Identification **not** guaranteed
- ☐ Conflict
- ☐ No conflict

Other headings searched and Comments:

Edition Report

Latest Widener edition

Year
Call number

- ☐ Only edition
- ☐ No edition
- ☐ Earlier, ☐ Later, ☐ 5 or more } editions in Widener
- ☐ Earlier, ☐ Later } editions in K

Author number (unless shown above)

9.5
12h 32m 36s 81°01'

net in northern

be about in
erhaps, slightly
l in same
ginated last
W. obs.

Bond 394

18 10 30 00

∴ Bond 236 is 26.5 fast.

This comparison is evidently wrong as the next shows.

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1881phae.proj.1313w

July 27. 1881.

12	37	+81,1
16	19	
+3	44	

16	29
+3	44

Comp star = D M + 81° 401 mag 9.5 $12^h\ 32^m\ 36^s$ 81° 10,1

39.5 = Zone
45
84°5 Let alone

Tip at $16^h\ 46^m\ 11^s.4$

Order * * ⊜ ⊜
Star in southern and comet in northern half of square.

Nucleus seems to night be be about in its normal state except, perhaps, slightly brighter and more marked in same south pre ceding place designated last night. W. obs.

~~Bond 236.~~ ~~Bond 394~~

~~18 53 54,0~~ 10 30 0.0

∴ ~~Bond 236 is 26s fast.~~
This comparison is evidently wrong as the next shows.

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1881phae.proj.1313w

July 27, 1881

Lunch with Comet Seekers on Mt. Bakewell

Telescope Clifford 4 in.

Polaris 27.3

9 04 Hrm = 17h 25 B 206

9 05 x Sup

	17h 32m	202.4	+16.2		3rd mag	
	17h 35				4th "	
	17 43	165.6			2 of 5th "	
15 58	17 43	166.7	-19.5	186.2	6th "	β Scorpii ?
	17 48	231.6	+45.4		3rd	
	17 50	182.4	-3.8		3rd	

Clouds begin to interfere at 17h 53m

16 8 17 54 182.3 2 of 4th mag.

Stopped by Clouds

15h 46m 15 16h 08m

Bond 206 is 7.6 Jack.

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July 27, 1881

81.1 Nucleus. Compan. Star B hrs Min

about 9 30	Outside	
	10.8	8.2
	10.7	8.5

Reject cloudy.

July 28.

	Bond 236.		Bond 394.		
7	31	34.4	23	2	0.0
7	37	37.4	23	4	0.0

∴ Bond 236 is 6.4° fast.

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Aug. 2. 1881.

Comet b. 1881.

13	15	+80.0	W. obs.
16	24		
+3	9		
16	33		
13	15		
3	21		

17^h 28 40 by Bond 236 = taps on chron. in midst of sets,

Order Star, stars, comet, comet.

Star = Northern half outside square.
Comet = Southern " inside "

$17^h 38^m 21^s$ = tap on chronograph at end of sets.

Comp. star + 80° 40 4 (7.5)

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1881phae.proj.1313w

Z.D. δ = +16.3 Obs. = 0.10
" " β = 39.7 " = 0.04

Aug. 2. 1881.

Coordinates of tail. P. obs.

	Time		R. A.		Dec.	
17	45	1s	4h	32m	+0.1	
	47	2s	4	2s	+0.2	
	48	2s	4	2s	+0.2	

Observations of above abandoned on account of faintness of tail.

Phot. Z. Comp. star β Urs. Min. P. obs.

		Nucleus outside.	Nucleus inside.		
9	13	11.6	7.8		
		11.1	7.1		7 magn.
		11.4	4.0	7.4	2.0

0.5 from nucleus - side opp. tail. P. obs.

		Outside.	Inside.		
9	15	13.5	5.0		
		13.7	5.0		7.4
		13.6	4.6	5.0	4.3

0.5 from nucleus - same side as tail

		Outside.	Focus.		
9	20	15.3	9.5		
		15.4	~~6.1~~	6.1	4.1
		15.6			

15' from nucleus along line of tail. P. obs.

		Outside	Focus.		
9	23	32.6	9.0		
		33.5			11 magn.
		33.0	24.0	diff.	

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Aug. 2. 1881.

Light of sky in vicinity of tail. P. obs.
Comp. star below β Urs. Min.

	outside	focus	
9 2±	20.0	9.8	9.1 mean.
	19.0		9.7 diff.
	19.5		

Nucleus.

	outside	inside	W. obs.
9 33±	12.8	6.4	Comp. star β Urs. Min.
	13.0	6.1	6.2 mean.
	25.8 13.3	12.5 3.3	

0.5' from nucleus on side opp. tail

	outside	inside	W. obs.
9 36	15.2	3.8	
	15.1	4.0	7.9 mean.
	30.3 22.5	7.8 5.6	

0.5' from nucleus, same side as tail

	Outside	Focus	W. obs.
9 40	18.2	9.0	
	18.2	9.2 diff.	9.0 mean.
	18.2		

5' from nucleus, along line of ~~same side as~~ tail.

	outside	focus	W. obs.
9 43	25.2	9.8	seem to be wrong
	26.7 16.8	9.2	10.3 mean.
	26.0	~~Comp. star~~	

15' from nucleus, along line of ~~same side as~~ tail

	outside	focus	W. obs.
9. 47	14.6	9.5	~~Comp. star~~
	14.1		
	14.4	4.9 diff.	

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1881phae,proj.1313w

Aug. 2

Light of sky in vicinity of tail W. obs.

9 49 outside 17.7 16.2 focus 10.0

Comp. star B Urs. Min.

15' from nucleus in line of tail. W. obs.

9 58 Outside ~~31.2~~ 31.2 32.8 32.0 focus 9.8 10.9 magn. 22.2 diff.

Comet C. 1881.

6 44 22 40 15 56 ~~+47.8~~ +47.3 W. obs.

4 20 22 59 18 39

4 23 23 7 18 44

Pos. Zero 35.2 45 30 F. 2

23 41 ∨ = tap by Boud 236 after sets.

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1881phae.proj.1313w

~~Z. d. ∝ = 69.8 Abs. = 0.49~~
~~" " * = 57.5 " = 0.26~~
~~0.23~~
Z. d. ∝ = 64.3 Abs. 2 0.35
" " β = 58.0 " = 0.23 f. 2. 1881.
0.11

Order ∝ ∝ * *
Comet in northern and star in southern half of square.

Phot. 2.

Nucleus. Comp. star β Aurigæ. W. obs.

	Outside	Inside.	
15 cot	11.2	8.2	~~β Aurigæ assumed to be 1.77 by our own meas.~~
	11.4	7.4 ~~.2 cor.~~	~~.1 cor.~~ ~~.3~~ ~~.0~~
	11.3	8.0	β is 2.07 by H. P. now and so assumed.

0.5 from nucleus – side opp. tail. W. obs.

16.4	4.0	~~8.1~~ ~~7.8~~ ~~7.9 cor.~~ ~~8.0 cor.~~
15.8	3.6	
16.1	3.8	

0.5 from nucleus – same side as tail. W. obs.

16.0	3.0	~~8.2~~ ~~9.7~~ ~~7.9~~ ~~8.0 cor.~~ ~~8.1 cor.~~ 8.2 mean.
15.8	2.8	
15.9	2.9	

Dec. of nucleus 4/7/5
Set at 43.5

5' from nucleus in line of tail. W. obs.
Focus book.

31.9	9.8	~~10.7~~ ~~10.4~~ 10.6 cor. ~~10.5 cor.~~
28.2		
30.0		

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1881phae.proj.1313W

Aug. 2, 1881.

0.°5 from nucleus in line of tail. Tr. obs.

	Focus prob.	
33.2	9.9	10.9 v 10.2 cor.
31.6		~~10.6 10.7 cor.~~
32.4		

1.°0 from nucleus in line of tail. Tr. obs.

~~25.1~~	~~10.7~~
24.6	10.0
~~24.8~~	

~~Light of sky.~~ Tr. obs.

15 44 ~~21.5~~ 9.7 9.5

The means of light of sky and of the 1.°0 point should probably be rejected. The sky is beginning to grow bright fast and clouds and fog suddenly put an end to the above set.

Slightly cloudy and hazy throughout in region of comet.

The comet appears about as a 5.5 mag. star to the naked eye. The tail is seen by indirect vision with naked eye to extend to ~~0.°5~~ over 0.°5 Sometimes seems to extend nearly 1.°0

Easily seen in opera glass. Seen in small finder to extend over half across the field - ~~It~~ seems at times to extend entirely across (2.°7)

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1881phae.proj.1313w

Aug. 2. 1881.

Direction of tail about north preceding.
The nucleus ~~is~~ proper is sharper and smaller than heretofore. — There then is a ~~fan~~ bright portion immediately surrounding it 20" or 30" in diam. — then a ~~good~~ strong bright coma about 5' in diam. fading off into a faint nebulosity about 7' in diam. W.

~~Direction of tail about north preceding. W.~~

	Bond 236.			Bond 394.	
1	8	9.6	16	20	0,0
	9	9.8		21	0.0

∴ Bond 236 is 5.2 fast.

Comp. star for Comet C = Dm. +44° 1346.

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1881phae.proj.1313W

Aug. 3. 1881.

Comet b. 1881.

13 20 +79.4

16 37

+3 17

17 1

13. 20

+3 41

Pos. Zero 242.4

4v.

197.4

18 17 v0 = tap in midst of rets.

18 24 4v = " at end " "

Order ⊏ ⊏ 1st " star - 2d " star - 1st " star - 2d " star.
Comet in northern and stars (both) in southern half of square.

~~Compar star~~ Both stars taken but the first is 2 m. + 79° 420 (9.5)
Second star fol. first by 14 secs. and is 1/3' south.

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1881phae.proj.1313w

Z.D. ☌ = ν 2.4 Abs. = 0.16
" " * = +9.9 " = 0.16

Aug. 3. 1881.

Nucleus – very well defined and small. Low Power. P. obs.

		Outside.	Inside.	Comp. star
11	ν	~~10.ν~~	9.3	3 Hrs. min.
		14.7		
		14.1	10.ν	
		24.ν	19.8	2.2 diff.
		9.0		5.9

0.ν from nucleus on side opp. tail. P. obs.

		Outside.	Focus, 2d Power.
12	0	22.0	9.6
		19.ν	9.4
		41.ν	11.2 diff.
		20.ν	

0.ν from nucleus – same side as tail. P. obs.

		Outside.	Focus.
12	2	20.6	9.2
		19.2	9.3
		39.8	10.7 diff.
		19.9	

5' from nucleus, in line with tail. P. obs.

		Outside.
12	8	26.7
		29.ν
		56.2

8.6
10.7 major.
19.6 diff.

15' from nucleus – in line with tail. P. obs.

		Outside.	Focus.
12	9	37.1	8.ν
		3ν.6	11.4 major.
		36.ν	27.6 diff.

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1881phae.proj.1313W

Aug. 3. 1881.

~~Light of~~
Moon has set and light of sky too faint to affect results. P. Obs.

Telescope clamped 2h 30m west of meridian
Sweeps from ±10° to ±7°

Began at 21 14
21 15 6.0 Cloudy

1843	18	16	8.1 −8.0	7 m	4 IV good
		19.6	6.6		Neb. ?
		22.0	6.0±	5 m	
1858	0	30 ±	5.9 −5.8	7 m	IV

follow a 4.0 in Camm dec.
Color 3

Arnold + Dent 9 ½.

12	√3	4 2.3	
	√4	4 2.4	

Bond 39 ½.

12	√√	44.5
		0.0
	√6	0.0

+62.7
+62.1

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1881phae.proj.1313w

Aug. 3, 1881.

Dis. Sat. I. Phot. R. P. obs.
Compared with Sat III.
Order of satellites IV III II I.

13	15	14,5
	20	41,1
13	38	55.6
12	56	0,0
	42	55.6
12	54	42,4
13	37	38.0

App. time eclipse.

13	20	5.0	120,6
	28	20,0	196,2
		32,5	125.4
		42,5	199.8
		55,5	124.9
	27	12,0	197.6
		25,0	122,0
		35,0	196,3
		53,0	125,0
	22	7,0	194,6
		38,0	125,7
		53,5	195.1
	29	5,0	125,6
		19,0	200.1
		31,0	125.9
		42,0	195.2

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1881phae.proj.1313w

Aug. 3. 1881.

10	29	54.0	120.7
	30	7.5	190.2
		20.0	126.6
		31.5	193.4
		47.0	125.7
	31	4.0	197.9
		15.0	200.9
		25.5	192.9
		37.5	129.5
		46.0	194.2
		54.0	126.0
	32	7.0	196.1
		35.5	126.7
		46.5	196.0
		56.5	125.8
	33	6.5	195.9
		15.0	120.0
		21.5	194.4
		31.0	126.7
		41.5	194.6
		54.0	125.9
		55.5	195.0
	34	12.0	124.0
		19.5	191.5
		29.0	120.6
		35.5	192.2
		42.5	124.0

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1881phae.proj.1313w

Aug. 3. 1881.

13	24	49.5	186.9	
	25	2.0	126.6	
		11.0	192.6	
		23.0	104.3	
		30.0	196.3	
		40.0	129.6	
		47.0	195.2	
		55.5	126.4	
	26	4.5	195.3	
		13.0	132.6	
		22.0	189.7	
		24.5	134.2	
		34.5	194.4	
		42.0	136.1	58.7
		47.5	190.5	54.4
		54.0	129.4	61.1
	27	1.5	189.1	59.7
		11.0	137.6	51.5
		14.0	185.4	48.2
		25.0	139.2	46.6
		31.5	180.9	44.7
		34.0	182.3	41.6
		43.5	182.4	40.1
		49.0	144.4	37.6
		56.5	179.2	34.4
	28	3.5	147.7	31.5
		9.0	176.6	31.1

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1881phae.proj.1313W

Aug. 2. 1881.

10	38	18,5	150,6	20,0
		25,0	171,0	20,4
		35,0	154,2	16,8

Limit of Vis.

10	39	152,0	
		170,7	18,4
	40	152,9	
		171,8	18,9

Seeing good. R. Ds. Wms

Comet c 1881
Cent Star DM +47° 1370, $6^h 44^m 44^s.2$ +47° 36'

Tail at 154°.4 Sec at 199°.4

Comet, Comet, Star. Star.
Comet in another star in another half of Eye.

Tail at $23^h 4^m 10^s.5$ B. 236

Dent. 14
$+72^h 13^m 42^s$
14 42

B 394
14 15 00
16 00
+62.0
+62.0

Comet = star near by.

Too cloudy and foggy for photometric measures.

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1881phae.proj.1313W

Aug. 4. 1881.

Comet b 1881.

17 26 79.6 W. obs.

17 24

+3 -8

Pos. Zero 244.8

45.

289.8

17 47 30 1st. taps on chron.

17 47 40 2d " " " " close by.

18 16 30 = taps on chron after new start.

18 37 10 = last taps at end.

Order * * = =

Both in southern half of square.

Comps. star same as last night (first of the two close ones.) = +79° 42' (9.5)

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1881phae.proj.1313w

Aug. 5. 1881.

Comet C. 1881. Tr. obs.

7 4 54
−7 59 +45.9
7 1
22 24
+15 20

Too thick for comet.
Seeing becoming worse.

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1881phae.proj.1313w

Aug. 6. 1881.

Comet b.

18 27
19 22
+ ν ν

W. obs.

+79.4

Sup at 18h 41m 21.6 = 1st ⁄⁄ on chron.

Star, Star, Comet Comet

~~Star a northern.~~
Comet a ~~southern~~. northern half of eyes
Star a southern " " "

Zero at 244.8
45
289.8
Set at 199.8

19 20 40 by Bond 236 = last tap of all - being last of two near together. after chronometer was switched in.

Comp. star D M. +79° 422 (6.0)

Two sets - seeing rapidly growing worse.

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1881phae.proj.1313w

Aug. 8. 1881.

Comet b 1881.

17 15
13 39
+3 36 +79.0

8/36
4½
½
14

8/78
9

8/75
9½
½
20

17 21 = 8 17
3 24
13 57

Pos. Zero. 93.3
45.
13 8.3

8 50 β Urs. Min. 3 α Urs. Min. S. obs.
ε Urs. Maj. 2 α Urs. Min.
α Urs. Min. 3 γ Cass.

5 33 5 = taps on chron. by sid. watch

Sid. watch.		Bond 394.		
20	42	36.2	11	31 0.0
4	3	36.4	32	0.0

∴ Sid watch is 39.9 fast.
Order * * ⊏ ⊏
Star in northern half of field outside square.
Comet in southern " " " inside " .

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1881phae.proj.1313w

Aug. 8. 1881.

Comet C 1881.

Pos. Zero 14 2.9
45.
137.9

23 23 10 = tap on chron. after first set.
0 15 40 = last tap on chron.

In first set reject last two taps at apparent end of set and use next two. Rejected ones belong to another star.

order = = * *
Bolt in southern half of square.

Comp. star D M. +50° 1452 (7.2) =
Oe. A. 8093

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1881phae.proj.1313W

Aug. 8. 1881.

0	24.5	1	46.0
0	52.5	1	64.5
0	19.8	1	2.2
0	49.3	1	25.1
0	64.1	1	39.1
0	36.4	1	12.9

Micrometrical measurements. W. obs.

Total nucleus.

0	76.0	1	49.5	113.5
0	72.8	1	49.9	117.1
0	55.5	1	51.8	96.3
0	21.8	1	11.9	90.1
0	39.9	1	39.2	99.3
				516.0
				103.26

Kernel. W. obs.

0	49.0	1	1.2	52.2
0	11.9	1	54.3	142.4
0	66.5	1	18.0	51.5
0	82.0	1	46.3	64.1
0	22.5	1	59.0	130.0
				446.7
				89.34

Mars micrometer used.

Seeing not sharp. — ~~somewhat cloudy,~~ ~~Cloudy~~ — Fleecy clouds, varying in density. Not suitable for photometric measts. There seems to be a kernel proper — then a close envelope, as measured. — then a bright coma and a fainter one outside.

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1881phae.proj.1313w

Aug. 6. 1881.

Not suitable for micrometric measurements of the coma or outer envelope, as the cloud and haze evidently contract them.

W.

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1881phae.proj.1313w

Aug. 10. 1881.

Comet b 1881.

W. obs.

13 47 +78.6

17 7

+13 20

17 20

13 47

+13 36

17 26

13 43

13 43

4 | 36

4 2

4

22

11

10 47

6

47

4 | 25

9 2 1

8

45

2

47

26

78 29

Pos. Zero. 134,0

45.

179.0

17 37 45 = tap on chron. in mid. of first set.

Obs. with first power.

Order * * ⊏ ⊏

Star in southern and comet in northern half of square.

Use second close taps on first comet in second set.

Comp. star D M. +78° 466 (5.8)

18h 51m 30s by Bond 236 = last tap on chron.

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1881phae.proj.1313w

Z. d. α = 49.1 Ab. = 0.13
" " β = 47.9 " = 0.10
No diff. Ab. perceptible between α and γ Urs. Min.

Aug. 10, 1881.

Photometer Q.

Comet b 1881 β Urs. Min.

Nucleus (brightest central part of comet; no stellar nucleus visible).

10 13 7.0 12.2 S. obs.
6.8 12.1 6.3
6.9 7.3 12.2 2.6 diff.

Coma, about 0.5 p nucleus.

10 18 2.6 17.0 S. obs.
3.3 17.9 d.γ
3.0 14.4 17.4 7.2 diff.

10 21 Coma, about 0.5 f nucleus.
20.2 8.8 focus S. obs.
20.5
20.4 11.6 diff. 9.γ

Coma about 0.5 n of nucleus
Delayed by clouds. S. obs.

10 31 2.4 18.7
2.2 18.7 d.ε magn.
4.6 32.8 37.4 d.2

Coma, about 0.5 s of nucleus.

10 36 2.2 18.9 S. obs.
2.1 17.5
4.3 36.4 4/32.1
d.0 diff. d.7 magn.

Coma, about 0.5 p nucleus, star 5 magn. nearest β Urs. Min.

10 40 6.9 11.6 (Comp. κ = γ Urs. Min.) on n/p side.
6.5 11.2 S. obs.
13.4 22.8 d.3 magn.
9.4 2.4 diff.

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1881phae.proj.1313w

Aug. 10, 1881.

Coma about 0.5 f nucleus, same star.

10 45 6,8 11.8 S. obs.
5.8 11.6 6.4 magn. 8.6 magn.
12.6 23.4 4/10.8 2.7 diff.

Coma, about 0.5 n of nucleus, same star.

10 50 7.2 11.0 S. obs.
7.0 11.4 7.9 magn.
14.2 22.4 4/11.2 2.0 diff.

Coma, about 0.5 s of nucleus, same star.

10 53 7.0 11.1 S. obs.
6.7 11.6 8.1 magn.
13.7 22.7 4/9.0 2.2 diff.

Nucleus, β Urs. Min.

10 56 6.3 12.0 S. obs.
6.6 12.0 6.4 magn.
12.9 24.0 4/11.1 2.4 diff.

Sky preading comet, β Urs. Min.

10 59 23.0 9.2 focus S. obs.
23.0 8.9 " 10.0
46.0 18.1 2/2 7.9 7.0 diff.

Moonlight & at times, passing clouds. Coma pretty uniformly diffused around nucleus except on f side where it was evidently somewhat deficient. Time required for transit of visible part of coma about 9s. No tail visible.

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1881phae.proj.1313w

Aug. 10. 1881.

Transits to identify H. C. 41 (new number)

~~39.6~~

20 ~~K~~ 1.0 J ~~9.~~ +4.7

J ~~9~~ 30.

~~46 K 31~~

0 ~~3~~ 31

21 29

0 ~~J~~

20 J 6

~~2 4~~

J

12 15 Found and identified Σ 78. Examined neighborhood for other double stars. Could find none. There is no star 13' south of it ~~or 18'~~ or within 18' south of it and preceding 1m or less, of nearly the same magnitude. Still farther south there is a star which might be taken for that found by J. W. 1868 Dec. 15, but on examination with several powers it did not appear to be double.

S. obs.

~~21 44 45~~

21 45 7

3 7

0 52 7 d

Double star inspected by O. & W.

(Apparently same mentioned above)

+4.0 J

21 50 52

3 2.5

0 53.4

Σ 78

+4.7 J

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1881phae.proj.1313W

Aug. 10, 1881

21 5 33,5

2 5 +3°,5

22

0. 5

W. obs.

22 1 22 2d. star about
22 2 34,5 6's of 1st.

These stars seem to be
D.M. + 2° 32 & 35,
D.M. + 2 28 also seen in place
Relative magnitudes also correct.
D.M. +2° 28 has a companion
p 295° s 30" to 35" magn. 10.5
The double star s p D.M. +2° 28
not seen; probably too faint in moonlight.

D.M. +2° 32 does not look red; may be slightly orange. The triangle of stars s f is too faint to allow detecting either as a triple star.

See the record of 1868, Nov. 17, for old observations.
All above confirmed by S.; D.M. +2° 32 has no red color.

22h	33m 26s	+2',5	D.M. +1°	210
	33 40	+3'		211
	34 2	0'		212
	34 23	+7',5		

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1881phae.proj.1313w

Aug. 10. 1881.

a star follows D M. + 1.° 212 1m 3s and is abt. 1′ north ~~of~~ mag. 8.5 which is not in the D M. and is undoubtedly the star referred to in previous H. C. O. records 1868 Nov. 27 and Dec. 2.

D M. — 1.° 116 found. Stops seem sp it, but too faint to determine whether either of them is the double star seen 1868 Nov. 15 by C. S. P.

~~Comet C 1881.~~
Comet C 1881.

7 49 +5 1.0
23 1 5
1 5 2 K

23 22 +51.9
3 35
19 47
12
7 47

23 30.5 +51.9
3 44.1
19 46.5
7 46.5

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1881phae.proj.1313W

Z d. o = 71.0 obs. = 0.vv
" " E = 2v.0 " = 0.03
0.v2

Aug. 10, 1881.

Comet d 1881 and DM. +51° 1372
W. obs.

188°.5
45.
163°.5 set for transits.

Comet, star, comet star, both in southern half of square. (Obs. with 1st power.)

B 236 23h 41m 10s, Signal on chronograph.
23 53 55.5 " " "

Photometer Q

Comet c 1881, @ ε Cassiopeiæ.

Coma, 0'.5 fr. nucleus.

	outside	inside		
14 45	7.2	11.0		W. obs.
	7.2	11.2	2/3.9	7.1 vagu.
	7.2	11.1	1.9v	6.6 cor.

Coma, 0'.5 f. nucleus.

14 47	7.1	11.2		W. obs.
	7.5	11.6	2/4.1	
	7.3	11.4	2.0v	7.2 vagu.
				6.7 cor.

Coma. 0'.v fr. nucleus.

	6.0	11.v		S. obs.
14 v4	6.4	11.v	2/v.3	
	6.2	11.v	2.6v	7.4 vagu.
				7.3 cor.

Coma. 0'.v f. nucleus.

14 v6	5.0	11.8		S. obs.
	6.0	12.0	2/6.4	
	v.v	11.9	3.20	8.2 vagu.
				7.7 cor.

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1881phae.proj.1313w

Aug. 10. 1881.

Arnold + Dent 9 ½ t.			Bond 394.		
15h	7m	27.2 ~~22.2~~	15	9	0.0
	9	21.4		10	0.0

+8 8.3
+8 4.1

Dis. of ap. I, Comp. with Sat. II. S. obs.
Phot. H.

15	8	½ 8
	23	41.
15	32	39
15	11	0
	21	39
15	9	21
15	31	0 ap. time dis.

15h	15.m ½	30.0
		129.2
	~~17~~	34.6
	17.0	123.9
	18.½	39.0
		125.8
		38.3
	19	125.2

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1881phae.proj.1313W

Aug. 10. 1881.

15h	19.5m	29.0
		129.2
		33.2
	21	123.8
	22.5	38.0
		122.7
		35.5
	24	127.5
	24 25	30.5
		128.5
		28.5
	25 40	123.8
27	5.5	32.0
	22	127.0
	33	29.0
	45.5	127.8
	56.0	31.0
28	10	122.2
	26	30.8
	39	115.7 rej. on sand work.
29	5	122.3
	21	34.5
	31.5	122.0
	43.5	37.0

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1881phae.proj.1313w

Aug. 10. 1881.

15	29	55.0	112.0
	30	5.5	43.4
		13	112.2
		20.5	49.0
		27	116.3
		34.0	49.0
		42	111.4
		49	55.0
		55.5	104.3
	31	2	60.0
		8.5	104.5
		15	62.0
		21	106.1
		29	66.4
		41	100.0
		51.5	67.5
	32	0.5	Suspected.

Limit of Vis.

32	44	69.1
33	7	98.0
	24	70.0
	40.5	94.4

Arnold + Dutt 958.

15	40	21.5

Bond 236.

15	42	0,0
		+83.0

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1881phae.proj.1313W

Aug. 11. 1881.

Comet b. 1881. W. obs.

13	57		56
	5		42
13	52	+76.5	
17	41		75
+3	49		9½
21	24		
13	52	7 33	74.4
+7	32	21 37	
		14 4	

Pos. Zero 170.9
45.
223.9

22 10 20 by Bond 236 = tap on chr.

order = = * *
Comet in southern and ~~comet~~ star in ~~not~~ northern half of square.
Comps. star D m. + 78° 476 (9.1)
1st power used.

Bond 236.			Bond 394.		
23	19	10.5	13	56	0.0
	20	10.5		57	0.0

∴ Bond 236 is 0.5 8v fast.

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1881phae.proj.1313w

Aug. 12. 1881.

Comet b 1881. M. obs.

13	57	+7F.0
17	36	
+3	47	

3	42	7F.K Dec. } Setting on
17	42	Comet by circles.
14	0	R.A.

Pos. Zero 279.3
K.F.
Set at 322K.3 for transits.

Cloudy.

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1881phae.proj.1313W

Aug. 15 1881.

Comet C, 1881. Wr. obs.

9	33	+50.1
17	21	
+7	44	

Comet (C)

t 17 46.
H.a 8 47 1/2 δ = 52° 45 } Setting on ☉ by circles
9 2

Comp. star D M. +52° 1371. (8.0) Double, Brighter and northern component used, Pos. ang. 155° dist. 5".

Spectrum of Comet c 1881 examined with comet-finder and direct vision prism. Bands distinctly seen and more marked than in Comet b.

5h 15m 0° Dark Bright two extend 8m

Pos 2mm 274.2
45
Setting 229.2

Last at 18 3 58.5
18 5m 5.5
8h 15 C.M.T.

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1881phae.proj.1313W

Aug 15. 1881.

Sweep on West Balcony.
Telescope inclined about
alt. of Pole Star 277.1

18h	8m	First Sweep	
		8 stars 5th Magnitude at	228.8
18h	10m	Sweep	
18	13	3rd "	202.0
18	14	Sweep	
18	15	3rd "	160.0
18	16	4th "	163.7
	20	dV Lyrae	233.2

Disturbed by dew & dogs
at about 18 24

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1881phae.proj.1313W

Aug. 15, 1881

Comet C, 1881. Wr. obs.

order comet comet star star
comet in Southern and star in Northern. 1/2 square

18 25 10 by Bond 236 = taps on chron.
after sets.

Comet b 1881.

8/25
9

14	28	+78.0
18	36	
+4	28	

4	30	+78.1
18	40	
14	10	R. A. Comp. star.

Pos. Zero 279.7
45.
234.7

18h 59m 0s by Bond 236 = last taps of all on chron. (3 taps near together in all - use only last as above)

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1881phae.proj.1313w

Aug. 15. 1881.
Comet b. 1881. W. obs.
Order + + = =
Star in northern and comet in southern half of square.
Comp. star B.M. +78° 478. (V.O)

One complete set — Somewhat cloudy. Last transit in set on comet somewhat obscured by increased cloudiness at that time.

Bond 296.			Bond 394.		
20	ν	24.2	10	27	0.0
	6	24.4		28	0.0

∴ Bond 296 is 2.6 faster.

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1881phae.proj.1313W

Aug 16, 1881.

Comet c. 1881

Lens at 211.0 W. obs.

Set at 256.0

Comp stars Dm, 52° 401 ? 8 Ursæ Majoris

Comet, Comet, Star, Star.
both in Southern half of Lenses

7 10 72.t

21 22

14 9

Became cloudy before completion of first transit.

After waiting looked again for ~~record~~ comet C. Failed to obtain it.

Becoming densely cloudy over whole sky.
Closed dome. W.

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1881phae.proj.1313w

Aug. 21. 1881.

Comet C 1881.

11 30	36 1/4	4/120
31	+2 3/4	30
11 0	+39	
17 41		4/27
+6 41		6 3/4

43
6 3/4
36 1/4

At 18h 2m 1 — 44.9 — 6h 58m — 3d Margin of Ocular Micr.

Star Star — Comet Comet.

2108

Sky at 2558 — Star in Centre, Comet in centre

Left of Ocular. — Eye and ear transits B236

18	5	47.4
	6	16.3
	9	28.5
	10	13.8
18	11	40.1
	12	10.3
	15	24.8
	16	16.0

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1881phae.proj.1313W

Aug. 21. 1881.

18	17	36.2
	18	7.4
	21	23.3
	22	20.2
18	23	17.8
	23	50.4
	27	8.4
	28	10.7
18	29	25.0
	29	58.0
	33	17.2
	34	26.4

W. obs. R. me.

8 30 Comet = ν Ursæ Maj. S. obs.

Estimated diameter of outer nebulosity = 6′

" " inner nebulosity = 2′

" " bright part 30″ diameter

Tail not seen on other side of nucleus

nucleus small and sharp. W. obs.

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1881phae.proj.1313w

Aug 21, 1881

Examination of red stars in U Argelander

~~91 Scorpii~~ 9 v. E Scorpii.

Color 2. Spec. hot peculiar. W. obs.

" 0 " " " P. obs.

U. A. 91 Scorpii.

8 50 Color 2 bands indistinct P obs

but not seen with certainty too low.

Color. 1 bands indistinct W. obs

10 ♃ U. A. Scorpii.

16 4 v + 42°.1 W. obs.

19 0 Too low.

+2 1 v

U. A. Scorpii 108. W. obs.

16 47 + 39.2

19 4

+2 17 Too cloudy.

U. A. Scorpii 110. W. obs.

16 48 + 38.3

19 3 6

+2 27

48

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1881phae.proj.1313w

Aug. 21. 1881.

U. A. Scorpii III.
16 47 −31.2 W. obs.
Cloudy.

U. A. Ophiuchi. 7 W. obs.
16 8 −3.4
19 49
+3 41
Color 2 Banded W. obs.

U. A. 9 Oph.
16 12 −4.4
19 57
+3 45

Color 1. Spec. not peculiar W. obs.
U. A. 75 Oph.
16 20 −14.2 W. obs.
20 6
+3 46
Cloudy.

U. A. 70 Oph. W. obs.
16 54 −4.0
20 24
+3 30
Cloudy.

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1881phae.proj.1313w

Aug. 21. 1881.

Bond 2364				Bond 394.		
20	42	1.5	10	40	0.0	
	43	1.7		41	0.0	

∴ Bond 2364 is 1.5 slow.

Arnold + Dent 9 5 8.			Bond 394.		
13	59	55.0	14	2	0.0
14	0	55.0		3	0.0
				+109.5	

Dis. Sup. II. Phot. R. P. obs.
Corresp. with pat I.

14	11	51.8
	23	41.1
14	35	32.9
14	2	0.0
	33	32.9
13	59	55.0
14	33	27.9 apps. time eclipse.

14	19	59.5	1555.4
	20	24	2502.2
		39	1553.0
		51	2459.7
	21	7.0	1557.3
		26	2510.3
		59	1559.7
	22	14	2469.0

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1881phae.proj.1313W

Aug. 21, 1881.

14	22	31	157.4
		47	249.3
	23	1.5	159.2
		20	250.0
	~~24~~	~~10.5~~	—
	24	38	160.0
		50	244.2
	25	1.5	156.6
		12	246.3
		25	158.7
		41	253.2
		56	159.8
	26	10	248.4
		27	159.2
		38	243.3
		47	162.4
		57	244.9
	27	10	156.7
		25.5	246.5
		34.5	162.3
		54	245.1
	28	6	161.9
		17	248.3
		32	154.4
		45	248.7

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1881phae.proj.1313w

Aug. 21. 1881.

14	29	2	158.1
		18	248.7
		47	152.6
	30	2.5	246.6
		14.5	158.1
		30.0	247.2
		42.0	166.7
		57.0	248.0
	31	4.5	164.2
		19.5	247.1
		30.6	162.7
		42.0	246.3
		57.5	165.4
	32	4.0	238.8
		13.0	164.9
		21.5	237.8
		30.5	169.3
		38.5	239.2
		48.0	170.0
		58.5	239.4
	33	8.0	171.2
		17.5	201.8
		28.0	175.3
		37.0	203.6
		45.0	178.6
		57.0	228.4
	34	1.5	181.0
		9.5	220.6

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1881phae.proj.1313w

Aug. 21. 1881.

14	34	16.5	183.9
		14.5	221.5
		30.5	144.9
		36.0	214.9
		43.0	149.6
		49.5	216.0
		57.0	192.6
	35	5.0	2222
		11.5	195.6

Limit of Vis: Sat. I.

	36	20	195.3
		39.5	211.0
		54.5	195.7
	37	9.5	210.8

Arnold + Dent 954

15	17	54.9
	18	54.9

Bond 954.

15	20	0.0
	21	0.0
		+109.6

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1881phae.proj.1313w

Aug. 22. 1881.

Comet C.

11 27 +42.5
17 43
+6 16

At 17 47 12 6h 20
+ 42.8

~~Comp stars = Dm 42°~~

17 53 37.5 26.1 25.5
54 3.6 11.3 15.0
14.9

Comp stars.
Dm +42° 22 25 11h 29m 13.3 +42° 51'.3

W. obs.

341.8
45
386.8

This star appears to be out of place by about 50 in Dm.

Comet Comet B.Star 8.3 F. Star B Star B Star
N. half N half S half N Half.

Sat. at 18h 2m 0s in middle of first set.
In large Equatorial outer envelope est. at abt. 10'
" " " inner " " " " 3.5
" " " nucleus " " " 8" to 10"

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1881phae.proj.1313w

Aug. 22. 1881.

after new start two sets taken
order same as before viz.
= a star. f. star. f. star. b star.
but all in southern half of square.

18 $\sqrt{3}$ 30 by Bond 236 = Cops
at end of sets after
new start.

U. A. 10 Scorpii.
Too low for estimate of colors. – Brightest
star in cumulus seems to be banded.
W. obs.

Too low. V. obs.

U. A. 110 Scorpii.

16	47	33,7		19	22		
19	18			16	49		
+2	31			+2	33		
		19	24				
		16	42	16	42		
		+2	42	19	23		
				+2	41		

9 25 Color 1; Spectrum not peculiar S. obs.
" 0; " " " " W. obs.

U. A. Scorpius 113

9 25 Color 0; Spectrum not peculiar. S. obs.
" 1; " " " " W. obs.

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1881phae.proj.1313w

Aug. 22, 1881.

U. A. Scorpius 111
Color 0.
Spectra not peculiar W. obs.
Same by S.

U. A. 131. Scorpii.
17 6 — 39.6
19 42
+2 42
Too low S. obs.

U. A. 134 Scorpii.
17 7
19 +2
+2 45 — 33.4
9 45 Color 0; spectrum not peculiar, S. obs.
" 1 " " " , W. obs.

U. A. Scorpius 145
Too low W. obs.

U. A. Scorpius 153
Color 1 Spec. not pec. W. obs.
" " " " " S. obs.

U. A. 159 Scorpii.
17 22 — 38.5
20 6
+2 38
Too low.

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1881phae.proj.1313w

Aug. 22. 1881.

U. A. 163 Scorpii.

17 33 −32.1

20 F

+2 35

10 5 Color 0; spectrum not peculiar S.Br.

" 0; " " " " Wisbr.

U. A. Scorpius 166

Color 2. Spec. not peculiar

Star rather low W. obs.

Too low S. obs.

U. A. 167 Scorpii.

17 35 −33.0

20 27

+2 48

10 20 Color 0; spectrum not peculiar S.Br.

" 1; " " " " Wisbr.

Star nf the last, 2/3 field north in large finder.

Color 2; spectrum probably peculiar. Wisbr.

Too faint. S. obs.

U. A. Scorpii 179

17 45 −34.6 Cummins.

20 35

+2 50

10 30 Colors 0 & 1; spectra not peculiar. S.Br.

Too low P. obs.

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1881phae.proj.1313w

Aug. 22, 1881.

U. A. Cor. Aus. 7.
18 14 −38.7
20 41
+2 27
Too low.

U. A. Cor. Aus. 7K.
18 50 −37.7
20 43
+1 53

~~1873~~
10 40 Color 0 Spec not pec R. ob
Color 1. " " " W. "
" 0. " " " V. "

U. A. 43 Cor. Aus.
19 0 −40.7
20 53
+1 53

Color 1. Spec. not peculiar S. obs.

Bond 236.			Bond 394.		
21	7/8	2.4	11	0	0.0
	8	2.5		1	0.0

∴ Bond 236 is 59.4ᵐ fast.

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1881phae.proj.1313w

Aug 25 1881

Time by B. 236

17 51 Scorpius. 108 U.A. Color 0 too low clouds

18 10 χ[15] Ophiuchi Color 0 Spec. pec. P. obs.
" 1 " " " W. obs.

18.4 Dec 1h 50m

17 Ophiuchi (U.A. 17)

18 15 Color 3. Third type. finely banded W. obs.

Color 2. Third type P. obs.
This is Lal. 29935 III (d'Arrest).

40 Ophiuchi. (U.A. 40)

18 20 Color 1 Faint bright bands at first suspected but afterwards concluded that spect is not pec.
P. obs.

Color 1 Probably banded W. obs.

18 23 66 Ophiuchi sp
Southern and preceding star is 3d type finely banded, color 3. — latter is color 1 bands suspected.
W. obs.

18 30 Southern is color 2 – 3d type.
northern is " 0 – Spec. not peculiar.
Southern star's Northern star's P. obs.
Color 2; probably banded Spec not peculiar. S. obs.

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1881phae.proj.1313w

aug. 25, 1881

Time by B 236

U. A. 70 Ophiuchi.

16 54 14 52.

18h 35m Color 1. Spectrum not peculiar. S obs.

[Same; P obs. Entered from memory a little later].

~~106~~ Ophiuchi.

103 & 104

18h 37m

Color 1 not peculiar S obs.

" 2 " " W obs.

U. A. Ophiuchus, 110

18 49 Color 0 not peculiar S obs

" 0 " " S obs

U A. Ophiuchus, 125

18 50 Color 1 not peculiar S. obs.

" 2 " " P. "

U. A. Oph. 112 & 113

18 57 Color 1 not peculiar Robs.

" 1 " " S. obs.

U. A. Oph. 128

Mean time 8 50 Color 2 { not peculiar / Bands somewhat disputed } S. obs.

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1881phae.proj.1313W

Aug. 25, 1881.

U. A. Oph. 135

8 55 Color 1 not peculiar S. obs.

U. A. Oph. 149

9 5 Color 0 not peculiar S. obs.

U. A. Oph. 179

9 15 Color 1 not peculiar S. obs.

U. A. Oph. 193

9 17 Color 0 not peculiar S. obs.

U. A. Oph. 206

9 20 Color 1 Type III S. obs.

U. A. Sagittarius 28

9 38 Color 1 not peculiar S. obs.

U. A. Sagittarius 31

9 42 Color 1 not peculiar S. obs.

U. A. Sagittarius 37

9 46 Color 1 not peculiar S. obs.

U. A. Sagittarius 40

9 49 Color 1 not peculiar S. obs.

U. A. Sagittarius 42

9 53 Color 2 not peculiar S. obs.

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1881phae.proj.1313w

Aug. 25 1881.

9 55 U. A. Sagittarius 43
Color 1 not peculiar S. obs.

10 1 U. A. Sagittarius 57
Color 1 not peculiar S. obs.

10 5 U. A. Sagittarius 50
Color 0 not peculiar. S. obs.

10 9 U. A. Sagittarius 54
Color 1 not peculiar S. obs.

10 15 U. A. Sagittarius 56
Color 2 bands; probably type III S. obs.
" 1 banded W. obs.
" 2 banded P. obs.

10 15 U. A. Sagittarius 67
Color 1 not peculiar S. obs.
" 1 not peculiar P. obs.

10 19 U. A. Sagittarius 65
Color 2 not peculiar P. obs.
" 1 " " S. obs.
" 1 Faint bands suspected in less refrangible end of spec. W. obs.

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1881phae.proj.1313w

Aug. 25, 1881.

Sweep for plan. neb. East Equatorial at H.A. $2^h\ 39^m$ and dec. from $-14°$ to $-20°$.

Sweep begins at $20^h\ 49^m$ by Bond 236.

at $-18.°9$ dec. $20^h\ 50^m$ = time. 7 mag.
Star 4th " ~~typ~~ type at $-15.°7$ Time = $20^h\ 51^m$ 8 mag.
a 7th " mag. at $-17.°9$ Time = $20^h\ 52^m$
Cluster, contin. spectrum at $-16.°3$ Time $20^h\ 57^m$.
16.9 21 3 [illegible] ? 10 mgn

Ended 21 21

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1881phae.proj.1313w

Aug. 26. 1881.

Comet C. 1881.

12 24 32.6

17 51

+5 27

18 53

12 24

+6 29

12 32 31.0

19 7

+6 31

6 37 +29.8 Dec. =

19 8

12 35 = R.A. = by circles.

Comet found but too cloudy to see comp. stars.

19 38 76.7

4 49

14. 49

6 21

3 10

1 40

32 13

32

4/31.1

9

34 15

32 38

34

29

14

3 10

34 17

1881phae.proj.1313w

Aug. 26. 1881.

Comet b 1881. Tr. obs.

Pos. Zero $\sqrt{2.2}$

Set at $\frac{4\sqrt{}}{97.2}$ for transits.

20 10 4$\sqrt{}$ by Bond 236 = taps for time after first set.

Order * * ≡ ≡

Both in northern half of square.

Comp. star R.A. + 76° $\sqrt{}$36 (7.$\sqrt{}$)

First ≡ in last set our second late.

20 $\sqrt{}$0 40 by Bond 276 = last tap of all on sheet.

2 d.p. power used.

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1881phae.proj.1313w

Aug. 26. 1881.
Dis. Jup. I. Phot. R. S. obs.

13	24	55.0
	27	41.1
13	46	36.1
	28	0.0
	20	36.1
13	25	40.0
13	46	16.1

27

Arnold + Dent. grs.

13	24	40
	25	40

Bond 394.

13	27	0.0
	28	0.0

Became foggy suddenly so that eclipse could not be observed.

Bond 236.

0	24	17.1
	25	17.4

Bond 394.

14	1	0.0
	2	0.0

∴ Bond 236 is 58.1 fast.

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1881phae.proj.1313w

Aug. 27. 1881.

Comet C. 1881.

W. obs.
6 46

12 50 +26.7 3 23
19 42 26 16
+6 32

≡ found.
Too cloudy for work.

6 39
19 27
12 48

26.2 = Pos. ≡

Comet b. 1881.

19 45 76.2
4 52
14 53

6 34
21 27
14 49

26 57
45.0
220.7

19 [illegible] 40 by Bond 26 =
~~tap on clown, in middle of first set.~~

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1881phae.proj.1313w

Aug. 27. 1881.

20 31 10 = taps by Bond 236 ~~after~~ ~~first~~ in middle of second set.

Order * * = =
* in northern and comet in southern half of square.

21 20 35 = taps at end,

Same comparison star used as last night viz: 2 Lyn. +76° 536 (7.5)

2d power used,

	Bond 236.			Bond 394.	
21	41	45.6	11	15	0.0
	42	45.6		16	0.0

∴ Bond 236 is 57.5 fast.

15 45 Cloudy with a few drops of rain. Dome not opened for eclipse of Jupiter III.

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1881phae.proj.1313w

August 29, 1881.

19 35
18 28

Sagitt 81 Ref.
9 11 Red Color S obs

Sagittarius 78
9 13 Color 2 Red not Int. S obs

9 15 Sagitt 77
Color 2 Red not Int. S obs

Sagitt 80 to faint in Rays

19 50
18 38

~~U. A. Sagittarius 99~~ Very young
~~Color 1; not Remarkable~~ S. obs.
U. A. Sagittarius, 111 & 113,
ν' and ν² S. obs.
Preceding star redder than the other
10 0 Colors 2 and 1; Spectra not peculiar.
U. A. Sagittarius 104
10 5 Color 0; not peculiar S. obs.

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1881phae.proj.1313w

Aug. 29, 1881.

U. A. Sagittarius 131.

10 10 Color 1 not peculiar S. obs.

U. A. Sagittarius 139

10 13 Color 1 not peculiar S. obs.

U. A. Sagittarius 140

10 20 Color 1 not peculiar (faint) S. obs.

U. A. Sagittarius 142

10 25 Color 1 not peculiar S. obs.

U. A. Sagittarius 152

Color 1 not peculiar S. obs.
" 2 " " P. obs.

U. A. Sagittarius 154
Too faint

U. A. Sagittarius 153

10 34 Color 1 Small pec. P. obs.
" 1 " " W. obs.

160 U. A. Sag.
Color. 1. Spec. not pec. W. obs.
" 1. " " " S. obs.

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1881phae.proj.1313w

Z. d. ☉ = ν 1.° 4 Abs. = 0.16
" " β = ν 3.ν " " = 0.14
" " χ = ν 2.4 " " = 0.16

Aug. 29. 1881.

U. A. Sag. 161.

Color. 1 bands suspected W. obs.
Col. 1. Spec. not pec. S. obs.

No. 160 is the star called red in the U. A.; it was observed also (see front of last page).

Field glass from Hall's compared with that of Mr. Edmands by looking at χ Draconis and 16 & 17 Draconis. P. and S. obs. Hall's glass slightly the better.

Opera glass A from Hall's tried; very poor. λ Urs. Min. not seen; ε & ζ Lyrae not separated.

Opera glass B much better. P. obs.

Cent B with B Ursae Minoris

10 55

a.	B	
7.3	15.8	W. obs.
6.0	16.6	ν
13.3	32.4	7.6 wages.
19.1	4.8 diff.	

½' from nucleus on side opposite tail

11 0

Z	B	
11.6	35.4	W. obs.
11.0	32.2	ν
22.6	67.6	11.0 wages.
45.0	22.ν diff.	

Dia. length of edge of field assumed to be 7'

11 02

~~½' from nucleus on same side as tail.~~

¼ field from nucleus in direction of tail. W. obs. at distance equal to that of star.

	B	
34.2	37.1	11.0 W. obs.
11.0	39.2	ν
23.2		11.4 wages.

Transit ½ diam field by clock with 1m 14s Dec 7°.5

∴ diam of field = 7' 22".6

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1881phae.proj.1313w

Aug 29. 1881

β Ursae Min. A B Nucleus Bomb B.

11 13 5.7 15.0 S obs. ✓
5.0 13.7
10.7 14.0 24.7 9.5 diff. 7.5 magn.

Just dilation of tail dist equal to that of star

11 15 37.9 8.6 (focus) S obs.
38.4 ✓
38.2 29.6 diff. 11.6 magn.

Nucleus P. obs.

11 20 14.7 6.1
14.8 3.7 (rejected on second look)
29.5 5.4 ✓
4/14.0 4.5 ✓ 11.5 7.5 magn.

11 23 Tail, opposite small star P. obs.
27.6 10.1 (trans) ✓
26.8
27.2 17.1 10.4 magn.

Comet B, 7 Hrs. Min.

Nucleus

11 26 13.1 7.1 P. obs.
13.2 7.0 ✓
26.3 12.2 14.1 3.0 diff. 7.7 magn.

Tail, opposite small star

11 28 18.4 8.9 (trans P. obs.
19.6
19.0 10.1

~~8.9 diff.~~

~~8.9 magn.~~

10.3 magn. ✓

nucleus ⊙ star

H. obs.

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1881phae.proj.1313w

Aug 29, 1881.

Nucleus of Corona Borealis

11 30 11.4 7.0 S. obs.
12.4 5.5
23.8 11.3 12.5 2.8 diff. 7.5 magn.

Red below nucleus at distance of small diam.

11 32 (188) 10.0 S. obs.
31.2 Prob. 28.8 12.2 magn.
37.2 24.2 diff. 11 magn.
34.2

Egyptian used = that of Plate I.

11 35 Focus 11.0 W. obs.

Nucleus
12.6 7.8 W. obs.
13.3 7.5
25.9 10.6 15.3 2.6 diff. 7.7 magn.

Tail, as previously.

11 40 28.4 12.1 (focus) W. obs.
27.4 15.8 diff. ~~10.2 magn.~~
27.9 11.2 magn.

Tail, as previously.

11 43 25.4 9.6 (focus.) P. obs.
21.6
23.5 13.9 diff. ~~9.9 magn.~~
11.0 magn.

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1881phae.proj.1313w

Aug. 29. 1881

Comet b 1881.

11 45 $22^h\ 19^m\ 35^s$ Last a chronographs

Compar Star identified with D M +76° 557

8.0 $15^h\ 14^m\ 53^s$ 76° 0.7

Pos. Zero 307.0

45.

352.0

Second comet in second set 0.5 early.

Order = = * *

= in northern half inside square.

* " southern " outside "

23 24 15 by Bond 236 = Cap

in middle of 3d " set.

3d " set not completed on account of clouds just as star reached last bar.

Bond 236.			Bond 394.		
0	10	3.0	13	35	0.0
0	11	3.3		36	0.0

∴ Bond 236 is 58.5 fast. ✓

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1881phae.proj.1313w

Aug. 29. 1881.

6 0
23

Transits from ⊏ to small star near used as reference point in plot.

41	24.5	⊏	meas.
41	50.0	*	W. obs.
42	48.5	⊏	
42	51.0	*	

	43	57.5	⊏
14 13	44	15.0	*
	45	14.0	⊏
	45	15.0	± *

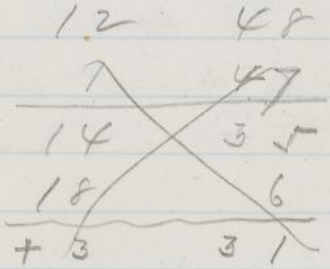
Seeing bad – small star almost invisible.

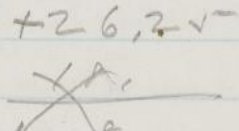
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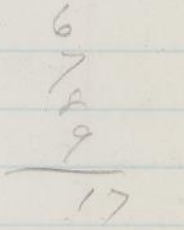
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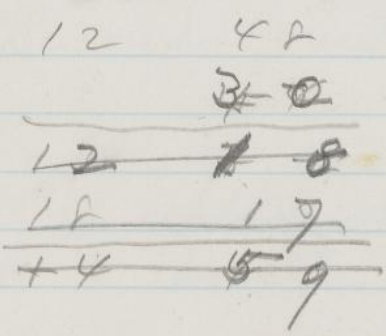
Aug. 30. 1881.

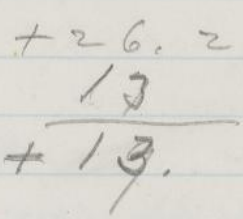
Comet C. 1881. Wr. obs.

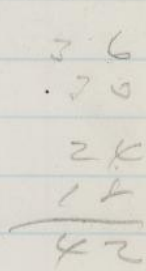


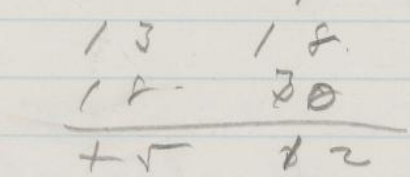




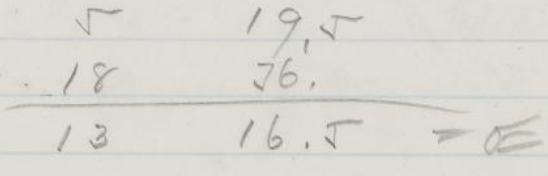




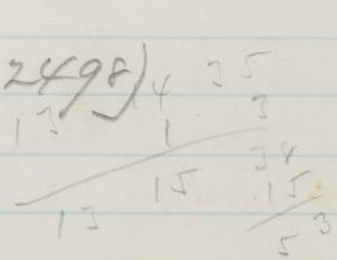




+16.7 = place.



Comp. star R.A. +16° 2498



(7.1)

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1881phae.proj.1313w

Aug. 30, 1881.
Comet C. 1881.
Pos. Zero 40.8 W. obs.
45.0
85.8

19 31 V-0 = tap after sets (by Bond 236)
Order * * ≡ ≡
Star in northern half outside square.
Const " southern " inside "

In next to last set use last clock tap on last ≡.

Comet b. 1881.
Photometer 2. W. obs.
Nucleus. Comp. star 8 mes. mid.
Inside Outside.
4.5 9.6 ✓
9 24 4.9 9.6 6.1 mag.
9.4 9.8 19.2 2.4 diff.

¼ breadth of precis from nucleus in direction of tail.
Outside Focus. W. obs.
9 29 22.1 7.8
23.7 ✓
22.9 15.1 diff. 10.8 magn.

1881phae.proj.1313w

Aug. 30. 1881.

Nucleus. Comp. star ✓ Mus. Min. W. obs.

	Outside.	Inside.	
	9.0	5.6	~~5.4~~ magn. ✓
9 35	9.2	5.3	6.6 "
	14.2	7.3 10.9	1.4 diff.

¼ breadth of prism in direction of tail. (from nu.) W. obs.

	Outside	Inside.	
	22.0	7.6	7.4 diff.
9 40	22.9	~~4.8 diff~~	~~10.1 magn.~~ 9.6 magn. ✓
	22.4		11.2 "

Comet B. P. obs.

Nucleus & Ursae Min.

	a	b	
9 49	9.6	4.0	6.3 magn. ✓
	9.3	4.6	
	14.1	10.2 4.6	2.6 diff.

a & b Ursae P. obs.

9 54	14.2	7.4	
	14.0	6.7	~~9.4~~ magn. ✓
	14.1		8.4 "

Nucleus a & b ✓ Ursae Min. P. obs.

	a	b	
10 0	8.7	5.1	
	8.8	4.9	6.6 magn. ✓
	17.5	7.4 10.1	1.8 diff.

a & b ✓ Ursae Min. P. obs.

10 02	12.6	6.4	
	11.9		✓
	12.2	5.8 diff.	9.1 magn.

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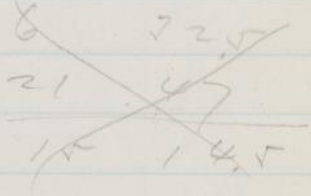
1991phee.proj.1313w

Aug. 30. 1881.
Comet b. 1881. W. obs.

20 ⁵4 ⁵0 by Bond 236 before rets.

Pos. Zero 99.4
4⁵.
144.4

21 49 0 = tap by Bond 236 after rets.



Order = = * *
Comet in northern and star in southern half of square.

Same comparison star as last night used, viz. DM. +76° ⁵⁵7 (8.0)

Bond 236.			Bond 394.		
22	15	49.1	11	38	0.0
	16	49.2		39	0.0

∴ Bond 236 is 7.°6⁵ fast.

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1881phae.proj.1313w

Sept. 8, 1881

9 15 β Urs. Min. 2 α Urs. Min. S. obs.
ε Urs. Maj. = α Urs. Min.
α Urs. Min. 2 γ Cass.

B. 394 ——	10	47	0
Arnold & Dent	10	44	11.5
	2	48.5	

	11	14	9.1
		23	41.1
	11	37	50.2
		2	48.5
	11	35	1.7

. S. obs.
Correc

Reappearance & occultation of Jupiter II.

	h	m	s	
Sat II Ecl. Re.	11	35	50.4	Suspected
	11	36	5	Seen certainly in contact with limb of planet

	h	m	s	
Sat II. Oc. Dis.	11	39	9.0	Apparently bisected
		39	41.2	Still visible
		40	17.0	Thought to be seen
		40	35.5	Suspected
		42	11.	Certainly gone

achrom. eye piece 400.
Planet rather unsteady, - limb indistinct
Sky slightly hazy.

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1881phec.proj.1213w

Sept 8, 1881

B 394	11	51	0.
Arnold & Dent	11	48	11.5
	2	48.5	

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1881phae.proj.1313w

Sept 13. 1881.

7 50 Red Star Just ℞ a Color 2.
Spectrum banded

6 mag at 72°6 HA. 2 50 at 19 20
∴ RA = 16ʰ30ᵐ Dec = 72°.6

DM 734 = 6.3 Mag
" 735 = 9.0 "
" 736 = 8.9 "

19 38 ✓8
39 8
36

P. Obs.

Passing clouds; the supposed var. about 8.9 mag.

19 42 33.2 var? 9 ∫ 1st min
44 20.8 1 47.6 19 "
44 48.7 2 ~~47.7~~ 15.5 21 "
44 54.0 var? 10 2d min
46 41.5 1 47.5 1 "
49 9.0 2 15.0 "

Approximate place by Dr 72°735 16ʰ 32ᵐ 0ˢ 72° 35.5
72 736 11 32 0 72° 36.7

836 835
a 5 b = Var. P.
a 1 b = Var S.

8 20 Color 2 S. obs

Sb at 75°.8 not exact owing to want of time.

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nasm.si.edu/research/archives/collection_info.cfm?proj_id=1231

α = 2 d. = 60.5 Obs. = 0.26
B M. Min. = " " = 60.9 " = 0.13
0.13

Sept 13, 1881.

Approx. details of suppd variable.

~~Dillo~~ ab $74^{\circ}0'$ Sub $119^{\circ}0'$.

~~Varieb~~ B. 236

P. obs.

[20 5 39.7 var.? south half of square
[6 38.5 var. ~~north~~ " " " "
5 [7 28.0 Dll. +72° 735 north " " "
6 [~~8 25.3 Dll. +72° 736 outside " "~~
5 8 31.2 Dll. +72° 735 north half of square
~~10 57.8 Dll. +72° 740 outside " " "~~
[11 13.2 Dll. +72° 740 north half
[14 15.3 Dll. +72° 740 " "

889.8 889.8
272.2 537.3
617.6 352.5

						$\Delta\alpha$		$\Delta\delta$
G.C.	16	10	12	44	Dll.	72° 735	1	50.50	~~8' 32.4"~~	10' 17.6
	16	47	0	57		72 740	6	35.15	~~8' 57.4"~~	5' 52.5

16 34 : 72 55
16 17 : 73 45-

Nucleus of Comet Comet b 1881 compared with β Vrs. Min.

P. obs.

a	b		
3.2	10.6	72 41.1	46.9
3.1	12.2	~~3 5.9~~	10.3
2.4	10.2	72 35.2	72 36.6
3 | 8.7	3 | 33.0		
2.9	11.0		
~~3 | 8.1~~			
4.0 diff.			

7.3
~~7.2~~ mean.
7.2 cor.

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1881phae.proj.1313w

Sept. 13, 1881.

	a	b	
9 9	3.2	10.1	S. obs.
	3.7	11.0	
	2.9	11.3	7.1 mean.
	3/9.8	3/32.4	2/7.5
	3.3	10.8	3.8 diff. 7.0 cor.
	20h	+9	+9.50
			2+.0

Comp. Star DM +74° # 649

t = 20h v1m v2.3s comet. Comet 3½° north of Comp. Star, Nucleus not well defined

Pos. 0 129.7

t = 20 v3 v2.6 = Comp. Star.

129.8
+v-
Set at 17 +.6

P. obs.

Comet + Star in northern half of field.

t = 20h v vm 26.2 Comet
t = v8 N.0 "
t = 1v.0 Star
t = v9 22.1 "

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1881phae.proj.1313W

Sept. 10, 1881.
Same again Southern half of sq.

t = 21 0 21.8 = Comet over first bar.
t = 46.9 "
t = 1 29.4 Star
t = 3 33.0 "

9 45 — U. A. Serpens, Canda, 30. P. obs.
Sp. not peculiar

9 50 U. A. Serpens Canda 32
Color 2 Spec. not Peculiar P. obs.
" 1 " " " S. "

U. a Serpens 42
+6.5
Spec not peculiar S obs
" " " P. "

U. a. Serpens 43
+3.7
Color 2 Spec. not peculiar P. obs.
" 1 " " " S. "

U. a. Serpens 45
−2.1
Color 1 Spec not peculiar S. obs
" 0 " " " P. obs

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1881phae.proj.1313w

Sept. 13, 1881.

Serpens U.a 67

Color 1 Spec. not peculiar P. obs.
" 2 " " "

Serpens U.a. 69
+6.5

Color 0 Spec. not peculiar. P. obs.
" 1 " " " S. obs.

Serpens U.a. ~~72~~ 71-72

Color 0 Spec not peculiar S obs.
" 0 " " " P. obs.

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1881phae.proj.1213w

Sept 17, 1881.

~~Sagittarius U A 46~~

Sagitt U. A. 80

12 2+ -29.8

Color 1 Spec. not peculiar P. Obs.

Sag U A 93

Bands Suspected Star too low. P. Obs.

Sag. U. A. 108

Color 0 Spec. not peculiar P. Obs

Sag U A 1V-34

Color 0 Spec. not peculiar. P. Obs.

~~Sag. U. A. 216~~

~~Color 2 Distinctly banded; Probably III type~~ ~~P. Obs.~~

t = 21 46
H.A. 2 19 -31.0 } = 6 mag.
a.R. 19 27

Color 2 Distinctly banded. prob. III type. P. Obs.
10' n 7 m p. No 216. ~~Sagittarius~~ [Most likely U. A. Sagittarius 198].

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1881phae.proj.1313w

Sept 17, 1881.

t = 21 48 } -29.9 } = 7 mag
H.a. = 2 27

Sagitt. U.a. 216

21 v0 -3k.2
19 32
2 18

Spec. continuous. P. obs.

Sagitt U.a. 2v0

19 49 -27.v

Color 0, Spec. not peculiar P. obs.

III type star is 10' north of Nebula (216) and ~~is~~ prec. it 7m P. obs. [Apparently U. A. Sagittarius 198].

Sag. Ua 2v7

Color 0 Spec not peculiar P. obs.

Sag. Ua 260

Color 1 Spec not peculiar P. obs.

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1881phae.proj.1313w

F

Sept. 17, 1881

Sagitt. N. a. 265

−28.1

This star had been previously observed and reported to the Astr. Nachrichten

III Typ a. Color 1. Banded. P. obs.

Sagitt. N. a. 268.

Stars Low. Images very poor. P. obs.
Spectrum prob. banded.

22. 18 38.1
2 22
1956

Sagitt. N. a. 270
Color 0. Spectrum not peculiar. P. obs.

Sagitt. N. a. 272

Color 0. Spectrum not peculiar. P. obs.

Sagitt. N. a. 279

Color 1. Spectrum not peculiar.

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1881phae.proj.1313W

Sept. 17, 1881.

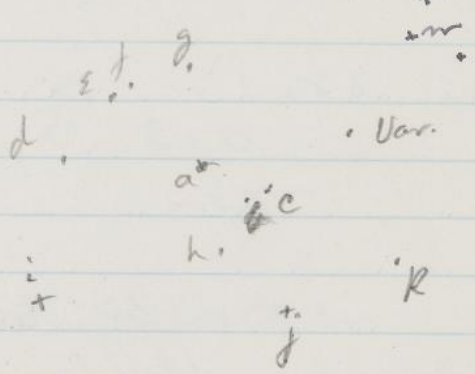
Sagitt. N. of 283.

Bands suspected. Color 2. Probe.

22 38
16 30
6 8

Involved at var = Linear Magnitude

Vicinity



11. 15 Var. brighter than b
Var = j 5 k
" ε 3 d
Var = a

a 5 i 3 ε 1 f j var k b h h c

Bands with Com. = Uranus

Compar. with Comet reported on Sept 16

1881phae.proj.1313w

Sept. 18, 1881

Scorpii. H. a. 131.
Stars low. Images large. Spectrum not peculiar. C. Obz.

Scorpii. H. a. 145
Color 2. Spectrum not peculiar. C. Obz.

Scorpii 159
7 24 Color 1 S. not Pec. Obz

Cor. Austrina. H. a. 7
Color 1. Spect. not. peculiar. C. Obz.

Examined several naked eye clusters in Milky Way with spectroscope. C. Obz.

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1881phae.proj.1313w

Sept. 18, 1881.

Sweep for planetary nebulae with large telescope.

Telescope set 1.40 west.
Sweep from −25 to −30 P. obs.

19 33 30 Sweep began.
Nebula at 30.0 P. obs.

19 34 25 Sweep.
Large nebula at 24.5

19 35 28 Sweep.
6th mag. at 29.6

Sweep.
19 37 50 5th magnitude at 28.3

19 39 30 Sweep.

19 45 50 Sweep.

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1881phae.proj.1313w

Sept. 16, 1881

19 46,48 Swef. . Planetry nebula.

28, 1

This nebula is apparently identical with No. 2 discovered last year.

22 20 Capricorn. U. A. 5

Color 0. Spectrum not peculiar. P. obs.

Capricorn. U.A. 21

Color 1. Spectrum not peculiar. P. obs.

Capricorn. U. A. 24.

Color 1. Spectrum not peculiar. P. obs.

Capricorn. U. A. 26.

Color 1. Spectrum not peculiar. P. obs.

Capricorn. U.A. 41

Color 1. Spectrum not peculiar. P. obs.

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1881phae.proj.1313w

Sept. 18, 1881

Capricorn. H. A. 43.

Color 1. Spectrum not peculiar. P. obs.

Capricorn. H. A. 52.

Color 1. Spect. not. peec. P. obs.

Capricorn. H. A. 56

Col. 0 Banded. III Type. P. obs.

Capricorn. H. A. 68

Col. 0 Spect. n. yo., Cloud-bye-
to interfere.

Capricorn. H. A. 73

Col. 1. Spect. n. p. P. obs.

Capricorn. H. A. 80

Col. 0. Spect. n. yo., P. obs.

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1881phae.proj.1313W

Sept. 18, 1881

Capricorn. 26. a. 81.

Col. 0 III type. P. obs.

Capricorn. 26. a. 86.

Col. 0. Spect. not spec. P. obs.

Capricorn. 26. a. 89.

Col. 0. Bands suspected. Prob. III type. P. obs.

Capricorn. 26. a. 90.

Col. 0. Spect. n. p. P. obs.

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1881phae.proj.1313w

Sept 19, 1881

Sagitt U.a. 2.

Color 1 Possibly banded - Star low P. obs.

21 √ 3 6 = 18 0

21 6 / 17 √ 1 = 30.2

3 1 √ = 3.8

Sagitt U.a. 14

Color 1 Spec. not peculiar P. obs.

Sagitt. U.a. 24

Spec. continuous P. obs.

Sagitt U.a. 27

Spec. prob continuous P. obs.

Sagitt. U.a 26

Color 1 Spec. not peculiar - P. obs.

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1881phae.proj.1313w

Sept 19, 1881.

Microscopium U.A. 13

21 15
20 32
42

Clouds

Sagitt. U.a. 153

Color 0 Spec. not-peculiar. P. obs.

Sagitt U. a. 160

Color 0 Spec. not-peculiar P. obs.

Sagitt U. a. 163

Color 1, Spec. not peculiar P. obs.

Sagitt U.a. 176

19 15
21 30
2 15

-1682

Fine specimen of IV type spec. 4.9 = 176 U.A. Sagitt.

over

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1881phae.proj.1313w

Sept 19 1881

a b

21h 21h

Double Star 7.4m δ 4.5

21 37 v.s over wire a 4m 5s.3

Double δ s 9 mags 3m 38s.3

37 32.s over wire a

First Double

37 v0.s over wire b 4m 3s.4

38 16.0 second star 3m 36s.3

38 36.s Transit over 1st wire δ 9 2 34s.3 2 34s.3

39 20.0 red over wire b

41 10.s = 4.9 Mag δ 4.5

41 v43 = Same over second wire.

t = 21 44 δ −16.1

H.C. 2 29

19h 10m −16.1 Obs

v Sagitt. 19 15 14 34 −16.2 Calc

Red. 19h 12m 0s −16° 8'

Date 8. 19 10 30 −16 11

.9 19 10 58 −16 10

v 19 14 34 −16 11.2"

Sagitt. U.A. 182

Color 1 Spec. not peculiar Pols.

Sagitt U.A 185

Color 0 Spec not peculiar Pols.

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Sept 19, 1881

Sagitt. U.a. 202

Color 0 Spec not peculiar Pols.

Sagitt. U.a. 204

Color 0 Spec. not peculiar P. ols.

Sagitt. U.a. 209

Color 1 Spec. not peculiar. P. ols.

Sagitt. U.a. 221

Color 0 Spec. not peculiar P. ols.

Sagitt U.a. 229

Color 0 Spec not peculiar Pols.

Sagitt U.a. 250

Color 1, Spec. not peculiar Pols.

Sagitt. U.a. ~~257~~ 264

-251

Color 0 Spec not peculiar P. ols

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Sagitt. U.a. 26 v

Color 1 III type. Pols.

Sagitt. U.a. 266
Color 0 Spec. not peculiar Pols.

22 4
17 48 +1.8
4 16

Double Star distant 3" 8+9 Mags
δ = 2.1 H.a. 4 1v P. obs.
+22 9

18 19 +0.8

22h 13m v1.8 = 9 Mag δ = 9
14 24.4 = 9 " δ = 4
1v 10.v = Red δ = 8.v Mag. 8.v
H. a. = 4h 2m + a 6 mag. which is 4' south of the red and H.a. = 3h v6m This star is Color 2 Spectrum not peculiar P. obs.

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Sept. 19, 1881.

+8.6

14 40
22 14
3 38

Scutum U.a. 10

Color 2 Spec. not peculiar Pols.

Scutum U.a. 14

Color 0 Spec not peculiar P. Nebs

Scutum U.a 17

7.9

Color 1 Bands suspected P. Nebs.

Scutum U.a 27

v. 8

Color 2 Bands - probably III type Pols.

Scutum U.a. 27

6.1

Color 2 Spec. not peculiar. P. Nebs.

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Sept. 19. 1881.

Scutum U.a. 30

Color 0 Spec. continuous 6.4 P. ols.

Scutum U.a. 33

Color 1 Spec. not peculiar. P. ols.

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Sept 20, 1881

B 236 — 18 9 47

B 394 — 6 9 40.1

Tap for time on chron — 18 17 35.0
18 18 35.0

Each tap pen & fork by watches

δ 18 37
α 13 31½
5 5½.

Aquila U.a. 9

18 vv
19 39
74

−5.9

Color 1 Spec. not peculiar P. obs.

Aquila U.a. 15

−4.2

Color 0 Spec not peculiar P. obs.

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Sept. 20, 1881.

Aquila U.a. 22
Skiff

Aquila U.a. 0 v
12 13
09
+ 0.9
Color 1 Spec. not peculiar P. obs.

Aquila U.a. 4 2
- 0.v
Color 1 Spec. not peculiar Pols.

Aquila U.a. v 3
- 7.6
Color 2 Spec. not peculiar. P. obs.

Aquila U.a. v 3
+ 2.6
Color 2 Spec. not peculiar P. obs.

Aquila U.a. v 4
- 3.0
Color 2. Spec not peculiar Pols.

Aquila U.a. v 8
+ 7.1
Color 1 Spec. not peculiar Pols.

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1881phae.proj.1313w

Sept. 20, 1881.

Aquila U.a. v-g
10.4

Color 1 Spec. not peculiar Pols.

Aquila U.a. 64
-1.6

Color 0 Spec. not peculiar Pols.

~~Aquila U.a. 80~~
~~+11.2~~

Aquila U.a. 8v
-2.8

Color 1 Spec not peculiar Pols

Aquila U.a 89

Color 0 Spec. not peculiar Pols

Aquila U.a. 101
+1

Color 1 Spec. not peculiar

Aquila U.a 103
+8.2

Color 2 Spec not peculiar Pols

Aquila U.a. 107
+6.9

Color 1 Spec. not peculiar Pols.

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1881phae.proj.1213w

Sept. 20, 1881.

Aquilae U.A. # 123
-1.4
Color 1 Spec. not peculiar P. obs.

Aquila U.A 131
-1.5
Color 1 Spec. not peculiar

Aquila U.A 135
+0.7
Color 1 Spec. not peculiar P. obs.

Aquila U.A. 142
+1.8
Southern Star decidedly the brighter
Diff. in color very slight. P. obs.
Color 1 Spec not peculiar
8 45 . Aquila U.A. # 80
Color 0. Spec. not peculiar P. obs.

Var in Ursae Min on fig n 198

Var = j
" .2 flr than R P obs.

9 0 Var = f R 7 j Ch. Obs.

Var = 5 d P. obs

9 10 Var = n 9 e Ch. Obs

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1881phaeproj.1312w

Sept 20, 1881.

Delphinus U a 4
-9.7
Color 1 Spec. not peculiar P. obs.

Delphinus U a 13
-9.7
Color 0. Spec. not peculiar P. obs.

Equuleus U. a. 8
Color 1. Spec not peculiar P. obs.

Equuleus U. a 12
Color 1. Spec not peculiar. P. obs.

Equuleus U a 27
Color 0. Spec not peculiar. P. obs.

Pegasus U. a. 9
Color 2 ~~Spec.~~ Banded Prob. III type. P. obs.

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Sept 20, 1881

Pegasus U.A. 11

Color 0 Spec not peculiar Pols.

Pegasus U.A 18

Color 2 Spec. not peculiar. Pols.

Pegasus U.A. 25
+v.6

Color 0 Spec not peculiar Pols.

Pegasus U.A 33

Color 1. Spec not peculiar Pols

Pegasus U.A. 34
+8.5

Color 1 Spec not peculiar: Pols.

Pegasus U.A. 42
+8.7

Observed by Vogel

Color 1 ~~Pols.~~ Banded Type III Pols.

Pegasus U.A. 43
8.0

Observed by Vogel

A very fine III type

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1881phae.proj.1313w

Sept. 20, 1881

217

Capricornus U.a. 94

Color 1 Spec. not peculiar Pols.

Capri. U.a. 99

+

Color 1 Spec. not peculiar Pols.

Capri U.a. 106

+20.8

Color 1 Spec not peculiar Pols.

Capri U a 113

-19.4

Color 0 Spec. not peculiar Pols.

Aquarius U.a. 9

-V-6

Color 2 III type Pols. Observed by Vogel

Aquarius U.a. 10

The star is 6' north & 2m 37s following #9

Is visible in small finder - This star is perfectly white and gives no bands in spectrum. Est. 9th Mag. Pols.

The time of minimum (Vitlth XV 2½) was predicted as Sept 4. 1881.

10 is Aquarius U.a. 13

-6

Color 0 Spec. not peculiar Pols.

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21h.

Sept. 20, 1881.

10 30 Aquarius U a 24
Color / Spec not peculiar. Pola.

~~U a 75~~

Very bright Auroral Arch noticed at 10 30 M.T. extending from the West to the Meridian. limited by f & S Hrs. Major P. obs.

In the next 10 minutes extending to the East about 15° P. obs.
Finally reaching the eastern horizon at being detected at the eastern horizon

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