

SEXTANT OBSERVATIONS

Book No 1 1869

From Camp Halleck Nev. June 19 /

To Monte Christo Mill Nov 18.

Observer Wheeler

Lackwood.

Computers

No. 1.

1869

By
Thomas Wheeler - D.V.S.
U. S. Engineer

1869

No. 1.

Geo Wheeler - D. S.

U. S. Engineer

1819

ASTRONOMICAL OBSERVATIONS.—No. 3.

(1)

Sextant No. *7* and artificial horizon of Mercury

Mean Solar Sidl Chronometer No. *1283* by *Negus*

Station *Camp Halleck Nev* Date *June 19th 1869*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>♌ Scorpis</i>	✓ 9 - 32 - 55	55 - 0 - 0	<i>Carried to Equal altitude Book Page 1</i>
<i>or Antares</i>	✓ 9 - 34 - 52	55 - 10	
"	✓ 9 - 37 - 8.5	55 - 20	
"	✓ 9 - 39 - 4	55 - 30	
"	✓ 9 - 41 - 7	55 - 40	
"	✓ 9 - 43 - 34.3	55 - 50	
"	✓ 9 - 46 - 15.4	55 - 00	<i>Lockwood</i>
"	✓ 9 - 49 - 4.4	56 10	
"	✓ 9 - 50 - 50.6	56 - 20	
"	✓ 10 - 53 - 24	56 - 20	44 - 14.6 +
"	✓ 10 - 56 - 35.5	56 - 10	45 37.9
"	✓ 10 - 59 - 12	56 -	45 27.4
"	✓ 11 - 1 - 44	55 - 50	45 18.3
"	✓ 11 - 3 - 6	55 - 40	44 7 +
"	✓ 11 - 6 - 16	55 - 30	45 20
"	✓ 11 - 8 - 34	55 - 20	45 42.5
"	✓ 11 - 10 - 45	55 - 10	45 37
"	✓ 11 - 12 - 36.5	55 -	45 41.5
Sextant No. <i>8</i>	Chro <i>1283</i>	June <i>20th</i>	<i>1869</i>
<i>Polaris</i>	10 - 14 - 25.4	79 - 55 - 35	<i>58 - 12.8</i>
	10 - 16 - 13.3	89 - 00 - 10	<i>10 - 5 - 6 -</i>
	10 -		<i>2 - 12.8</i>
<i>Polaris</i>	10 19 32.5	79, 55, 50	
	10 21 75	79, 58, 30	
	10 30 50.5	80, 8, 10	

(2)

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8. and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Negus Wheeler

Station Hall's Nevada Date June 20th 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Sun's upper limb	8 23' 5.5"	94° 36' 45"	41.6.2 11.7
" "	8 24' 2 -	95 - -	Morning Angles 4.9 6.9
" "	8 25.12.4	95 20 -	for Equal Altitudes 39 13.4 25.8
" "	48.68 26 1 -	95 40 -	38 24.2 25.8
" "	55.28 26 56 2	96 00 -	37 29.8 26.
" "	6 26.18 27 25 3	96 10 -	37 1.9 25.3
" "	42.9 7 33. 8 27 54 8	96 20 -	2 41.2 36 32.2 27.5
" "	8 28 36 -	96 30 -	8 - 26 - 41.94 } End of
" "	8 29 36 -	97 -	2 - 37 - 44.30 } Equal alt
" "	8 30. 5.4.	97 10	34 15 21.4 } Book
" "	8 31 18 -	97 40	2 34. 19.2 24.6
" "	8 32. 46 -	98. 01.	32. 56.4 14.4
" "	8 33. 41 -	98 15	38 9.5
" "	8 33 8 -	98 40.	37 30.5
" "	8 34 30.5	98 50	30 13.8
" "	8 35 3.5	99 .	29. 45. 2 15.7
" "	8 37 5.	99 20	29 22.1 25.6
" "	8 38 5.	99 30	28 39.2

Carried to Equal Altitudes Book Page 2

ASTRONOMICAL OBSERVATIONS.—No. 3.

(3)

Sextant No. 8 and artificial horizon of Mercury

Mean Solar

Sid'l Chronometer No. 1283 by Negus.

Whole

8-37-15.5
17-26-8.9
-03-24.4

Station Camp Halleck Nev Date June 20th

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Sun's upper limb	8. 36 18.3	99. 30 -	2 27 58.2 16.5
" "	18 8 36 22 5	99 40	2 27 35.4 16.9
" "	x 19 8 37 15 5	99 50	2 27 8.9 24.4
" "	x 20 8 37 44 5	100 -	2 26 38.4 22.9

Posted.

37	25
157	19
187	8
37	1015
	12
	2215
	44.30

(4)

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 7 and artificial horizon of Mercury
Sid'l Chronometer No. 1283 by Negus Lockwood -
Station Camp Halleck Date June 20th 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Sun's upper limb	8. 43. 6.	102. -	Morning angles for equal altitudes
" " "	8. 43. 33.5	" 10.	
" " "	8. 43. 50	" 20.	
" " "	8. 44. 27 -	" 30.	
" " "	8. 44. 52.5	" 40.	
" " "	8. 45. 14 -	" 50.	
" " "	8. 45. 45.4	103. 00.	
" " "	8. 46. 13.3	" 10.	
" " "	8. 46. 40.6	" 20.	
" " "	8. 47. 4.4	" 30.	
" " "	8. " 33.7	" 40.	
" " "	8. " 58.2	" 50. -	
" " "	8. 48. 28.6	104. " -	
" " "	8. " 56.3	104. 10.	
" " "	8. 49. 26.2	104. 20.	
" " "	8. " 52.3	104. 30.	
" " "	8. 50. 18.7	104. 40.	
" " "	8. " 46.4	104. 50.	
" " "	8. 50. 14.4	105. 00.	
" " "	8. " 39.7	" 10.	
" " "	8. 52. 8.2	" 20.	
" " "	8. " 34.9	105. - 30.	
" " "	8. 53. 8.6	105. - 40.	
m sun	8. 7.9		
M sun	8. - 49. - 20.4		

Corrected to single altitudes by

17. 53.4
17. 25 -
16. 58.3
16. 35.4
16. 16.6
15. 37 -
15. 11.6
14. 45 -
14. 17. -
13. 52.6
13. 19.8
12. 53.4
12. 27.9
11. 57.5
11. 31.6
11. 5.4
10. 40.2
10. 11.8
9. 59.1
9. 41.0
9. 15.2
8. 43.3
-8. 20 -

ASTRONOMICAL OBSERVATIONS.—No. 3.

(5)

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp Halleck Date June 21^u

L. Wheeler 27 | $\begin{array}{r} 1043 \\ 963 \\ \hline 2106 \\ 189 \\ \hline 216 \\ 216 \end{array}$ (78)

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Sun's upper limb	1 24 21.4	72 20.	
	2 24 46.1	72 30.	39 55 6
	3 25 12.2	72 40.	39 37.4
	4 25 36.3	72 50	
	5 25 8.-	73 -	38
	6 26 35.1	73 10	38. 155
	7 27 24.-	73 30	'
	8 27 56.-	73 40	
	9 28. 19.8	73. 50	Not Posted
	10 28 46.4	74 -	Carried to Single altitude Book Page 15.
	11 29 3.4	74 10	
	12 29 35.-	74 20	
	13 29 59 4	74 30	
	14 30 24.4	74 40.	
	15 31 23 6	75 -	
	16 31 50 5	75 10	
	17 32 16 8	75 20	
	18 32 44. 5	75 30	
	19 33 5. 8	75 40	
	20 33 35. 9	75 50.	
	21 33 59. 3	76	
	22 34 28. 1	76 10	
	23 34 54. 9	76 20	
	24 35 19. 1	76 30	
	25 35 50. 4	76 40.	
	26 36 16. 5	76 50.	
	27 36 41. *	77 -	
	78 - 27.03		
	7-30-3681		

27 | $\begin{array}{r} 610 - 873.9 \\ 22 - \\ \hline 960 \\ 873 \\ \hline 1833 \\ 162 \\ \hline 213 \\ 189 \\ \hline 240 \\ 216 \\ \hline 240 \end{array}$

27 | $\begin{array}{r} 963 - 670 \\ - 36 - 27.03 \end{array}$

730
54
190
189
10
14

216
222
225
380
1043
233
216
170

(6)

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 7 and artificial horizon of Mercury

Mean Solar

Sid'l Chronometer No. 1283 by Negro

Lt. Lockwood

Station

Hallbeck New

Date

Jun 21th

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.			
Sun's upper limb	7 56. 28. 4	84 30.				
	7 56 54. 5	40.				
	7 57 21. 3	50				
	7 57 46. 5	85. -				
	7 58 15. 8	10 ^x				
	7 58 40. 7	20				
	7 59. 6. 9	30				
	7 59 33. 6	40				
	7 59 58. 3	50				
	8 - 27. 4	86 - ^x				
	53. 8	10				
	1 19. 4	20.				
	1 45. 5	30 ^x				
	2. 12. 9	40				
	2 33. 4	50 ^x				
	3 4. 1	87 -				
	2 30. 9	10				
	3 57. 8	20				
	4. 26. 3	30	3	0	26	3
4 57 -	40 ^x		50	58	5	
5. 18. 4	50.		50	36	-	
5 45 -	88		59	6	8	
6. 12. 3	10		58	39	1	
6 39. 5	20		58	13	4	
7. 3. 4 ^x	30 ^x			47	5	
7. 32. 9	88. 40	2	57	21	6	

Carried to page 51
Altitude by 51

8^h 58^m 2^s Mean 86° 35'

ASTRONOMICAL OBSERVATIONS.—No. 3.

(7)

Sextant No. *8.* and artificial horizon of Mercury
Near Solar
 Sidl Chronometer No. *1283* by *Negus*
 Station *Halleck Mr.* Date *June 21st*

Wheeler
L. Lockwood

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Sun's upper limb (1)</i>	9. 2 59.5	109 10	2 1 50 4 + 49.9
	3 23 9	20	2 1. 22 8 v 46.7
	5 16 4	110 -	59.32 3 + 42
	(2) 5 44 1	10	59.2 9 v 47.0
	6 10 4	20.	
	6 41 6	30.	
	(3) - 7 5. 2	40	1 57.37 4 v 45.6
	9 - 8. - 1. 4	111 -	1 56.44 6 + 26.7 - 44.
	(4) 29.2 8 20 6	10	1 56. 16 9 v 31.1 46.5
	26.6 8 56 2	20	1 55. 18 8 + 25.4 - 42.0
	(5) 29.8 9 26 -	30.	1 55. 20 4 v 26.8 - 46.4
	29.8 9 54 8	40.	1 54.52 6 + 30.1 - 49.4
29.8 10 25 6	50.	1 54.23 5 + 23.3 49.1	
(6) 20.8 10 40 4	112 -	1 + 54 + 2 v 32.3 46.6	
(7) 32.7 11 17 1	10.	1 53.27 9 v 30.1 47.	
(8) 29.9 11 49 -	20.	1 52.57 8 v 46.8	
12 14 9	30	4 5.8	
12 43 5	40	1 - 54 - 52.52 } Equal Alt	
13 10 7	50.	9 - 09 - 54.12 } Page.	
13 38 1	113 -		
14 4 4	10		
15 4 6	30		
(9) 15 31. 4	40	49. 15 8 v 47.2	
(10) 16 - 4	50	48. 45 1 v 45.5	
(11) 16 23 9	114 -	48. 19 7 v 43.6	
(12) 16 56 4	10	47. 49 6 v 46.0	
17 4 2	20		
17 50 8	30		
18 10 4	40		
18 48 5	50		
19 17 -	115 -		
Mean of 18.	9 - 9 - 55.13	1 54 51.39	

*Carried to
 single altitude Book
 Page 14 + Equal
 altitude Book Page 4
 Posted
 3-47.6*

*Have used
 mean of 12 min
 both by Equal +
 single altitudes*

*Equal Alt
 Page.
 Back part of Book.*

(8.)

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 7 and artificial horizon of Mercury

Mean Solar Sidl Chronometer No. 1283 by

L. Lockwood

Station Halleck Nev.

Date June 21st

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.		REMARKS.	
	9. 46.40.4	124. 20	1	18 5 9	46.3
	47 13.	30	1	17 36 8	49.8
	47 45 8	40	1	17 4 9 +	50.7
	48 9 5	50.	1	16 30 4 +	59.9
	48 45 4	125 -	1	16 7 8	47.2
	49 10 8	10	1	15 32 .1	42.9
	49 45 9	20	1	15 3 8	49.7
	50.16 8	30.	1	14 32 -	46.4
	50 47 6	40.	1	13 56 9	44.5
	51. 15 -	50	1	13 21 9	42.9
	51 49 8	126 -	1	12 55 -	44.8
	52 19 4	10	1	12 28 5	47.9
	52.50 -	30	1	11 59 8	49.8
	53. 21 8	30		11 22 4	
	53. 21. 8	126.30	1		44.2
	9. 50 00.5	Mean. 125. 25	1	14 45 52	
	9 - 57 - 20.25		1	13 44 02	
	50 5 - 32.9. 5	1 - 15 - 15. 67	9	51 20 25	
			23	05 04 27	
			11	32 32 135	
				121 297 8	
				11 22 4	
			91	122 320 2	
				5 300	
				127 20 2	
				2 140 2	
				80 2	
				86 50	
				7 45	
				5 2	
				11 2	
				20	

14-15
57
80.2

ASTRONOMICAL OBSERVATIONS.—No. 3.

(9)

Sextant No. *7*

and artificial horizon of Mercury

L. Lockwood

Sid'l Chronometer No. *1283* by *Negus*

L. Whelpley

Station *Camp Halleck, Nev.* Date *June 21st 1869*

Polaris

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.			
	<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>th.</i>	<i>o</i>	<i>'</i>	<i>"</i>	<i>h.</i>	<i>m.</i>	<i>s.</i>	<i>ths</i>
<i>Polaris</i>	<i>9</i>	<i>13</i>	<i>16</i>	<i>2</i>	<i>79</i>	<i>31</i>	<i>30</i>				
		<i>15</i>	<i>15</i>	<i>8</i>		<i>32</i>	<i>-</i>				
		<i>16</i>	<i>46</i>	<i>1</i>		<i>33</i>	<i>30</i>				
		<i>17</i>	<i>54</i>	<i>2</i>		<i>34</i>	<i>-</i>				
		<i>19</i>	<i>5</i>	<i>4</i>		<i>34</i>	<i>25</i>				
		<i>20</i>	<i>31</i>	<i>9</i>		<i>35</i>	<i>-</i>				
		<i>21</i>	<i>41</i>	<i>8</i>		<i>35</i>	<i>20</i>				
		<i>23</i>	<i>21</i>	<i>2</i>		<i>35</i>	<i>30</i>				
		<i>25</i>	<i>37</i>	<i>4</i>		<i>36</i>	<i>40</i>				
		<i>28</i>	<i>0</i>	<i>4</i>		<i>4267</i>	<i>75</i>				
					<i>33</i>						
					<i>79</i>	<i>38</i>	<i>5-7.3</i>				

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *7* and artificial horizon of Mercury
 Sid'l Chronometer No. *1283* by *Jogus* *L. Lockwood*
 Station *Walleck's Riv.* Date *June 22^d 1869.*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.			
	<i>h.</i>	<i>m</i>	<i>s</i>	<i>th's</i>	<i>o</i>	<i>'</i>	<i>"</i>	<i>h</i>	<i>m</i>	<i>s</i>	<i>th's</i>
<i>Sun's upper limb</i>	<i>7</i>	<i>32</i>	<i>47</i>	<i>1</i>	<i>75</i>	<i>30</i>					
		<i>33</i>	<i>12</i>	<i>6</i>		<i>40</i>					
			<i>38</i>	<i>.</i>		<i>50</i>					
		<i>34</i>	<i>4</i>	<i>9</i>	<i>76</i>	<i>-</i>					
			<i>29</i>	<i>11</i>		<i>10.</i>					
			<i>54</i>	<i>x</i>		<i>20.</i>					
		<i>35</i>	<i>27</i>	<i>4</i>		<i>30</i>					
		<i>35</i>	<i>49</i>	<i>4</i>		<i>40</i>					
		<i>36</i>	<i>19</i>	<i>6</i>	<i>76</i>	<i>50</i>					
		<i>36</i>	<i>42</i>	<i>3</i>	<i>77</i>	<i>4</i>					
		<i>37</i>	<i>9</i>	<i>1</i>		<i>10.</i>					
		<i>37</i>	<i>34</i>	<i>4</i>		<i>20.</i>					
		<i>38</i>	<i>1</i>	<i>5</i>		<i>30.</i>					
		<i>38</i>	<i>27</i>	<i>3</i>		<i>40</i>					
		<i>38</i>	<i>54</i>	<i>3</i>		<i>50</i>					
		<i>39</i>	<i>22</i>	<i>4</i>	<i>78</i>	<i>-</i>					
		<i>39</i>	<i>58</i>	<i>6</i>		<i>10.</i>					
		<i>40</i>	<i>13</i>	<i>9</i>		<i>20</i>					
		<i>40</i>	<i>37</i>	<i>8</i>		<i>30</i>					
		<i>41</i>	<i>6</i>	<i>2</i>		<i>40</i>					
	<i>41</i>	<i>33</i>	<i>4</i>		<i>50</i>						
	<i>41</i>	<i>58</i>	<i>-</i>	<i>79</i>	<i>-</i>						
			<i>7</i>								

Carried to page 6
single altitude

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus. L. Wheeler*

Station *Walleck* — *New* Date *June 22^d 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.			
	<i>h</i>	<i>m</i>	<i>s</i>	<i>th</i>	<i>o</i>	<i>'</i>	<i>"</i>	<i>h</i>	<i>m</i>	<i>s</i>	<i>th</i>
<i>Sun's upper limb</i>	<i>8</i>	<i>18</i>	<i>18</i>	<i>9</i>	<i>93</i>						
		<i>19</i>	<i>41</i>	<i>8</i>		<i>10</i>					
		<i>20</i>	<i>4</i>	<i>9</i>		<i>20</i>					
		<i>20</i>	<i>37</i>	<i>9</i>		<i>30</i>					
		<i>20</i>	<i>55</i>	<i>4</i>		<i>40</i>					
		<i>21</i>	<i>38</i>	<i>9</i>		<i>50</i>					
		<i>22</i>	<i>25</i>	<i>4</i>	<i>94</i>	<i>10</i>					
		<i>22</i>	<i>44</i>	<i>-</i>		<i>20</i>					
		<i>23</i>	<i>22</i>	<i>2</i>		<i>30</i>					
		<i>23</i>	<i>41</i>	<i>5</i>		<i>40</i>					
		<i>24</i>	<i>14</i>	<i>2</i>		<i>50</i>					
		<i>24</i>	<i>42</i>	<i>3</i>	<i>95</i>						<i>Carried to single altitude Book Page 17</i>
		<i>25</i>	<i>7</i>	<i>1</i>		<i>10</i>					
		<i>25</i>	<i>36</i>	<i>8</i>		<i>20</i>					
		<i>25</i>	<i>53</i>	<i>9</i>		<i>30</i>					
		<i>26</i>	<i>22</i>	<i>2</i>		<i>40</i>					
		<i>27</i>	<i>22</i>	<i>8</i>	<i>96</i>	<i>-</i>					
		<i>27</i>	<i>44</i>	<i>2</i>		<i>10</i>					
		<i>28</i>	<i>38</i>	<i>4</i>		<i>30</i>					
		<i>29</i>	<i>11</i>	<i>-</i>		<i>40</i>					
		<i>29</i>	<i>41</i>	<i>1</i>		<i>50</i>					
		<i>30</i>	<i>5</i>	<i>9</i>	<i>97</i>	<i>-</i>					
		<i>31</i>	<i>20</i>	<i>8</i>	<i>97</i>	<i>30</i>					
		<i>31</i>	<i>55</i>	<i>6</i>		<i>40</i>					
		<i>32</i>	<i>17</i>	<i>3</i>		<i>50</i>					
		<i>32</i>	<i>40</i>	<i>4</i>	<i>98</i>	<i>-</i>					
		<i>33</i>	<i>12</i>	<i>9</i>		<i>10</i>					
		<i>33</i>	<i>37</i>	<i>-</i>		<i>20</i>					
		<i>34</i>	<i>7</i>	<i>2</i>		<i>30</i>					
		<i>34</i>	<i>35</i>	<i>8</i>		<i>40</i>					
		<i>35</i>	<i>3</i>	<i>-</i>		<i>50</i>					
		<i>35</i>	<i>28</i>	<i>2</i>	<i>99</i>	<i>-</i>					
		<i>35</i>	<i>56</i>	<i>3</i>		<i>10</i>					
		<i>36</i>	<i>22</i>	<i>-</i>		<i>20</i>					
		<i>36</i>	<i>47</i>	<i>6</i>		<i>30</i>					
		<i>36</i>	<i>38</i>	<i>9</i>		<i>40</i>					
		<i>37</i>	<i>38</i>	<i>9</i>		<i>50</i>					
		<i>38</i>	<i>38</i>	<i>9</i>		<i>100</i>					

8-28-47.1
96-36-14.21

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *7* and artificial horizon of Mercury
 Sid'l Chronometer No. *1283* by *Negus* *L. Lockwood.*
 Station *Waller's New.* Date *June 22nd 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.	
	h	m	s	sec	Alt.	Dist.		
<i>Sun's upper limb</i>	<i>5</i>	<i>45</i>	<i>13</i>	<i>4</i>	<i>102</i>	<i>40</i>		
			<i>40</i>	<i>2</i>		<i>50</i>		
			<i>46</i>	<i>7</i>	<i>1</i>	<i>103</i>		
			<i>32</i>	<i>9</i>			<i>10</i>	
			<i>58</i>	<i>14</i>			<i>20</i>	
			<i>47</i>	<i>28</i>	<i>8</i>		<i>30</i>	
			<i>56</i>	<i>9</i>			<i>40</i>	
			<i>48</i>	<i>23</i>	<i>3</i>		<i>50</i>	
			<i>48</i>	<i>4</i>		<i>104</i>		
			<i>49</i>	<i>16</i>	<i>9</i>		<i>10</i>	
<i>5</i>	<i>47</i>	<i>47</i>	<i>8</i>		<i>20</i>			
		<i>50</i>	<i>10</i>	<i>4</i>	<i>30</i>			
		<i>37</i>	<i>4</i>		<i>40</i>			
		<i>51</i>	<i>9</i>	<i>8</i>	<i>50</i>			
		<i>51</i>	<i>35</i>	<i>6</i>	<i>105</i>			
		<i>52</i>	<i>7</i>		<i>10</i>			
		<i>28</i>	<i>3</i>		<i>20</i>			
		<i>44</i>	<i>2</i>		<i>30</i>			
		<i>53</i>	<i>24</i>	<i>3</i>	<i>40</i>			
		<i>52</i>	<i>5</i>		<i>50</i>			
<i>20</i>	<i>54</i>	<i>15</i>	<i>8</i>	<i>106</i>				
<i>25</i>	<i>x</i>							

*Corrected with
 length alt.*

ASTRONOMICAL OBSERVATIONS.—No. 3.

13

Sextant No. *8*

and artificial horizon of Mercury.

Whaler

Sid'l Chronometer No. *1283*

by *Regus*

Station *Habakkuk*

Date *June 22nd + 23rd*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Sun's upper limb</i>	<i>P.M.</i>		<i>A.M.</i>
<i>13</i>	<i>54.50.8</i> ✓	<i>67</i>	<i>7. 10.44.5 - 27.</i>
	<i>54.50.8</i>	<i>66.50</i>	<i>7. 10.44.5</i>
<i>2</i>	<i>55.40.5</i> ✓	<i>66.20</i>	<i>7. 9.50.4</i>
<i>3</i>	<i>56.4</i> - ✓	<i>66.30</i>	<i>7. 9.20.6</i>
<i>4</i>	<i>56.30</i> ✓	<i>66.20</i>	<i>7. 8.55.8</i>
<i>5</i>	<i>56.56</i> ✓	<i>66.10</i>	<i>7. 8.29.9</i>
<i>6</i>	<i>57.24</i> - ✓	<i>66 -</i>	<i>7. 8.3.8</i>
<i>7</i>	<i>57.40</i> ✓	<i>65.50</i>	<i>7. 7.40.9</i>
<i>8</i>	<i>58.16</i> ✓	<i>65.40</i>	<i>7. 7.2.2</i>
<i>9</i>	<i>59.8</i> ✓	<i>65.20</i>	<i>Carried to Equal Altitude Book Page (5) + Simple Altitude Book Page - 16 Posted</i>
<i>10</i>	<i>59.40</i> ✓	<i>65.10</i>	
<i>11</i>	<i>60.0</i> ✓	<i>65 -</i>	
<i>12</i>	<i>0 32.4</i> ✓	<i>64.50</i>	
<i>13</i>	<i>0 58</i> - ✓	<i>64.40</i>	
<i>14</i>	<i>1 26</i> ✓	<i>64.30</i>	
<i>15</i>	<i>1 52</i> ✓	<i>64.20</i>	
<i>16</i>	<i>2 15</i> ✓	<i>64.10</i>	
<i>17</i>	<i>2 44</i> - ✓	<i>64 -</i>	
<i>18</i>	<i>3 11</i> - ✓	<i>63.50</i>	
<i>19</i>	<i>3 36</i> ✓	<i>63.40</i>	
<i>20</i>	<i>4 5</i> ✓	<i>63.30</i>	
<i>21</i>	<i>4 34</i> ✓	<i>63.20</i>	
<i>22</i>	<i>5 26</i> ✓	<i>63 -</i>	
<i>23</i>	<i>5 49</i> ✓	<i>62.50</i>	
<i>24</i>	<i>6 14</i> ✓	<i>62.40</i>	
<i>25</i>	<i>6 43</i> - ✓	<i>62.30</i>	
<i>26</i>	<i>7 11</i> - ✓	<i>62.20</i>	
<i>27</i>	<i>7 33</i> ✓	<i>62.10</i>	
<i>28</i>	<i>8 1</i> ✓	<i>62</i>	
<i>29</i>	<i>8 28</i> ✓	<i>61.50</i>	
<i>30</i>	<i>8 54</i> - ✓	<i>61.40</i>	
<i>31</i>	<i>9 22</i> ✓	<i>61.30</i>	
<i>32</i>	<i>9.49</i> ✓	<i>61.20</i>	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 7 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Sequ* Lt Lockwood

Station *Camp Halleck, Nev.* Date *June 23rd 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.			
	<i>h</i>	<i>m</i>	<i>s</i>	<i>ths</i>	<i>o</i>	<i>'</i>	<i>"</i>	<i>h</i>	<i>m</i>	<i>s</i>	<i>ths</i>
<i>Sun's upper limb</i>	8	43	36	9	102						
		44	2	-		10.					
			29	8		20.					
			58	9		30					
		45	23	7		40.					
			54	8		50					
		46	19	6		103					
			47	5		10					
		47	15	3		20					
			44	2		30					
		48	13	6		40					
			40	4		50					
		49	9	-		104					
			32	8		10					
			59	7		20					
		50	28	6		30					
		55	1		40.						
	51	23	8		50.						
		50	6		105.						
	52	10	8		10						
		45	-		20.						

*Current to
109 f. double alt.*

Sextant No. 8 and artificial horizon of Mercury

Lt Wheeler

Sid'l Chronometer No. 1285 by Regus

Station Camp Halleck Nev. Date June 23^d 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.			
	<i>h</i>	<i>m</i>	<i>s</i>	<i>th</i>	<i>a</i>	<i>th</i>	<i>''</i>	<i>h</i>	<i>m</i>	<i>s</i>	<i>th</i>
Sun's upper limb	1	9	20	47	9	115	-				
	2		20	7	5		10				
	3		20	49	1		20				
	4		21	12	8		30				
	5		21	42	.		40				
	6		22	12	2		50				
	7		23	35	4	116	20				*
	8		24	5	-		30				
	9		24	35	8		40				
	10		25	4	2		50				
		25	34	9	117						
		26	1	-		10					
		26	30	0		20					
		26	59	5		30					
15		27	30	4		40					
		27	50	9		50					
		28	26	8	118						
		28	55	3		10					
		29	25	-		20					
20		29	51	4		30					
		30	19	4		40					
		30	51	9		50					
		31	22	4	119						
		31	50	4		10					
25	25	32	10	8		20					
		32	49	.		30					
		33	79	4		40					
		33	47	5		50					
		34	15	8	120	-					
30	30	34	44	9		10					
		35	13	9		20					
		35	44	5		30					
	9	28	0	1.67	117	51	15				

Carried to Single altitudes
Book Page 19.

Sextant No. *7* and artificial horizon of Mercury *Lowwood**Mean Solar*
Sid'l Chronometer No. *1283* by *Nicus*Station *Hall's New* Date *June 25th*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Sun's upper limb</i>	8 - 25 - 19.8	<i>95</i> - 00	
	8 - 25 - 42.7	<i>95</i> - 10	
	8 - 26 - 15.4	<i>95</i> - 20	
	8 - 26 - 41.6	<i>95</i> - 30	
	8 - 27 - 07.6	<i>95</i> - 40	
	8 - 27 - 31.9	<i>95</i> - 50	
	8 - 28 - 1.8	<i>96</i> - 00	
	8 - 28 - 27.8	<i>96</i> - 10	
	8 - 28 - 53.6	<i>96</i> - 20	
	8 - 29 - 21.6	<i>96</i> - 30	
	8 - 29 - 48.8	<i>96</i> - 40	
	8 - 30 - 14.7	<i>96</i> - 50	
	8 - 30 - 42.4	<i>97</i> - 00	
	8 - 31 - 08.4	<i>97</i> - 10	
	8 - 31 - 32.4	<i>97</i> - 20	
	8 - 32 - 01.2	<i>97</i> - 30	
	8 - 32 - 55.2	<i>97</i> - 50	
	8 - 33 - 21.9	<i>98</i> - 00	
	8 - 33 - 49.9	<i>98</i> - 10	
	8 - 34 - 17.2	<i>98</i> - 20	
	8 - 34 - 43.8	<i>98</i> - 30	
	8 - 35 - 8.6	<i>98</i> - 40	
	8 - 35 - 37.8	<i>98</i> - 50	
	8 - 36 - 03.6	<i>99</i> - 00	
	8 - 36 - 30.3	<i>99</i> - 10	
	8 - 36 - 58.1	<i>99</i> - 20	
	8 - 37 - 25.7	<i>99</i> - 30	
	8 - 37 - 51.4	<i>99</i> - 40	
	8 - 38 - 19.1	<i>99</i> - 50	
	8 - 38 - 45.9	<i>100</i> - 00	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Moon's Sidl Chronometer No. 1283 by *Weyns*

Wharton

Station *Walleck N.Y.* Date *June 23rd*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Sun's upper limb</i>	9 - 3.23.5	109 - 00	<i>Not possible</i>
	9-4-17.50	109 - 20	
	9 4-48.50	109 - 30	
	9-5-4.4	109 40	
	9-5-40.6	109 56	
	9-6-10.5	110 00	
	9-6-34.5	110 10	
	9-7 - 5.4	110 20	
	9-7-35.2	110 30	
	9-8 - - .4	110 40	
	9-8-28.5	110 50	
	9-9 - - 2.4	111 00	
	+ 9.9 22.3	111 10	
	9.9 - 56.4	111 20	
	9.10, 15.3	111 30	
	9.10 51.7	111 40	
	9.11.11.5	111 50	
	+ 9.11.50.3	112. 00	
	9.12, 10.5	112 10	
	9.12 - 30.5	112 20	
9.12 56.2	112 30		
9.13 29.8	112 40		
9.13 54.5	112 50		
9 15 - 6.2	113. 10		
9 15 - 33.7	113 20		
9 16 - 3.	113. 30		
9 16 29.7	113 40		
9 16 56.5	113 50		
9.17 - 23.8	114 00		
9-17 - 53.5	114 10		
9 18 - 25.2	114 20		
+ 9.18 51.3	114 30		
9.19, 19.5	114 40		
9 19 46.2	114 50		

Sextant No. $\text{\textcircled{8}}$

and artificial horizon of Mercury

Whaler

Mean Solar

Sid'l Chronometer No. 1283 by Regus.

Station

Hall's New

Date

June 25th 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Luna's upper limb	10 4-58.50	129. 50	10-24-15.5
	10-5-30.5		10-9-30.5
	10-6-4		14-45.0
	10 7 7.5	130 - 20	84.0
	10 7-48.5	30	24/885. 210
		134	36.87
(1)	10-9-30.5	131-10	
26.7-(2)	10 9 - 35.2	131-20	
27.3-(3)	10-10-35.3	131-30	
30.0-(4)	10-12-15.5	132.00	
32.0-(5)	10.12.47.5	132.10	
32.5-(6)	10.13.20-	132.20	
38.5-(7)	10.13.58.5	132.30	
33.5-(8)	10.14.32.0	132.40	
40.0-(9)	10 15 12.0	132.50	
27.5-(10)	10 15 39.5	133.00	
43.3-(11)	10.16.22.8	133.10	
29.7-(12)	10.16-52.5	133.20	
40.3-(13)	10-17-32.8	133.30	
37.-(14)	10.18-09.8	133.40	
32.1-(15)	10 18 41.9	133.50	
40.7-(16)	10.19-22.6	134.00	
32.4-(17)	10 19 55.0	134.10	
41.2-(18)	10.20.36.2	134.20	
32.6-(19)	10 21 -07.8	134.30	
36.7-(20)	10.21 45.5	134.40	
36.3-(21)	10 22 21.8	134.50	
37.4-(22)	10 22 59.2	135.00	
37.3-(23)	10 23 36.5	135-10	
39.0-(24)	10 24 15.5	135-20	
	10-17-08.75	133-22-30	

$a_0 = 36.87$

Carried to Single Altitudes
Book Page - 20

3-56.55

ASTRONOMICAL OBSERVATIONS.—No. 3.

19

Sextant No. *R* and artificial horizon of Mercury

Whaler

Sid'l Chronometer No. 1283 by

Nyons

Station

Hulluck

Date

June 25 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Jupiter upper limb</i>	<i>4, 17-53.8</i>	<i>58. 30</i>	
(1) <i>31.7</i>	<i>18-25.5</i>	<i>58 20</i>	
(2) <i>21.7</i>	<i>18. 47.2</i>	<i>58 10</i>	
(3) <i>27.4</i>	<i>-19-14.6</i>	<i>58 00</i>	
(4) <i>27.1</i>	<i>19-41.7</i>	<i>57 50</i>	
(5) <i>24.1</i>	<i>20-5.8</i>	<i>57 40</i>	
(6) <i>27.2</i>	<i>20-33</i>	<i>57 30</i>	
(7) <i>27.5</i>	<i>21-00.5</i>	<i>57 20</i>	<i>Not Posted</i>
(8) <i>28.5</i>	<i>21 29.</i>	<i>57 10</i>	
(9) <i>25</i>	<i>21 54</i>	<i>57 00</i>	<i>Could get no morning equal</i>
(10) <i>26.5</i>	<i>22-20.5</i>	<i>56 50</i>	<i>altitudes -</i>
(11) <i>28.5</i>	<i>22-49.</i>	<i>56 40</i>	
(12) <i>26.</i>	<i>23-15</i>	<i>56 30</i>	
(13) <i>28.2</i>	<i>23-43.2</i>	<i>56 20</i>	
(14) <i>23.3</i>	<i>24-6.5</i>	<i>56 10</i>	
(15) <i>29.2</i>	<i>24 35.7</i>	<i>56 00</i>	
(16) <i>27.3</i>	<i>25 3-</i>	<i>55 50</i>	
(17) <i>24.5</i>	<i>25-27.5</i>	<i>55 40</i>	
(18) <i>27-</i>	<i>25 54.5</i>	<i>55 30</i>	
(19) <i>28.6</i>	<i>26. 23.1</i>	<i>55 20</i>	
(20) <i>26.4</i>	<i>26 49.5</i>	<i>55 10</i>	
(21) <i>27.3</i>	<i>27. 16.8</i>	<i>55 00</i>	
(22) <i>25.7</i>	<i>27 42.5</i>	<i>54 50</i>	
(23) <i>25.5</i>	<i>28- 8</i>	<i>54 40</i>	
(24) <i>26.7</i>	<i>28, 39.7</i>	<i>54 30</i>	
(25) <i>27.6</i>	<i>29- 2.3</i>	<i>54 20</i>	
(26) <i>26.7</i>	<i>29- 29,</i>	<i>54 10</i>	
(27) <i>23.5</i>	<i>29, 52.5</i>	<i>54 00</i>	
(28) <i>28.5</i>	<i>30- 21.</i>	<i>53 50</i>	
(29) <i>28.</i>	<i>30 49-</i>	<i>53 40</i>	
(30) <i>28.</i>	<i>31. 17.</i>	<i>53 - 30</i>	

W = 26.77

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 7 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by

Station Hallett New

Date June 25th

49-15
31-00-5
18-14-55
31-19-26
50-26
Do Altitude
30-56
19-16
50-72

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
B. Scorpii	9 - 02 - 09.7	60 - 55 - 10	
	9 - 04 - 23.5	61 - 04 - 05	20
	9 - 06 - 22.8	61 - 11 - 25	9 - 53 - 41.2 - 61 - 53 - 0
	9 - 07 - 27.6	61 - 15 - 00	21 9 - 55 - 21.7 - 61 - 50 - 20
	9 - 08 - 29.7	61 - 20 - 00	
	9 - 09 - 40.2	61 - 25 - 00	
	9 - 11 - 00.6	61 - 27 - 30	
	9 - 11 - 54.0	61 - 30 - 00	
	9 - 12 - 57.4	61 - 32 - 50	
	9 - 13 - 57.8	61 - 35 - 00	
	9 - 15 - 02.5	61 - 37 - 30	
	9 - 16 - 01.4	61 - 40 - 00	
	9 - 17 - 17.8	61 - 42 - 30	
	9 - 18 - 41.8	61 - 45 - 00	
	9 - 19 - 55.8	61 - 47 - 30	
	1 9 - 21 - 13.2	61 - 50 - 00	
	2 9 - 22 - 25.8	61 - 52 - 00	
	3 9 - 23 - 23.3	61 - 53 - 00	
	4 9 - 24 - 08.4	61 - 54 - 00	
5 9 - 25 - 07.4	61 - 55 - 00		
6 9 - 26 - 04.3	61 - 56 - 40		
7 9 - 27 - 36.7	61 - 59 - 00		
8 9 - 29 - 28.7	62 - 01 - 10		
9 9 - 31 - 14.6	62 - 02 - 30		
10 9 - 32 - 53.8	62 - 03 - 15		
11 9 - 34 - 06.1	62 - 03 - 55		
12 9 - 36 - 14.6	62 - 05 - 00		
13 9 - 38 - 14.6	62 - 05 - 55		
14 9 - 42 - 11.4	62 - 05 - 00		
15 9 - 44 - 42.3	62 - 03 - 00		
16 9 - 45 - 59.9	62 - 02 - 30		
17 9 - 47 - 29.2	62 - 01 - 30		
18 9 - 49 - 42.2	62 - 00 - 00		
19 9 - 52 - 11.8	61 - 55 - 40		

6-14-
9-40
15-54

62-2-57.5
1-125
62-1-45.0
1-34
62-0-11
31-0-5.5

ASTRONOMICAL OBSERVATIONS.—No. 3.

21

Sextant No. 8 and artificial horizon of Mercury

Mean Polar Star Chronometer No. 1283 by Negus

Station Halluc new Date June 25th 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Polaris.	10-33-44	80-15-25	barned to Polaris Book Page 6
	10-35-40.8	80-20-	
	10-29-41	80-19-30	
	(1) 10-32-55.8	80-23-35	
	(2) 10-35-10	80-26-15	
	(3) 10-38-04	80-26-25 x	
	(4) 10-41-16.2	80-29-35	
	(5) 10-43-46.2	80-30-10	
	(6) 10-45-25.5	80-33-00	
	(7) 10-47-19.8	80-33-00	
	(8) 10-48-59.5	80-34-00	
	(9) 10-50-01.5	80-35-00	
(10) 10-51-42.0	80-36-00	10-50-15.80 - 80-35-00	
(11) 10-53-12.5	80-37-00		
(12) 10-55-09.8	80-38-00		
1-18.2 (13)	10-56-28	80-38-30	
1-01.5 (14)	10-57-29.5	80-39-00	
1-07.5	10-58-30	80-39-30	
1-12.0	10-58-48	80-40-00	
1-14-17	11-1-02	80-40-30	
1-32-18	11-2-34	80-41-30	
0-56.5 (19)	11-3-30.5	80-42-00	
-46.0 (20)	11-4-16.5	80-42-30	
58.21	11-5-14.5	80-43-00	
47.7 (22)	11-6-02.2	80-43-30	
53.8 (23)	11-6-56.1	80-44-00 -	11-6-49.71 - 80-44-00
53.2 (24)	11-7-49	80-44-30	
38.2 (25)	11-8-27	80-45-00	
0-35.8 (26)	11-9-02.8	80-45-30	
32.2 (27)	11-9-35	80-46-00	
52.2 (28)	11-10-27	80-47-00	
51.5 (29)	11-11-18.5	80-48-00	
56.3 (30)	11-12-14.5	80-49-00	
1-13.5 (31)	11-13-28	80-50-00	
	10-57-39.41	80-39-01.93 ✓	

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 7 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regu Lovell

Station Hallett New Date June 25

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Polaris	11 - 29 - 58.7	81 - 01 - 50	
	11 - 31 - 30.8	81 - 03 - 00	
	11 - 32 - 22.2	81 - 04 - 00	
	11 - 33 - 14.8	81 - 05 - 00	
	11 - 34 - 11.6	81 - 06 - 00	
	11 - 35 - 8.6	81 - 07 - 00	
	11 - 35 - 57.7	81 - 08 - 40	
	11 - 36 - 38.1	81 - 09 - 00	
	11 - 37 - 13.1	81 - 10 - 00	
	11 - 37 - 50.7	81 - 11 - 00	
	11 - 38 - 27.1	81 - 12 - 00	
11 - 39 - 44.7	81 - 14 - 00	- 81-10	
11 - 41 - 56.6	81 - 10 - 00	X White	
11 - 43 - 36.	81 - 11 - 25	Carried to Polaris Book	
- 44 - 57	81 - 12	Page 7 -	
- 45 - 41	81 - 13		
- 46 - 43.5	81 - 14		
- 48 - 20.5	81 - 15		
- 49 - 35.5	81 - 16		
- 51 - 11.5	81 - 17		
52 - 45	81 - 18		
53 - 56.5	81 - 19		
55 - 32.5	81 - 20		
57 - 12.	81 - 21 - 10		
	81 - 27 - 6 - 35		
11 - 49 - 56.81	81 - 16 - 3.18		
11 - 49 - 54.81			

ASTRONOMICAL OBSERVATIONS.—No. 3.

23

Sextant No. 8

and artificial horizon of Mercury

White.

Sid'l Chronometer No. 1283 by

Nyeus

Station

Hulluck

Date

June 26/49

5 minutes to be subtracted from the mean of the times of morning observations

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Sun's upper limb	7-00-30	61.0	1-4 11 24.5 54.5
	2 7 00 57.5	61-10	2-4 11 02.2 23.3 59.7
	3 7 1 22.5	61-20	3-4 10 35.0 27.2 59.5
	4 7 1 49	61-30	4-4 10 06.6 28.5 55.5
	5 7 2 15.5	61-40	5-4 9 40.6 25.9 56.1
	6 7 2 45	61-50	6-4 9 16.04 24.6 61+
	7 7 3 9	62-05	7-4 8 48.2 27.8 52.2
	8 7 3 37.2	62-10	8-4 8 22.5 25-7 59.7
	9 7 4 29.5	62-30	9-4 7 56.2 26.3 +
	7-5-28	62-50	10-4 6 36.0 52
	10 7-5-28	62-50	10-4 6 36.0 52
	11 7-5-48.5	63-00	11-4 6 10.6 25.4 59.1
	12 7-6-10	63 10	12-4 5 38.10 32.5 48.1+
	13 7-6-39.5	63-20	
	14 7-7-7	63-30	4-9-11.79
	15 7-7-32	63-40	
	16 7-8-1.8	63 50	
	17 7-8-27.5	64	
	18 7-8-54.5	64-10	
	19 7-9-17	64-20	
	20 7 10 11	64 40	
	21 7 10 42.3	64 50	
	22 7 11 6.8	65-00	
	7-2-14.58		
	16-9-17.79		
	23-11-26.37		
	11-35-43.185		

Equal altitudes
Book page 9

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 52/30
 1/4
 1/2
 1/4

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No.

and artificial horizon of Mercury

Mean Solar

Sid'l Chronometer No. 1283 by Meigs

Sur M...

Station

Hall's New

Date

June 26th

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.		
Luna's upper limb 1/4 1/5	8 - 26 - 59.2	95 - 30 - 00	2	39	47.6
	8 - 27 - 28.8	95 - 40 - 00	2	39	21.6
	8 - 27 - 55.3	95 - 50 - 00	2	38	55.7
	8 - 28 - 19.4	96 - 00 - 00	2	38	27.6
	8 - 28 - 46.8	96 - 10 - 00	2	38	01.8
	8 - 29 - 13.2	96 - 20 - 00	2	37	34.6
	8 - 29 - 41.3	96 - 30 - 00	2	37	09.8
	8 - 30 - 07.2	96 - 40 - 00	2	36	40.1
	8 - 30 - 33.8	96 - 50 - 00	2	36	16.8
	8 - 31 - 01.8	97 - 00 - 00	2	35	47.6
	8 - 31 - 30.3	97 - 10 - 00	2	35	18.7
	8 - 31 - 54.9	97 - 20 - 00	2	34	52.3
	8 - 32 - 21.8	97 - 30 - 00	2	34	25.8
	8 - 32 - 51.7	97 - 40 - 00	2	34	00.3
	8 - 32 - 42.2	98 - 00 - 00	2	33	62
	8 - 34 - 08.4	98 - 10	2	32	39.9
	8 - 34 - 36.7	98 - 20	2	32	12.2
	8 - 35 - 4.9	98 - 30	2	31	44.6
	8 - 35 - 28.8	98 - 40	2	31	17.4
	8 - 35 - 57.8	98 - 50	2	30	51.7
8 - 36 - 24.6	99 - 00	2	30	25.8	
8 - 36 - 52.2	99 - 10	2	29	59.3	
8 - 37 - 19.7	99 - 20	2	29	30.4	
8 - 37 - 45.4	99 - 30	2	29	03.6	
8 - 38 - 13.6	99 - 40	2	28	37.6	
8 - 38 - 37.4	99 - 50	2	28	10.8	
8 - 39 - 4.9	100 - 00	2	27	43.4	
8 - 39 - 32.4	100 - 10	2	27	15.7	
8 - 39 - 59.6	100 - 20	2	26	47.7	
8 - 40 - 29.4	100 - 30	2	26	23.9	
8 - 40 - 52.9	100 - 40	2	25	54.6	
Mean	8 - 33 - 58.46	98°	2	32	50.63

92
 assumed to
 being the
 7 1/2
 7 1/4
 6 1/2
 13 1/2

83

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Wheeler

Sid'l Chronometer No. *1283* by *Nymys*

Station *Bulluck N.W.* Date *June 26 1869*
marked out by Lickmoot

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
	1 9-19-9.5	114-30	47 48.0 - 57.5+
<i>Stars upper</i>	28.3 2 9-19-37.8	114 40	30.2 47 18.2 - 56.0+
	29.2 3 9-20-7.	114 50	29.0 46-47.2 - 54.2
	84 4 9-21-31.	115-20	30.3 45-20.3 - 51.5
	27.8 5 9-21-58.8	115-30	38.7 44-54.2 - 53.0
	26.6 6 9-22-24.8	115-40	32.6 44-26.5 - 51.6
	31.7 7 9-22-56.5	115-50	+ 26.7 43-53.5 - 50.
	30.3 8 9-23-26.8	116-00	33.7 43-27.2 - 54.
	26.2 9 9-23-33.	116-10	28.8 42-56.0 - 49+
	32 10 9-24-23.	116-20	32.0 42-28.0 - 53.
	23 11 9-24-48	116-30	32.0 42-00.0 - 48+
31 12 9-25-19	116-40	31.5 41-91.5 - 50.5	
29.5 13 9-25-48.5	116-50	31.9 41-03.7 - 51.9	
27.5 14 9-26-16.	117-00	31.9 40-55.3 - 51.3	
28.2 15 9-26-44.2	117-10	29.7 40-05.0 - 49.2	
26 16 9-27-10.2	117-20	34.3 39-39.2 - 49.4	
31.3 17 9-27-41.5	117-30	30.7 39-10.0 - 51.5	
29.9 18 9-28-11.4	117-40	29.5 38-59.5 - 50.9	
27.6 19 9-28-39.	117-50	30.5 38-10.0 - 49.	
31.8 20 9-29-10.8	118-00	31.5 37-47.5 - 52.3	
25.2 21 9-29-36	118-10	34.3 37-13.8 - 51.8	
<i>Δ = 27.94</i> 32 22 9-30-8.	118-20	29.7 36-45.5 - 53.5	
26.8 23 9-30-34.8	118-30	30.5 36-16.0 - 50.8	
31.2 24 9-31-6.	118-40	31.0 35-47.0 - 53.0	
25 25 9-32-31.2	119-00	61.5 34-48.5 - 51.5	
23.8 26 9-32-27	119-10	29.0 34-17.5 - 44.5+	
31.2 27 9-32-58.2	119-20	31.0 33-48.5 - 46.5+	
31.8 28 9-33-30	119-30	31.1 33-19.6 - 49.6	
30.2 29 9-34-00.2	119-40	30.4 32-50.0 - 50.2	
31.3 30 9-34-31.5	119-50	29.0 32-19.0 - 50.5	
28.6 31 9-35-00.1	120-00	1 29.5 31-48.5 - 48.6+	
31 293-05-43.8		51-27-10.9	
9-27-16.89	117-20-13.55	1-39-35.16	
	39-47-14.1	9-27-16.89	
		2 23 06-52.05	
		11-33-26.035	

Carries to equal altitudes from

Bruck

Bruck

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

W. L. Allen

Mean Value
Sid'l Chronometer No. *1283* by

Index Error June 26 ^m ^s *3-42*

Station *Hallett New* Date *June 26th*

Object Observed.	Time of Observation by Chronometer.			Observed Double Altitudes.			REMARKS.
<i>Polaris</i>	<i>8</i>	<i>40</i>	<i>17.8</i>	<i>79</i>	<i>24</i>	<i>45</i>	<i>1</i>
	<i>8</i>	<i>42</i>	<i>08</i>	<i>79</i>	<i>26</i>	<i>00</i>	<i>2</i>
<i>2-44</i>	<i>8</i>	<i>44</i>	<i>56</i>	<i>79</i>	<i>27</i>	<i>00</i>	<i>3</i>
<i>1-21.5</i>	<i>8</i>	<i>45</i>	<i>11.5</i>	<i>79</i>	<i>28</i>	<i>00</i>	<i>4</i>
<i>2-01.5</i>	<i>8</i>	<i>47</i>	<i>12</i>	<i>79</i>	<i>29</i>	<i>00</i>	<i>5</i>
<i>1-38.5</i>	<i>8</i>	<i>48</i>	<i>30.5</i>	<i>79</i>	<i>30</i>	<i>00</i>	<i>6</i>
<i>1-48.5</i>	<i>8</i>	<i>50</i>	<i>38.0</i>	<i>79</i>	<i>30</i>	<i>30</i>	<i>7</i>
<i>1-03.8</i>	<i>8</i>	<i>51</i>	<i>41.8</i>	<i>79</i>	<i>31</i>	<i>00</i>	<i>8</i>
<i>1-53.3</i>	<i>8</i>	<i>53</i>	<i>35.1</i>	<i>79</i>	<i>31</i>	<i>30</i>	<i>9</i>
<i>1-37.9</i>	<i>8</i>	<i>55</i>	<i>13.0</i>	<i>79</i>	<i>32</i>	<i>00</i>	<i>10</i>
<i>1-30.4</i>	<i>8</i>	<i>56</i>	<i>43.4</i>	<i>79</i>	<i>32</i>	<i>30</i>	<i>11</i>
<i>1-27.1</i>	<i>8</i>	<i>58</i>	<i>10.5</i>	<i>79</i>	<i>33</i>	<i>00</i>	<i>12</i>
<i>1-39.3</i>	<i>8</i>	<i>59</i>	<i>48.8</i>	<i>79</i>	<i>33</i>	<i>30</i>	<i>13</i>
<i>1-12.2</i>	<i>9</i>	<i>01</i>	<i>02.0</i>	<i>79</i>	<i>34</i>	<i>00</i>	<i>14</i>
<i>1-38.5</i>	<i>9</i>	<i>02</i>	<i>40.5</i>	<i>79</i>	<i>34</i>	<i>30</i>	<i>15</i>
<i>1-14.0</i>	<i>9</i>	<i>03</i>	<i>54.5</i>	<i>79</i>	<i>35</i>	<i>00</i>	<i>16</i>
<i>Mean</i>	<i>8-53</i>	<i>-14.77</i>		<i>79-30</i>	<i>-45.99</i>		
<i>"</i>							
<i>Sextant No 7</i>	<i>9</i>	<i>06</i>	<i>17.7</i>	<i>79</i>	<i>34</i>	<i>50</i>	
	<i>9</i>	<i>07</i>	<i>47.3</i>	<i>79</i>	<i>36</i>	<i>00</i>	
	<i>9</i>	<i>08</i>	<i>45.6</i>	<i>79</i>	<i>37</i>	<i>00</i>	
	<i>9</i>	<i>10</i>	<i>04.2</i>	<i>79</i>	<i>37</i>	<i>30</i>	
	<i>9</i>	<i>11</i>	<i>09.8</i>	<i>79</i>	<i>38</i>	<i>00</i>	
	<i>9</i>	<i>12</i>	<i>11.9</i>	<i>79</i>	<i>38</i>	<i>30</i>	
	<i>9</i>	<i>13</i>	<i>15.6</i>	<i>79</i>	<i>39</i>	<i>00</i>	
	<i>9</i>	<i>14</i>	<i>07.2</i>	<i>79</i>	<i>39</i>	<i>30</i>	
	<i>9</i>	<i>15</i>	<i>12.6</i>	<i>79</i>	<i>40</i>	<i>00</i>	
	<i>9</i>	<i>16</i>	<i>13.8</i>	<i>79</i>	<i>40</i>	<i>30</i>	
	<i>9</i>	<i>17</i>	<i>12.9</i>	<i>79</i>	<i>41</i>	<i>00</i>	
	<i>9</i>	<i>18</i>	<i>00.2</i>	<i>79</i>	<i>41</i>	<i>30</i>	
	<i>9</i>	<i>19</i>	<i>00.3</i>	<i>79</i>	<i>42</i>	<i>00</i>	
<i>Mean</i>	<i>9-13</i>	<i>-1.46</i>		<i>79-38</i>	<i>52.3</i>		

Carried to Polaris Book page 9

8-56-36.87
79-32-30

Sextant transferred to list by Polaris

ASTRONOMICAL OBSERVATIONS.—No. 3.

27

Sextant No. ⁸ 1253 and artificial horizon of Mercury

Sid'l Chronometer No. 1253 by *Myers*

Station *Halleck* Date *June 26th 1869*

Object Observed.	Time of Observation by Chronometer.		Observed Double Altitudes.			REMARKS.
	h	m	Observed	Time	Observed	
<i>β Scorpion</i>	9	36	34.8	62	4	50
	9	39	6.8	"	5	50
	9	40	3.7		2	35
	9	42	10	60		50
<i>Scorpius 0?</i>	9	45	46	51	54	45
		47	8.8		56	
		49	30.		33	30
		53	6.5		31	30
<i>α (Scorpius)</i>	9	55	18.2	57	36	50
		57	9.1		43	10
		58	46.2		45	
		59	43.7		46	
<i>Antares.</i>	10	00	35.8		47	
		1	34.8		50	35
		2	44.7		52	
		7	2.8		59	25
		8	29.6	58	51	1
		10	13.5	58	2	
		11	7.9	58	3	
		12	21	58	4	
		13	37.5	58	5	
		15	43.	58	6	
		16	58.2	58	7	
		18	48.	58	8	
		21	34.1	58	5	10
		23	29	58	4	
		24	50.9	58	3	
	25	41.2	58	2		
	27	14	58	1		
	28	20.5	58	0	00	

No good.

Whiter.

*Carried to Circum Meridian
altitude Book Page 1*

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

m 5 solar Sidt Chronometer No. *1283* by *Nyons* *Whelan*

Station *Walters Camp* Date *June 27*

Object Observed.	Time of Observation by Chronometer.			Observed Double Altitudes.			REMARKS.	
<i>Polaris</i>	11	10	13	80	42	40	<i>Carried to Polaris Book Page 10.</i>	
	11	11	28.2	80	45	10		
	11	12	40	80	46	—		
	68.9	11	13	48.9	80	47		—
	67.9	11	14	56.	80	48		
	61.1	11	15	57.1	80	49		
	78.7	11	17	158	80	50		
mean =	11	13	48.57	80	46	50		
<i>1st</i> magnitude	<i>Camp I June 27th Lockport Sec No 7</i>							
	11	26	57.4	105	45	25	<i>Carried to Sec 7 Page 9</i>	
	11	28	06.2	106	05	45		
	11	29	26.8	106	23	20		
	11	31	11.2	106	46	30		
	11	32	38.7	107	03	00		
	11	33	43.2	107	17	20		
	11	35	05.6	107	34	20		
	11	36	20.8	107	49	10		
	11	37	56.2	108	08	30		
	11	32	20.75	106	59	15.55		

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Mean Solar Sid'l Chronometer No. 1283 by Regis

Station Camp 2 Elko Date June 28th

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Polaris	10-56-13.1	80-47-10	Carried to Book Polaris Page 11 3-2 305
	10-57-38.2	80-49-00	
	10-59-06.8	80-50-00	
	11- -39.5	80-51- -	
	11-2-16.0	80-52 ^x - -	
	11-3-43.5	80-53- -	
	11-4-56.5	80-53-30	
	11-6-14.8	80-54-00	
	11-7-04.1	80-54-30	
	11-7-47.0	80-55- -	
		80-51-55	
Lockwood			7
	11-15-26.4	103-40-50	
	11-16-32.8	103-56-10	
	11-17-34.8	104-11-10	
	11-18-31.6	104-23-45	
	11-19-25.4	104-35-40	
	11-20-23.2	104-49-20	
	11-21-52.6	105-09-55	
	11-23-00.6	105-24-35	
11-24-51.8	105-35-40		
Mum	11-19-44.4	104-38-83.33	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 7 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Megus*Station *Camp II Elko.* Date *June 29th* *Lockwood*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Sun's upper limb</i>	10-09-08.2	130° - 00 - 00	
	10-10-16.8	130 - 20	
	10-10-48.8	130 - 30	
	10-11-19.9	130 - 40	
	10-11-52.4	130 - 50	
	10-12-29.7	131 - 00	
	10-13-05.6	131 - 10	
	10-13-35.7	131 - 20	
	10-14-15.6	131 - 30	
	10-14-45.4	131 - 40	
	10-15-21.4	131 - 50	
	10-15-54.2	132 - 00	
	10-16-31.7	132 - 10	
	10-17-09.9	132 - 20	
	10-17-39.9	132 - 30	
		131 - 18	
	<i>Sun's upper limb</i>	10-21-10.4	133 - 20
21-42.5		133 - 40	
22-23.8		133 - 50	
22-51.2		134 - 00	
23-33.0		134 - 10	
23-58.0		134 - 20	
24-35.0		134 - 30	
25-16.0		134 - 40	
25-54.0		134 - 50	
26-38.1		135 - 00	
27-14.8		135 - 10	
27-46.7		135 - 20	
29-05.5		135 - 40	
29-50.2		135 - 58	
30-26.1	136 - 00		
	10-25-29.69	134° - 42'	

*Carried to page 6
altitude 18016
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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8

and artificial horizon of Mercury

Mean Solar Sidt Chronometer No. 1283 by Regus -

Station

Camp 2. Elko

Date

June 29th + 30th

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
	3 - 26 - 22.	79 - 40	
	26 - 52.1	79 - 30	
	27 13.7	79 - 20	
	27. 41.8	79 - 20	
	28 - 5.7	78°	
	31 - 19.	76 - 50	
	+ 41 - 20.8	73.	30 30
	41 - 48.7	72 - 50	3
	3 - 42 - 13.8	72 40	29 - 36.2 - 50.0
28.1 (1)	- 42 - 41.9	72 30	28.2 29 - 08.0 - 49.9
27.3 (2)	- 43 - 09.2	72 20	26. 28 - 42.0 - 51.2
26.5 (3)	- 43 - 33.7	72 10	24. 28 - 18.0 - 53.7+
23.3 (4)	- 43 - 59.0	72	24.5 27 - 53.5 - 52.5
29.8 (5)	- 44 - 28.8	71 50	29.5 27 - 24.0 - 52.8
25.6 (6)	- 44 - 54.5	71 40	29.5 26 - 54.5 - 49
28.3 (7)	- 45 - 22.8	71 - 30	25.5 26 - 29.0 - 51.8
	(8) - 46 - 40.8	71 - 00	25 - 11.0 - 51.8
26.1 (9)	- 47 - 06.9	70 - 50	28.5 24 42.5 - 49.4
26.6 (10)	- 47 - 33.5	70 - 40	27.5 29 - 13.0 - 48.5
26. (11)	- 47 - 59.6	70 - 30	27.5 23 47.5 - 47 *
27.7 (12)	- 48 - 27.2	70 - 20	24 29 23.5 - 50.7
24.3 (13)	- 48 - 51.5	70 - 10	26.4 22 57.1 - 48.6 +
27.3 (14)	- 49 - 18.8	70 -	29.6 22 - 27.5 - 46.3+
28.3 (15)	- 49 - 47.1	69 - 50	25.5 22 - 02.0 - 49.1
26.1 (16)	- 50 - 13.2	69 - 40	24 31 - 38.0 - 51.2
24. (17)	- 50 - 37.2	69 - 30	27 21 - 11.0 - 48.2
27.8 (18)	- 51 - 03.0	69 - 20	27.5 20 - 43.5 - 48.5
24.5 (19)	- 51 - 29.5	69 - 10	26.5 20 - 18.0 - 47.5+
27.2 (20)	- 51 - 56.7	69 - 00	25.5 19 - 52.2 - 48.9
27.5 (21)	- 52 - 24.2	68 - 50	26.1 19 - 26.0 - 50.2
25.6 (22)	- 52 - 49.8	68 - 40	24 19 - 02.0 - 51.8
26.7 (23)	- 53 - 16.5	68 - 30	7 27.8 18 - 34.0 - 50.6
	53 - 41.2	68 - 20	7 - 25 - 12.9
	3 - 50 - 28.05		
	int. = 11 - 01.7		int. = 11 - 02.00

Carried to equal altitudes
Book page 8

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *J* and artificial horizon of Mercury

W. Huber

Sid'l Chronometer No. *1283* by *Weyns*

Station *Camp (2) Elk* Date *June 29 1869*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>B Scorpis</i>	8 40. 45	67-57-10	
	8- 38- 13.2	60-10-00	
	8- 39- 31	60-16-45	
	8- 44- 36.8	60-39-40	
	8- 50- 32.5	61-00-40	
	8- 55- 23.1	61-19-15	
	8- 58- 44.8	61-26-40	
	9- 1- 37.5	61-37-10	
	9- 3- 5	61-44-15	
	1 9- 9- 52.7	61-50-50	
	2 9- 10- 53.5	61-52-	
	3 9- 11- 47.9	61-54-	
	4 9- 12- 38.8	61-55-	
	5 9- 14- 13.6	61-56-	
	6 9- 15- 23.7	61-57-	
	7 9- 16- 33.8	61-58-	
	8 9- 18- 27.2	61-59	
	9 9- 20- 7.8	62-00	
	10 9- 21- 27.7	62-00-30	
	11 9- 22- 42.	62-01-00	
12 9- 24- 24.	62-01-30		
13 9- 26- 25.6	62-02-00		
14 9- 29- 10.5	62-02-30	x	
15 9- 30- 45.2	62-58-30		
16 9- 32- 48.9	61-58-10		
17 9- 35- 38.0	61-56-15		
18 9- 36- 42.7	61-53-50		
19 9- 38- 19.7	61-52-		
20 9- 38- 59.5	61-51-		
21 9- 39- 59	61-50-		

Carried to Circum Meridian Altitude Book Page 2

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *9* and artificial horizon of Mercury

Sid'l Chronometer No. *1283*, by *Reque*

Lockwood

Station *Camp 2* *Elko Nev* Date *June 29*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Polaris</i>	1 9 <i>10</i> - 51 - 09.1	80 - 04 - 55	
	2 9 <i>10</i> - 55 - 18.2	80 - 07 - 20	
	3 9 <i>10</i> - 56 - 40.7	80 - 08 - 15	
	4 9 <i>10</i> - 58 - 24.8	80 - 09 - 30	
	5 9 <i>10</i> - 59 - 53.2	80 - 10 - 10	
	6 <i>10</i> - 03 - 03.1	80 - 12 - 25	
	7 <i>10</i> - 03 - 45.8	80 - 13 - 00	
	8 <i>10</i> - 05 - 03.6	80 - 14 - 00	
	9 <i>10</i> - 07 - 35.1	80 - 15 - 00	
	10 <i>10</i> - 08 - 38.1	80 - 16 - 00	
	11 <i>10</i> - 10 - 04.7	80 - 17 - 00	
	12 <i>10</i> - 11 - 13.6	80 - 18 - 00	
	13 <i>10</i> - 12 - 31.2	80 - 19 - 00	
<i>Mean</i>	<i>10 - 3 - 15.77</i>	<i>80 - 12 - 46</i>	

*Circus W.
Polaris 1300 R*

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. ⁸ 1283 and artificial horizon of Mercury

Whitaker

Sid'l Chronometer No. 1283 by Myers

Station Peko New Date June 30 1869 + July 1st

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
	3 - 3 - 11	87 -	
	3 - 3 - 41.1	88 - 10 86.50	
	3 - 4 - 7.5	87 - 20 86.40	
	1 3 - 22 - 19.8	79 - 50	7 - 47 - 54.0 26.5 14.8
21.7	3 - 22 - 42.5	79 - 40	7 - 47 - 52.5 27.0 14.8
26.43	3 - 23 - 08.9	79 - 30	7 - 47 - 50.1 27.5 11.4
29.14	3 - 23 - 36.5	79 - 20	7 - 46 - 53.5 24.8 11.0
28.15	3 - 24 - 04.4	79 - 10	7 - 46 - 50.9 26.2 14.3
27.46	3 - 24 - 32.0	79 -	7 - 45 - 53.0 23.5 15.5
24.67	3 - 24 - 58.9	78 - 50	7 - 45 - 51.3 29.2 17.4
25.68	3 - 25 - 24.5	78 - 40	7 - 44 - 50.3 32.3 13.8
26.39	3 - 25 - 49.8	78 - 30	7 - 44 - 52.8 20.5 17.8
56.4	26.4/16 3 - 26 - 16.2	78 - 20	7 - 43 - 52.5 50.5 17.7
347	25.3/11 3 - 26 - 46.8	78 - 10	
	26.2/12 3 - 27 - 07.7	78 - 00	7 - 43 - 50.7 29.5 14.7
	26.8/13 3 - 27 - 34.5	77 - 50	7 - 42 - 53.5 25.3 12.0
	27.1/14 3 - 28 - 01.5	77 - 40	7 - 42 - 51.2 27.4 13.7
		77 - 30	7 - 41 - 54.8 27.1 13.3
	27.15/15 3 - 28 - 28.5	77 - 20	7 - 41 - 51.7 28.2 13.4
	27.16/16 3 - 28 - 55.7	77 - 10	7 - 40 - 59.5 25.0 17.1
+	22.3/17 3 - 29 - 18.0	77 - 10	7 - 40 - 52.4 27.7 14.0
	21.5/18 3 - 29 - 49.5	77 - 00	7 - 39 - 56.5 26.3 19.3
+	23.1/19 3 - 30 - 12.5	76 - 50	
	29.2/20 3 - 30 - 41.8	76 - 40	
	25.4/21 3 - 31 - 07.2	76 - 30	
	24.2/22 3 - 31 - 33.5	76 - 20	
Mean of 22	3 - 26 - 55.59	78 - 05	Equal altitude Page 11
Mean of 9 obs	3 - 29 - 15.54	7 - 40 - 57.74	
" " 16 selected	3 - 27 - 04.52	7 - 43 - 10.95	10.70
	3 - 24 - 14.03	7 - 46 - 09.14	

Sextant No. ⁸ 1283 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Nyons*

Station *Peko*

Date *Jan 30 1869*

Whole

*51-39
45
51*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>2 Aquilae</i>	9-30-44.5	51-42-15	
	9-20-47.4	115-56-30	
	9-23-10.5	116-21-50	
	11-25-34.5	108-16-	
	11-39-49.4	108-28-50	
	9-30-48.	108-40	
	-32-36.5	109-	
	36-15.	109-50	
	37-12.	109.50	
	1 38-11.0	110.80	1 - 3 2 - 04.8 15.8
64.4	2 39-15.4	110-10	1 - 3 3 7 - 04.8 60. 20.2
+ 46.6	3 - 40-02.0	110-20	1 - 3 3 6 - 05.5 59.3 07.5+
74.2	4 41-16.2	110-30	1 - 3 4 5 - 01.0 64.5 17.2
+ 55.7	5 42-11.9	110-40	1 - 3 3 2 - 58.0 63. 99+
68.1	6 43-20.0	110-50	1 - 3 2 2 - 58.5 59.5 18.5
+ 55.7	7 44-15.7	111 -	1 - 3 1 1 - 49.5 69.0 5.2+
+ 68.7	8 45-24.0	111-10	1 - 3 0 4 - 43.5 66 75+
+ 77	9 46-41.0	111-20	1 - 2 9 - 42.5 61 23.5+
62.3	10 47-43.3	111-30	1 - 2 8 - 38.5 64 21.8
71.7	11 48-55.0	111-40	1 - 2 7 - 27.0 71.5 22.
72.8	12 50-08.8	111-50	1 2 6 - 15.7 71.3 24.5
69.4	13 51-22.2	112. 00	1 2 4 - 56.0 79.7 14.2
68.3	14 52-31.5	112-10	1 2 3 - 47.5 70.5 16.
71.5	15 53-48.0	112-20	1 2 2 - 32.5 73 20.5
76	16 55-04.0	112-30	1 2 1 - 18.8 73.7 22.8
+ 81.5	17 56-25.5	112-40	1 - 19 - 42.5 101.3 8+
10-5.2	83.2 18 57-45.7	112-50	1 - 18 - 32.9 68.6 16.6
	88.3 19 59-17.0	113. -	1 - 17 - 04.0 84.9 21.
		13-08-48.02	
		2-09.23	
Mean of 13 obs	19-49-07.08	13-06-38.79	113-27-12.05
RA =	19-44-25.46	12-38-09.54	14-49-07.08
Sid time of mean noon at Station =	6-35-37.44		25-16-19.08
	13-08-48.02	slow = 28-29.25	12-38-09.54

Carried to page 3

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Mean Solar Sidl Chronometer No. 1283 by Regus

Station Pess Nev Date June 30 $\frac{75}{11}$

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Polaris	1 12 - 38 - 28.0	82 - 18 - 30.	Carried to new Polaris Book Page 1
	2 39 - 37.0	82 - 20	
	3 1 - 3 40 - 40.0	82 - 21	
	4 58.5 41 - 39.5	82 - 22	
	5 1 - 10.5 42 - 44.0	82 - 23	
	6 1 - 37.2 47 21.2	82 - 25	
	7 1 - 41.6 46 02.8	82 - 26	
	8 1 - 28.4 47 31.2	82 - 27	
	9 1 - 39.8 49 11.0	82 - 28	
	10 485 49 59.5	82 - 29	
	11 57 34.0	82 - 30	
	12 - 44 - 42.02	82 - 24 - 31.81	
	12 - 47 - 27.64	- 82 - 27 - 00	Polaris Page 160

ASTRONOMICAL OBSERVATIONS.—No. 3.

9-71
10-11
1-49
30
1-19

Sextant No. 8 and artificial horizon of Mercury

Mean Solar Sid'l Chronometer No. 1283 by Regas

Station Peko New Date July 14 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
	9 - 33 - 43.0	118 - 30.1	1 - 30 - 35.7
			1 - 29 - 06
	9 - 34 - 12.0	118 - 40.2	1 - 29.7
	9 - 34 - 43.1	118 - 50.3	41 - 07.6
	9 - 35 - 11.8	119 - 4	9 - 39 - 38
	9 - 35 - 41.0	119 - 10.5	29.6
	9 - 36 - 11.7	119 - 20.6	
	9 - 36 - 41.5	119 - 30.7	
	9 - 37 - 10.0	119 - 40.8	alt then 77.5
	9 - 37 - 38.0	119 - 50.9	Det u. 77.8 } moon
	9 - 38 - 10.5	120 - 10	
	9 - 38 - 38.6	120 - 10.11	
	9 - 39 - 07.8	120 - 20.12	
	9 - 39 - 38.0	120 - 30.13	1 - 30 - 33.7 13.7
	9 - 40 - 07.5	120 - 40.14	1 - 30 - 05.7 13.4
	9 - 40 - 38.0	120 - 50.15	1 - 29 - 36.2 29.5 14.2
	9 - 41 - 07.6	121 - 16	1 - 29 - 06.6 30.2 13.6
Mean of 16 obs	9 - 36 - 51.19	119 - 45	1 - 29 - 50.9 = mean
4	9 - 40 - 22.775		9 - 40 - 22.775 ✓
Carried to Equal Altitude Page 10			23 - 10 - 13.675
1-29.7			11 - 35 - 6.837

dots upper limb

24

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *W. W. M.*

Station *Camp 2, Elk,* Date *July 2nd 1869.*

Sextant No. 5
Sid'l Chronometer No. 1148
Station 5

Object Observed.	Time of Observation by Chronometer.			Observed Double Altitudes.		REMARKS.					
	1) 9	39	10.9	119	00	31.3	1	96	12.2	Taken by	
<i>Lines upper line</i>	2) 9	39	41.5	119	10	29.2	1	35	40.7	12.2	1268
	295) 3) 9	40	11.	119	20	28.2	1	35	11.5	22.5	
	29	4) 9	40	119	30	31.3	1	39	49.3	23.3	faster than
	30) 5) 9	41	10.7	119	40	32.8	1	34	12	22.7	
<i>29.9</i>	294) 6) 9	41	40.1	119	50		3) 9	33	49.2	22.3	1283 by
	9	42	108	120	00	1-58			32.8		m
	9	42	38.7	120	10				32.8		2-46.8
	9	43	9	120	20						
	9	43	39.	120	30						Then Pill
	9	44	10	120	40						by 1283
	9	44	37	120	50						
	9	45	9	121	00						
	9	45	38.7	121	10						
	9	46	7	121	20						
<i>Mean of 6 obs</i>	9	40	25.7				1	34	56.8		
		2	46.8								
	9	37	38.9								

*Equal altitudes
Page 14*

Camp 10 near Hamilton July 20th

	8	43	36.8	97	XX	2	30	55.2	32
	8	44	" "	97	10	2	30	26.5	26.5
	8	44	29.9	97	20	2	30	01.5	31.4
	8	44	57.0	97	30	2	29	31.9	28.9
	8	45	21.3	97	40	2	29	03.5	24.8
	8	45	51.4	97	50	2	28	41.0	32.4
<i>2-44.5</i>	8	46	21.3	98	XX	2	28	14.9	2-40.3 56.2
									4.2

Rather off

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury
 Sid'l Chronometer No. 1283 by Negus
 Station Camp 2 Kelko Date July 2nd + 22nd 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Sun's upper limb	1 3-58-33.2	66 30	Single altitudes Page - 21
	2 3-58-56.7	66 20	
	3 3-59-27.0	66 10	
	4 3-59-54.8	66 00	
	5 7-4-20.8	65 50	
	6 4-0-47.7	65 40	
	7 4-1-13.2	65 30	
	8 4-1-39.0	65 20	
	9 4-2-06.5	65 10	
	10 4-2-31.5	65 00	
	11 4-2-56.7	64 50	
	12 4-3-25.0	64 40	
	13 4-3-51.8	64 30	
	14 4-4-18.5	64 20	
	15 4-4-43.5	64 10	
	4-01-39.06	65°-20'	

Camp 10 near Hamilton New July 20th 869

Feller

Sun's upper limb	8-19-44.4	88°-xx			
	8-20-13.2	88-10	2-54-12.1	25.3	
	8-20-38.2	88-20	2-53-48.2	26.4	
	8-21-05.5	88-30	2-53-15.1	20.6	
	8-21-31.1	88-40	2-52-46.8	17.9	
	8-22-01.3	88-50	2-52-24.6	25.9	
	8-22-27.5	89-xx	2-52-04.3	31.8	
	8-22-53.5	89-10	2-		
	8-23-19.9	89-20	2-51-10.9	30.8	
	8-23-44.5	89-30	2-50-42.3	26.8	
	8-24-09.8	89-40	2-50-19.1	28.9	
	8-24-36.5	89-50	2-49-47.6	24.1	
				27.9	
	5-21.5	8-25-05.9	90-xx	2-49-22.0	5-09.9

$\frac{28.9}{4} = 52.7$
 $\frac{4}{4} = 50.1$

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8

and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by

Wynns

Station

Camp 2 Elk

Date

July 3, 1869

Object Observed.	Time of Observation by Chronometer.		Observed Double Altitudes.		REMARKS.	
<i>Suns upper limb</i>	9	51	58.5	124	00	
	9	52	38.5	124	10	
	9	53	00.0	124	20	
	9	53	30.5	124	30	
	9	54	34.9	124	50	
	9	55	04.0	125	00	
	9	55	38.5	125	10	
	9	56	11.7	125	20	
	9	56	40.6	125	30	
	9	57	12.1	125	40	
<i>Polaris</i>	9	55	12.11	125	01 40	
	10	9	22.2	80	29 50	
	10	10	41.8	80	30	
	10	12	25.5	80	31	
	10	13	52.8	80	32	
	10	15	42.7	80	33	
	10	17	06.5	80	34	
	10	18	16.0	80	35	
	10	20	04.0	80	36	
	10	21	15.0	80	37	
	10	22	37.0	80	38	
	10	23	51.1	80	39	
	10	25	35.3	80	40	
	10	14	33.825	80	34	3417

*Sun's altitudes
Page 23*

*Polaris Book
Page 20*

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Myns*

Station *Camp 2 Elk* Date *July 3^d*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h	m	s	sec	1	2	3	
<i>Alcyon</i>	10	35	24	8	98	39	40	<i>Equal Altitudes</i> <i>Page 16</i> <i>Single altitudes</i> <i>Page 22</i>
	10	37	31	2	99	2	50	
	10	38	36	5	99	20		
	10	39	12	0	99	50		
	10	39	31	0	99	40		
	10	40	35	8	99	50		
	10	41	9	3	100			
	10	41	49	8	100	10		
	10	42	26	4	100	20		
	10	43	4	8	100	30		
	10	43	46	8	100	40		
	10	44	21	0	100	50		
	10	45	4	0	101	00	2 9 57 8 305	
	10	45	39	0	101	10		
	10	46	15	3	101	20	<i>skip</i>	
10	77	00	8	101	30			
10	42	46	62	100	25			

Camp 10 *Feller* near *Hamilton* *July 19th*

<i>Sun's upper</i>	9	05	39	0	105	30	+	+
	9	06	06	8	105	40		
<i>Limb</i>	9	06	33	0	105	50		
	9	07	01	6	106	+	+	
	9	07	30	4	106	10		
	9	07	59	0	106	20		
	9	08	27	0	106	30		
	9	08	54	2	106	40		
	9	09	22	6	106	50		
	9	09	49	5	107	+	+	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *F* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by

Station *Camp 3 Crescent Sta* Date *July 4th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
<i>1</i>	<i>9</i>	<i>30</i>	<i>7</i>	<i>2</i>	<i>79</i>	<i>56</i>	<i>40</i>	<i>Polaris Page 3</i> $\begin{array}{r} 37 \\ 157 \\ \hline 120 \\ 9/260 \\ \hline 9/57 \\ \hline 6- \\ \hline 28.88 \end{array}$
<i>2</i>	<i>9</i>	<i>31</i>	<i>38</i>	<i>8</i>	<i>79</i>	<i>58</i>	<i>40</i>	
<i>3</i>	<i>9</i>	<i>33</i>	<i>54</i>	<i>7</i>	<i>80</i>	<i>59</i>	<i>60</i>	
<i>4</i>	<i>9</i>	<i>35</i>	<i>34</i>	<i>5</i>	<i>80</i>	<i>60</i>		
	<i>9</i>	<i>37</i>	<i>15</i>	<i>3</i>	<i>80</i>	<i>1</i>		
	<i>9</i>	<i>38</i>	<i>15</i>	<i>0</i>	<i>80</i>	<i>2</i>		
	<i>9</i>	<i>39</i>	<i>59</i>	<i>5</i>	<i>80</i>	<i>3</i>		
	<i>9</i>	<i>41</i>	<i>27</i>	<i>4</i>	<i>80</i>	<i>4</i>		
	<i>9</i>	<i>43</i>	<i>4</i>	<i>0</i>	<i>80</i>	<i>5</i>		
	<i>9</i>	<i>35</i>	<i>42</i>	<i>04</i>	<i>79</i>	<i>06</i>	<i>28.88</i>	
<i>Camp 4 Willow Creek July 5th</i>								
<i>Polaris</i>	<i>45</i>	<i>9</i>	<i>45</i>	<i>59</i>	<i>5</i>	<i>79</i>	<i>42</i>	<i>10</i>
	<i>47</i>	<i>9</i>	<i>48</i>	<i>03</i>	<i>7</i>	<i>79</i>	<i>43</i>	
	<i>48</i>	<i>9</i>	<i>48</i>	<i>00</i>	<i>5</i>	<i>79</i>	<i>44</i>	
	<i>49</i>	<i>9</i>	<i>49</i>	<i>56</i>	<i>8</i>	<i>79</i>	<i>45</i>	
	<i>51</i>	<i>9</i>	<i>51</i>	<i>03</i>	<i>7</i>	<i>79</i>	<i>46</i>	
	<i>52</i>	<i>9</i>	<i>52</i>	<i>16</i>	<i>5</i>	<i>79</i>	<i>47</i>	
	<i>53</i>	<i>9</i>	<i>53</i>	<i>42</i>	<i>5</i>	<i>79</i>	<i>48</i>	
	<i>54</i>	<i>9</i>	<i>54</i>	<i>42</i>	<i>7</i>	<i>79</i>	<i>49</i>	
	<i>55</i>	<i>9</i>	<i>55</i>	<i>59</i>	<i>2</i>	<i>79</i>	<i>50</i>	
		<i>9</i>	<i>50</i>	<i>58</i>	<i>34</i>	<i>79</i>	<i>46</i>	<i>01.11</i>

Polaris Page 4

Sextant No. 8

and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Meyers*

Station *Camp 4 Willow Creek* Date *July 5th 69*
Willow Creek.

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>α aquilae (Altair)</i>	10-21 55.2	97-30	<i>Single Altitude Page 24</i>
	10-22-34.0	97-40	
	10-23-12.0	97-50	
	10-23-44.8	98-00	
	10-24-28.0	98-10	
	10-24-59.3	98-20	
	10-25-37.0	98-30	
	10-26-13.5	98-40	
	10-26-47.5	98-50	
	10-27-23.0	99-00	
10-27-39.2	99-10		
	10-24-50.86	98°-20'	

<i>Camp 5. Reed Creek July 6th</i>						
<i>h</i>	<i>m</i>	<i>s</i>	<i>o</i>	<i>'</i>	<i>"</i>	
1	9	28	14	8	79	06 40.
2		30	15	4	79	08
3		31	48	4	79	08 30
4		32	45	-	79	09
5		33	28	3	79	09 30
6		34	37	4	79	10
7		35	36	9	79	10 30
8		36	34	2	79	11
		37	34	9	79	11 30
9		38	12	2	79	12
	9	33	29	72	79	09 27.78 = mean

<i>α aquilae (Altair)</i>	1	9	42	32	2	87	-	<i>Single altitudes Page.</i>
	2	9	43	1	2	87	10.	
	3	9	45	29	4	87	20	
	4	9	44	3	3	87	30	
	5	9	44	38	2	87	40	
	6	9	45	10	8	87	50.	
	7	9	45	40	5	88	-	
	8	9	46	10	8	88	10	
	9	9	46	41	4	88	20	
	10	9	47	10	4	88	30	

9-44-51.82 / 87°-45' = mean

Sextant No. *8*

and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus*Station *Camp 6* near *Cold Spring* Date *July 7th*
Station

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Polaris -</i>	<i>9^h41' 16".4</i>	<i>78-50-40</i>	<i>Polaris Page 6</i>
	<i>9^h43' 57".3</i>	<i>78-52</i>	
	<i>9^h44' 22".1</i>	<i>78-53</i>	
	<i>9^h46' 29".1</i>	<i>78-54</i>	
	<i>" 47' 41"</i>	<i>78-54-30</i>	
	<i>" 48' 44".9</i>	<i>78-55</i>	
	<i>" 50' 2".2</i>	<i>78-55-30</i>	
	<i>" 50' 54".6</i>	<i>78-56</i>	
	<i>" 51' 49".4</i>	<i>78-56-30</i>	
	<i>" 52' 32".4</i>	<i>78-57</i>	
	<i>9-47-46.82</i>	<i>78°-54'-25"</i>	
<i>α aquilae + (Altair)</i>	<i>9 54' 25".9</i>	<i>93-10</i>	<i>Single Altitudes Page 26</i>
	<i>9 58 00".4</i>	<i>93-20</i>	
	<i>9 58 31".1</i>	<i>93-30</i>	
	<i>9 59 04".5</i>	<i>93-40</i>	
	<i>9 59 41".1</i>	<i>93-50</i>	
	<i>10 00' 13".3</i>	<i>94 50 -</i>	
	<i>" 00' 45".8</i>	<i>94-10</i>	
	<i>" 01' 24".3</i>	<i>94-20</i>	
	<i>" 01' 55".5</i>	<i>94-30</i>	
	<i>" 02' 32".0</i>	<i>94-40</i>	
	<i>" 02' 58".9</i>	<i>94-50</i>	
	<i>10-00-13.89</i>	<i>94-00-00</i>	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *J* and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by

Station *Camp 7 Camp Red* Date *July 9*

Object Observed.	Time of Observation by Chronometer.					Observed Double Altitudes.	REMARKS.	
	h	m	s	sec	cent			
<i>Sun upper limb</i>	8	34	9	0	96		<i>2.</i>	
	8	34	56	1	-	20		35 - 26.7 26.9 0.57
	8	37	39	0	97	20 20		34 - 59.8 27.3 0.43
	25.5	8	38	04	5	30		34 - 32.5 28.5 0.40
	27.0	8	38	31	5	40		34 - 04.0 24.9 0.20X
	26.5	8	38	58	0	50		33 - 39.1 26.1 0.51
	28.0	8	39	26	0	98		33 - 13.0 29.5 0.56
	26.6	8	39	52	6	10		32 - 49.5 24.5 0.42
	28.1	8	40	20	7	20		32 - 19.0 28.1 0.380
	24.1	8	40	44	8	30		31 - 50.9 25.9 0.58
	30.1	8	41	14	9	40		31 - 25.0 25.5 0.57
	25.8	8	41	40	7	50		30 - 59.5 26.7 0.80
	27.8	8	42	8	5	99		30 - 32.8 28.8 0.90X
	27.7	8	42	36	2	10		30 - 04.0 28.9 0.45
	21.5	8	43	00	5	20		29 - 35.1 50.1 0.21
26.5	8	43	27	0	30	28 - 17 - (28.8)		
56.6	8	44	33	0	50	27 - 48.2		
24.7	8	44	47	7	100	28 - 17 - (28.8)		
26.1	8	45	13	8	10	27 - 48.2		
7 - 38.7 9.15 - 48	8	45	39	0	20			
<i>Av of 11 selected</i>	8	40	14.88			2 - 32 - 50.27 ✓ 8 - 40 - 14.88 ✓ 2 23 - 13 - 0.515 11 - 36 - 32.545		

Req. equal altitudes Page 17.

*21.5
22.0*

*5-22
5-21*

5-51.6

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ASTRONOMICAL OBSERVATIONS.—No. 3.

47

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Wynns*

Station *Camp 7 Renss* Date *July 9th + 10th / 69*

Object Observed.	Time of Observation by Chronometer.					Observed Double Altitudes.	REMARKS.	
<i>Altair.</i>	<i>12-13-5</i>					<i>117-48-50</i>		
	<i>12-14 36.8</i>					<i>117-43-40</i>		
<i>Polaris</i>	<i>1</i>	<i>12</i>	<i>17</i>	<i>57</i>	<i>4</i>	<i>80-48-40</i>	<i>Polaris</i> <u><i>Page 7</i></u>	
<i>poor thing</i>	<i>2</i>	<i>12</i>	<i>19</i>	<i>40</i>	<i>0</i>	<i>80-47-20</i>		
	<i>3</i>	<i>12</i>	<i>22</i>	<i>00</i>	<i>5</i>	<i>80-49-30</i>		
	<i>4</i>	<i>12</i>	<i>23</i>	<i>3</i>	<i>5</i>	<i>80-50-00</i>		
	<i>5</i>	<i>12</i>	<i>23</i>	<i>46</i>	<i>0</i>	<i>80-50-30</i>		
	<i>6</i>	<i>12</i>	<i>27</i>	<i>28</i>	<i>0</i>	<i>80-51-00</i>		
	<i>7</i>	<i>12</i>	<i>25</i>	<i>01</i>	<i>1</i>	<i>80-51-30</i>		
	<i>8</i>	<i>12</i>	<i>25</i>	<i>36</i>	<i>9</i>	<i>80-52-00</i>		
	<i>9</i>	<i>12</i>	<i>26</i>	<i>13</i>	<i>4</i>	<i>80-52-30</i>		
	<i>10</i>	<i>12</i>	<i>26</i>	<i>53</i>	<i>9</i>	<i>80-53-00</i>		
	<i>11</i>	<i>12</i>	<i>27</i>	<i>47</i>	<i>8</i>	<i>80-53-30</i>		
	<i>12</i>	<i>12</i>	<i>28</i>	<i>29</i>	<i>0</i>	<i>80-54-00</i>		
	<i>13</i>	<i>12</i>	<i>29</i>	<i>03</i>	<i>0</i>	<i>80-54-30</i>		
	<i>14</i>	<i>12</i>	<i>29</i>	<i>35</i>	<i>3</i>	<i>80-55-00</i>		
	<i>12</i>	<i>24</i>	<i>58</i>	<i>48</i>		<i>80-51-25.71</i>		
<i>Camp 10</i>	<i>Mar 14 Hamilton</i>					<i>July 19</i>		<i>7869 - Rahnkopff</i>
<i>Renss upper</i>	<i>8</i>	<i>53</i>	<i>37</i>	<i>4</i>		<i>101-50</i>		
	<i>8</i>	<i>54</i>	<i>04</i>	<i>4</i>		<i>101-10</i>		
<i>limb</i>	<i>8</i>	<i>54</i>	<i>30</i>	<i>5</i>		<i>101-20</i>		
	<i>8</i>	<i>54</i>	<i>57</i>	<i>8</i>		<i>101-30</i>		
	<i>8</i>	<i>55</i>	<i>25</i>	<i>3</i>		<i>101-40</i>		
	<i>8</i>	<i>55</i>	<i>51</i>	<i>4</i>		<i>101-50</i>		
	<i>8</i>	<i>56</i>	<i>19</i>	<i>3</i>		<i>102-00</i>		
	<i>8</i>	<i>56</i>	<i>47</i>	<i>2</i>		<i>102-10</i>		
	<i>8</i>	<i>57</i>	<i>13</i>	<i>2</i>		<i>102-20</i>		
	<i>8</i>	<i>57</i>	<i>39</i>	<i>8</i>		<i>102-30</i>		

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Neyns*

Station *Camp² Roky* Date *July 10 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
<i>Suns upper limb</i>	9	-	8	-	26	108	-	30 - 00	
	25.8	-	8	-	51.8	108	-	40 - 00	
	267	9	-	9	-	18.5	108	-	50 - 00
	285	9	-	9	-	47.	109.	-	00 - 00
	273	9	-	10	-	14.3	109	-	10 - 00
	279	9	-	10	-	42.2	109	-	20 - 00
	282	9	-	11	-	10.4	109	-	30 00
	281	9	-	11	-	38.5	109	-	40 00
	285	9	-	12	-	7.	109	-	50 00
	275	9	-	12	-	34.5	110	-	00 00
	265	9	-	13	-	01.0	110	-	10 00
279	9	-	13	-	28.9	110	-	20 00	
301 x	9	-	13	-	59.0	110	-	30 00	
<i>July 11. 69</i>	8.	53	08	0	78	31	40		
<i>Polaris</i>	8	55	19	4	78	33			
	8	56	58	0	78	33	30		
<i>Station 7.</i>	8	58	13	0	78	34	00		
	8	59	15	5	78	34	30		
<i>Camp Roky</i>	9	1	35	0	78	35	30		
	9	2	51	8	78	36	00		
<i>Alt 9 AM</i>	9	4	07	1	78	36	30		
<i>Det J 62.9</i>	9	4	57	0	78	37	00		
<i>Det J 63.1</i>	9	6	03	8	78	37	30		
	9	6	44	5	78	38	00		
	9	00	44	74	78	35	11.73		
							11.82		

Polaris Book Page 8.

ASTRONOMICAL OBSERVATIONS.—No. 3.

48

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Negus.

Station Camp 7 Ruby Date July 11

Object Observed,	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
limb upper	1 10-00-04.9	125-20-00.0	
limb -	2 10-00-39.2	125-30-	
	3 10-01-39.6	126-00	
31.1	4 10-02-10.7	126-10	
33.5	5 10-02-43.7	126-20	
32.6	6 10-03-16.3	126-30	
31.3	7 10-03-47.6	126-40	
31.8	8 10-04-19.4	126-50	
31.5	9 10-04-50.9	127-00	
32.0	10 10-05-22.9	127-10	
33.4	11 10-05-56.3	127-20	
34.6	12 10-06-30.9	127-30	
32.7	13 10-07-03.6	127-40	
33.0	14 10-07-36.6	127-50	
33.5	15 10-08-10.1	128-00	
	16 10-09-45.4	128-30	
	17 10-10-19.9	128-40	
X min	9 12 53 0	68 49 45	1
AOP	9 15 41 1	68 49 55	2
	9 19 16 0	68 48 45	3
	9 20 0 5	68 48 45	4
	9 20 49 9	68 47	5
Camp Ruby	9 21 50 0	68 46	6
	9 22 58 5	68 45	7
	9 24 3 0	68 44	8
	9 24 55 3	68 43	9
	9 25 49 5	68 42	10
			11
			12
			13
			14
			15
			16

95
3

July 11 1869
Circum Book
Meridian Book
PM 5

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regu

Station Camp 7. Ruby Date July 11th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
@ Op	9	43	18	5	125	16	10		
	9	45	57	4	125	10	50		
	9	48	4		125	8	50		
		48	46	5		8			
		49	26	7		7			
		49	37	5		6			
		50	43	5		3			
		51	3			1			
		52	2	5	124	58			
		53	14	8	124	55			
Polaris	9	55	28	8	79	08	20	1	
	9	56	36	2	09	30	1	2	
	408	9	57	17	0	10	00	2	3
	27.5	9	57	44	5	10	30	3	4
	27.7	9	58	12	2	11	00	4	5
	28.3	9	58	40	5	11	30	(5)	6
	37.9	9	59	18	7	12	00	6	7
	35.6	9	59	52	0	12	30	7	8
	42.0	10	00	34	0	13	00	8	9
	44	10	01	18	0	13	30	9	10
43	10	02	01	0	14	00		11	
Altair	10	5	14	8	100	8	50		
	10	5	35	5		20			
	10	6	31	8		30			
	10	7	5	9		40			
	10	7	43	5		50			
	att J - 61.1	10	8	19	3	101			
	Det 60.5	10	8	59	2		10		
		10	9	37	0		20		
		10	10	14			30		
		10	10	52	1		40		
	10	11	28	0		50			
	10	12	3		102				

Polaris Book
Page 9

11 9^x - 58 - 50.31 79° - 11' - 3000

ASTRONOMICAL OBSERVATIONS.—No. 3.

5

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regas

Station Camp 7 near Ruby Date July 11th

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.	
α Aquilae Altair	11-24-1	115-29-30		
	11-25-12	115-35-00	11-51-28	116-58-00
	11-26-17.5	115-40-00	11-52-21.5	116-59-00
	11-27-8	115-45-00	11-54-03.0	117-00-00
	11-27-36	115-50-00	11-55-36.5	117-01-00
	11-28-52.5	115-55-00	11-56-49	117-02-00
	11-30-30	116	11-58-43-0	117-00-45
	11-30-48.0	116-3-00	12-00-2-3	117-00-00
	11-31-34.0	116-6-00	12-00-35-2	116-3-9-00
	11-32-12.9	116-9-00	12-1-14-7	116-4-8-00
att J = 52.3 DEN II 52.9	11-32-47.0	116-12-00	12-2-81.7	116-5-6
	11-33-29.6	116-15-00	12-3-18-0	116-5-5
	11-34-12.0	116-18-00	12-3-32.5	116-5-4
	11-34-46.5	116-21-00	12-4-36.5	116-5-3
	11-35-31	116-24-00	12-5-14.4	116-5-2
	11-35-24.2	116-27-00	12-5-47	116-5-1
	11-37-26.8	116-30-00	12-6-17	116-5-0
	11-38-1.2	116-32-00		
	11-38-47.5	116-34-00		
	11-39-33.7	116-36-00		
Circum Meridia Altitudes Page 4	11-40-14	116-38-00		
	11-40-42.3	116-40-00		
	11-41-17.8	116-42-00		
	11-42-16.4	116-44-00		
	11-43-52.0	116-48-10		
	11-44-46.5	116-49-30		
	11-45-48.7	116-51-00		
	11-46-21.5	116-52-00		
	11-46-52.7	116-52-00		
	11-47-21.0	116-53-00		
11-47-58.7	116-54-00			
11-48-59.8	116-55-00			
11-49-42.7	116-56-00			
11-50-32.5	116-57-00			

11-5-7
10-2-6
1-31

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Myers*

Station *Camp 7 near C. Rocky* Date *July 12 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
	h	m	s	sec	h	m	s	h	m
<i>Equal Altitudes Page 21</i>	9	43	54	0	120	30	1-30	-00.0	54.0
	33	9	44	27	0	40	1-29	29.4	29.4 56.4
	281	9	44	55	1	50	1-29	01.2	31.8 56.3
	30.4	9	45	25	5	121	1-28	28.5	27.3 54
	29.5	9	45	55	0	10	1-28	00.0	31.5 55
	30.2	9	46	25	2	20	1-27	30.5	30.5 55.7
	29.3	9	46	56	5	30	1-26	57.0	26.5 53.5
	29.6	9	47	26	1	40	1-26	28.2	31.2 54.3
	29.1	9	47	55	2	50	1-25	59.4	31.2 54.6
	32.3	9	48	27	5	122	1-25	27.8	28.4 55.3
	28.3	9	48	55	8	10	1-24	56.0	28.2 57.8
	31.1	9	49	26	9	20	1-24	28.1	32.1 55
	28.1	9	49	55	0	30	1-23	59.0	30.9 54
	31.0	9	50	26	0	40	1-23	27.0	28. 53.
	15 32.0	9	50	58	0	50	1-22	57.7	30.7 55.7
	9	47	25	92			1-26	-28.65	
<i>Equal Altitudes Page 22</i>	10	5	54	0	127	30	1 8	19.7	16.9 53.7
	17.5	5	51	5	127	35	1 8	02.8	18.3 54.3
	16.0	6	07	5	127	40	1 7	44.5	14.1 52.
	17.5	6	25	0	45	1 7	30.4	19.4 55.4	
	15	6	40	0	50	1 7	11.0	13.9 51.	
	16.1	6	56	1	127	55	1 6	57.1	16.1 53.2
	17.9	7	14	0	128	00	1 6	41.0	17.2 55
	15.2	7	32	2	128	5	1 6	-23.8	16.7 56 x
	15.8	7	48	0	128	10	1 6	07.1	18.1 55.1
	14.9	8	02	9	128	15	1 5	49.0	16.8 51.9
	16.9	8	19	8	128	20	1 5	32.2	17.2 52.
	15.8	8	25	6	128	25	1 5	-15.0	14.5 50.6 x
	17.1	8	52	2	128	30	1 5	00.5	15.5 53.2
	15.3	9	07	0	128	35	1 4	-45.0	52.
		10	07	21.88				1-06	-30.80
	10	07	14.875				1-06	-38.364	

ASTRONOMICAL OBSERVATIONS.—No. 3.

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Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. by

Station Camp 7

Date July 12th

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.			
	Alt	Time									
Antares 1 Error 3 3.2 3.3 C - Meridian altitudes Page 3	8	36	27		69	7	10	(Altair)			
	8	38	12	2		9	45	116-59-25	11	42	35
		43	2	5				116-5-5-00	11	43	43
	8	46	4	8	58	51	38	116-5-6-00		44	22
	8	47	33	9	58	53	38	116-5-7-00		45	24
	8	48	33	2	58	54	45	116-5-8-00		46	48
	8	50	28	2	58	53	10	116-5-9-00		47	50
	8	51	27	8	58	53	45	116-5-9-30		48	42
	8	52	53		58	52	00	117-00-00		49	43
	8	53	49	5	58	51	00	117-00-30		51	06
Polaris att 3 - 64.5 Det " = 64	8	33	03	5	78	32	40	117-01-00		52	33
	8	36	03	0		33	30	116-5-9-10		55	16
	8	36	59	2		34	00	116-5-8-30		56	17
	8	57	56	8		34	30	116-5-8-40		57	08
	8	58	41	5		35	00	116-5-5-00		58	04
	8	59	22	5		35	30	116-5-4-00		58	58
								116-5-3-00		59	26
	9	00	12	2		36	00				
	9	1	01	7		36	30				
	9	1	46	4		37	00				
Polaris - Polaris Book Page 10 Polaris Book Page 11	12	00	33	0	80	42	45				
	12	1	38	9		44	00				
	12	2	19	3		44	30				
	12	3	05	7		45	00				
	12	3	31	8		45	30				
	12	4	32	8		46	00				
	12	5	40	2		46	30				
	12	6	29	0		47	00				
	12	7	09	5		47	30				
	12	7	48	0		48	00				
12	8	29	0		48	30					

Circinus Meridian altitudes Page 2

1st Set Polaris

h - m - s
8-59-21.12 78° 35' 28" 18

2nd Set

12-04-42.47 80 45 55 91

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *J* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Weyns*

Station *Camp 8. Long Valley* Date *July 13 1869.*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Polaris</i>	9 57 18 5	78 47 75	
	9 58 39 8	49	
	9 59 30 5	49 30	
	10 00 48 5	50 30	
	10 1 3 7	51 00	
	10 2 0 1	51 30	
	10 3 49	52	
	10 4 28 5	52 30	
	10 5 11 1	53 00	
	10 5 47	53 30	
	10 6 35 1	54 18	
	10 7 37	55 00	
mean =	10° 03' 13" 94	78° 51' 58.64	
<i>Polaris -</i>	<i>July 14 Camp 9.</i>		
	10 00 42 8	78 3 15	
	10 2 21 5	78 6 00	
	10 3 19 0	78 6 30	
	10 4 6 1	78 7 00	
	10 4 46 7	78 7 30	
	10 5 22 1	78 8 00	
	10 6 00 8	78 8 30	
	10 6 33 0	78 9 00	
	10 7 19 2	78 9 30	
10 7 52 0	78 10 00		
<i>Altair</i>	10 11 57 8	106 00	10 10 - 04 - 50.32 78° - 07 - 43.5
	10 12 36	106 10	
	10 13 18 7	106 20	
	10 14 1 8	106 30	
	10 14 41 5	106 40	
	10 15 24	106 50	
	10 16 8	107 00	
	10 16 48 8	107 10	
	10 17 27 7	107 20	
	<i>Camp 9</i>		

Polaris Page 12

Polaris Page 13

ASTRONOMICAL OBSERVATIONS.—No. 3.

54

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1253 by Myers

Station Camp 9 Antelope Springs Date July 14, 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Altair	10 18 - 13.0	107 - 30 -	10 Single Altitudes
	10 - 18 - 54.8	107 - 40	
	10 - 19 - 36.7	107 50	
	✓ 10 - 20 - 23.2	108 - 50	13
mean =	10 - 16 - 07.08	107° - 00' - 00"	= mean
Camp 10 near Hamilton July 23			
Upper limb	9 59 24 0	123 30	1 15 18 8 31.3 428
	9 59 57 0	40	1 14 47 5 32.8 445
	10 00 28 0	50	1 14 14 7 427
	10 01 28 0	24 50	
	5 10 1 32 8	124 10	1 13 09 0 32.5 418
	349 10 2 07 7	20	1 12 36 5 32.5 442
	318 10 2 38 5	30	1 12 04 0 33.5 325
	319 10 3 10 2	40	1 11 32 5 30.5 427
	31.9 10 3 42 1	50	1 11 02 0 32.2 441
	344 10 4 16 5	125	1 10 29 8 34.6 463
	33.3 10 4 49 8	10	1 9 55 2 29.7 457
	28.2 10 5 18 0	20	1 9 25 5 36.5 435
	33. 10 5 51 0	20	1 8 49 11 36.5 435
	10 02 29 51		1 12 14.14
			54 57031

Upper limb

Wind 4
Drooping

Equal alt page 24

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

W. White

Sid'l Chronometer No. 1283 by Regus

Station *Camp near Hamilton* Date *17 July 1869*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Sun's upper limb	9. 09. 33. 3	108. -	513.8
• 286	9 10. 5. 9	10	
49.2	9 10 55. 1	108 - 30	
28.7	9 11. 23 8	108 - 40	
29.2	9 11 53. 0	108 - 50	
27.9	9 12 20. 9	109 -	
28.	9 12 48 9	109 - 10	
25.5	9 13 14 4	109 - 20	
27.1	9 13 41 5	109 - 30	
29.1	9 14 10 6	109 - 40	
27.2	9 14 37 8	109 - 50	
27.1	9 15 04 9	110	
27.3	9 15 34 4	110 - 10	
31.1	9 16 01 7	110 - 20	
25.2	9 16 32 8	110 - 30	
25.8	9 16 57 0	110 - 40	
25.4	9 17 25 8	110 - 50	
25.2	9 17 51 2	111 -	
Camp 10 July 18 th			
Sun's upper limb	1 9 12 7 8	109 40	
2	9 12 34 7	50	
3	9 13 1 7	109	
4	9 13 30 0	10	
5	9 13 59 0	20	
6	9 14 26 8	30	
7	9 14 52 0	40	
8	9 15 20 0	50	
9	9 15 48 1	110	

$$\begin{array}{r} 62 \\ 8 \overline{) 37.8} \\ \underline{32} \\ 5 \\ \underline{36} \\ 18 \\ \underline{16} \\ 2 \\ \underline{2} \\ 0 \end{array}$$

 16 $\sqrt{74}$ 24.61
 $\begin{array}{r} 393.8 \\ 32 \overline{) 72} \\ \underline{32} \\ 40 \\ \underline{36} \\ 48 \\ \underline{48} \\ 0 \end{array}$

Single Altitude
Page

9 - 14 - 24.61 - 109 - 45
 Aug 10 July 18

Not Posted

ASTRONOMICAL OBSERVATIONS.—No. 3.

33
20
51 ✓

Sextant No. 8 and artificial horizon of Mercury

Mean Time Sid'l Chronometer No. 1283 by *Weyns*

Station *Camp 10, Vermont* Date *July 18 1869*

Jupiter's upper limb

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.
	1	9	26	57	0	114 00	
	2	9	27	27	2	114 10	
	3	9	27	33	0	114 20	
	4	9	28	25	3	114 30	
	5	9	28	51	8	114 40	
	6	9	29	21	9	114 50	
	7	9	29	48	4	115 0	
	✓ 8	9	30	22	0	115 10	
	9	9	30	45	8	115 20	
	10	9	31	13	3	115 30	
	11	9	31	41	5	115 40	
	12	9	32	12	0	115 50	
	1	9	3	34	5	77 18 - 40	
	2	9	4	59	0	77 19 - 30	
	3	9	5	38	2	77 20 - 00	
	4	9	6	41	8	77 20 - 30	
	5	9	7	18	8	77 21 - 00	
	6	9	7	51	5	77 21 - 30	
	7	9	8	44	2	77 22 - 00	
	8	9	9	30	8	77 22 30	
	10	9	10	12	5	77 - 23 - 00	
	11	9	11	30	8	77 - 23 - 30	
	12	9	12	17	8	77 - 24 - 00	
		9	08	07	81	77 - 21 - 28.18	

$$\begin{array}{r} 42 \\ 47 \\ \hline 370 \\ 4212 \\ \hline 108 \\ 7.12 \\ \hline 12 \mid 115 \\ 115 \\ \hline 4212 \mid 3510 \\ 61 \end{array}$$

$$\begin{array}{r} 300 \\ 12 \mid 660 \mid 55 \\ \hline \end{array}$$

single alt B. 1 h.

9^h 29 35.10 114° 55' 0"

Polaris
 July 18th 1869
 Lex Hunt
 Polaris Book
 Page 14

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8

and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Wey*

Station *Camp 10 near Hamilton* Date *July 24th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.	
	h	m	s	sec	h	m		
<i>Sun's upper limb</i>		9	13	30	2	107	30	
	26.5	9	13	46	7		40	
	27.8	9	14	14	5		50	
	28.0	9	14	42	5	108		
	29.0	9	15	11	5		10 5	
	26.8	9	15	38	3		20	
	27.5	9	16	5	8		30	
	29.4	9	16	35	2		40	
	28.3	9	17	3	5		50	
	27.5	9	17	31	0	109	10	
	26.5	9	17	57	5		10	
	28.	9	18	35	5		30	
	<i>Int = 5 - 32.8</i>	27.5	9	18	58	0		30
	<i>Sun</i>	<i>Camp 10 July 25th 1869</i>						
		9	18	18	8	109		
		9	18	45	7		10	
		9	19	14	0		20	
		9	19	45	5		30	
5		26.	9	20	11	5		40
		28.7	9	20	40	2		50
		27.0	9	21	07	2	110	44
		28.0	9	21	35	2		10
		28.8	9	22	04	0		20
10		29.2	9	22	53	2		30
		27.3	9	23	00	5		40
		29.5	9	23	30	0		50
13		28.5	9	23	58	5	111	44
	28.5	9	24	27	0		10	
	29.0	9	24	56	0		20	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp 10 near Hamilton Date July 25th

Object Observed.		Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.
Sun	1	9	55	6	8	121	30	
	2	9	55	39	8		40	
	3	9	56	12	0		50	
	4	9	56	42	1	122		
	5	9	57	14	2		10	
	6	9	57	46	0		20	
	7	9	58	18	8		30	
	8	9	58	49	7		40	
	9	9	59	21	8		50	
	10	9	59	52	0	123		
	11	10	00	23	2		10	
	12	10	00	57	0		20	
	13	10	1	50	0		30	
		July 25 - 1869						
Polaris	1	9	10	17		77	42	
	2	36	9	10	53		30	
	3	798	9	12	12	8	43	
	4	75.1	9	13	47	9		30
	5	819	9	15	8	0	44	
	6	775	9	16	26	5		30
	7	40	9	17	15	5	45	
	8	27.7	9	17	53	2		30
	9	292	9	18	23	0	46	
	10	29	9	18	52	0		30
	11	30	9	19	22	5	47	
	12	24.5	9	19	47	0		30*
	13	285	9	20	15	5	48	
	14	27.	9	20	42	5		30
	15	294	9	21	11	9	49	
	16	27.6	9	21	39	5		30
	17	36.5	9	22	16	0	50	
		9	19	47	14	78	47	30

Polaris Page

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. by

Station: *Camp 10*

Date *July 26th*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Sun</i> 1	9 - 6 - 32.3	104 - 30	
2	9 - 6 - 59.0	40	
3	9 - 7 - 27.0	50	
4	9 - 7 - 57.0	105	
5	5 9 - 8 22.0	10	
6	9 - 8 50.0	20	
7	9 - 9 18.1	30	
8	9 - 9 46.8	40	
9	9 - 10 14.0	50	
10	10 9 - 10 41.7	106	
11	9 - 11 10.0	10	
12	9 - 11 36.8	20	
13	9 - 12 03.1	30	
<i>Sun</i> 1	9 - 49 51.5	119 - 30	
2	33.5 9 - 50 25.0	-40	
3	31 9 - 50 56.0	-50	
4	30.9 9 - 51 26.1	120	
5	31.5 9 - 51 57.9	-10	
6	14.1 9 - 52 30.0	20	
7	31.5 9 - 53 01.5	30	
8	30.5 9 - 53 32.0	40	
9	30.7 9 - 54 02.7	50	
10	31.6 10 9 - 54 34.3	121	
11	31.7 9 - 55 06.0	-10	
12	31.4 9 - 55 37.4	-20	
13	30.6 9 - 56 08.0	-30	
14	32.5 9 - 56 40.5	40	
15	32.3 9 - 57 12.8	50	
16	32.2 9 - 57 44.0	122	

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No.

and artificial horizon of Mercury

Sid'l Chronometer No.

by

Station

Camp 10

Date

Jul 26

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h	m	s	sec	1st	2nd	3rd	
Sun's lower limb TTTTT	11	35	6	3	139	39	30	
	11	37	38	1	139	40	15	
	11	42	7	1	139	39	10	
	11	43	31		139	36	55	
	11	44	22	2	139	33	20	
	11	45	6	8	139	32	20	
	11	48	37	7	139	31	00	
	11	46	10	0	139	29	40	
10	11	46	43	1	139	27	00	
Camp 10 July 27 th 1869								
6	9	23	44	5	110	20		1 51 00 0 28.0445
7	27.7	9	24	12	2	30		1 50 32 0 28.9 44.2
9	27.8	9	24	40	0	40		1 50 3 1 29.9 43.1
9	28.3	9	25	08	3	50		1 49 33 2 26.4 46.5
8	29.9	9	25	38	0	111		1 49 6 8 28.6 44.8
9	29.5	9	26	07	5	40		1 48 38 2 27.2 45.7
10	27.2	9	26	34	7	20		1 48 9 26.8 43.7
10	30.2	9	27	04	9	30		1 47 40 2 47.1
		9	25	09	31			1 49 34 61
10		9	28	58	4	112		10
10	29.0		29	27	4	20		20
10	29.2		29	56	6	30		30
10	30.3		30	26	9	40		40
10	29.3		30	56	2	50		50
10	28.7		31	24	9	113		10
10	28.6		32	03	5	10		20
10	24.5		32	28	-0	20		30
10	25.2		32	53	2	30		40
10	29.8		33	23	-	40		
8	29.2		52	2		50		

Original
 Altitude
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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Ruyus

Station Camp 10 Date July 27

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.			
263	3-5-47.5	82 70	8	9	40 5	28.0
263	3-6-13.8	82 50	8	9	14 0	26.2 27.8
259	3-6-34.7	82 20	8	8	47 8	26.8 27.5
251	3-7-4.8	82 10	8	8	21 0	26.5 25.8
257	3-7-31.5	82 20	8	7	54 5	24.8 26.0
260	3-7-57.5	81 50	8	7	29 7	27.7 27.2
24.5	3-8-22.0	81 40	8	7	2	25.8 24.0
268	3-8-48.8*	81 50	8	6	36 2	26.7 25.0
27.5	3-9-16.3	81 20	8	6	9 5	26.5 25.8
272	3-9-40.5	81 10	8	5	49 0	23.5 24.5
26.1	3-10-7.7	81 20	8	5	18 5	27.3 26.2
257	3-10-33.8	80 50	8	4	52 2	27.2 26.
27.5	3-10-59.5	80 40	8	4	25	25.5 24.5
	3-11-26.0	80 30	8	3	59 5	25.5
	3-08-49.38		8	6	36 45	25.8 5
	26.5 25.5					
July 28, 1869 Camp 10 m						
	9-5-53.5	103 40				
280	9-6-21.5	50				
265	9-6-48.0	107				
271	9-7-15.1	10				
284	9-7-43.5	20				
283	9-8-11.8	30				
282	9-8-40.0	40				
28	9-9-8.0	50				
274	9-9-33.4	103				
276	9-10-3.0	10				
285	9-10-31.5	20				
26.	9-10-57.5	30				
295	9-11-27.0	40				
27.	9-11-54	50				

Equal Altitudes Page 27

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No.

and artificial horizon of Mercury

Sid'l Chronometer No.

by

Station

Camp 10

Date

July 28

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.		
	h	m	s	T	0	1	"			
	9	39	53		118	10		1	41 54 6	303 475
275	9	39	20	5		20		1	41 27 2	304 447
30.	9	33	50	5		30		1	40 53 8	298 443
31.5	9	34	21	5		10		1	40 24 0	28 45.5
28.5	9	39	30	0		50		1	39 56 0	30 46
29.0	9	35	19		114			1	39 26 0	295 45
30.5	9	35	49	5	*	10		*1	38 56 5	34.4 46.
30.3	9	36	19	8		20		1	38 29 1*	26.1 439 * 27.1?
28.7	9	36	48	5		30		1	37 58 0	30.3 465
29.3	9	37	16	8		10		1	37 27 7	24.7 445
30.7	9	37	47	5		30		1	37 09 00	30. 475
30.0	9	38	17	5	115			1	36 30 0	9305 475
29.5	9	38	47	0		10		1	36 07 5	475
	9	35	49	32				1	38 56 56	
	9	34	16	8	113	20		7	40 26 1	31.4 424
397	9	34	46	5		30		1	39 54 2	28.6 40.7
286	9	35	15	1		40		1	39 25 1	28.9 412
294	9	35	44	5		30		1	38 57 7	29.2 422
5 325	9	36	17	0	114			1	38 27 0	302 44.
285	9	36	45	5		10		1	39 56.8	28.6 425
50	9	37	15	5		20		1	37 28.2	292 437.
295	9	37	45	0		30		1	36 59	44.
	9	36	00	74		50			12-58 14 5	1-38-41.89
	10	16	26		126	30			1-57 57 5	
1 34.5	10	17	04	0		40			125 7 39 0	17.8 430
2 17.5	10	17	22	0		45			125 7 21 2	19.5 43.2
3 18.1	10	17	40	1		50			125 7 02 7	15.7 42.8
4 16.4	10	17	07	5		55			125 6 46 0	19.5 42.5
5 18.5	10	18	13		120				125 6 26 5	17.8 41.5
6 18.0	10	18	33			05			125 6 08 7	17.7 41.7
7 18.8	10	18	51	8		10			125 5 51	18.3 42.8
8 17.9	10	19	9	7		15			125 5 32 7	18.7 42.4
9 19.8	10	19	28	5		20			125 5 14	19 42.5
10 16.0	10	19	46	5		25			12-54-55	41.5

Equal Altitudes Page 28

Long m p h July 29

Equal Altitudes Page 35

Long X

ASTRONOMICAL OBSERVATIONS.—No. 3.

by ✓

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp 10 Date July 28

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
	h	m	s	sec	h	m	s		
<i>h</i>	19	38	38	5	138	44	30		
<i>L. h</i>	17	39	38		138	45	30		
	11	41	9		138	43	50	<i>amp 8</i>	
		41	30	5		43	50		
		41	43	5		42			
		41	59	5		41			
		42	31	5		40			
		43	20			39			
		43	38			38			
		44	20	5		37			
		47	48			36			
		45	21	0		35			
<i>Polaris</i>	8	57	21	5	77	39	30		
	7	58	29	5	68	40	30		
	7	59	10	5	41	41			
	8	00	1	50.5		41	30		
<i>5</i>	8	00	42	0	41	42		<i>Very good</i>	
	8	1	26	5	44.5	42	30		*
	8	2	20	5	44	43			
	8	3	21	0	59.5	43	30		
	8	4	20	5	59.5	44			
<i>10</i>	8	5	6	5	46.0	44	30		
<i>Polaris</i>	9	24	30	0	77	58	15		
	9	25	37	8	67.6	59			
	9	26	19	5	42	59	30		
	9	27	10	8	41	78			
<i>5</i>	9	27	46	0	45.2	50	30	<i>Very fine</i>	
	9	28	26	0	40	1	*		
	9	29	4	7	38.7	1	30		
	9	29	57	5	52.8	2			
	9	30	42	0	44.5	2	30		
	9	31	21	7	39.7	3			
									9 28 28 44 78 01

✓

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. _____ and artificial horizon of Mercury

Sid'l Chronometer No. _____ by _____

Station *Camp 10*

Date *July 28 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h	m	s	sec	1st	2nd	3rd	
<i>Zeta Aquilae</i>	9	55	30	18	128	75	45	<i>Camp 10</i>
	9	56	32	0	128	47		
	9	58	18		128	49	15	
	9	59	35	5	128	50	40	
	10	2	16	8	128	50	40	
	10	3	19	8	128	51	50	
	10	5	38	0	128	51	40	
	10	8	12		128	50	40	
	10	9	42	2	128	49	45	
	10	11	9	8	128	47		
<i>Altair Aquilae</i>	10	12	41		128	42		<i>Too near the meridian</i>
	10	19	11		118	46		
	10	14	51	5	118	50		
	10	15	27			55		
	10	16	15	7	117			
	10	17	11	2		5		
	10	18	13			10		
	10	19	1	5		15		
<i>Altair Aquilae</i>	10	38	24	7	118	27	25	<i>Camp 10</i>
	10	39	55	8		28	35	
	10	41	1			30		
	10	41	31			31		
	10	42	00	5		32		
	10	42	43			33		
	10	43	22	7		34		
	10	44	20	8		35		
	10	45	32			36		
	10	47	46			37		
	10	49	53			38	30	
	10	50	55			39		
	10	51	54			39		

ASTRONOMICAL OBSERVATIONS.—No. 3.

68

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus.*

Station *Camp 10* Date *July 28th*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h.	m.	s.	ths.				
	10	52	46		178	32		
	10	53	34	8		31		
	10	54	25			30		
<i>Polaris</i>	10	53	10	1		29		
	10	58	19	3	79	4	30	
93.7	10	58	03			5	30	
55.4	10	58	48	1		6		
50.9	10	59	39			6	30	
50.8	11	00	33	2		7		
48.2	11	01	22			7	30*	
45	11	02	07			8		
46.5	11	02	33	3		8	30	
42.3	11	03	35	8		9		
10 44.2	11	04	20			9	30	
35	11	04	55			10		
<i>drum split</i>	11	02	01	51	79	08	00	
	11	01	07	81	79	07	27.27	
	9	07	08	08	103	50		
28.9	9	07	37	7	104			
29.3	9	08	08	5		10		
25.5	9	08	33	5		20		
5 29.3	9	09	02	8		30		
27.5	9	09	30	3		40		
27.7	9	09	38	0	50	50		
26.7	9	10	24	7	105			
28.8	9	10	53	5		10		
10 26.5	9	11	20			20		
28.5	9	11	48	5		30		
28.0	9	12	16	5		40		
13 28.5	9	12	45			50		
	9	09	57	38				
	2	07	35	7				
	2	07	04	8				
	2	05	39	0				
	2	06	09	7				
	2	05	42	5				
	2	05	15	0				
	2	04	46	8				
	2	07	19	0				
	2	03	50	8				
	2	03	21	7				
	2	02	33					
	2	02	25	7				
	2	01	58	3				
	2	04	46	15				

Polaris 9
Page

July 29 1869

Equal Altitude Page 36

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ASTRONOMICAL OBSERVATIONS.—No. 3.

12-10-43
28-20
H 1-9.7
28-43
37-

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus.

Station Camp 10 Date July 29th

X
L
L

Sun
low
dumb

Object Observed.	Time of Observation by Chronometer.					Observed Double Altitudes.		REMARKS.					
	h	m	s	sec	frac	Alt	Dist	h	m	s	sec		
	11	10	20	05	0	30		12	34	38	5	195	435
	167	10	20	21	7	35		12	34	19	8	17	407
	13	191	10	20	40	8	40	12	34	02	0	203	428
	14	192	10	21	00	0	45	12	33	41	7	185	417
	15	202	10	21	20	2	50	12	33	23	2	171	434
	16	123	10	21	37	5	55	12	33	06	1	181	456
	17	192	10	21	56	5	128	12	32	48	0	19	445
	18	199	10	22	15	8	5	12	32	20	8	185	435
							10	12	32	00	0		
		10	19	38	02			12	33	04	68		427
		11	28	18		138	5	40					
				49		138	7						
		32	18			138	12	50					
		33	6				14						
		33	38	5			15						
		34	34	7			16						
		38	29				16	30					
	11	41	16	5			13	35					
		41	50	5			13						
		42	56				12						
		43	33	7			11						
		44	07	5			10						
		44	47	2			8						
		45	52	5			6						

Equal altitudes Page 37

CMA
Page 9

ASTRONOMICAL OBSERVATIONS.—No. 3.

19-44-25.73
 8-30-57.586
 11-14-28.17
 1-50.49

68

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Weyss*

Station *Camp 10 Hamilton* Date *July 29 1861*

11-12-37.68
 10-43-55.02
 1283 = 28-42.66

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.																																																																																																																																							
	h	m	s	sec	1st	2nd	3rd	1st	2nd	3rd	Remarks																																																																																																																																				
25 Altiss	9	38	28	8	111	55	60	49	21	5	50.3																																																																																																																																				
	9	39	48	2	112	10		11	48	25	50.7																																																																																																																																				
	9	40	34	2	112	20		11	47	14.5	48.7																																																																																																																																				
	9	41	29	0	112	30		11	46	20.7	49.7																																																																																																																																				
	9	42	19	8	112	40		11	45	22.5	52.3																																																																																																																																				
	9	43	9	5	112	50		11	44	30.8	54.5																																																																																																																																				
	9	44	12	0	113			11	43	35.0	47.0																																																																																																																																				
	9	44	40	0		0.5		11	43	10.5	270 50.5																																																																																																																																				
	9	45	7	5		10		11	42	48.8	56.0																																																																																																																																				
	9	45	36			15		11	41	20.2	40.0.2																																																																																																																																				
10 Polaris	9	46	2	5		20		11	40	55	50.0.3	9	42	04	24				21	28	50.03.6	33	11	8	48	7	79	16	55	10	43	55.01	38.7	11	10	35	2		18						423	11	19	17.5		18	30				11.8	545	11	12	10		19						5	40	11	12	52		19	30				375	11	13	32.5		20	*					373	11	14	12.8		20	30					30	11	14	42.8		21						387	11	15	21.5		21	30					382	11	15	59.7		22							11	13	24.89			30				
	9	42	04	24				21	28	50.03.6	33																																																																																																																																				
	11	8	48	7	79	16	55	10	43	55.01	38.7																																																																																																																																				
	11	10	35	2		18																																																																																																																																									
	423	11	19	17.5		18	30				11.8																																																																																																																																				
	545	11	12	10		19																																																																																																																																									
	5	40	11	12	52		19	30																																																																																																																																							
	375	11	13	32.5		20	*																																																																																																																																								
	373	11	14	12.8		20	30																																																																																																																																								
	30	11	14	42.8		21																																																																																																																																									
387	11	15	21.5		21	30																																																																																																																																									
382	11	15	59.7		22																																																																																																																																										
	11	13	24.89			30																																																																																																																																									

Polaris
 Page 20

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Mean Solar Sidl Chronometer No. *1283* by *negas*

Station *Camp 10 near Hamilton* Date *July 29th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
	Lunar Distances.								
Star Jupiter & Moon's Bright Limb	1	6	57	5	44	36	30	Star	
	1	8	54	8	63	11	20	Moon	Limb
	1	10			25	41		Star	
	1	11	54	2	64	10	15	Moon	
	1	13	39	2	77	10	40	Star	
2300 observations to this point no observations at Camp No (1+2)									

Pol *Camp 3* *Murray Creek Aug - 3. 69*

Polaris	9	45	21	0	78	31	30		
	45.8	9	46	06	8	82			
	48.2	9	46	55	0	82	30		
	43.5	9	47	38	5	83			
	57.5	9	48	36	0	83	30		
	* 51.5	9	49	27	5	* 84	*		
	64.3	9	50	31	8	84	30		
	43.8	9	51	15	0	85			
	51.9	9	52	06	9	86	30		
	44.1	9	52	51	0	86			
43.5	9	53	34	5	86	30			
	9	49	27	63	78°	34'	05"		
<i>Murray Creek</i>	8	51	05	0	97				
<i>Equal altitudes</i>	27.9	8	51	52	9	10			
	27.1	8	52	00	0	20			
<i>Poster</i>	252	8	52	25	2	30			
	291	8	52	54	3	40			
	275	8	53	21	8	50			
	279	8	53	49	7	98			
	295	8	53	18	8	10			
	261	8	54	45	8	20			
	297	8	55	14	3	30			
	270	8	56	42		70			
	28.5	8	56	11	5	80			
		2	16	13	5	27.620.7			
	2	16	28	9	269	22.2			
	2	16	4	5	29	23.8			
	2	13	33	0	282	22.7			
	2	15	4	8	271	24.			
	3	14	37	7	272	23.3			
	2	14	10	0	282	25.5			
	2	13	42	0	265	29			
	2	13	15	5	25	27.			

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 ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury
 Mean Solar Sid't Chronometer No. 1283 by Negus

Station Camp 3 Murray Brook Date Aug 4th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.				
	8	56	37		99		12	50	5	27.5	
	8	54	18	19			2	15	05	41	
	9	18	20	0	106	40	1	51	04	5	298 24.5
Sun's	275	9	18	47	5	50	1	50	35	2	281 22.7
upper limb	297	9	19	17	2	107	1	50	07	1	291 24.3
	285	9	19	45	7	10	1	49	36	0	28 21.7
	292	9	20	15	8	20	1	49	08	0	28.2 23.8
	319	9	20	45	8	30	1	48	36	8	281 22.6
9-21-14.48	298	9	21	15	7	40	1	48	08	7	289 24.4
14.53	278	9	21	44	5	50	1	47	39	8	303 24.3
Equal Altitudes	293	9	22	13	8	108	1	47	09	5	298 23.3
Page 39	279	9	22	41	7	10	1	46	39	7	29.2 21.4
	306	9	23	12	3	20	1	46	10	5	260 22.8
	287	9	23	40	0	30	1	45	44	5	275 24.5
	29	9	24	08	5	40	1	45	17	0	27.5 28.5
		9	56	14	5	119	1	12	54	5	18 25.2
	167	9	56	31	2	05	1	12	20	0	15.3 24.8
	163	9	56	47	5	10	1	12	03	7	17.9 24.8
	173	9	57	4	8	15	1	11	46	8	17.5 24.7
	163	9	57	21	1	20	1	11	29	3*	17. 23.8
	178	9	57	37	9	25	1	11	12	9	17.3 23.8
	156	9	57	54	5	30	1	10	35	0	14.9 23.2
	17	9	58	11	5	35	1	10	40	1	16.8 24.6
	167	9	58	28	2	40	1	10	23	3	16.6 24.6
	163	9	58	54	5	45	1	10	06	7	16.8 24.4
	173	9	59	1	5 (3)	50	1	9	49	9	24.4
	159	9	59	17	7 (7)	55		9	34	9	
	17.1	9	59	34	4 (4)	120		9	10		
		9	57	54	55		1	11	29	89	

Posted

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Wey*

Station *Murray's Creek* Date *May 4 1869*

19-44-25.73
8-53-36.56

10-50-49.17
1-46.62

10-49-02.55
10-18-04.65

30-57.90

Amis lens
lens for
lens by
which

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	Error	REMARKS.
	11 33 8 9	135 14 30		
	11 35 10 2	135 14 30		
	11 37 16 8	133 48 45		
	11 38 6 9	135 12 50		
	11 38 31 2	135 12		
	11 38 59 3	135 11		
<i>Altair Murray's Creek May 4 1869</i>				
	9 19 27 5	113 72 10		
	9 20 8 0	20		
	57.5 9 21 5 5	30		
	553 9 22 0 8	40		
5	57.1 9 22 5 9	50 3		
5	26.6 9 23 24 5	55		
	26.5 9 23 50 5	114		
	284 9 24 29 4	05		
	337 9 25 31	10		
	241 9 25 27 2	15		
10	342 9 26 1 4	20		
	351 9 26 36 5	25		
	26.2 9 27 2 7	30		
		35		
<i>Polaris</i>	9 28 4 8	78 21 35		
	9 28 41 5	22 00		
	272 9 29 5 7	22 30		
	361 9 29 44 8	23 00		
5	387 9 30 23 5	23 30		
	395 9 31 13 0	24 00		
	429 9 31 55 8*	24 30*		
	40 9 32 45 0	25 00		
	35 9 33 22 0	25 30		
10	34 9 33 59 0	26 00		
11	405 9 34 34 5	26 30		
	40.3 9 35 14 8	27		

Error
Sing. = 76985
Error = 1-15.29

CMC
Page 10

Posted

Polaris
Page 22

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Mean Solar Sidl Chronometer No. 1283 by Mequ

Station Camp 4 Ice break Date Aug 7th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.		
	h	m	s	sec	h	m	s			
Polaris		7	47	39		76	57	50	Slightly Hazy	
		7	49	18	8	76	56	00		
	444	7	50	8	2	76	56	30		
	61.5	7	51	1	7	76	57	00		
	Page 5	488	7	51	49	5	76	57		30
	53.0	7	52	42	5	76	58	00		
	* 5.04	7	53	32	9	76	58	86*		
	53.9	7	54	26	8	76	59	00		
	452	7	55	17	0	76	59	30		
	10 45	7	56	2	0	77	00	00		
50	7	56	52	0	77	00	30			
4.55	7	57	39	5	77	01	00			
	7	53	31	36	76	58	30			
Altair		8	46	28	8	109	20		Single altitudes Hazy	
	42.5	8	47	11	3		30			
	447	8	47	56	0		40			
	435	8	48	39	5		50			
	445	8	49	25	0	110	00			
	452	8	50	10	2		10			
	1-37.5	8	51	47	5		30			
	405	8	52	28	0		40			
	488	8	53	16	8		50			
	452	8	54	2	0	111	00			
alt		10	00	4	0	119	00	45	CM A Page 12	
		10	1	26	0	119	02	00		
		10	2	9	2	119	03	00		
		10	3	17	7	119	04	00		
		10	4	54	3	119	05	00		
		10	7	21	0	119	07	50		
		10	9	14	1	119	04	00		
		10	9	46	5	119	03	00		
		10	10	32	2	119	02	00		
		10	11	22	0	119	01	00		
	10	12	13	8	119	00	50			

Posted

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1243* by *Nyons*
near the *in* *base* *vally*

Station *Camp 5, Curu* Date *Dec 10 1869*

4-39

Object Observed.	Time of Observation by Chronometer..				Observed Double Altitudes.		REMARKS.							
	h	m	s	sec	Alt	Dist	h	m	s	sec				
<i>lms upper</i>		9	12	51	2	102	20	1	57	20	0	295	11.2	
	27.8	9	13	19	5		30	1	56	54	0	26.5	10.5	
	28.5	9	13	48	5		40	1	56	23	0	31	11.5	
	27.6	9	14	16	5		30	1	55	53	5	27	10.9	
<i>Equal altitudes</i>	28.2	9	14	44	3	103		1	55	26	0	29	10.3	
	28.7	9	13	15	0		70	1	54	58	5	30	11.5	
	27.2	9	13	43	1	*	20	*	1	57	27	3	27.9	10.4
	30.1	9	16	12	3		30	1	53	58	1	28.6	10.4	
	29.4	9	16	44	7		40	1	53	29	5	28.9	11.2	
	10 29.5	9	17	11	2		50	1	53	00	4	30.8	11.3	
	28.9	9	17	40	1	104		1	52	29	8	26.3	9.9	
27.4	9	18	7	5		10	1	52	03	5	27.8	11.0		
<i>little too late</i>	30.5	9	18	36	0		20	1	51	35	7	17.7	4.3	
5-48	9	15	43.61					1	54	27	23			
<i>Equal altitudes</i>		10	2	49	2	119	20	1	64	33	0	164	22.3-33.5	
	16.8	10	3	6	0		25	1	04	16	6	15.2	22.6	
	15.7	10	3	21	7		30	1	04	01	4	19.7	23.1	
	18.3	10	3	40	0		35	1	03	41	7	18.7	21.7	
	19	10	3	59	0		40	1	03	23	0	16.2	22.0	
	17	10	4	16	0		45	1	03	06	8	19.3	22.8	
	17.8	10	4	33	8	*	50	*	1	02	47	5	15.5	21.3
	17.8	10	4	51	6		55	1	02	32	0	18.0	23.6	
	17.4	10	5	9	0	120		1	02	14	0	19.0	23	
	10 18.5	10	5	27	5		05.5	1	01	53	0	20.3	22.5	
	17.5	10	5	43	5		10	1	01	39	7	19.2	20.2	
	16.4	10	6	4	8		15	1	01	15	5	16.0	20.3	
	19.8	10	6	21	9		20	1	00	59	5		21.4	
3-32.7	10	04	34	31				1	02	47	74			
								10	04	34	31			
								23	07	22	05			
								11	33	41	02.5			

Posted

ASTRONOMICAL OBSERVATIONS.—No. 3.

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Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus
in Cave Valley

Station Camp 5 near the Cave Date August 10th 1869

Equal Altitudes
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2-17.5
1-17

Aug 11
Polaris

Polaris Page 24

5
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Posted

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.							
		10	17	32	5	123	20		12	49	48	5	19.5	21.0	
	20.5	10	17	53	0		25		12	49	28	8	17.8	21.5	
	29.0	10	18	12	0		30		12	49	10	7	20.2	22.7	
	17.8	10	18	30	4		35		12	48	50	5	18.8	20.9	
	21.0	10	18	30	8		40	*	12	48	31	7	19.8	22.5	
	20.2	10	19	11	0		45		12	48	12	5	20.5	23.5	
	19.2	10	19	30	2		50		12	47	52	0	20.5	22.5	
	20.3	10	19	50	0	123	55		12	47	31	5	21.5	2-16.5	
		10	18	51	07				12	48	31	37	11	33	41.22
									10	18	51	07	23	07	-22.44
		9	50	2	5	77	45	40							
		9	51	16	1	77	46	30							
	43.0	9	51	59	9	77	47	00							
	48.1	9	52	47	0	77	47	30							
	52.8	9	53	39	0	77	48	00							
	47.5	9	54	28	0	77	48	30							
	44.5	9	55	18	5	77	49	00	*						
	38.1	9	55	51	9	77	49	30							
	39.8	9	56	32	7	77	50	00							
	39.1	9	57	12	8	77	50	30							
	38.9	9	57	50	8	77	51	00							
	40.0	9	58	30	8	77	51	30							
		9	55	01	59	77	49	00							

ASTRONOMICAL OBSERVATIONS.—No. 3.

75

$\frac{14}{2}$ gives = 31-16.21
 2^{nd} = 31-14.99
 $\frac{162-3120}{2}$
 mean = 31-15.60

Sextant No. *f* and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Nigus*

Station *Camp 55-Cave Valley* Date *July 13/69*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.			REMARKS.				
<i>Stars x</i>	39.8	8 19 58 3	109	20					
		8 20 28 3		25					
		8 20 50 8							
<i>a aquilae</i>	417	8 21 28 0	109	40	10	03	18	5	420 465
		8 22 9 7	109	5-0	10	02	36	5	422 462
	403	8 22 50 8	110		10	01	54	8	462 443
	44.5	8 23 34 3		10	01	81			421 426
<i>marked up</i>	45.	8 24 19 5		20	10	00	26	0 x	458 455
		8 25 9 8		30	10	39	40	2	392 50
	414	8 25 37 2		40	10	38	58	3	467 495
<i>5-5.8</i>	426	8 26 33 8		5-0	10	38	13	8	426 471 5.52
<i>5-554</i>	49.6	8 27 23 4	111		10	38	13	8	426 5-478
<i>Altair</i>	38.8	8 27 23 4	112	40	10	38	13	8	426 403
		8 35 34 8		45	10	49	14	5	214 493
	25.0	8 35 59 8		50	10	48	53	4	214 43.2
	24.7	8 36 23 5		5-5	10	48	32	0	275 45
	23.5	8 36 49 0	113		10	48	4	5	295 51.5
	27.5	8 37 15 0		05	10	47	35	0	305 50.0
	30.	8 37 43 8		10	10	47	06	5	286 49.5
	28.5	8 38 12 0		15	10	46	37	9	261 49.9
<i>9</i>	26.7	8 38 39 7		20	10	46	11	8	253 51.5
	24.3	8 39 64 0		25	10	45	46	5	255 50.5
	24.	8 39 28 0		30	10	45	29	00	26 49.0
<i>4-447</i>	24.7	8 39 52 7		35	10	44	55	00	252 47.7
<i>5-147</i>	26.8	8 40 19 5		40	10	44	29	8	493 05.7
<i>Polaris</i>		8 58 46 8	77	13					4-437
	37	8 59 50 5	77	14					
	32.2	9 00 22 7	77	15					
	39	9 1 1 7	77	15					
	38.3	9 1 40 0	77	16					
<i>Posted</i>	38.3	9 2 18 3	77	16					
<i>*</i>	39.5	9 2 57 8	77	17					
<i>7</i>		8 3 42 5	77	17					
<i>8</i>		8 3 42 5	77	17					

Polaris 25
Post

ASTRONOMICAL OBSERVATIONS.—No. 3.

9-46-676
 31-34 14
 10-52 — 10-17-20
 9-46-6
 8-40-
 1-6

Sextant No. *S*

and artificial horizon of Mercury

Sid'l Chronometer No. 1283

by

Wynns

Station

Camp 5

Carefully

Date

Aug 13 1869

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
	9 4 31 0	77 18 00	
<i>345</i>	9 5 5 5	77 18 30	
	9 5 41 5	77	
<i>2. Aymilai</i>	7 4 4 4	7 4 4	
	9 40 5 0	119 52 10	
	9 41 33 5	119 51 40	
	9 42 35 0	119 51 00	
	9 43 28 7	119 50 00	
	9 46 6 5	119 49 00	
<i>655</i>	9 47 12 0	119 48 00	
<i>50</i>	9 48 2 0	119 47 00	
<i>485</i>	9 48 48 5	119 46 00	
<i>47.7</i>	9 49 33 2	119 45 00	
<i>Loave Valley to Jeff Davis Peak & Cross Lake</i>			
<i>Camp 1 Benson's Creek Aug 14th 1869</i>			
	9 44 55 2	77 57 35	
	9 46 00 9	77 55 30	<i>Polaris Page 26</i>
<i>395</i>	9 46 40 4	77 56	
<i>358</i>	9 47 17 2	77 56 30	
<i>5- 385</i>	9 47 54 7	77 57	
<i>405</i>	9 48 33 2	77 57 30	<i>9-47-36.23</i>
<i>398</i>	9 49 19 0	77 58	<i>77-56-45</i>
<i>50</i>	9 50 03 0*	77 58 30	
<i>36</i>	9 50 39 0	77 59	
<i>38</i>	9 51 17 0	77 59 30	
<i>* 298</i>	9 51 46 8	78 00 00	
<i>362</i>	9 52 23 0	78 00 30	
<i>415</i>	9 53 4 5	78 01 00	
<i>385</i>	9 53 42 5	78 01 30	

C.M.A. Page 14 10

Polaris

Posted

77
 ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus.

Station Camp 2 Clear brook Date Aug 15th 1869
 Spring Valley

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
Polaris	7 48 14	76 51 55	Polaris Page 28
	8 49 14 1	76 52 30	
	32.7 8 49 46 8	76 53 00	
	361 8 50 22 8	76 53 30	
	5 40.1 8 51 3 0	76 54 00	
	368 8 51 39 8	76 54 30	
	35x8 8 52 16 0	76 55 00	
	37.1 8 52 52 8	76 55 30	
	367 8 53 29 5	76 56 00	
	10 345 8 54 45 0	76 56 30	
39.8 8 54 43 3	76 57 00		
41.9 8 55 21 2	76 57 30		
	8 52 15 85	76 55 00	
Mercurius Penk. Aug 17			
Mars	11 53 13 5	128 47 55	Mars Page 15
	11 54 8 9	128 50 40	
	11 55 9 0	128 53 48	
	11 55 44 2	128 55 00	
	11 56 6 3	128 56 00	
	11 58 48 1	128 58 00	
	11 57 53 58	129 00 00	
	11 58 30 0	01 15	
	11 59 25 5	02	
	11 59 53 9	03	
	12 00 39 5	04	
	12 01 34 5	05	
	12 02 24 5	06	
	12 03 20 5	07	
	12 6 71 1	08 35	
12 8 41 0	06 50		
12 9 45 6	06		
12 10 52 6	05		

Posted

ASTRONOMICAL OBSERVATIONS.—No. 3.

78

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 5212 by Arnold

Station *J. J. Davis Reef* Date *May 17 1869*

nicknamed Wheeler's Pecker Buss

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.					
	9	52	51	2	102	30	2	19	12	8	<i>Equal Altitudes Page 56</i>	
28.9	9	53	20	1		40	2	18	40	1		
31.0	9	53	51	1		50						
29.9	9	54	21	0	103							
31.0	9	54	52	0		103						
31.8	9	55	23	5		20						
30.7	9	55	54	5		30	2	16	12	0		305 06.5 3-04
30.5	9	58	25	0		40	2	15	40	5		305 06.5
30.7	9	56	55	7		50	2	15	11	0		315 06.5
30.8	9	57	26	5	104		2	14	40	2		298 06.0
30.3	9	57	56	6		10	2	14	9	7	321 06.8	
52.4	9	58	27	5		20	2	13	38	5	305 06.0	
31.0	9	58	58	3		30	2	13	8	0	06.5	
	9	57	26	33			2	14	40	13		
	10	10	37	8	108	10	2	0	133	5	323 11.3	
33.1	10	11	10	9		20	2	00	59	7	325 10.6	
33.3	10	11	44	2		30	2	00	27	2	333 10.4	
30.8	10	12	27	5		40	1	59	53	9	321 13.4	
30.1	10	12	50	1		50	1	59	21	8	323 11.9	
32.4	10	13	22	5	109		1	58	49	2	324 11.7	
30.5	10	13	55	2		10	1	58	17	1	321 12.3	
32.4	10	14	28	1		20	1	57	45	0	131	
29.8	10	14	54	9		30						
	10	13	38	5		40	1	56	35	5	33.0 14.0	
32.0	10	16	10	5		50	1	56	02	5	345 13.0	
36.7	10	16	47	2	110		1	53	28	0	39.8 15.2	
26.9	10	17	14	1		10	1	54	48	2	023	
6-363												
	12	11	44	5	129	4						
	12	12	47	1	129	3						
	12	13	12	5		2						
	12	13	36	7		1						
	12	14	10	5	129							

Hazy

Posted

My book

221

453
95

49

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Myers

Station ^{Camp 3} Rattle snake Springs Date Aug 18 1869 Spring Valley

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.				
	h	m	s	sec	Alt	Dist	h	m	s	sec	
	9	35	26	7	108	50					
	9	36	3	5	108		1	25	3	8	16.06.3
127	9	36	16	2		5	1	24	46	8	16.703.0
136	9	36	29	3	10		1	24	32	1	18.101.4
183	9	36	48	1	15		1	24	13	0	16.01.7
172	9	37	5	3	20		1	23	56	0	16.301.3
164	9	37	24	7	25		1	23	39	7	15.809.4
168	9	37	37		30		1	23	23	9	15.700.9
171	9	37	53	1	35		1	23	8	2	01.3
161	9	38	10	2	40						
196	9	28	09	8	45						
147	9	28	44	5	50						
143	9	28	58	8	55						
170	9	29	15	8	109						
	9	46	35	7	111	10					
170	9	46	52	7		15					
175	9	47	10	2		20					
168	9	47	27	0		25					
168	9	47	43	8		30					
171	9	48	00	9		35					
171	9	48	18	0		40					
167	9	48	34	7		45					
179	9	48	52	6		50					
176	9	49	10	2		55					
171	9	49	27	3	112						
177	9	49	45	0		05					
180	9	50	3	0		10					

Low up
Low

Posted

x x x x

Low

Equal Altitude
Page 55

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regas

Station Camp 4 near Sacramento Date Aug 19th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.		
	h	m	s	0	1	2	3			
C Ma El Aymula	9	8	44	0	118	41	40	C Ma Page 17		
	9	9	40	3	118	43	10			
	9	10	23	8		44				
	9	10	52	8		45				
	9	11	28	9		46				
	9	12	15	0		47				
	9	13	27	0		48				
	9	15	5	0		49				
	9	16	30	0		49	30			
	9	18	39	9		48	30			
	9	19	27	5		48				
	9	19	57	7		47				
	9	20	42	6		46				
	9	21	41	3		45				
	9	22	36	0		44				
	9	23	19	0		43				
	Camp 5 near Clear Springs Snake Valley Aug 20 th									
Polaris	7	41	50	8	77	22	50	Polaris Page 30		
	7	42	47	1	77	23	30			
	488	7	43	30	9	24	00			
	468	7	44	17	7	24	30			
	5	47.1	7	45	4	8	25		00	
	45.6	7	45	50	4	25	30			
	46.4	7	46	36	0	*	26		00	xx
	42.2	7	47	18	5	26	30			
	43.5	7	48	02	5	27	00			
	10	46.3	7	48	48	8	27		30	
	46.2	7	49	31	0	28	00			
	55.4	7	50	19	9	28	30			
Posted	7	46	34	38	77	26	xx			

ASTRONOMICAL OBSERVATIONS.—No. 3.

82

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Weyns*

Station *Camp 6, Ham...* Date *Aug 23, 1869*

Sms sp.
per hilt
E. Al
Page 59

3-52.6
Ditto

53.1
54.7
Equal altitudes
Page 60
Posted

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.								
		9	41	11	2	109		1	9	47	3	16.2	58.5	33.4	
	168	9	41	28	0		0 5	1	9	31	1	16.3	59.1		
	17	9	41	45	0		1 0	1	9	14	8	17.5	59.8		
	172	9	42	02	2		1 5	1	8	57	3	17.8	59.5		
	* 173	9	42	20	0		2 0	1	8	39	5	17.3	59.0	*	
	195	9	42	39	0		2 5	1	8	22	2	18.0	61.2		
	* 16	9	42	57	0		3 0	1	8	4	2	17.5	61.2		
	175	9	43	14	5		3 5	1	7	46	7	19.4	61.2		
	172	9	43	31	7		4 0	1	7	27	9	18.3	59.0		
	17.4	9	43	49	1		4 5	1	7	9	0	17.7	58.1		
	17.7	9	44	6	8		5 0	1	6	50	3	17.2	58.1		
	18.2	9	44	25	0		5 5	1	6	32	8	19.9	57.8		
	18.8	9	44	43	8	110		1	6	15	9		56.7		
		9	42	20	9			1	08	38	93				
		9	55	40	2	113	0 0		53	19	3	19.7	59.5		
	171	9	55	58	0		0 5		53	00	4	18.3	59.0		
	194	9	56	17	4		1 0		54	41	8	18.8	59.2		
	186	9	56	36	0		1 5		54	23	0	19.7	59.0		
	190	9	56	55	0		2 0		54	9	5	18.8	58.5		
	213	9	57	15	0		2 5		53	44	5	19.5	59.5		
	20.0	9	57	35	0		3 0		53	25	0	17.8	60.8		
	182	9	57	54	8		3 5		53	7	2	20.7	61.9		
	167	9	58	13	7		4 0		52	46	5	20.0	60.2		
	181	9	58	31	8		4 5		52	26	1	19.8	57.9		
	212	9	58	50	0		5 0		52	6	3	21.3	59.3		
	193	9	59	12	3		5 5		12	51	45	0	19.9	57.3	
	23.7	9	59	33	0	114			12	31	25	1		58.6	
		9	56	56	18				12	54	53	47			

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *✓* and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Nisus*

Station *Camp 6. N-S near* Date *Aug 23/69* *Lake Valley Utah*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.					
<i>Stars upper limb</i>	20.5	10	8	57	5-	116	20	-	12	42	32	21.0	00.7
	22.5	10	9	18	0		25	$\frac{10}{2}$	12	41	42	22	59.7
	215	10	9	39	9-		30	$\frac{2}{2}$	12	41	20		59.5
	215	10	10	22	5-		35						
	205	10	10	43	0		40						
	225	10	11	5	5-		45						
	21.0	10	11	26	5-		50						
	22	10	11	44	5-	117	55						
	23	10	12	11	5-		60						
	212	10	12	32	7		10						
216	10	12	54	8		15							
		10	13	23	5-		20						
		10	09	18	46				12	41	41	46	
		Aug	23			76	15	30					
		7	21	41	5	76	17	00					
	51.2	7	22	36	2	76	17	30					
	36.5	7	23	08	7	76	18	00					
	39.5	7	23	48	2	76	18	30					
	5 41.8	7	24	28	0		19	00					
	* 43.8	7	25	10	8 *		19	30 *					
	* 36.2	7	25	51	0		20	00					
	37.6	7	26	30	6		20	30					
	46.2	7	27	11	8		21	00					
	41.0	7	27	52	8		21	30					
	36.9	7	28	32	7		22	00					
							22	30					
		7	25	09	26	76	19	30					

Stars upper limb
limb
Equal altitudes
Jan 61
Polaris

Polaris Page 31

3
3
5
Posted

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp of Lake Creek Date Aug 27th 1869
 Springs, Snake Valley Nev

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
	h	m	s	sec	h	m	sec		
Sun's upper limb		8	57	09	5	92	20	xx	Single altitudes Page 30
	29.1	"	57	38	6	92	30	xx	
	31.6	"	58	10	2	92	40	xx	
	30.5	"	58	40	7	92	50	xx	
	27.4	"	59	08	1	93	xx	xx	
	31.2	"	59	39	3	93	10	xx	
	30.4	9	00	09	4	93	20	xx *	
	29.2	"	00	38	6	93	30	xx	
	34.3	"	01	10	9	93	40	xx	
	27.3	"	01	40	2	93	50	xx	
	29.7	"	02	09	9	94	xx	xx	
	30.0	"	02	39	9	94	10	xx	
	29.2	"	03	09	1	94	20	xx	
Posted		9	00	09	57	93	20	xx	
Sun's upper limb Centre		9	06	50	0	95	xx	xx	
	32.9	9	07	22	9	95	10	xx	
	30.5	9	07	53	4	95	20	xx	
	29.8	9	08	23	2	95	30	xx	
	29.9	9	08	53	1	95	40	xx	
	31.5	9	09	24	6	95	50	xx	
	32.8	9	09	57	4	96	xx	xx	
	29.2	9	10	26	6	96	10	xx	
	31.5	9	10	58	1	96	20	xx	
		9	11	29	4	96	30	xx	
	9	12	02	6	96	40	xx		
	9	12	31	8	96	50	xx		
13	9	13	04	1	97	00	xx		
					98	xx	xx		

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Nyas*

Station *Camp 7 Lake Creek Spring* Date *Aug 27th 1869*

San's upper limb Equal altitudes Page 63

3-20.3 Posted

San's upper limb Centre

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.						
	h	m	s	sec	1	2	3	1	2	3	4	5	6	
<i>San's</i>	9	29	36	1	102	40	X X	1	24	16	4	169	52.5	10
	157	9	29	51	8	102	45	X X	23	59	5	16.2	51.3	9
	163	9	30	8	6	102	50	X X	23	43	3	71.79	51.9	
<i>upper limb</i>	176	9	30	25	2	102	55	X X	23	27	4	812.5	52.6	
	162	9	30	40	4	103	XX	X X	23	12	9	5	53.3	
	174	9	30	57	8	103	65	X X						
	166	9	31	14	4	103	10	X X	22	37	5	786	51.9	
	178	9	31	32	2	103	15	X X	22	18	9	16.5	51.1	
	165	9	31	49	0	103	20	X X	22	24		15.8	50.4	
	174	9	32	6	1	103	25	X X	21	46	6	20.3	52.7	
	163	9	32	22	4	103	30	X X	21	26	3	17.2	48.7	
	171	9	32	39	5	103	35	X X	1	21	9	1	47.3	48.6
	169	9	32	56	4	103	40	X X	1	20	51	8		48.2
		9	30	49	30				1	23	02	77		
<i>San's upper limb Centre</i>	9	39	41	08	9	105	30	X X						
	168	9	41	25	7	105	33	X X						
	181	9	41	43	8	105	40	X X	1					
	178	9	42	01	6	105	45	X X						
	154	9	42	17	0	105	50	X X	1					
	187	9	42	33	7	105	55	X X	1					
	21.9	9	42	55	6	106	XX	X X						
	18.0	9	43	13	6	106	05	X X						
	17.9	9	43	31	5	106	10	X X						
	16.9	9	43	48	4	106	15	X X						
	17.3	9	44	05	7	106	20	X X						
	18.8	9	44	24	5	106	25	X X						
	18.8	9	44	43	3	105	30	X X						

ASTRONOMICAL OBSERVATIONS.—No. 3.

9-29

9-13
16

25
16
1-41

Sextant No.

8

and artificial horizon of Mercury

Sid'l Chronometer No.

1283 by Regus

Station

Camp 7 Lake Creek
Strung

Date Aug 27th 1869

Object Observed.		Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
Sun's upper limb	18.4	9	50	4	2	108	30	X X	Single Altitudes Page 31
	29.2	9	50	22	6	108	35	X X	
	19.3	9	50	41	8	108	40	X X	
	20.6	9	51	1	1	108	45	X X	
	19.2	9	51	21	2	108	50	X X	
	19.0	9	51	40	4	108	55	X X	
	16.8	9	51	59	4	109	X X	X X	
	19.1	9	52	17	7	109	05	X X	
	16.9	9	52	35	8	109	10	X X	
	20.5	9	52	53	7	109	15	X X	
Sun's Centre	19.1	9	53	13	2	109	20	X X	* 13
	19.5	9	53	32	3	109	25	X X	
		9	53	51	8	109	30	X X	
		9	51	58	10	109	X X	X X	
	22.1	9	57	54	X	110	X X	X X	
	22.1	9	58	16	1	110	05	X X	
	17.4	9	58	38	2	110	10	X X	
	21.0	9	58	55	6	110	15	X X	
	14.8	9	59	16	6	110	20	X X	
	14.2	9	59	31	4	110	25	X X	
Sun's Centre	14.2	9	59	45	6	110	30	X X	* 13
	24.6	10	00	09	2	110	35	X X	
	27.3	10	00	36	5	110	40	X X	
						110	45		
		10	01	11	6	110	50	X X	
	21.8	10	01	33	4	110	55	X X	
	22.8	10	01	56	2	111	00	X X	
	18.9	10	02	15	1	111	05	X X	
	22.5	10	02	37	6	111	10	X X	
	19.4	10	02	57	0	111	15	X X	
20.2	10	03	17	2	111	20	X X		

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 ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Negus

Station Camp 7 Lake Creek Date Aug 27th 1869
 5 miles

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.						
	h	m	s	sec	Alt	Dist	Cor	h	m	s	sec			
Sun's upper limb	19.9	10	05	33.2	112	00	x x	Equal altitudes Post						
	20.2	10	06	13.1	112	05	x x							
	20.1	10	06	33.3	112	10	x x							
	22	10	06	53.4	112	15	x x							
	227	10	07	15.4	112	20	x x							
	227	10	07	38.1	112	25	x x		12	48	15	1	9	53.2
	207	10	07	59.8	112	30	x x		12	45	57.7		8	51.5
	213	10	08	20.6	112	35	x x		12	45	30.9		9	51.
	236	10	08	42.7	112	40	x x		12	45	13.1		7	56.8
	208	10	09	04.5	112	45	x x		12	48	49.3		9	54.8
	216	10	09	26.1	112	50	x x		12	46	29.2		7	56.3
	203	10	09	46.4	112	55	x x		12	46	17.4		6	57.8
	227	10	10	09.1	113	00	x x		12	41				
		10	08	21.32				12	45	31.42				
Sun's Centre		10	14	48.6	114	00	x x		10					
	26.4	10	15	15. x	114	05	x x		30	0			58.6	
	257	10	15	40.7	114	10	x x	3	39	1			54.1	
	19.2	10	15	59.9	114	15	x x	37	21	2			61.9	
	25.4	10	16	25.3	114	20	x x	37	59	9			59.8	
	19.6	10	16	44.9	114	25	x x	37	27	2			52.5	
	26.0	10	17	10.9	114	30	x x	37	05	2			50.1	
	27.8	10	17	28.7	114	35	x x		41	3			52.2	
	25.0	10	17	53.7	114	40	x x	36	21	2			49.9	
	23.2	10	18	16.9	114	45	x x		54	0	18.6		47.7	
	25.2	10	18	42.1	114	50	x x		35	4	23.0		52.3	
	25.0	10	19	07.1	114	55	x x	12	35	12	4	27.4	54.5	
	13 23.5	10	19	30.6	115	x x	x x	12	34	45	0	29.1	52.1	
							12	34	15	9			46.5	

44.
 3
 13.2
 2
 Posted
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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regas

Station Camp 7 Lake Creek Springs Date Aug 27th 1869
Snake Valley Nev

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.
	h	m	s	sec	Alt	Dist	
Sun's upper limb	11	19	17	4	122	51	C. m. a Page 19
	11	20	27	3		53	
	11	20	57	9		54	
	11	21	45	1		55	
	11	22	36	3		56	
	11	24	21	1		57	
	11	26	51	6		57 35	
	11	28	12	2		57 20	
	11	30	8	9		56 40	
	11	30	41	3		56	
	11	31	12	1		55	
	11	31	57	4		54	
	11	32	45	9		53	
	11	33	34	1		52	
Posted	11	34	12	8		51	
	11	34	49	8		50	
Camp 8	Indian Springs Monument Cañon, Fortification Range.						
	Aug 27 th 1869.						
aquilae altair	7	32	10	10	111	20	Range Altitudes Page 32
	237	7	32	33	7	25	
	243	7	32	58	0	30	
	227	7	33	20	7	35	
	235	7	33	43	7	40	
	232	7	34	7	4	45	
	*27	7	34	33	4	50 *	
	247	7	34	58	1	55	
	242	7	35	22	3	112	
	234	7	35	45	7	05	
	253	7	36	11	0	10	
	22	7	36	33	0	15	
	225	7	36	53	5	20	

7-34-33.27 111-50-00

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1243 by *Weyno*

Camp 8 Station *Mount Currier* Date *Aug 27 1869*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Polaris</i>	7-57-15.1	77-10	
509	7-58-06.0	77-10-30	
385	7-58-50.5	77-11-00	
457	7-59-35.0	77-11-30	
541.2	8-00-18.4	77-12-00	
* 453	8-1-03-7	77-12-30	*
50	8-1-49.7	77-13-00	
475	8-2-37.2	77-13-30	
46.7	8-3-24.9	77-14-00	
36.2	8-4-03.1	77-14-30	
50.4	8-5-55.5	77-15-00	

Polaris Page 34

8-01-05.75 77-12-30

Camp 5 Cave Valley Aug 29 1869

<i>Polaris</i>	8 35 20	9	77	41	30
33.0	8 35 33	9	77	42	00
39.3	8 36 38	2	77	42	30
34.8	8 37 8	0	77	43	00
42.4	8 37 50	4	77	43	30
* 29.8	8 38 20	2	77	44	00
29.7	8 38 49	9	77	44	30
38.1	8 39 28	0	77	45	00
44.8	8 40 12	8	77	45	30
# 32.1	8 40 44	9	77	46	00
11 39.2	8 41 24	1	77	46	30

Polaris Page 32

8 38 20 57 77 44 00

Posted

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 9 and artificial horizon of Mercury

Sid'l Chronometer No. 1253 by *W. J. M. S.*

Station *Cure Valley* Date *Aug 29 1869*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
<i>Polaris</i>	8 58 8 2	77 59	
	8 58 50 0	77 59 30	
	8 59 35 7	78 50 50	
	8 60 23 2	78 50 30	
	8 61 37 1	78 01 20	
	8 62 25 9	78 02 00*	
	8 63 6 7	78 02 30	
	8 64 47 7	78 03 50	
	8 64 32 8	78 03 30	
	8 65 49 6	78 04 50	
8 65 56 0	78 04 30		
<i>Posted</i>	9 02 13 90	78 01 48.18	

Polaris Page 33

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Nyman*

Station *Cape Horn* Date *Aug 30 1869*

Equal Altitudes Page 68

Equal Altitudes Page 69

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.						
	h	m	s	sec	h	m	sec	1	2	3	4			
<i>hms up</i>	15.4	9	19	47	5	97	30	xx	1	37	37	8	16.3	25.3
	15.6	9	20	2	9		35		1	37	22	5	16.0	25.4
	16.0	9	20	18	5		40		1	37	6	5	15.0	24.6
	16.7	9	20	34	0		45		1	36	37	4	15.7	25.4
	15.2	9	21	7	4		50		1	36	35	7	17.8	26.9
	16.0	9	21	23	4	98			1	36	18	8	17.8	25.6
	15.6	9	21	39	2		05		1	35	44	0	16.0	22.4
	15.6	9	21	55	0		10		1	35	28	0	15.5	22.0
	15.6	9	22	10	6		15		1	35	12	5	15.0	23.6
	15.4	9	22	25	0		20		1	34	37	0	15.0	22.0
"	17.0	9	22	43	0		25		1	34	41	50	16.5	24.5
	17.2	9	23	0	2	98	30	xx	1	34	25	00		26.2
		9	21	23	01				1	36	01	74		
		9	45	56	8	105	10		1	11	29	4	17.9	26.2
	17.7	9	46	14	5		15		1	11	11	5	18.	26.0
	17.9	9	46	32	4		20		1	10	33	5	19.6	25.9
	18.1	9	46	50	5		25		1	10	33	9	18.1	24.4
	18.5	9	47	9	0		30		1	10	15	8	19.0	24.8
	20.2	9	47	29	2		35		1	9	56	8	18.9	26.0
	17.5	9	47	46	7		40		1	9	38	4	16.1	25.6
10	17.8	9	48	4	5		45		1	9	21	8	18.8	26.3
	18.6	9	48	23	1		50		1	9	3	0	19.0	26.1
	19.5	9	48	42	6		55		1	8	44	0	19.9	26.6
	18.4	9	49	1	0	106			1	8	24	1	18.4	25.1
	18.5	9	49	19	5		05		1	8	5	7	17.7	25.2
	18.7	9	49	38	8		10		1	7	48	0		26.2
	9	47	46	77		1		1	09	38	91			

Posted

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Myers

Station Camp 5 Cave Valley Date Aug 30th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.							
	h	m	s	sec	h	m	h	m	s	sec				
S. up L	19.5	9	58	38	108	30	12	58	44	8	20.1	22.8		
	22.5	9	58	57	35		12	58	24	7	21.2	22.2		
	18.2	9	59	20	40		12	58	03	5	19.0	20.5		
	5. 20.5	9	59	38	4.5		12	57	44	5	18.3	19.7		
	19.5	9	59	58	7*	50	*	12	57	25	2	22.2	24.9	
	21.9	10	00	18	2	55		12	57	50		21.0	24.2	
	19.1	10	00	40	1	109		12	56	44	0	20.6	24.8	
	19.6	10	00	59	2	0.5		12	56	24	1	20.6	23.3	
	18.8	10	01	18	8	10		12	56	8	5		22.3	
	22.4	10	01	37	6	15		12	55	48	5			
Equal altitudes Page 70	22.3	10	02	00	0	20								
	22.3	10	02	22	3	25								
	21.4	10	02	43	7	30		12	57	24	37			
		9	59	58	54									
		10	7	36		110	40		12	49	49	8	22.3	25.8
	198	10	7	55	8	45		12	49	27	5	20.3	22.7	
	21.0	10	8	16	8	50		12	49	7	2	20.5	24.	
	22.2	10	8	39	0	55		12	48	46	7	23.3	25.7	
	5. 20.5	10	8	59	5	111		12	48	24	4	20.0	23.9	
	22.5	10	9	22	0	0.5		12	48	03	4	23.9	25.4	
Equal altitudes Page 71	23.5	10	9	45	5	10		12	47	39	5	20.9	25.0	
	21.5	10	10	7	0	15		12	47	18	6	21.9	25.6	
	21.8	10	10	28	8	20		12	46	56	7	21.2	25.5	
	21.2	10	10	50	0	25		12	46	35	8	23.5	25.5	
	23.4	10	11	13	4	30		12	46	12	0	23.9	25.4	
	21.3	10	11	34	7	35		12	45	48	1	21.6	22.8	
	22.8	10	11	57	5	40		12	45	26	5		24.0	
		10	09	45	08				12	47	39	68		

49.5

Posted.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Megus*

Station *Camp 6 Miles Hop Creek Pine Nut Canon* Date *Sept 2nd 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.		
<i>Altair</i>		6	46	43	96	40.	<i>Single Altitudes 34</i>		
	22		47	3		45			
	20		47	24		50			
	18	2	47	43	2	55			
	19		48	2	3	97			
	22		48	22	6	5			
	18	+	48	40	3	10		*	
	225		49	1	8	15			
	206		49	22	4	20			
	188		49	41	2	25			
	168		49	59	4	30			
	158		50	15	8	35			
<i>Altair</i>	196		50	34	5	40	<i>Single Altitudes Page 35</i>		
		6	48	41	0 1	97		10	xx
		6	56	36	1	99		10	
	199	"	56	56				15	
	208	"	57	16	8			20	
	211	"	57	37	9			25	
	205	"	57	58	4			30	
	200*	"	58	18	4			35	*
	199	"	58	30	3			40	
	214	"	58	59	7			45	
	191	"	59	18	8			50	
	206	"	59	39	4			55	
209	7	-	-	3	100	-			
	6	58	18	28	99	35	*		

Posted

Posted

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Negus

Station Camp 6 WildHog Cañon Date Sept 2nd 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.
	h	m	s	h	m	s	
Polaris		7	3	29	8	76	5 - 25
374			4	7	2		6 - 30
252			4	32	4		7 30 *
282			5	-	6		7 30
322			5	32	8		8 -
339			6	6	7		8 30
311			6	37	8		9 -
310 *			7	-8	8		9 30
339			7	42	7		10 -
296			8	12	3		10 30
323			8	44	6		11 -
324			9	17	-		11. 30.
<u>Ported</u>			7	06	53	57	76 09 15
Camp 7 Sheep Ranch Sept 5 th 1869							
Polaris			8	20	59	7	76 59 55
			22	-	-	17	30
318			22	31	8		1 30
305			23	3	5		2 -
377			23	34	2		3 30
316			24	10	8		3 -
301			24	41	9		4 30
303			25	15	2		4 -
283			25	45	5		4 30
			"	"	"		5 -
328			26	18	3		5 -
363			26	52	6		0 2 45
			8	24	25	68	77

Polaris
Page 35

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Sextant No. *J*

and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by

Station *Camp 7 Shup Ranch*

Date *Sept 5th*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
<i>α. Aquilae</i>	8	50	45	2	101	07	40	<i>Single altitudes</i>
			44	6		30	00	
<i>Altair</i> <i>probably</i>	8	51	37	2	102	XX	-	<i>Page 36</i>
			37	2				
<i>γ. Regulus</i>	24.6	52	21	8		10		
	24.2	52	46	5		20		
	25.2	53	11	2		30		
	25	53	36	2		40		
	26.3	54	2	5	102	50		
	26.5	* 54	28	* 5	103	*		
24.4	54	53	4		10			
25.4	55	18	8		20			
24.2	55	43	-		30			
25.2	56	8	2		40			
25.6	56	33	8		50			
24.1	56	57	0	104	XX			
<i>Polaris</i>	8	54	27	65	103	XX	XX	<i>Camp 8. near Lower Redoubt Valley. Sept. 6th 1860</i>
	8	6	52	8	76	35	40	
		9	-	4		37	-	
33.4	9	33	8		37	30		
32.4	10	6	2		38	-		
38.8	16	45	-		38	30		
36.1	11	21	1		39			
26.7	11	53	8	*	39	30		
29.8	12	27	6		40			
44.9	13	2	5		40	30		
39.1	13	40	6		41			
44.8	14	20	4		41	30		
39.9	15	1	3		42	-		
	8	11	55	88	76	39	30	

Sextant No. *and artificial horizon of Mercury*

Sid'l Chronometer No. *1283* by *Megus*

Station *Camp 3 Homer Cedar Valley* Date *Sept 6th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	8	10	27	5	90	58	40	
<i>Pegasi</i>	8	20	17	-	91	10		
		20	41	6	91	30		
<i>α (Sirrals)</i>		21	8	5		40		
		21	34	5		50		
		21	59	9	92	44		
		22	26	3		10		
		22	53	0	*	20		
		23	19	-		30		
		23	43	9		40		
		24	3	5		50		
		24	35	9	93	-		
		25	-	-		10		
		25	25	9	-	20		
		25	51	8		30		
<i>Polaris</i>	8	23	04	81	92	25		
	8	27	38	4	76	50		
33.4		28	11	8		30		
32		28	45	8		51		
38.2		29	22	-		30		
40.4		30	02	4		52		
* 39.9		30	42	0	*	30		
43.1		31	23	4		53		
33.2		31	58	6		30		
35.3		32	33	9		54		
34.3		33	8	2		30		
30.8		33	39	-		55		
	8	30	40	35	46	52	30	

Single altitudes
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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by

Station *Camp 8 near Homer* Date *Sept 6th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
	h	m	s	sec	h	m	s		
<i>Altair</i> <i>after passing</i> <i>the meridian</i>		<i>9</i>	<i>18</i>	<i>23</i>	<i>8</i>	<i>112</i>	<i>22</i>	<i>30</i>	<i>Single Altitudes</i> <i>Page 38</i>
			<i>19</i>	<i>35</i>	<i>-</i>		<i>10</i>		
	<i>221</i>		<i>19</i>	<i>57</i>	<i>1</i>		<i>5</i>		
	<i>19.4</i>		<i>20</i>	<i>48</i>	<i>5</i>	<i>112</i>	<i>-</i>		
	<i>18.5</i>		<i>20</i>	<i>38</i>	<i>-</i>		<i>55</i>		
	<i>17.1</i>		<i>20</i>	<i>57</i>	<i>1</i>		<i>50</i>		
	<i>17.4</i>		<i>21</i>	<i>10</i>	<i>5</i>		<i>45</i>		
	<i>16.8</i>		<i>21</i>	<i>37</i>	<i>3</i>	<i>*</i>	<i>40</i>		
	<i>23.5</i>		<i>21</i>	<i>54</i>	<i>8</i>		<i>35</i>		
	<i>24.4</i>		<i>22</i>	<i>15</i>	<i>2</i>		<i>30</i>		
	<i>24.1</i>		<i>22</i>	<i>38</i>	<i>3</i>		<i>25</i>		
	<i>20.5</i>		<i>22</i>	<i>58</i>	<i>8</i>		<i>20</i>		
	<i>22.6</i>		<i>23</i>	<i>21</i>	<i>4</i>		<i>15</i>		
	<i>24.8</i>		<i>23</i>	<i>45</i>	<i>2</i>	<i>111</i>	<i>10</i>		
		<i>9</i>	<i>21</i>	<i>38</i>	<i>17</i>	<i>112</i>	<i>40</i>		
<i>Polaris</i>	<i>Camp 9 Rose Valley.</i>								<i>Sept 7th 1869</i> <i>Page 39</i>
	<i>7</i>	<i>59</i>	<i>40</i>	<i>-</i>	<i>76</i>	<i>14</i>	<i>40</i>		
	<i>8</i>	<i>-</i>	<i>32</i>	<i>3</i>		<i>16</i>			
<i>30.1</i>		<i>1</i>	<i>2</i>	<i>4</i>			<i>30</i>		
<i>24.0</i>		<i>1</i>	<i>26</i>	<i>4</i>		<i>17</i>			
<i>24.1</i>		<i>1</i>	<i>50</i>	<i>5</i>			<i>30</i>		
<i>25.5</i>		<i>2</i>	<i>16</i>	<i>..</i>		<i>18</i>	<i>-</i>		
<i>26.1</i>		<i>2</i>	<i>42</i>	<i>1</i>			<i>30</i>		
<i>27.3</i>		<i>3</i>	<i>29</i>	<i>4</i>		<i>19</i>	<i>-</i>		
<i>31.2</i>		<i>3</i>	<i>40</i>	<i>6</i>			<i>30</i>		
<i>30.4</i>		<i>4</i>	<i>11</i>	<i>.</i>		<i>20</i>	<i>-</i>		
	<i>8</i>	<i>01</i>	<i>57</i>	<i>87</i>	<i>76</i>	<i>17</i>	<i>45</i>		

Sextant No. *A* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by

Station *Camp 9 Rose Valley* Date *Sept 7 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
<i>Polaris.</i>	<i>8</i>	<i>26</i>	<i>15</i>	<i>.6</i>	<i>76</i>	<i>34</i>	<i>40</i>	<i>Page 40</i>	
		<i>27</i>	<i>12</i>	<i>8</i>		<i>36</i>	<i>-</i>		
	<i>327</i>	<i>27</i>	<i>45</i>	<i>5</i>			<i>30</i>		
	<i>338</i>	<i>28</i>	<i>10</i>	<i>3</i>		<i>37</i>	<i>-</i>		
	<i>25.4</i>	<i>28</i>	<i>57</i>	<i>7</i>			<i>30</i>		
	<i>32.6</i>	<i>29</i>	<i>38</i>	<i>3</i>	<i>*</i>	<i>38</i>	<i>-</i>		
	<i>32.9</i>	<i>30</i>	<i>02</i>	<i>2</i>			<i>30</i>		
	<i>30.2</i>	<i>30</i>	<i>33</i>	<i>4</i>		<i>39</i>	<i>-</i>		
	<i>35.5</i>	<i>31</i>	<i>06</i>	<i>9</i>			<i>30</i>		
	<i>37.9</i>	<i>31</i>	<i>42</i>	<i>8</i>		<i>40</i>	<i>-</i>		
	<i>8</i>	<i>29</i>	<i>27</i>	<i>.91</i>	<i>76</i>	<i>38</i>	<i>00</i>		
<i>α Persei. (Anah) (Markab)</i>	<i>8</i>	<i>35</i>	<i>50</i>	<i>-</i>	<i>95</i>	<i>15</i>	<i>40</i>	<i>Single altitudes Page 39</i>	
		<i>35</i>	<i>50</i>	<i>-</i>		<i>30</i>			
	<i>25.2</i>	<i>36</i>	<i>15</i>	<i>2</i>		<i>40</i>			
	<i>27.3</i>	<i>36</i>	<i>42</i>	<i>5</i>		<i>30</i>			
	<i>27.0</i>	<i>37</i>	<i>00</i>	<i>5</i>	<i>96</i>	<i>00</i>			
	<i>27.0</i>	<i>37</i>	<i>36</i>	<i>5</i>	<i>96</i>	<i>10</i>			
	<i>26.3</i>	<i>38</i>	<i>03</i>	<i>4</i>	<i>96</i>	<i>20</i>			
	<i>25.6</i>	<i>38</i>	<i>28</i>	<i>4</i>		<i>30</i>			
	<i>28.</i>	<i>38</i>	<i>56</i>	<i>4</i>		<i>40</i>			
	<i>28.2</i>	<i>39</i>	<i>24</i>	<i>6</i>		<i>50</i>			
	<i>28.9</i>	<i>39</i>	<i>53</i>	<i>5</i>	<i>97</i>	<i>-</i>			
	<i>26.8</i>	<i>40</i>	<i>20</i>	<i>8</i>		<i>10</i>			
		<i>8</i>	<i>38</i>	<i>03</i>	<i>67</i>	<i>96</i>	<i>20</i>		
		<i>7</i>	<i>13</i>	<i>39</i>	<i>7</i>				
				<i>57</i>	<i>4</i>				
			<i>01</i>	<i>6</i>					
			<i>30</i>						
			<i>41</i>	<i>8</i>					

Sextant No. *8*

and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Nepes*

Station *Camp 12 Rose Valley* Date *September 28th 1869*

*Scenes upper limb.
Equal altitudes
Page 72*

*Equal altitudes
Page 73*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.					
	9	31	35	2	98	10	1	15	18	0	133	53.2
	17.9	31	53	3		15		15	3	5	213	56.8
	19.1	32	12	4		20		14	42	2	15.5	54.6
	16.4	32	28	8		25		14	26	7	19.2	55.5
	18.6	32	47	4		30		14	7	5	36.0	54.9
	15.8	33	23	2		40		13	31	5	16.5	54.7
	17.7	33	40	6		45		13	15		19.6	55.6
	19.5	34	00	1		50		12	55	4	20.7	55.5
	17.5	34	17	9		55		12	34	7	18.3	52.8
	17.4	34	35	5	90	*4		12	17	4	14.4	52.9
	18.5	34	53	5		05		12	2		17.6	55.5
	17.7	35	11	2		10		14	44	4	19.9	55.6
	18.4	35	20	6		15		1	11	24	5	54.1
	9	33	34.52				1	13	29	82.3		
	9	49	10	8	102	50	12	57	44	4	18.6	55.2
18.2	1	49	29			55		57	25	8	21.0	54.8
20.9		49	49	9	103			57	4	8	18.6	54.7
21.		50	10	9		5		50	40	2	23.0	57.1
20.5		50	31	4		10		56	24	2	20.4	54.6
18.6		50	50	5		15	*	56	4	8	16.5	52.8
20.8		51	10	8		20		55	45	4	21.1	56.2
17.3		51	30	1		25		55	24	5	22.5	54.4
19.2		51	50	3		30		55	2	8	19.8	53.1
23.1		52	13	4		35		54	41		21.0	54.4
21		52	34	4		40		54	20		18.5	54.4
21.1		52	55	5		45		54	7	5	19.0	57
20.5		53	16	-	103	50	12	53	42	5	58.5	
	9	50	51.04				12	56	63.98			

Windy

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Nique

Station Camp 12 Date September 8th 1869
Rose Valley

Equal Altitudes Page 74

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.							
	h	m	s	sec	Alt.	Dist.	h	m	s	sec	h	m	s	sec
Sun	212	10	9	30	0	107	30	12	37	31	4	24.2	62.2	
			9	32	-		35		37	7	2	24.4	59.2	
	239		10	15	9		40		36	42	8	23.9	58.7	
	246		10	40	5		45		36	18	9	25.5	59.4	
	263		11	4	8		50		35	53	4	23.6	58.2	
	211		11	28	9		55		35	20	8	24.8	58.7	
	291		11	54	5	108	-		35	5	-	24.6	60.0	
	248		12	22	8		5		34	40	4	25.5	62.2	
	298		12	41	6		10		34	15	9	28.1	57.5	
	238		13	6	4		15		33	52	8	26.0	59.2	
	261		13	31	5		20		33	26	8	25.4	58.3	
	223		13	54	8		25		33	07	4	24.4	56.2	
	554 224		14	20	2		30		12	32	36	0		63.2
			10	11	53.9									
			10	18	46	-	100	20	12	35	04	8.5		
21.4		19	7	4		25		28	15	-0	25	61.0		
281			35	5		30		27	50	-0	23.3	57.4		
322		20	7	7		35		27	10	7	23.7	52.2		
273			35	-		40		26	53	0	24.8	60.7		
248			50	8		45		12	26	28	2		63.2	
299		21	29	7		50								
207			50	4		55								
306		22	21		110	-								

49. 46.6

Not reported

Wind + Sun

ASTRONOMICAL OBSERVATIONS.—No. 3.

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Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp #2 Rose Valley Date September 8th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h	m	s	sec	1st	2nd	3rd	
Sun's upper limb at Meridian	11	13	58	-	115.	35	40.	CMA Page 20
		14	36	8		36	45	
		15	51	4		38		
		16	17	8			30	
			45	4		39		
		17	13	2			30	
			44	1		40	30	
		18	34	2		41	30	
		19	29	8		41	30	
		20	10	9		42		
			48	-			30	
		21	18	-		43		
		22	30	6		43	40	
		24	27	2		43	25.	
		25	34	9		43		
		26	48	5		42		
	27	35	2		41			
	29	8	8		40			
	30	3	8		39			
		34	-		38			
	31	14	5		37			
	32	5	5		36			

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regas

Station Camp 14 Mead on Valley Date Sept 15th 1869

Sun's upper limb

Equal altitudes Page 76

Sun

Equal altitudes Page 77

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.	REMARKS.			
	h	m	s	sec		h	m	s	sec
Sun's upper limb	11.5	9	15	6	93	20	out good		
	115		15	17		25			
	158		15	20		30			
	157		15	46		35			
	193		16	2		40			
	182		16	21		45			
	165		16	38		50			
	184		16	54		55			
	15.1		17	12		—			
	164		17	22		5			
	168		17	44		10			
	196		18	1		15			
	15.8		18	20		20			
	162		18	36		25			
		18	52	30					
		9	17	11.48					
Sun	18.4	9	32	17	97	20	1 29 39.55 = 51.03 = 26.52		
	181		32	35		25	1 14 35 9 16.6 52.7		
	173		32	54		30	14 18 6 18.9 54.5		
	185		33	12		35	13 59 7 15.2 53.7		
	167		33	30		40	13 43 0 20.0 56.5		
	193		33	44		45	13 24 0 18.4 55.0		
	182		34	6		50	13. 5 8 17.2 53.3		
	1813		34	25		55	* 12 47 6 18.2 55.4		
	171		34	43		55	12 59 4 20.6 55.4		
	189		35	—		5	12 8 8 20.3 53.1		
	185		35	19		10	11 50 5 17.6 49.9		
	197		35	37		15	11 31 9 18.7 51.0		
	1908		35	57		20	11 13 2 20.2 51.0		
	18.33		9	34		06.74	98	1 10 54 5 50.5	
						1 12 46 39.9	53.23 = 26.61		

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus.*

Station *Camp #14 Mission Valley* Date *Sept 10th 1869* *Feller*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.				
<i>Sun's upper limb</i>	9	22	46	6	94	40	xx	1	23	58	6	32.9
	9	23	26	8	94	50	xx	1	23	25	7	34.6
	9	24	10	1	95	00	xx	1	22	51	9	34.0
	9	24	52	8	95	10	xx	1	22	17	1	33.7
	9	25	42	1	95	20	xx	1	21	43	4	38.3
	9	26	10	2	95	30	xx	1	21	05	1	35.2
	9	26	40	0	95	40	xx	1	20	29	9	30.5
	9	27	18	2	95	50	xx	1	19	59	4	42.8
	9	27	59	5	96	00	xx	1	19	16	6	76.2
<i>Sun's upper limb</i>	9	40	30	1	99	50	xx	1	05	18	7	38.3
	9	42	18	9	100	xx	xx	1	04	40	4	32.4
	9	42	52	1	100	10	xx	1	03	38	0	114.6
	9	44	10	9	100	30	xx	1	02	43	4	42.4
	9	44	58	8	100	40	xx	1	02	01	0	36.1
	9	45	28	1	100	50	xx	1	01	24	9	38.3
	9	46	07	2	101	00	xx	1	00	46	6	39.2
	9	46	43	8	101	10	xx	1	00	07	4	
	9	47	xx	xx	101	20	xx	xx	1	00	07	4

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp 10 Meadow Valley Date Sept 10th 1869

18-8
7-3

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
	h	m	s	sec	1st	2nd	1st	2nd	3rd	4th			
Sun's upper limb	9	49	27	-	101	50	57	29	9	19.3	56.0		
		49	45	8		55	57	8	8	7.12	54.6		
		50	8	4	102	-	56	47	6	2.12	54.0		
		50	27	-		5	56	26	4	2.13	53.4		
		50	47	5		10	50	6	1	18.9	53.6	a little	
		51	9	3		15	55	46	2	26.4	53.5		
		51	30	4		20	* 55	25	8	18.2	57.2	windy	
		51	50	4		25	55	7	6	21.7	58.0		
		52	11	3		30	54	45	9	23.6	57.2	P.M.	
		52	30	8		35	54	22	9	20.5	53.7		
		52	52	5		40	54	-2	4	19.9	54.9		
		53	14	.		45	53	42	5	21.7	56.5		
83		53	35	3		50	12	53	20	8	56.6	08.2	
		9	51	29	89		12	55	25	54			
Sun		9	57	48	-	103	12	40	6	8	21.8	54.8	quite windy.
		58	10	8		55	48	45	-	-	22.2	55.8	
		58	31	5	104	-	48	28	8	21.3	54.3	P.M.	
		58	51	6		5	48	1	5	23.1	53.1		
		59	74	2		10	47	38	4	21.8	52.6		
		59	36	5		15	47	16	6	23.3	53.1	Equal altitudes	
		59	58	.		20	46	54	-	21.2	52	Page 79	
		10	00	18	8	25	40	32	8		57.6		
			48	20		30							
		01	5	3		35	45	48	5	20.5	53.8		
		01	27	-		40	45	28	-	22.9	55		
		01	48	5		45	45	-5.2			54.2		
		02	12	4		50	45	-5.2		22.7	54.8		
24.4		9	59	55	22		12	44	42	4			
							12	46	58	49			

ASTRONOMICAL OBSERVATIONS.—No. 3.

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Sextant No. 8. and artificial horizon of Mercury

Sid'l Chronometer No. 1285 by Nequs

Station Camp 10 Meadow Valley Date Sep^r 10th 1869.

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS:
	h	m	s	sec	h	m	s	
Sun's upper limb at meridian	11	22	23	5	114	31	20	C.M. 1 Page 21
		23	43	2		32	-	
		25	27	8		31	10	
		26	4	5		30	10	
		27	1	4		29	50	
		27	47	8		29	-	
		28	51	3		28	-	
		30	24	8		27	-	
Polaris.	9	48	50	-	77	17	-	9 51 04 01 = 77° - 19' - XX
	38.8	49	26	8			30	
	30.5	49	58	3		18	-	9 57 10 76 = 77° - 23' - XX
	28.7	50	29	-			30	
	30.3	50	03	3 *		19	-	
	31.9	* 51	34	2 *			30 *	
	37.2	52	-7	4		20	-	
	37.4	52	44	8			30	
	42.6	53	22	4		21	-	
	45.4	54	12	8			30	
	68.4	55	7.6	2		22	-	
	52.4	56	13	6			30	
	52.0	57	10	6 *		23	-	
	59.2	58	4	8		23	30	
	72.9	59	07	7		24	-	
61.9	10	00	6			30		
49.8	01	9	4		25	-		

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *f*

and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus.

Station *Camp 12 Crown Valley* Date *September 12th 1869.*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
	h	m	s	sec	1st	2nd	3rd		
<i>α Pegasi</i> (Markab)	31.4	8	28	11	6	100	14	50	
			20	43	-		50	30	
	44.2		30	27	2	101	-	-	
	41.3		31	8	5		17	30	
	37.		31	40	5	101	30		
	27.7		32	8	2		40		
	26.8		32	35	-		50		
	27.5		33	2	5	102		*	
	29.		33	31	5		10		
	27.3		33	58	8		20		
27.2		34	26	-		30			
	8	33	03	21	102	x x	x x		
<i>Polaris</i>		8	35	15	8	76	6	30	<i>Polaris</i>
	35.7		36	51	5		7		
	32.7		37	24	2			30	
	34.2		37	58	4		8	-	
	31.2		38	29	6			30	
	34.2		39	3	8		9	-	
	32.7		39	36	5			30	
	32.9		40	9	4		10	-	
	33.8		40	43	2			30	
	38.0		41	21	2		11	-	
<i>Polaris</i>		8	38	47	36	76	0.8	45	
		8	46	25	8	76	14	-	
	35.2		47	4	-			30	
	37.8	8	47	36	8		15		
	31.9		48	8	7			30	
	38.7		48	47	4		16		
	33.8		49	28	2	*		30	
	43.2		50	-	4		17	-	
	45.5		50	46	9			30	
	39.1		51	24	-		18		
	38.2		52	4	2			30	
	41.6		52	41	8		19	-	
	8	49	29	05	76	-	76	30	

Polaris
Par 44

Polaris
Par 45

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus*

Station *Camp 12 Clover Valley* Date *September 12th 1869*

Object Observed.	Time of Observation by Chronometer.			Observed Double Altitudes.			REMARKS.
	h	m	s	h	m	s	
<i>Altair</i>		<i>8</i>	<i>54</i>	<i>10</i>	<i>113</i>	<i>28</i>	<i>30</i>
	<i>41.3</i>		<i>54</i>	<i>51</i>	<i>3</i>	<i>20</i>	
	<i>40.2</i>		<i>55</i>	<i>31</i>	<i>5</i>	<i>10</i>	
	<i>23.0</i>		<i>55</i>	<i>54</i>	<i>5</i>	<i>5</i>	
	<i>22.1</i>		<i>56</i>	<i>16</i>	<i>6</i>	<i>113</i>	
	<i>20.4</i>		<i>56</i>	<i>37</i>		<i>55</i>	
	<i>22.4</i>		<i>58</i>	<i>59</i>	<i>4</i>	<i>50</i>	
	<i>20.8</i>	*	<i>57</i>	<i>20</i>	<i>2</i>	<i>43</i>	*
	<i>19.6</i>		<i>57</i>	<i>39</i>	<i>8</i>	<i>40</i>	
	<i>20.5</i>		<i>58</i>	<i>50</i>	<i>3</i>	<i>55</i>	
	<i>21.4</i>		<i>58</i>	<i>21</i>	<i>7</i>	<i>30</i>	
	<i>23.7</i>		<i>58</i>	<i>45</i>	<i>4</i>	<i>25</i>	
	<i>23.4</i>		<i>50</i>	<i>08</i>	<i>8</i>	<i>20</i>	
		<i>8</i>	<i>57</i>	<i>19</i>	<i>56</i>	<i>113</i>	<i>45</i>
<i>Camp 13 - Long Valley Cañon September 14th</i>							
<i>Polaris</i>		<i>9</i>	<i>18</i>	<i>52</i>	<i>2</i>	<i>76</i>	<i>10</i>
	<i>42.3</i>		<i>19</i>	<i>34</i>	<i>5</i>	<i>11</i>	
	<i>41.7</i>		<i>20</i>	<i>16</i>	<i>2</i>	<i>11</i>	<i>30</i>
	<i>38.2</i>		<i>20</i>	<i>49</i>	<i>4</i>	<i>12</i>	
	<i>41.2</i>		<i>21</i>	<i>20</i>	<i>6</i>	<i>12</i>	<i>30</i>
	<i>39.2</i>	*	<i>21</i>	<i>59</i>	<i>8</i>	<i>13</i>	
	<i>41.6</i>		<i>22</i>	<i>37</i>	<i>4</i>	<i>13</i>	<i>30</i>
	<i>39.3</i>		<i>23</i>	<i>10</i>	<i>7</i>	<i>14</i>	
	<i>39.2</i>		<i>23</i>	<i>49</i>	<i>9</i>	<i>14</i>	<i>30</i>
	<i>39.5</i>		<i>24</i>	<i>29</i>	<i>4</i>	<i>15</i>	
	<i>48.9</i>		<i>25</i>	<i>16</i>	<i>3</i>	<i>15</i>	<i>30</i>
	<i>40.2</i>		<i>26</i>	<i>03</i>	<i>5</i>	<i>16</i>	
	<i>49.3</i>		<i>26</i>	<i>52</i>	<i>8</i>	<i>16</i>	<i>30</i>
	<i>52.2</i>		<i>27</i>	<i>45</i>		<i>17</i>	
	<i>55.2</i>		<i>28</i>	<i>38</i>	<i>2</i>	<i>17</i>	<i>30</i>
	<i>53.1</i>		<i>29</i>	<i>28</i>	<i>3</i>	<i>18</i>	
	<i>45.9</i>	*	<i>30</i>	<i>19</i>	<i>2</i>	<i>18</i>	<i>30</i>
	<i>43.6</i>		<i>31</i>	<i>08</i>	<i>8</i>	<i>19</i>	
<i>41.4</i>		<i>31</i>	<i>49</i>	<i>2</i>	<i>19</i>	<i>30</i>	
<i>40.6</i>		<i>32</i>	<i>29</i>	<i>8</i>	<i>20</i>		

$1^{\text{st}} (11) = 9\ 22\ 00.94 = 76^{\circ}13'00''$
 $2^{\text{nd}} (9) = 9\ 29\ 23.09 = 76^{\circ}18'$
 avg 20 =

* *Ported*
Pop 47

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Nequs

Station Camp 15 Long Valley Cañon or Meadow Creek Date September 15th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.	REMARKS.							
	Hour	Min	Sec	Day		1	2	3	4				
Suns upper limb	221	9	16	58	8	91.	5	26	30	1	(98) ⁰	28.9	
	245		17	10	9		10	26	13	1	177	24.0	
	172		17	34	4		15	25	54	4	308	29.8	
	174		17	51	6		20	25	35	-6	15.7	27.2	
	178		18	00	-		25	25	10	.9	17.7	28.9	
	177		18	26	8		30	25	-2	2	17.6	29.0	
	177		18	44	5	*	35	24	44	-6	17.2	29.1	
	198		19	02	2		40	24	27	4	85	29.6	
	14.9		19	35	9		45	23	52	4	18.9	28.3	
	20.1		19	55	-		50	23	33	5	18.1	28.5	
17		20	13	-		55	23	15	4	17.2	28.4		
32.7		19.5	20	31	5.	92	-	1	22	58	-2	29.7	30.9
		9	18	41	13			1	24	47.23			
		9	24	32	.5	93	10	18	55	5	17.9	28.6	
178		24	50	.3		15	18	38	2	17.8	28.5		
19.2		25	9	.5		20	18	20	4	18.2	28.9		
17.7		25	27	.2		25	18	-2	2	19.7	29.4		
17.6		25	45	3		30	17	42	-5	18.0	27.8		
18.8		26	3	6	*	35	*	17	25	.0	17.2	28.1	
18.2		26	21	8		40.		17	-7	3	18.2	29.1	
18.1		26	30	9		45.		16	49	1	19.1	29.0	
20.3		26	59	2		50		16	30	-	15.8	29.2	
14.3		27	15	5		55.		16	14	2	19.1	29.7	
01.7		19.7	27	34	2	94	-	1	15	55	4	29.6	58.1
			27	57			5						
			28	10	.5		10	!	17	25	45		
		9	26	53	55								

Equal Altitude Page 81

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 12 by

Station Camp 13 Meadow Creek Date Sept 15th 1889

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.			
Sun's upper limb	18.9	9 31	49	1	95	10	11 39	0	20.2	28.1
			2			15	11 20	-	17.2	28.0
	18.2	32	26	2		20	11 -	8	17.3	27.0
	17.4	32	43	6		25	10 43	5	22.1	27.1
	18.4	33	3	-		30	10 21	4	17.5	23.4
21.4	33	23	4	35	10 4	1	16.9	27.5		
Equal Altitude Page 82	19.4	33	42	3	90	40	* 9 47	2	17.4	29.5
	16.8	33	59	6		45	9 20	8	19.0	29.4
	18.6	34	18	2		50	9 10	2	19.2	29.0
	19.1	34	37	5		55	8 57	6	19.7	28.9
	19.1	34	56	4		-	8 31	9	18.6	28.3
	18.6	35	15	-		5	-8 13	3	17.1	28.3
	3-447 18.8	35	33	8		10	1 -7 56	2		29.0
	9 33	41.25				1 09	46.82			
		9 36	50	2	96	30	6 30	-	18.8	29.2
	27.5		2	7		35	6 20	2	18.9	28.9
	19.7	37	28	4		40	6 -	3	18.8	29.7
	18.9	37	47	3		45	5 42	5	19.3	29.8
	18.3	38	-5	6		50	5 23	2	16.7	28.8
	18.8	38	24	4		55	5 -6	5	22.5	30.9
	21.0	38	45	4		-	* 4 44	-	20.4	29.4
	18.4	39	-3	8		5	4 23	6	18.1	27.4
	19.4	39	23	2		10	4 -5	5	19.2	28.7
	17.7	39	40	9		15	3 47	8	17.1	27.2
	21.2	40	-2	1		20	3 20	2	18.9	31.3
	19.1	40	21	2		25	3 9	3	21.3	31.5
3-594 19.4	40	40	6	30	1 02	49	-	29.6	50.	
Equal Altitude Page 83	9 38	44.75				1 04	44.66			

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Negus

Station Camp 13 Meadow Creek Date Sept 15th 1869

Object Observed.	Time of Observation by Chronometer:				Observed Double Altitudes.		REMARKS.	
Sun's upper limb at Meridian	11	12	15	4	111	32	30	
			13	6		34	-	
			14	5		35	-	
			15	4		36	-	
			16	4		37	-	
			17	5		38	-	
			18	5		39	-	
			20	5		39	20	
			21	8		39	55	
			22	5		39	35	
			23	-		39	-	
			24	8		38	-	
			25	-		37	30	
			26	8		37	-	
			28	5		36	-	
			53		35	-		
		29	4		34	-		
		30	4		33	-		

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Page 27

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *S* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Megus*

Station *Camp 22 West Point* Date *Sept 23rd*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
<i>Polaris</i>		<i>7</i>	<i>58</i>	<i>58</i>	<i>9</i>	<i>74</i>	<i>26</i>	<i>10</i>	<i>Polaris Page 50</i>
		<i>7</i>	<i>59</i>	<i>49</i>	<i>0</i>		<i>27</i>	<i>30</i>	
		<i>8</i>	<i>00</i>	<i>36</i>	<i>6</i>		<i>27</i>	<i>55</i>	
		<i>8</i>	<i>1</i>	<i>23</i>	<i>0</i>		<i>28</i>	<i>50</i>	
	<i>5</i>	<i>8</i>	<i>2</i>	<i>03</i>	<i>4</i>		<i>29</i>	<i>30</i>	
		<i>8</i>	<i>2</i>	<i>43</i>	<i>1</i>		<i>29</i>	<i>55</i>	
		<i>8</i>	<i>3</i>	<i>19</i>	<i>3</i>		<i>30</i>	<i>15</i>	
		<i>8</i>	<i>4</i>	<i>04</i>	<i>9</i>		<i>30</i>	<i>45</i>	
		<i>8</i>	<i>4</i>	<i>37</i>	<i>0</i>		<i>31</i>	<i>20</i>	
	<i>10</i>	<i>8</i>	<i>5</i>	<i>18</i>	<i>8</i>		<i>32</i>	<i>00</i>	
	<i>8</i>	<i>5</i>	<i>57</i>	<i>1</i>		<i>32</i>	<i>30</i>		
<i>Polaris</i>		<i>8</i>	<i>02</i>	<i>37</i>	<i>05</i>	<i>74</i>	<i>29</i>	<i>41.82</i>	<i>Polaris Page 48</i>
		<i>8</i>	<i>15</i>	<i>09</i>	<i>0</i>	<i>74</i>	<i>38</i>	<i>00</i>	
	<i>23.1</i>	<i>8</i>	<i>15</i>	<i>58</i>	<i>1</i>		<i>38</i>	<i>30</i>	
	<i>28.1</i>	<i>8</i>	<i>16</i>	<i>9</i>	<i>2</i>		<i>39</i>	<i>00</i>	
	<i>26.0</i>	<i>8</i>	<i>16</i>	<i>38</i>	<i>2</i>		<i>39</i>	<i>30</i>	
	<i>5</i>	<i>8</i>	<i>17</i>	<i>13</i>	<i>0</i>		<i>40</i>	<i>00</i>	
	<i>*</i>	<i>8</i>	<i>17</i>	<i>50</i>	<i>7</i>	<i>++</i>	<i>40</i>	<i>30</i>	
	<i>51.1</i>	<i>8</i>	<i>18</i>	<i>28</i>	<i>8</i>	<i>*</i>	<i>41</i>	<i>00</i>	
	<i>41.7</i>	<i>8</i>	<i>19</i>	<i>09</i>	<i>5</i>		<i>41</i>	<i>30</i>	
	<i>31.3</i>	<i>8</i>	<i>19</i>	<i>44</i>	<i>8</i>		<i>42</i>	<i>00</i>	
	<i>33.2</i>	<i>8</i>	<i>20</i>	<i>29</i>	<i>0</i>		<i>42</i>	<i>30</i>	
	<i>11</i>	<i>8</i>	<i>20</i>	<i>56</i>	<i>3</i>		<i>43</i>	<i>00</i>	
<i>Menz of 11 =</i>	<i>8</i>	<i>17</i>	<i>55</i>	<i>41</i>	<i>74</i>	<i>40</i>	<i>30</i>	<i>Polaris Page 48</i>	
<i>" of 7 =</i>	<i>8</i>	<i>19</i>	<i>05</i>	<i>73</i>	<i>74</i>	<i>41</i>	<i>30</i>	<i>" " 49</i>	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *f* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by

Station *Camp 22 West Point* Date *Sept 24th 1869*

*Lines upper
Lower by
Equal altitudes
Page 96.*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
	8 55 42 0	80 40	1 - 42 15.9 164 57.9
	15 55 57 0	45	1 - 41 - 59.5 168 56.5
	157 56 12 3	50	1 - 41 42.7 152 57.4
	159 56 28 6		1 - 41 27.5 170 56.1
	176 56 46 2		1 - 41 - 10.5 170 56.7
	163 57 2 5		1 - 40 - 53.5 171 56.0
	163 57 18 8*		* 1 - 40 - 37.9 152 55.2
	167 57 35 5		1 - 40 - 21.2 167 56.8
	165 57 52 0		1 - 40 9.5 158 56.5
	159 58 07 9		1 - 39 48.7 167 56.6
	171 58 25 0		1 - 39 32.0 149 57.0
	154 58 40 4		1 - 39 17.1 171 57.5
	168 58 57 2	84 40	1 - 39 00.0 172 57.2
	8 57 18 91		1 40 37 75 3-15.9
<i>Drto</i>	9 7 23 0	84 10	
171	9 7 40 1	75	
189	9 7 58 0	20	1 30 37.0 170 58.0
152	9 8 15 2	25	1 30 20.0 179 60.1
193	9 8 32 5*	30	1 30 02.1 171 61.1
145	9 8 50 0	35	1 29 45.0 172 59.2
181	9 9 07 1	40	1* 29 127.8 171 61.3
184	9 9 24 5	45	1 29 10.7 173 58.7
167	9 9 41 2	84 50	1 28 54.4 159 59.5
			1 28 37.5 176 62.0
	9 10 32 40		X 1 28 19.9 61.1
	9 10 32 5		
	9 10 50 1	85 10	1 29 28.27 2-17.1

3-15.2

138.27
17.27

*Equal altitudes
Page 97*

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus*.

Station *Camp 22 West Point* Date *Sept 24th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.	
	h	m	s	sec	h	m	sec		
<i>Polaris</i>		7	7	55	5	73	5-2	00	<i>Polaris</i> <i>Page 52</i>
	28.3	7	8	29	8	73	5-2	30	
	34.5	7	8	58	3	73	5-3	00	
	30.8	7	9	29	1	73	5-3	30	
	5 29.4	7	10	00	5	73	5-4	00	
	27.5	*7	10	31	0*	73	5-4	30*	
	X 30.5	7	11	1	5	73	5-5	00	
	25.0	7	11	30	5	73	5-5	30	
	-X 35.0	7	12	1	5	73	5-6	00	
	10 35.5	7	12	37	0	73	5-6	30	
5-173 35.5	7	13	12	8	73	5-7	00		
	7	10	31	04	73	5-4	30		
<i>Polaris</i>	7	7	47	38	5	74	20	00	<i>Polaris</i> <i>Page 53</i>
	29.0	7	48	7	5	74	20	30	
	28.1	7	48	35	6	74	21	00	
	33.6	7	49	9	2	74	21	30	
	5 35.8	7	49	45	0	74	22	00	
	32.5	*7	50	32	5	*74	22	30	
	41.3	7	51	8	8	74	23	00	
	40.8	7	51	49	6	74	23	30	
	37.43	7	52	22	6	74	24	00	
	6-14.3 45.4	7	53	8	0	74	24	30	
11 44.8	7	53	32	8	74	25	00		
	7	50	32	74	74	22	30		

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Nexas*

Station *Camp 2² West Point* Date *Sept 25 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
	8	47	13	5	77	30	1	49	59	5	145	153	
<i>13.3</i>		<i>47</i>	<i>29</i>	<i>8</i>				<i>1</i>	<i>49</i>	<i>45</i>	<i>0</i>	<i>162</i>	<i>141</i>
<i>15.9</i>		<i>47</i>	<i>43</i>	<i>3</i>				<i>1</i>	<i>49</i>	<i>28</i>	<i>8</i>	<i>168</i>	<i>138</i>
<i>16.5</i>		<i>48</i>	<i>1</i>	<i>5</i>				<i>1</i>	<i>49</i>	<i>12</i>	<i>0</i>	<i>161</i>	<i>135</i>
<i>16.0</i>		<i>48</i>	<i>17</i>	<i>5</i>				<i>1</i>	<i>48</i>	<i>53</i>	<i>9</i>	<i>160</i>	<i>134</i>
<i>15.5</i>		<i>48</i>	<i>33</i>	<i>0</i>				<i>1</i>	<i>48</i>	<i>39</i>	<i>9</i>	<i>172</i>	<i>129</i>
<i>16.8</i>		<i>48</i>	<i>49</i>	<i>8</i>			<i>*</i>	<i>1</i>	<i>48</i>	<i>23</i>	<i>7</i>	<i>152</i>	<i>125</i>
<i>15.2</i>		<i>49</i>	<i>5</i>	<i>0</i>				<i>1</i>	<i>48</i>	<i>8</i>	<i>3</i>	<i>144</i>	<i>125</i>
<i>17.9</i>		<i>49</i>	<i>22</i>	<i>9</i>				<i>1</i>	<i>47</i>	<i>53</i>	<i>0</i>	<i>171</i>	<i>160</i>
<i>13.8</i>		<i>49</i>	<i>37</i>	<i>7</i>				<i>1</i>	<i>47</i>	<i>36</i>	<i>0</i>	<i>171</i>	<i>127</i>
<i>16.7</i>		<i>49</i>	<i>53</i>	<i>4</i>				<i>1</i>	<i>47</i>	<i>19</i>	<i>9</i>	<i>139</i>	<i>123</i>
<i>16.6</i>		<i>50</i>	<i>10</i>	<i>0</i>				<i>1</i>	<i>47</i>	<i>5</i>	<i>0</i>	<i>165</i>	<i>150</i>
<i>16.5</i>		<i>50</i>	<i>26</i>	<i>5</i>	<i>78</i>	<i>30</i>		<i>1</i>	<i>46</i>	<i>48</i>	<i>5</i>		<i>150</i>
	<i>8</i>	<i>48</i>	<i>49</i>	<i>73</i>				<i>1</i>	<i>48</i>	<i>24</i>	<i>27</i>		<i>=14</i>
	<i>8</i>	<i>58</i>	<i>4</i>	<i>4</i>	<i>80</i>	<i>50</i>		<i>1</i>	<i>39</i>	<i>9</i>	<i>5</i>	<i>160</i>	<i>139</i>
<i>16.3</i>		<i>58</i>	<i>20</i>	<i>7</i>				<i>1</i>	<i>38</i>	<i>58</i>	<i>5</i>	<i>165</i>	<i>142</i>
<i>16.4x</i>		<i>58</i>	<i>37</i>	<i>1</i>				<i>1</i>	<i>38</i>	<i>37</i>	<i>0</i>	<i>160</i>	<i>131</i>
<i>16.4</i>		<i>58</i>	<i>53</i>	<i>0</i>				<i>1</i>	<i>38</i>	<i>21</i>	<i>0</i>	<i>173</i>	<i>135</i>
<i>17</i>		<i>59</i>	<i>09</i>	<i>5</i>				<i>1</i>	<i>38</i>	<i>4</i>	<i>2</i>	<i>152</i>	<i>132</i>
<i>15.5</i>		<i>59</i>	<i>26</i>	<i>0</i>				<i>1</i>	<i>37</i>	<i>48</i>	<i>5</i>	<i>167</i>	<i>136</i>
<i>17</i>		<i>59</i>	<i>42</i>	<i>0</i>	<i>*</i>		<i>*</i>	<i>1</i>	<i>37</i>	<i>31</i>	<i>8</i>	<i>162</i>	<i>138</i>
<i>16.7</i>		<i>59</i>	<i>58</i>	<i>7</i>				<i>1</i>	<i>37</i>	<i>13</i>	<i>3</i>	<i>179</i>	<i>143</i>
<i>16.8</i>	<i>9</i>	<i>50</i>	<i>15</i>	<i>5</i>				<i>1</i>	<i>36</i>	<i>57</i>	<i>8</i>	<i>162</i>	<i>132</i>
<i>16.5</i>		<i>50</i>	<i>32</i>	<i>0</i>				<i>1</i>	<i>36</i>	<i>41</i>	<i>5</i>	<i>170</i>	<i>135</i>
<i>16.5</i>		<i>50</i>	<i>48</i>	<i>5</i>				<i>1</i>	<i>36</i>	<i>24</i>	<i>5</i>	<i>162</i>	<i>130</i>
<i>18.3</i>		<i>50</i>	<i>6</i>	<i>3</i>				<i>1</i>	<i>36</i>	<i>8</i>	<i>3</i>	<i>188</i>	<i>151</i>
<i>15.8</i>		<i>01</i>	<i>23</i>	<i>6</i>	<i>81</i>	<i>50</i>		<i>1</i>	<i>35</i>	<i>50</i>	<i>0</i>		<i>131</i>
	<i>8</i>	<i>59</i>	<i>42</i>	<i>87</i>				<i>1</i>	<i>37</i>	<i>31</i>	<i>04</i>		

Sun's upper limb
Equal altitudes Page 98

sun

Equal altitudes Page 99

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *S* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus*

Station *Camp 22 West Point* Date *Sept 25th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
	9	9	22	0	89	10	1	27	52	6	16.6	14.1	
<i>Sun's</i>	16	9	39	3			1	27	35	5	17.5	13.5	
<i>upper</i>	17	9	57	0			1	27	18	0	18.5	13.0	
<i>limb</i>	174	10	12	4			1	27	09	5	16.5	10.9	
<i>Equal Altitudes Page 100</i>	174	10	30	9			1	26	43	8	16.6	13.3	
	176	10	48	1			1	26	26	4	18.6	13.5	
	174	11	05	5*			1	26	8	8	17.1	13.3	
	172	11	22	8			1	25	50	2	17.2	12.4	
	183	11	40	3			1	25	33	5	17.9	13.5	
	181	11	58	1			1	25	15	6	18.6	13.7	
	192	12	17	0			1	24	57	0	17.9	14.3	
	195	12	34	8			1	24	89	1	17.3	13.9	
<i>30.5</i>	197	9	12	62	5	85	10	1	24	21	8	14.3	
		9	11	06	36			1	26	08	04		
<i>Sun's</i>		9	20	02	5	87	10	1	17	12	5	19.1	15.0
<i>upper</i>	185		20	21	0			16	53	4	19.7	14.4	
<i>limb</i>	18		20	40	8	20		16	34	9	18.0	12.7	
<i>Equal Altitudes Page 101</i>	20		20	58	0			16	15	2	17.9	14	
	172		21	16	2	30		15	57	8	18.5	14.0	
	189		21	35	1			15	39	8	18.1	14.4	
	184		21	53	5	40		15	22	0	17.7	14.7	
	183		22	11	8			15	03	5	18.0	15.3	
	189		22	30	7	50		14	45	5	19.4	16.2	
	203		22	49	6			14	26	1	19.1	13.1	
	166		23	9	8	85		1	14	07	0	19.0	14.6
	184		23	27	0			1	13	48	0	18.4	14
<i>16</i>	204	9	23	46	4	88	10	1	13	28	6	15.0	
<i>43.6</i>		9	21	53	95			1	25	21	32		

30.3

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. _____ and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Weyns*

Station *Camp 22 West Point* Date *Sept 25th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h	m	s	sec	1	2	3	
<i>Cm a</i> <i>Sun's upper limb at Meridian</i>	11	12	06	6	105	01	55	<i>C.M.A</i> <u>Page 23</u> <u>Ported</u>
	11	13	17	8	105	02	50	
	11	14	53	8		4	50	
	11	15	29	0		4	30	
	11	16	39	0		4	48	
	11	17	45	5		4	55	
	11	18	38	0		5	50	
	11	19	39	0		4	55	
	11	20	17	4		4	45	
	11	21	0	1		4	30	
	11	21	35	5		4	50	
	11	22	7	9		3	30	
	11	22	47	8		3	50	
	11	23	19	6		2	30	
	11	24	2	0		2	50	
11	24	30	5		1	30		
11	25	6	0		1	50		
11	25	33	2		0	30		
11	25	58	5	105	0	0		
<i>Polaris</i>	7	15	11		74	50	50	<i>Polaris</i> <u>Page 54</u>
	22.5	7	15	33	5	50	30	
	37.2	7	16	10	7	01	50	
	38.8	7	16	49	5	01	30	
	38.5	7	17	28	0	02	50	
	26.	*7	17	54	0	02	30	
	32.2	7	18	26	2	03	50	
	25.9	7	18	52	1	03	30	
	41.5	7	19	33	7	04	50	
	36.1	7	20	09	8	04	30	
	43.2	7	20	53	0	05	50	
	7	14	54	58	74	02	30	

Cm a

Sun's upper limb at Meridian

Polaris

34.20
5-42

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regas

Station Camp 22 West Point Date Sept 25 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h	m	s	sec	h	m	s	
Polaris		7	35	53	77	15	00	Polaris Page 55
	5 1.1	7	36	24 1		00	30	
	43.4	7	37	7 5		16	00	
	33	7	37	40 5		16	30	
	5 39.6	7	38	18 1		17	00	
	481 *	7	39	6 2 *		17	30	
	431	7	39	49 3		18	00	
	47.5	7	40	96 8		18	30	
	40.49 46.6	7	41	23 4		19	00	
	29.5	7	41	32 9		29	30	
	6-44 9 11 45	7	42	37 9		20	00	
		7	39	09 97	74	17	30	
Lun's Upper limb at meridian	11	14	14 5	104	17	30	C.M. a Page 24 Porto	
	11	15	04 1		18	10		
	11	16	24 5	x	19	00		
	11	17	25 4		18	30		
	11	18	03 2		18	35		
	11	19	05 7		18	25		
	11	19	3 21		18	15		
	11	20	29 5		18	00		
	11	20	44 5		17	30		
	11	21	08 1		17	00		
11	21	37 5		16	30			
11	22	01 6	104	16	00			

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Camp No 23 near St Thomas Station

Date Sept 29th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
	9	15	26	1	83								
							25	55	3	16.3	21.4		
	17.7	15	43	8			25	39	0	17.8	22.8		
	18.1	16	1	9			25	21	2	18.1	23.1		
	16.4	16	18	3			25	3	1	19.6	21.4		
	20.1	16	38	4			24	43	5	17.1	21.9		
	17.1	16	55	5			27	26	4	18.9	21.9		
	18.1	17	13	6			24	7	5	18.5	21.1		
	18.9	17	32	5			29	00	0	19.5	22.5		
	19.5	17	52	0			23	37	5	19.8	24.5		
	15.5	18	7	5			23	14	7	15.2	22.2		
	18.5	18	26	0	50		1	22	56	5	23.5		
		9	16	55	96			1	24	26	34		
		9	42	38	90				58	39	5	23.0	17.5
	21.5		42	59	5				58	16	5	22.1	16.0
	21.0		42	20	5				57	54	4	18.9	14.9
	20.5		43	41	0				57	35	5	22.1	16.5
	21.5		49	2	5				57	18	4	20.2	15.9
	21.0		49	23	5				56	53	2	20.8	16.7
	23.5	9	49	47	0			12	56	53	4	20.1	20.4
	20		48	7	0				56	13	3	19.9	20.3
	24		45	31	0				55	52	4	19.9	23.4
	22.4		45	53	4				55	27	5	22.4	20.9
	22.7		46	10	1				53	5	1	20.0	21.1
	20.4		46	36	5				52	45	1	22.6	21.6
	24.9		47	1	4	91			12	54	20	5	23.9
		9	45	53	20				12	55	28	19	

Luna's upper limit
G.A. pag 102
2-59.9 11

Luna's upper limit

4-23.4

G.A. pag 103

4-17

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp 23 near St Thomas Date Sept 29th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
		9	5-2	14	5	92	10	12	49	41	2	21.7	18.7
Sun's	23.1		5-2	37	6		15		48	42	5	22.5	20.1
	23.9		5-3	1	5		20		48	29	0	24.7	21.5
upper	21.5		5-3	23	0		25		47	52	3	25.2	28.3
limb	23.3		5-3	46	3		30		47	30	1	22.6	26.4
	24.6		5-4	10	9		35		47	7	5	23.7	18.4
	23.6		5-4	37	5		40		46	45	8	19.5	18.0
E A	22.5		5-4	57	0		45		46	23	3	25.8	17.3
page 104	24.0		5-5	20	0		50		45	37	5	22.8	18.5
	23.0		5-5	44	0		55		45	34	7	25.6	18.7
	24.1		5-6	8	0	93			45	19	1	22.7	17.2
	25.4		5-6	33	5		5		44	46	4	23.3	15.9
4-44.	29.0		5-6	57	5	93	10	12	44	28	1	22.6	4-40.1
		9	5-4	34	56			12	46	44	42		
		10	1	1	9	94			40	18	1	26.1	15.0
Sun's	24.6		1	26	5		05		39	47	0	25.1	13.5
	26.6		1	53	1		10		39	22	1	23.5	15.2
upper	25.2		2	18	3		15		38	58	6	27.1	16.9
limb	25.9		2	44	2		20		38	31	5	23.1	15.7
	23.3		3	8	3		25		38	8	4	27.4	15.9
	27.2		3	34	7		30		37	41	0	26.5	15.7
	26.3		4	1	0		35		37	14	5	24.9	15.5
	24.4		4	25	4		40		36	99	6	26.8	15.0
	25.8		4	51	2		45		36	22	8	25.8	14.0
	27.8		5	19	0		50		35	57	0	23.5	16.0
	26.5		5	45	5		55		35	33	5	24.8	19.0
5-08.2	24.6		6	10	1	95	XX	12	35	8	7	18.8	5-04.4

Not to be noted

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regis

Station Camp 23 near St Thomas Date Sept 29th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
	h	m	s	sec	h	m	h	m	sec	sec			
	10	9	2	2	95	30		32	29	1	24.7	25.3	
Sun	203	9	22	5				31	58	4	28.8	20.9	
	275	9	50	0				31	29	6	25.4	19.6	
Upper limb	253	10	16	3				31	4	2	27.8	19.5	
	312	10	44	5				30	36	4	27.9	22.9	
	262	11	12	7				30	8	5	27.0	21.2	
	243	11	39	0				29	49	5	30.8	28.5	
	309	12	5	9				29	16	7	27.7	18.6	
	281	12	30	0				28	43	0	29.8	19.0	
	291	13	5	6				28	13	2	30.1	18.3	
	283	13	33	4				12	27	43	1	27.9	16.5
	321	14	5	5				12	27	15	2	27.1	20.7
	262	14	31	7	96	30		12	26	48	1	19.8	
		10	11	41	14			12	29	38	43		

morning
Sun
Upper limb
5-
E.A.
part 105.
10

5-29.5
5-09.2

5-10.3
5-35.0

Sun
Upper limb
at Meridian

	11	19	30	5	102	21	95
	11	21	42	2	102	21	50
	23	24	4		102	21	xx
	24	04	5		20	58	
	24	33	0		20	35	
	25	14	4		20	xx	
	25	53	5		19	46	
	26	17	2		19	25	
	26	36	1		19	x	
	27	05	0		18	45	
	27	23	5		18	25	
	27	51	8		18	-	
	28	14	5		17	15	
	28	35	-		16	50	
	28	59	2		16	20	
	29	21	8		15	40	
	29	51	0		14	40	
	30	12	1		14	10	
	30	33	5		14		

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ASTRONOMICAL OBSERVATIONS.—No. 3.

121

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1203* by *Weyss Delt 30th*

Station *Camp 25. Mouth of River* Date *Sept 25 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.		
	h	m	s	sec	h	m	s			
<i>Polaris</i>	7	3	58	1	73	1	15	<i>Polaris</i> <i>Page 56</i>		
	60.3	7	4	58	4	73	2		00	
	49.5	7	5	37	9	73	2		30	
	42.9	7	6	20	8	73	3		00	
	5	44.7	7	7	5	5	73		3	30
	42.9	7	7	48	4	73	4		00	
	51.7	7	8	30	1	73	4		30	
	39.4	7	9	9	5	73	5		00	
	44.9	7	9	54	4	73	5		30	
	10	41.1	7	10	35	5	73		6	00
	11		7	7	46	72	73		6	30
<i>Polaris -</i>		7	7	46	72	73	04	00	<i>Polaris</i> <i>Page 57</i>	
		7	22	7	1	73	13	30		
	46.2	7	22	53	3	73	14	00		
	33.9	7	23	29	2		14	30		
	34.8	7	24	4			15	00		
	5	38.5	7	24	42	5		15		30
	46.2	7	25	28	7		16	00		
	51.3	7	26	20	0		16	30		
	42.0	7	27	2	0		17	00		
	9	40.0	7	27	42	0		17		30
26.3	7	28	18	3		18	00			
	7	25	33	56	73	16	00			

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regis

Station Camp 25 Col River Date Sept 20 1869
 Month of Virgin

El Pegasus
(Markab)

El Pegasus
(Markab)

16.45

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.	
	h	m	s	sec	1st	2nd		
El Pegasus (Markab)	7	47	7	7	110	10	S A 42 Part	
	16.9	7	47	23	0	15		
	19.9	7	47	39	5	20		
	18.7	7	48	54	2	25		
	14.3	7	48	00	5	30		
	13.3	7	48	25	8	35		
	12.9	7	48	40	2	40		*
	13.1	7	48	55	3	45		
	12.7	7	49	8	5	50		
	13.9	7	49	23	4	55		
	14.9	7	49	38	8	114		
	15.2	7	49	53	5	5		
14.5	7	50	8	0	10			
El Pegasus (Markab)	7	48	42	81	110	40	S A Part 43.	
	7	48	48		114	10		
	19.5	59	04	5		15		
	15.2	59	19	7		20		
	19.3	59	35	0		25		
	14.2	59	50	2		30		
	12.1	8	00	06	3	35		
	13.2		00	21	5	40		
	14.6		00	36	7	45		*
	16.4		00	52	5	50		*
	15.0		1	07	7	55		
	15.5		1	23	0	115		50
16.5		1	38	5	5			
14.5		1	54	0	10			
13.1		2	08	7	15			
14.5		2	23	6	20			
	8	00	36	69	114	45		

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Neyns*

Station *Camp 25 Colorado River* Date *Sept 20 1869*
Month of origin

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.	
	h	m	s	0	100	30		
<i>(Altair)</i> <i>α Aquilae</i>	17.4	8	22	50	0	106	30	
	15.1	8	23	08	4		35	
	14.9	8	23	22	5		40	
	16.1	8	23	38	4		45	
	15.1	8	23	53	5		50	
	16.4	8	24	08	6		55	
	14.1	8	24	25	0	107	—	—
	15.9	8	24	40	1	107	05	
	14.8	8	24	55	5		90	
	15.9	8	26	10	0		15	<i>av = 15.55</i>
	15.1	8	26	26	4		20	
	15.1	8	25	41	5		25	
15.1	8	25	56	6		30		
<i>Months of the</i> <i>Min Kab</i> <i>α Pegasus</i>	195	8	24	24	27	107	00	<i>camp No 24</i> <i>Oct 2 1869</i>
	199	8	28	03	0	124	20	
	205		28	24	0		25	
	241		28	45	4		30	
	248		29	06	9	*	35	
	273		29	28	0		40	
			29	39	8		45	
			30	09	1	124	50	
<i>(Altair)</i> <i>α Aquilae</i>	31.4	8	29	05	3	124	35	<i>1861 = 21.01</i>
	259	8	46	27	0	98	00	
	29.9	8	46	56	4	97	50	
	263		47	24	9		40	
	296		47	53	2		30	
	298		48	20	5		20	*
	29.1		48	50	1		10	
	28.7		49	18	9	97	00	
			49	49	0	96	50	
			50	16	7		40	
						30		
	8	48	20	68	97°	20'		

Sextant. No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp 27 Col River Date Oct 2nd 1869
 Mouth of Negro Wash.

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.	
	h	m	s	sec	Alt	Dist		
Altair Aquilae	8	56	40	6	94	30	Single alt Page 47	
	28.7	8	57	09	3	20		
	25.4	8	57	36	7	10		
	26.1	8	58	04	8	94		50
	327	8	58	33	5*	93		50*
	269	8	59	00	4			40
	271	8	59	29	5			30
Polaris	31.6	8	59	58	1	20	Polaris Page 58.	
	26.6	9	00	25	7	10		
		8	58	33	29	93°		50' 00"
		9	12	29	5	74		27
	33.0	9	13	00	5			17 30
	34.2	9	13	42	7			18
	45.8	9	14	21	5			18 30
	38.0	9	15	07	5*			19
	38.5	9	15	39	6			19 30
	36.6	9	16	16	6			20
34.4	9	16	53	8		20 30		
40.6	9	17	30	6		21 50		
	9	14	59	97	74°	19' 00"	225.1 - 28.14 5 - 0.116 = 37.64	

ASTRONOMICAL OBSERVATIONS.—No. 3.

125

Mesquite Springs
No 30

Sextant No. 7 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Myng* by —

Station *El Dorado Canon* Date *Oct-6/69*
Camp 29- at mill

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.		
	h	m	s	sec	1	2	x			
<i>Polaris</i> 6-28.	9	25	22	7	73	46	00	<i>Polaris</i> <i>Page 60.</i>		
	1-14.9	9	26	34	6	78	46		30	
	59.6	9	27	42	2	73	47		00	
	1-11.5	9	28	44	7	73	47		30	
	1-04.7	9	29	53	4	73	48		00	
	50.6	9	30	50	0	73	48		30	
	1-02.8	9	31	50	8	73	49		00	
<i>Altair</i> <i>a aquilae</i>	9	28	42	63	73	47	30	<i>Single alt</i> <i>Page 48</i>		
	9	35	40	8	75	50	10' 00"			
	23.3	9	36	04	1	75	50		00"	
	22.4	9	36	26	5	74	50		00"	
	21.5	9	36	45	0	77	40		00"	
	24.8	9	37	12	8	74	30		00"	
	24.9	9	37	37	7	74	20		00"	
	30.3	9	38	08	0	74	10		00"	
	27.6	9	38	35	6	74	00		00"	
	9	28.2	9	39	03	8	73		50	00"
	29.8	9	39	33	6	73	40		00"	
11	29.4	9	40	02	0	73	30	00"		
<i>Altair</i> <i>a aquilae</i>	9	37	42	9	74	20	00	<i>Single alt</i> <i>Page 49</i>		
	9	41	55	5	72	40	00"			
	26.3	9	42	21	8	72	30		00"	
	30.7	9	42	52	5	72	20		00"	
	22.1	9	43	14	6	72	10		00"	
	22.5	9	43	37	1	72	00		00"	
	25.7	9	44	3	0	71	50		00"	
	24.1	9	44	27	1	71	40		00"	
	27.2	9	44	59	3	71	30		00"	
	9	25.7	9	45	20	0	71		20	00"
29.5	9	45	49	5	71	10	00"			
11	30.9	9	46	20	4	71	00	00"		
					70	5	00"			
		9	44	05	077	71	50	00"		

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Negus

Station Camp 29 Eldorado Cañon Date Oct 6th 1869
at mill.

Polaris

7

9

Camp 31

Sun

upper

limit

Equal alt
Pop 106
10

43.5

46.7

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.						
	9	47	25	5	73	53	50							
	409	9	48	6	4	73	54	00						
	56.5	9	49	0	9	73	54	20						
	53.6	9	49	56	5	73	54	40						
	51.3	9	50	47	8	73	55	00						
	44.3	9	51	33	1	73	55	30						
	50.9	9	52	24	0	73	55	40						
	54.5	9	53	18	5	73	55	00						
		9	50	44	17	73	55	00						
Lus Negus Oct-10 1869														
		9	15	51	6	75	00	00	1	36	12	5	18.1	04.1
	192	9	16	10	8				1	35	54	4	184	05.2
	178	9	16	28	6				1	35	36	0	192	04.6
	186	9	16	47	2				1	36	16	8	196	04.0
	185	9	17	5	7				1	34	57	20	197	02.9
	184	9	17	24	1				1	34	37	5	18.1	01.6
	191	9	17	43	2	75	-30	00	1	34	19	4	17.3	02.6
	187	9	18	1	9				1	34	21		18.9	04.0
	191	9	18	21	0				1	33	43	2	18.2	04.2
	185	9	18	39	5				1	33	25	0	19.9	04.5
	186	9	18	58	1				1	33	51		186	03.1
	17.2	9	19	15	3				1	32	46	5	187	01.8
	19.8	9	19	35	1	74	00	00	1	32	27	8	02.9	46.7
		9	17	43	24				1	34	20	27		

Polaris bl.
Page

ASTRONOMICAL OBSERVATIONS.—No. 3.

127

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Megus

Station Camp 31 Las Vegas Springs Date Oct 10th 1859

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.					
Sun's upper limb Equal alt Page 107	18.6	9	27	58	78	10	1	24	6	7	20.2	04.7
	19.1	9	28	35			1	23	26	6	19.9	03.1
	19.9	9	28	53			1	23	7	1	20.4	02.7
	20.4	9	29	14			1	22	46	7	19.3	02.7
	17.4	9	29	34			1	22	27	7	18.7	59.8
	19.6	9	29	53			1	22	7	7	20.7	60.7
	20.0	9	30	14			1	21	47	0	20.5	01.0
	20.1	9	30	34			1	21	26	5	21.2	60.6
	20.3	9	30	54			1	21	53		19.8	59.7
	20.6	9	31	15			1	21	46	5	17.9	60.5
176	9	31	33			1	20	28	6	18.8	60.2	
216	9	31	54	79	10	1	20	8	8	63.0	3-57.9	
Sun's upper limb Equal alt Page 108		9	29	54			1	22	07	03		
	22.2	9	39	32	81	—	1	12	29	8	21.5	61.8
	19.9	9	39	54			1	12	8	3	21.3	62.5
	18.4	9	40	15			1	11	47	0	22.7	61.1
	23.6	9	40	34			1	11	24	9	23.1	55.6
	19.3	9	40	57			1	11	1	2	23.9	58.3
	23.6	9	41	17			1	10	32	3	20.5	53.7
	20.9	9	41	40			1	10	18	8	18.4	56.8
	22.3	9	42	0			1	9	58	4	22.7	59.3
	20.4	9	42	23			1	9	35	7	20.4	58.9
23.0	9	42	43			1	9	15	3	20.5	58.9	
19.9	9	43	6			1	8	54	8	22.3	61.4	
4-17.5	9	43	29	5	52		1	8	52	5	20.7	59.0
	9	43	49	5			1	8	11	8	61.3	4-18.0
	9	41	40	12			1	10	19	71		

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ASTRONOMICAL OBSERVATIONS.—No. 3.

11-26
9-56
1-30
11-46
12-56

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1243 by Meigs

Station Camp 31 Las Vegas Ranch. Date Oct-10, 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.
	h	m	s	sec	h	m	
Sun upper limb	9	52	50		83	50	No afternoon observations Not to be Posted
	9	52	30	5			
	9	52	53	1			
	9	53	15	7			
	9	53	40	3			
	9	54	4	1			
	9	54	28	0			
	9	54	52	3			
	9	55	18	2			
	9	55	42	5			
Sun lower limb	9	56	6	4			84 50
	9	56	28	5			
	9	56	53	3			
	9	56	53	3			
Sun upper limb at Meridian.	11	19	56		94	24 25	CMA Page 26 Posted
	11	20	40	2		25 10	
	11	21	52	7		25 45	
	11	22	57	7		26 05	
	11	24	14	2		26 15	
	11	25	4	2		26 35	
	11	27	33	1		26 35	
	11	29	19	0		26 10	
	11	30	10	2		25 40	
	11	30	44	5		25 05	
	11	31	10	1		24 30	
	11	31	35	5		24 05	
	11	32	3	5		23 35	
11	32	31	5		23 35		

ASTRONOMICAL OBSERVATIONS.—No. 3.

129

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Weyno*

Station *Camp 31 Vegas* Date *Oct 11 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.							
		9	5	9	6	71	30		1	46	13	3	16.9	24.9
<i>Sun's</i>	171	9	5	26	7				1	45	59	4	19.0	25.1
	176	9	5	44	3				1	45	39	4	17.9	23.7
<i>upper</i>	179	9	6	2	2				1	45	21	5	16.1	23.7
<i>limb</i>	188	9	6	20	0				1	45	54		15.9	26.4
	166	9	6	37	6				1	44	48	5	18.6	27.1
	179	9	6	56	5				1	44	30	9	16.6	27.4
<i>Equal alt</i>	171	9	7	13	6				1	44	13	3	19.1	27.9
<i>page 110</i>	181	9	7	31	7				1	43	54	2	17.6	26.9
	173	9	7	49	0					43	38	6	18.2	26.6
<i>58.1</i>	187	9	8	7	7					43	17	7		27.1
	177	9	6	38	08				1	44	47	26		
						76	00	00						
		9	17	36	6				1	33	27	1	18.5	23.7
	163	9	18	14	9				1	33	10	6	16.5	21.5
	196	9	18	32	5				1	32	52	1	20.7	24.6
	172	9	18	50	7				1	32	31	4	20.8	21.1
<i>Equal alt</i>	208	9	19	10	5				1	32	12	6	16.1	21.1
<i>page 111</i>	185	9	19	29	0				1	31	54	8	17.5	23.5
	205	9	19	49	5				1	31	36	0	20.3	26.5
	183	9	20	7	8				1	31	16	7	20.7	24.5
	169	9	20	26	7				1	30	58	0	17.1	20.7
	209	9	20	45	6				1	30	38	9	21.3	24.15
	18.8	9	21	4	4				1	30	19	6	15.5	22.0
	169	9	21	23	0				1	30	21		18.1	23.4
<i>444 13</i>	19.7	9	21	41	0	76	00	24	1	29	74			25.0
		9	19	48	63				1	31	35	72		

43.1

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus.

Station Camp 32 Las Vegas Date Oct 11th 1869.

Object Observed.		Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.				
Polaris		7	41	55	2	73	57	00	Polaris Page 62				
	26.3	7	42	21	5		57	30					
	23.7	7	42	45	2		55	00					
	27.6	7	43	12	8		55	30					
	5 36.6	7	43	47	4		56	00					
	20.6	7	44	15	0	—	56	30					
	28.2	7	44	38	2		57	00					
	34.6	7	45	07	8		57	30					
	9 39.1	7	45	51	9		58	00					
	50.4	7	46	37	3		58	30					
	11 29.8	7	47	12	1		59	00					
Polaris		7	44	20	4	73	56	30	Polaris Page 63				
		7	58	28	5	74	4	30					
	42.5	7	59	11	0	74	5	00					
	30.6	7	59	41	6	74	5	30					
	38.1	8	00	19	7	74	6	00					
	46.3	8	1	6	0	74	6	30					
	38.2	8	1	49	2	74	7	00					
	51.2	8	2	30	4	74	7	30					
	54.6	8	3	25	0	74	8	00					
	51.4	8	4	26	4	74	8	30					
	54.1	8	5	10	5		9	00					
	43.6	8	6	21			9	30					
		8	1	00	03	74	06	30					

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sun's upper limb

Sid'l Chronometer No. 1283 by Wynno

Station Camp 34 Indian Spgs Date Oct 25 1869

Sun's
upper limb
Equal alt
Paper 112
3-17.9
196
303
800 Barb
at out
Equal alt
Paper 113.
4-3.8

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
		9	5	09	1	62	50		43	46	2	19.6	55.3
	18.5	9	5	27	6	62	55		43	26	6	21.2	54.2
	19.4	9	5	37	0	63			43	0	8	18.1	51.8
	19.9	9	6	08	9		05		42	47	7	18.7	53.6
	19.9	9	6	26	8		10		42	28	0	19.1	54.8
	18.2	9	6	46	0*		15	*	42	08	4	18.1	54.9
	20.4	9	7	05	4		20		41	30	8	18.1	56.2
	17.4	9	7	23	8		25		41	32	7	21.2	56.5
	19.0	9	7	31	8		30		41	12	9	17.0	54.7
	20.2	9	8	02	5		35		40	34	9	17.7	56.4
	20.	9	8	21	0		40		1	40	36	2	56.2
		9	06	45	17				1	42	10	07	
		9	16	19	2	65	40		32	39	7	21.0	58.9
	17.5	9	16	38	7		45		32	18	9	20.6	55.4
	20.8	9	16	58	5		50		31	58	6	20.6	55.6
	19.1	9	17	18	6		55		31	38	5	19.3	54.1
	20.9	9	17	38	5	66			31	18	2	20.2	55.7
	21.6	9	17	59	1		05		30	58	0	20.4	57.1
	20.9	9	18	20	0*		10	*	30	37	0	18.9	57.6
	18.5	9	18	40	5		15		30	17	7	19.5	57.2
	22.0	9	19	00	5		20		29	59	2	22.5	59.7
	19.3	9	19	20	8		25		29	36	7	20.1	56.5
	21.3	9	19	41	1		30		29	15	6	22.7	57.7
	21.6	9	20	2	7		35		28	53	9	18.8	56.6
	20.3	9	20	23	0	66	40		1	28	35	1	
		9	18	20	17				1	30	37	36	

3-11.0

4-4.3

132

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp 34 Indian ^{Agency} ~~Station~~ Date Oct 25th 1869

Sun's upper limb equal alt. Populif. 3-42.1

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.				
	h	m	s	sec	Alt	Dist	h	m	s	sec	
	9	30	22	0	69		18	31	4	23.9 53.0	
	22.1	9	30	44	1	05	18	09	1	21.3 51.2	
	21.7	9	31	05	8	10	17	47	8	17.4 51.6	
	20.1	9	31	25	9	15	17	27	4	24.7 54.3	
	22.5	9	31	48	4	20	17	03	7	23.6 52.1	
	22.8	9	32	11	2	25	16	40	4	22.1 51.3	
	22.2	9	32	33	4	30	16	18	4	21.1 51.4	
	22.7	9	32	56	1	35	15	57	5	21.9 53.0	
	22.3	9	33	18	4	40	15	35	5	21.8 53.4	
	21.8	9	33	40	2	45	15	13	2	22.0 53.4	
	22.9	9	34	03	P	50	1	14	50	6	53.7 3-40.4
		9	32	32	60		1	16	41	55	

Sun's upper limb

Not to be posted

9	40	18	8	71	10
9	40	40	9	15	
9	41	3	5	20	
9	41	28	1	25	
9	41	51	5	30	
9	42	17	0	35	
9	42	41	1	40	
9	43	2	6	45	
9	43	25	1	50	
9	43	52	0	55	
9	44	20	1	72	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *J* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus*

Station *Camp 34 Indian Spring* Date *Oct 25th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h	m	s	sec	1st	2nd	3rd	
	11	8	27	5	82	30		
<i>Sun</i>	11	8	58	1	82	30	30	
	11	9	36	0	82	31	10	
<i>upper</i>	11	10	13	8	82	32	30	
<i>limb</i>	11	16	47	1		34	20	
	11	11	26	1		35	15	
	11	12	00	5		36	10	
<i>about</i>	12	37	3			37	08	
	13	9	1			38	08	
<i>Meridian</i>	13	39	7			38	40	
	14	12	3			39	15	
	14	39	7			40	08	
	15	10	2			40	50	
	15	47	5			41	30	
	16	19	1			42	30	
	16	48	3			43	00	
	17	10	5			43	10	
	17	39	4			43	20	
	18	7	1			43	35	
	18	34	6			43	45	
	19	41	7			44	00	
	20	13	0			44	35	
	20	52	1			44	50	
	21	24	5			45	15	
	21	49	6			45	30	
	22	21	0			45	40	
	22	52	5			46	00	
	23	21	9			46	20	
<input checked="" type="checkbox"/>	24	39	5			46	25	
	25	73	5			46	20	
	26	32	0			46	00	
	27	9	0			45	50	
	27	35	0			45	30	
	28	43	1			45	15	

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Negus

Station Camp 34 Indian Spring Date Oct 25th 1849.

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.	
Sun's upper limb. in Meridian	11	29	28	1	44	55	CMA Page 27	
	11	30	17	8	44	15		
	11	31	13	.	43	40		
	11	31	38	3	43	05		
	11	32	10	9	42	20		
	11	32	46	8	41	50		
	11	33	16	9	41	20		
	11	33	46	0	40	55		
Oct-26 th Polaris	6	11	14	5	74	16	Polaris Page 64	
	37.0	6	11	57	5	30		
	37.2	6	12	28	7	17		
	35.1	6	13	03	8	30		
	34.2	6	13	42	0*	44 18 00		
	37.1	6	14	19	1	30		
	33.1	6	14	55	2	19		
	49.6	6	15	33	8	30		
	4- 59.4 9	6	16	13	9	20		
		6	13	42	61	74 18 00		
Polaris.	1	6	24	34	0	74 26	Polaris Page 65	
	44.9	6	25	24	9	30		
	36.6	6	26	04	5	27		
	48.6	6	26	04	1	30		
	5	58.3	6	27	34	4		74 28 00
	52.8	6	28	44	2	30		
	46.3	6	30	34	5	24		
	58.6	6	30	27	1	30		
	9	57.4	6	31	21	5		30
		6	27	48	80	74 28 00		

ASTRONOMICAL OBSERVATIONS.—No. 3.

135

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp 34 Indian Springs Date Oct 26th 1869.

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.	REMARKS.						
	8	43	42	4		2	02	58	3	18.0	40.7	
Sun's upper limb Equal alt 116.	157	43	59	8	57	05	02	40	8	169	40.6	
	165	46	17	0		10	02	23	9	175	40.9	
	173	46	34	8		15	02	06	9	195	40.7	
	207	46	54	0		20	01	46	9	167	40.9	
	17	47	11	0		25	01	30	2	183	41.2	
	188	47	29	8	*	30	2	01	11	9*	170	41.2
	161	47	45	9		35	2	00	54	9	193	40.8
	173	48	09	7		40	2	00	35	6	185	38.8
	179	48	28	1		45	2	00	17	6	171	38.2
	202	48	41	3		50	2	00	00	0	17.9	41.3
4 - 33.04	159	48	52	2		55	59	42	1	18.1	39.3	
	179	8	49	15	8	58	1	59	24	5	40.3	
	8	47	28	98			2	01	11	78	33.8	
Sun's upper limb Equal alt 117	176	8	56	31	3	60	52	09	8	199	40.6	
	196	56	48	9		05	51	49	4	197	38.3	
	186	57	08	0		10	51	30	7	165	38.2	
	187	57	27	1		15	51	13	2	192	40.3	
	183	57	45	8		20	50	54	0	177	39.8	
	189	58	04	1		25	50	36	3	186	40.4	
	169	58	23	0*		30	50	17	7	177	40.7	
	226	58	54	9		35	50	00	0	206	39.9	
	15.9	59	02	0		40	49	39	4	197	41.4	
	184	59	19	4		45	49	20	7	16.1	38.1	
21.1	59	36	8		50	49	03	6	19.2	40.4		
43	174	59	56	9		55	48	44	4	18.9	42.3	
	9	00	15	3	61		1	48	25	5	40.8	
	8	58	23	27			1	50	17	25	44.3	

136

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Camp 34 Indian Spring Date Oct 26th 1869

Jan's upper limit Equal alt page 118 57.6

2-468 Equal alt page 119

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
	9	9	12	3	63	20		39	29	2	29.7	41.5	
	195	9	31	8		25		39	09	5	19.5	41.3	
	196	9	52	9		30		38	50	0	19.5	41.9	
	195	10	11	9		35		38	30	2	20.1	42.1	
	202	10	37	6		40		38	10	1	19.7	41.7	
	177	10	50	8		45		37	50	4	19.9	42.2	
	221	11	11	4*		50	*	37	30	5	19.2	41.9	
	172	11	30	1		55		37	11	3	20.5	41.4	
	215	11	50	6	64			36	50	8	19.9	41.4	
	211	12	11	2		05		36	30	7	21.4	41.9	
	191	12	34	3		10		36	10	0	19.6	41.3	
	194	12	50	2		15		35	50	4	19.9	41.1	
	199	9	13	10	64	20		1	35	30	8	41.9	
		9	11	11				1	37	30	30		
		9	21	24	5	66	20	1	27	16	5	21.0	41.0
209		21	45	4		25		26	55	5	22.6	38.9	
204		22	05	8		30		26	34	9	20.8	38.2	
207		22	26	5		35		26	14	4	16.9	38.1	
19.8		22	46	9*		40		25	54	2*	23.4	41.0	
20.9		23	07	7		45		25	32	8	20.1	39.5	
205		23	28	2		50		25	12	2	19.4	34.4	
207		23	48	9		55		24	51	8	19.3	40.7	
224		24	09	3	67			x 1	24	32	5	41.2	
						65							
	9	22	47	02		10		1	25	53	87		
	9					15							
	9					20							

587

37.5

ASTRONOMICAL OBSERVATIONS.—No. 3.

187

Sextant No. *8* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Ryan*

Station *Camp 3rd Indian Spring,* Date *Oct - 26 1879*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	h	m	s	sec	h	m	s	
		6	36	53	74	36	50	
<i>Polaris</i>	46.2	6	37	39 2		50	20	<i>Polaris Page 66</i>
	42.6	6	38	25 8		37	50	
	34.9	6	39	04 7		50	30	
	58.4	6	39	57 1	x	38	50	
<i>21.9</i>	51.8	6	40	35 9		50	30	
<i>38.1</i>	50.6	6	41	30 5		39	50	
	52.8	6	42	18 3		50	30	
<i>6-12</i>	45.7	6	43	05 0		40	50	
		6	39	58 28	74	38	44	
<i>Polaris</i>		6	52	59 9	74	46		
	48.5	6	53	34 4		50	30	
	58.1	6	54	48 5		47		
	57.7	6	55	48 2		50	30	
	64.5	6	56	34 7	x	48		
	47.3	6	57	36 3		50	30	
	58.9	6	58	28 9		49		
	51.9	6	59	28 8		50	30	
<i>7-17 9</i>	50.1	7	00	16 9		50		
		6	56	36 29	74	48	44	

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by *Wheeler*

Station *Quinn's Cove* Date *Nov 11th 1869*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.						
		9	34	28		5-8		1	14	10	10	22.6	37.4
<i>Sun's</i>	22.6	9	34	31	9		05	1	13	46	8	26.8	37.4
	29.1		35	19	7		10	1	13	20	0	26.5	39.7
<i>upper</i>	24.1		35	44	8		15	1	12	53	5	24.4	37.3
	25.1		36	8	9		20	1	12	29	1	24.8	38.0
<i>limbs -</i>	25.6		36	34	5		25	1	12	9	3	28.3	38.8
<i>30.4 1.2</i>	23.9		37	00	4		30	1	11	37	0	21.8	34.4
	30.8		37	29	2		35	1	11	19	2	25.1	43.4
<i>305</i>	29.3	9	37	58	5	58	70	1	10	48	5		47.0
		9	35	44	03			1	12	54	59		
		9	44	03	9	59	50		4	33	7	28.3	37.6
<i>x Sun's</i>	25.6	9	44	31	5		55	1	4	05	4	27.3	34.9
<i>upper limb</i>	27.3		44	58	8	60		1	3	38	1	30.2	34.9
<i>5</i>	29.5		45	28	3		5	1	3	09	9	25.6	34.2
	31.7		45	56	0		10	1	2	42	3	26.6	40.3
	25.8		46	28	8		15	1	02	15	7	27.9	39.5
	27.9	9	46	51	7		20	1	01	47	8	29.4	39.5
	28.7		47	20	4		25	1	01	20	4	26.5	38.8
<i>3-440</i>	30.5	9	47	49	9	60	30	1	00	50	4		42.8
		9	45	56	64			1	02	42	64		
<i>Sun's</i>		9	54	36	2	61	40	12	54	02	0	32.1	38.1
<i>upper limb</i>	28.1	9	55	06	3		45	12	53	34	8	27.5	34.1
	33.5		55	37	8		50	12	53	2	3	33.3	40.1
	31.9		56	9	7		55	12	52	29	0	32.7	38.7
	29.8		56	39	5	62		12	51	56	3	30.5	35.8
	27.4		57	08	9		05	12	51	25	8	29.3	32.7
	32.8		57	39	7		10	12	50	56	5	31.3	36.2
	29.2		58	9	9		15	12	50	27	2	26.2	34.1
<i>4 - mb</i>	29.9		58	39	8		20	12	49	39	0		37.8
		9	56	38	43			12	51	58	88		

33.4

20.9

3-438

29-4

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8

and artificial horizon of Mercury

Sid'l Chronometer No. 1283

by Regas.

Station

Quinn Cove

Date

Nov 11th 1869

Index Error for
Doubtless
same as at
Indian Spring 139

Sun
at
Meridian

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
	11 13 23 1	69 17 30	
	11 17 1 8	69 18 10	
	11 18 7 6	69 18 10	
	11 16 13	69 19 5	
	11 16 51 8	69 20	
	11 17 59 1	21	
	11 19 16 9	21 20	
	11 19 47	21 35	
	11 20 45 8	21 50	
	11 22 32	21 55	
	11 23 21 9	22 10	
	11 24 0 1	22 15	
	11 25 32 7	22 10	
	11 26 16	22 05	
	11 27 6 9	22	
	27 48 8	21 50	
	28 17 6	21 40	
	28 42 8	21 30	
	29 10 3	20 20	
	29 45 5	21 10	
	30 16 9	20 50	
	30 46 2	20 30	
	30 10	20	

Index Error
= 15" minus

CMA

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140
 ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. *J* and artificial horizon of Mercury

Sid'l Chronometer No. *1283* by *Negus*

Station *Quinn Canyon* Date *Nov 11th 1869.*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	5	44	54	6	77	32	20	
<i>Polaris</i>	48.9	5	45	43	5	77	32	70
	50.2	5	46	33	7	77	33	00
	42.4	5	47	16	4	77	33	20
	45.1	5	48	1	2	77	33	40
	36.1	5	48	37	3	77	37	00
	40.3	5	49	17	6	77	37	20
		5	47	12	0	77	33	20
<i>Polaris</i>		5	56	58	3	77	38	40
	41.4	5	57	39	7	77	39	00
	38.5	5	58	18	2	77	39	20
	41.2	5	58	59	4	77	39	40
	49.9	5	59	49	3	77	40	00
	43.1	6	00	32	4	77	40	20
	36.1	6	1	8	5	77	40	40
		5	59	03	33	77	39	40
<i>Polaris</i>		6	10	47	0	77	48	40
	33.5	6	11	20	5	77	46	00
	27.9	6	11	48	4	77	46	20
	25.7	6	12	14	1	77	46	40
	23.1	6	12	37	2	77	47	
	21.8	6	12	59	0	77	47	20
	20.6	6	13	19	6	77	47	40
	23.9	6	13	43	5	77	48	
	21.5	6	17	5	0	77	48	20
		6	12	33	33	77	47	00

Polaris
Page 68

Polaris
Page 69

Polaris
Page 70

ASTRONOMICAL OBSERVATIONS.—No. 3.

141

Sextant No. 8

and artificial horizon of Mercury

Sid'l Chronometer No. 1283

by Negus

15-51.5

Station Cape Christo Hill

Date November 18th

5-05.5

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.							
Sun's upper limb.	19.1	9	-1	26	4	45	45	1	46	46	5	22.4	12.9	10
	21.5		1	46	5		50		46	26	1	19.7	12.6	
	22.7		2	29	7	46			46	4	4	19.6	11.4	10
10	22.1		2	57	8		5		45	22	4	23.0	14.2	9
10	20.7	—	3	14	0	—	10		44	57	9	21.4	11.9	9
8	26.3		3	38	2		15		44	36	—	20.4	14.8	
	22		4	—	3		20		44	15	6	21.8	15.9	8
10	20.2		4	21	—		25		42	53	8	20.9	14.8	6
	26.6		4	41	6		30		43	32	9	22.1	14.5	7
10	22.6		5	0	2		35		1	43	09	3	15.0	
3 37.8			9	3	14	30			1	44	59	06		
			6	42	49	9	47	50						
	26.5		20	26	2		50		28	9	8	28.1	36.0	
	29.3		20	55	5		55		27	41	7	22.8	37.2	
	24.3		21	19	2	50			27	18	9	27.9	38.7	
	20.6		21	40	4		5		26	52	—	27.2	31.4	
	24.6		22	5	—		10		26	26	8	23.4	28.8	
	28.4		22	33	4		15		26	2	4	19.5	33.8	
	22.4		22	55	2		20		25	40	9	23.5	36.7	
	25.0	—	23	20	8	—	25	—	25	14	6	26.7	35.4	—
	33.8		23	49	6		30		24	47	9	25.3	42.5	
	20.4		24	15	—		35		24	22	6	22.2	37.6	
	22.3		24	37	3		40		24	—	4	22.2	37.7	
	27.0		25	1	3		45		23	35	2	25.4	42.5	
	21.4		25	25	7		50		23	9	8	25.0	36.5	
	23.5		25	49	2		55		22	44	8	23.5	34.0	
482	25.2		26	14	4	51.	—		1	22	21	3	35.7	48.5
			9	23	21	96			1	25	13	94		6

Equal alt
Page 120

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ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

39

Sid'l Chronometer No. 1238 by Negus

Station *Pointe Christo Hill* Date *November 13th*

Sun
Equal alt
Page 121

probally skip
Equal alt
Page 122
54.2

Sun

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.		REMARKS.					
	h	m	s	sec	1st	2nd	1st	2nd	3rd	4th		
	9	28	46	2	51	30	1	19	54	2	14.8	40.4
13.3		28	59	5	51	33	1	19	39	4	13.8	38.9
15.5		29	15	-	51	36	1	19	25	6	14.3	40.6
14.5		29	29	5	57	39	1	19	11	3	17.9	40.8
16.0		29	45	5	51	42	1	18	53	4	17.2	38.9
15.9		30	1	4	57	45	1	18	36	2	18.0	37.6
		30	30	1	51	51	1	18	7	5	18.6	37.6
20.3		30	48	4	51	54	1	17	49	5	14.6	39.9
17.8		31	7	2	51	57	1	17	34	9	15.3	43.1
17		31	24	2	52	00	1	17	19	6	17.2	44.8
15.2		31	40	4	52	03	1	17	00	4		42.8
	9	31	06	26			1	17	34	38		
	9	29	22	85			1	19	16	68		
	9	34	54	8	52	40						
		35	9	2		43						
			24	4		46						
			43	3		49						
			56	2		52						
		36	11	8		55						
		36	31	7		58	1	12	16	2	17.7	47.9
14.9		36	46	6	53	1	1	11	58	5	18.3	45.1
15.3		37	1	9		4	1	11	40	2	19.7	42.1
14.6		37	16	5		7	1	11	20	5		37.0
16.9		37	33	4		10	1	-	20			

Breezy
Single Sun and Cloudy
51.8

ASTRONOMICAL OBSERVATIONS.—No. 3.

143

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station *Pointe Christie Mill* Date *Nov 18th 1889*

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.
	Hour	Min	Sec	10 th	1 st	2 ^d	3 ^d	
<i>Dem al Meridia</i>	10	55	58	6	62	33	30	
		56	0	7		35	25	
	10	57	26	8		41	-	
		59	26		62	46	-	
	11	1	8	6	62	50	15	
		3	37	5	62	57	10	
		6	20	2	63	3	15	
	11	18	00	8	63	18	45	
			38	3		19		
		19	15	6		19	35	
			57	2		19	55	
		20	56	6		20	15	
		21	44	5		20	25	
		22	26	8		20	35	
		24	54	2		20	45	
		26	1	6		20	40	
		28	15	2		20	25	
			37	7		20	-	
		29	42	2		19	-5	
		32	13	5		17	40	
	33	28	2		16	15		
		53	3		15	50		
	34	21	6		15	10		
		58	4		14	25		
	35	28			13	50		

CMA
Page 29

2.4
2.20

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. 8 and artificial horizon of Mercury

Sid'l Chronometer No. 1283 by Regus

Station Hallett New Date June 26th 1869

Object Observed.	Time of Observation by Chronometer.				Observed Double Altitudes.			REMARKS.					
		6	55	30	0	61	00	00	4	11	24	5	223
Sun's	27.5	55	57	5		10				11	02	2	272
upper	25.0	56	22	5		20				10	35	0	285
limit	26.5	56	49	0		30				10	06	5	259
	26.5	57	15	5		40				09	40	6	246
	24.5	57	45	0		50				09	16	0	278
	24.0	58	09	0	62	00				08	48	2	257
3-07.2	28.2	58	37	2		10				08	20	5	
		5	59	29	5	62	30	00	4	07	56	2	

8-02.
8-283

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No. and artificial horizon of Mercury

Sid'l Chronometer No. 8212 by *Fordham*

Station *Camp Gaston Cal* Date *May 23rd 187*

Object Observed.	Time of Observation by Chronometer.			Observed Double Altitudes.			REMARKS.						
<i>Suns upper limb.</i>		10	09	00	118	20	XX	1	50	40	(59)	46	31
	20		09	20		30			49	50	59	29	39
			09	40		40			49	25	58	30	54
	25		10	05		50			49	00	58	31	(28)
	1-37		10	39	119	XX		1	48	28	58	05	
		10	09	43				49	22	6			
		<i>23rd</i>											
<i>Suns upper limb</i>		10	09	00	118	20			50	39		39	
		10	09	30					50	09		39	
			10	06				1	49	33		39	
			10	38				1	48	59		37	
	2-08		11	08	119	00		1	48	29		37	
		10	10	04	40			1	49	33	50		

2-42

2-16

ASTRONOMICAL OBSERVATIONS.—No. 3.

Sextant No.

and artificial horizon of Mercury

Sid'l Chronometer No.

by

Station *Camp Gardiner Cal*

Date *May 24th 1870*

Object Observed.	Time of Observation by Chronometer.	Observed Double Altitudes.	REMARKS.
	9 58 00	115 20	2 00 54 54
	58 30	30	2 00 23 53
	59 00	40	59 14 54
	59 30	50	59 25 55
	10 00 00	116 00	58 55 55
	10 0 30	10	58 25 55
3	10 01 00	116 20	1 59 52 52
	<u>9 59 30</u>		<u>1 59 24</u>

Peko Nevada June 30th Longitude by Telegraph
 9:30 to 10:30 P.M. -

May Robert's time slow of San Francisco Mean time
 at instant of observation = 24.5 seconds -

His time of 1st signal = ^h 10 - ^m 06 - ^s 00
 " " " last " = 10 - 10 - 00

My times were 1st = 10 - 05 - 35.4
 - 05 - 50.8
 10 - 07 - 36.2 - 06 - 06.2
 07 - 51.3 - 06 - 21.1
 08 - 06.3 - 06 - 36.2
 08 - 21.3 - 06 - 51.3
 08 - 36.3 - 07 - 06.4
 08 - 51.4 - 07 - 20.9
 09 - 06.3
 09 - 21.3

10 - 09 - 36.3 - 10 - 05 - 35.4 = 4^m 00.9

My chronometer time of
 my first signal = 10 - 19 - 00
 " last " = 10 - 22 - 00

His simultaneous time = 10 - 19 - 24.5
 " " last signal = 10 - 22 - 25.5

D = 25
 25 + 24.5 = 49.5

2nd Set from Maj Roberts
 His time of 1st signal = 10 - 32 - 00
 " " last " = 10 - 35 - 00

My times were 1st = 10 - 31 - 36.2
 10 - 31 - 51.3
 10 - 32 - 06.4
 10 - 32 - 21.3
 10 - 32 - 36.2
 10 - 32 - 51.2
 10 - 33 - 06.1
 10 - 33 - 21.2
 10 - 33 - 36.3
 10 - 33 - 51.1
 10 - 34 - 06.1
 10 - 34 - 21.2
 10 - 34 - 36.2

Smith

Sextant No 8

on	off	
32 40.	33. -	20
32 45	33.05	20
32 45	32 05	20
32 50	33.05	10
32 50	33 -	10
		580
		216
		81 + = Error

60
 10.3
 49.7
 12
 169.7

Nov 18th
 Monte Cristo mill

1283 + 1268 -

Nov 18 | 12-47 PM

diff
 1283 fast
 169.79
 37.33
 2.22
 11 28
 9 37
 1.51

36.46
 31.40
 5.6

50

088

32-05
32-10
32-15
32-00
32-00
<hr/>
32-30
<hr/>
82-6

088

33-20
33-15
33-20
33-20
33-15
<hr/>
-90
<hr/>
83-18
32-06
<hr/>
112

36" to be substituted

Sept 29th

There are 8 panels: 4 2 part panels
 + 4 1 part panels

Boysen in the main
 Kitten in the main
 Boyoff in the main
 Washington in the main
 Smith in the main
 George by lobby
 Lawrence in the main