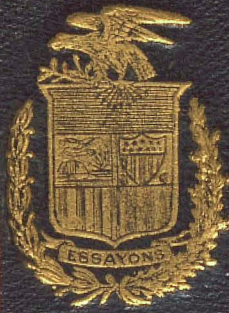


485  
Cupboard 27  
Shelf 4  
No. 47  
1 book



U. S. GEOGRAPHICAL SURVEYS.  
WEST OF 100<sup>TH</sup>. MERIDIAN.

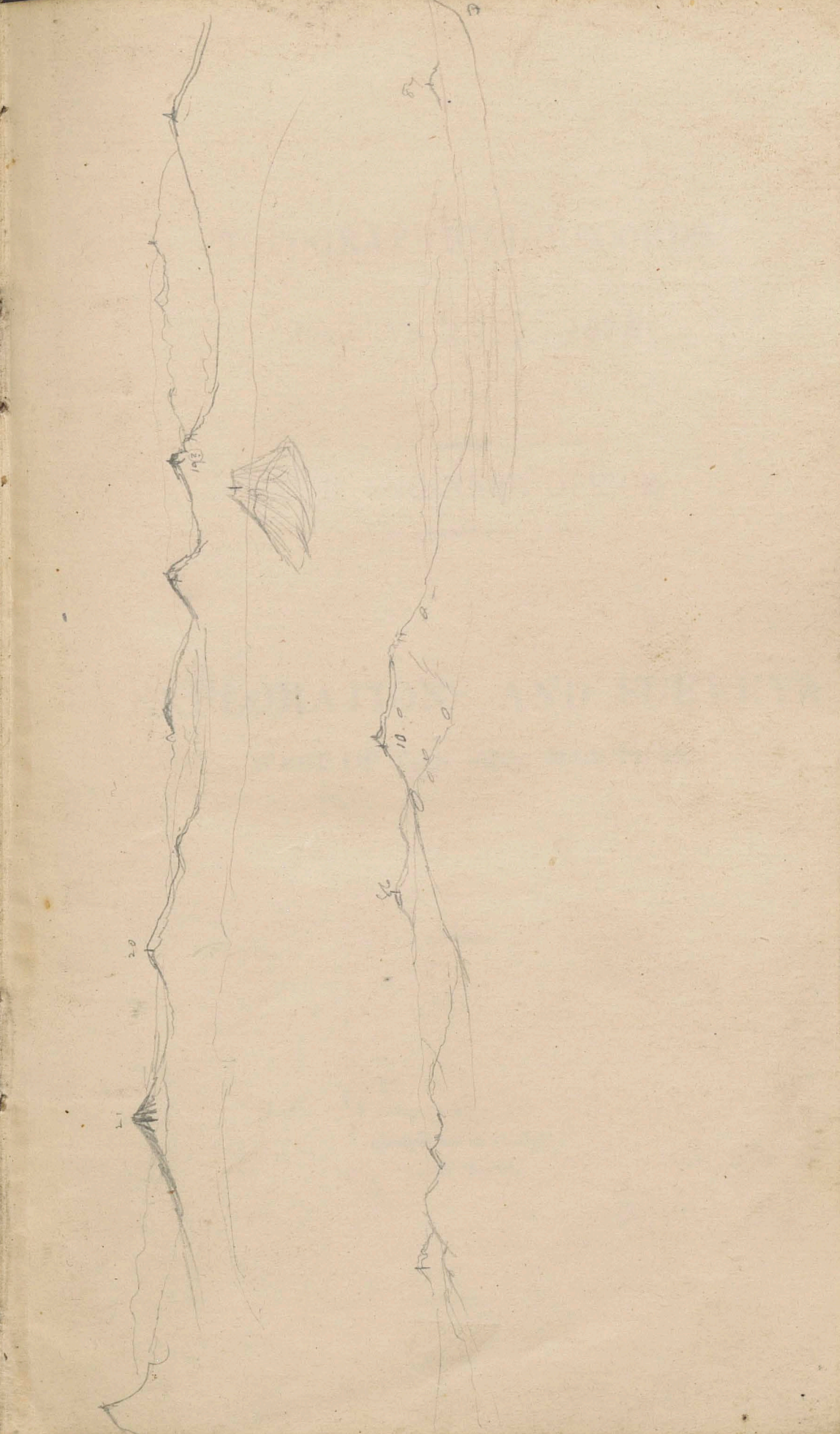
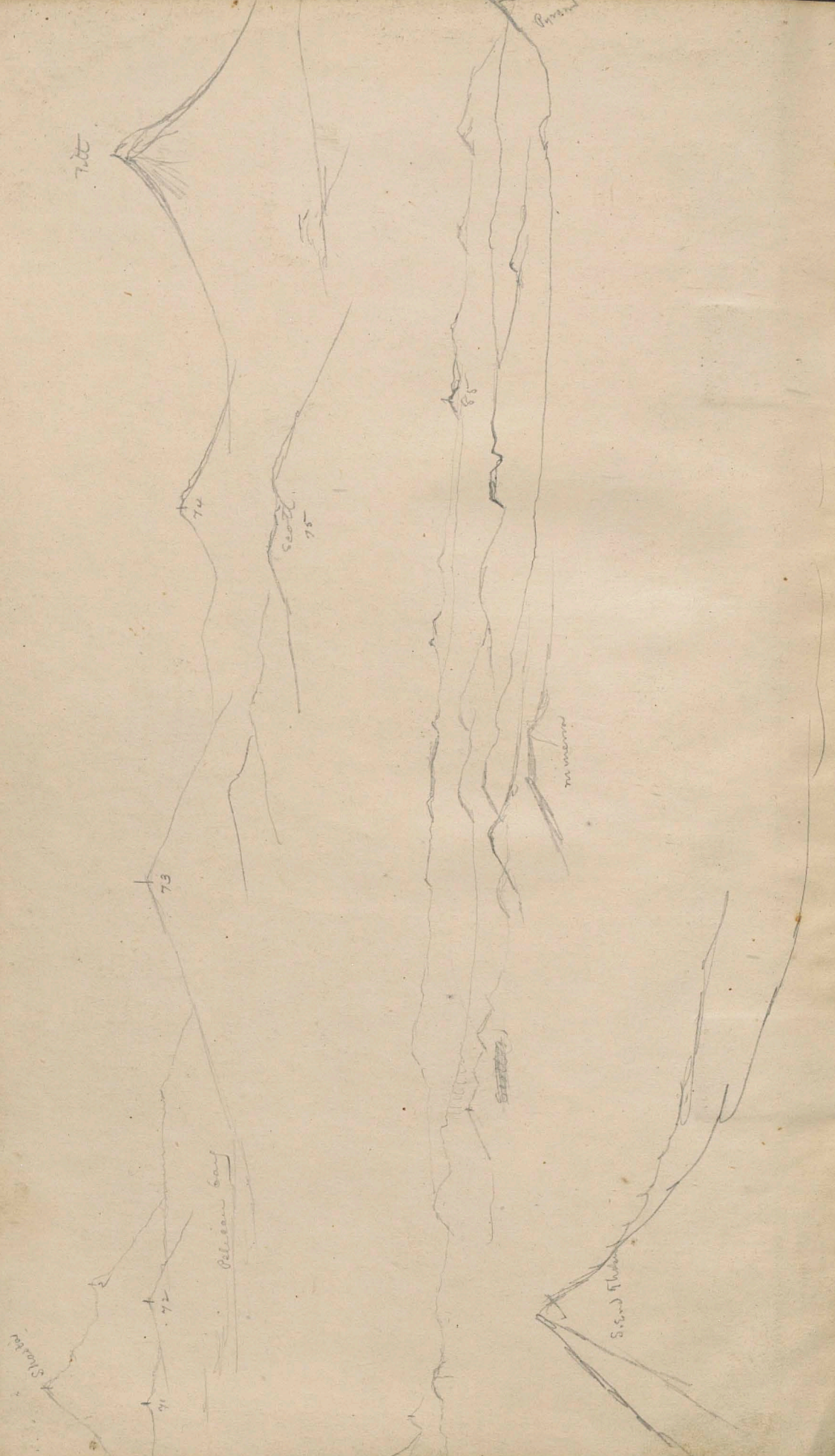
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TRIANGULATION  
OBSERVATIONS.

Book No. 485.

WHEELER.





TOPOGRAPHICAL RECORDS.

*Book No. 485, 1878.*

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U. S. ENGINEER OFFICE.

---

EXPLORATIONS AND SURVEYS

WEST OF THE 100TH MERIDIAN.

---

*Lt. Symons*

CORPS OF ENGINEERS,  
IN CHARGE.

Party No. 1 Cal.

From Camp Bidwell, Nev.

To Dalles, O., and return.

Date: Aug. 15 - Nov 9 - 1878

Karl and Kahler

Topographical Assistant.

**REMARKS.**

A  
B  
C  
D  
E  
F  
G  
H  
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J  
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Q  
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X  
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Z

U  
V  
W  
X  
Y  
Z

Y  
Z

336 24 05  
23 35 55  
25 36 20

324 60 30  
25 59 30  
3 06 40  
34 06 10

Col. 1. Synthes

1878

cup. leaf Sitka

highest of Chewancau

Date: Aug 15

Station: Pearl Z west of Chewancau Marsh

Observer: Shyous

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			Vernier A.	B.			
Cone	241	11							
Cedar or Juniper 1'	254	40 40							-29'
2'	255	19							-37'
Sugar leaf (Z) #	13	40 40							+23'
Sitka (a)	17	46 05							+20'
A	48	07 40							Highest of Chewancau -
B	58	45							same range about 4 M. N.W.
C	73	29							
D	121	37							
E									
Cone	241	11							

Too hazy and windy to do anything -

Date: Aug 17, 1878

Station: Peak B highest of Chewaucan

Observer:

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
Cane				
Junipers ✓				
Sugar leaf (Z)	22	54 50		
Snowy <u>Z</u>	29	29 10		
A	30	59 15		Maybe Sugar leaf
	61	57 00		
E <u>D</u>	109	56 30		07 10
	112	55 00		
E <u>D</u>	177	30 30		
C	236	23 10		
Z	252	06 10		
Cane				
Needle	39°			

REMARKS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
				+2' 30"
				-6' 30"
				+5'
				+2'
				T. may be Do L. chinensis
				+8' timber on top
				+10' 30"
				-24' 30"
				-48'

Date: Sept 2.

Station: Mount Pitt

Observer: W. S. Young

Instrument: 146

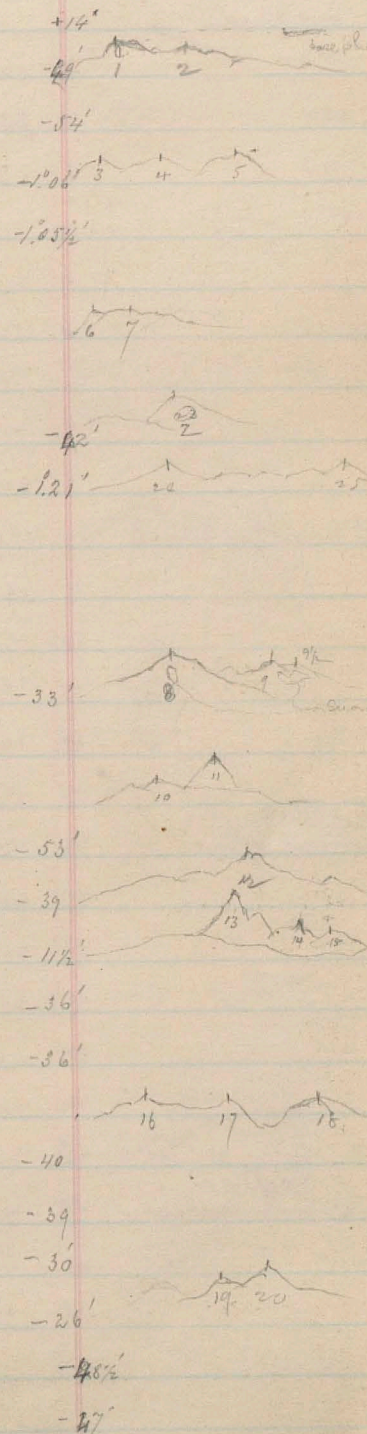
very hazy.

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
Needle	8.23 <sup>34</sup> E				
Shasta	0 0 0	179° 59' 40"			+14'
1	71° 06' 50"	06' 00"			-44'
1 1/2	71° 25' 30"	24' 50"			
2	71° 50' 20"	49' 40"			-54'
3	79° 23' 00"	22' 30"			-1° 06'
4	79° 58' 45"	58' 10"			-1° 55 1/2'
5	80° 44' 00"	43' 20"			
6					16 7
7					
13	52° 03' 00"	04' 10"			-42'
24	298° 20' 40"				-1.21'
25	312° 17' 50"				
8	190° 46' 00"	45' 00"			-33'
9	191° 32' 30"				
9 1/2	191° 38' 53"				
10	194° 38' 50"				
11	195° 07' 00"	06' 20"			-53'
12	197° 06' 00"	05' 00"			-39'
13	199° 33' 25"	32' 00"			-11 1/2'
14	200° 15' 00"	14' 20"			-36'
15	200° 32' 10"	31' 25"			-36'
16	202° 13' 10"				
17	203° 54' 30"	53' 20"			-40'
18	205° 29' 00"				-59'
19	209° 12' 10"				-30'
20	209° 47' 00"	46' 00"			-26'
21	63° 7' 50"	07' 10"			-48 1/2'
22	68° 15' 20"	14' 30"			-47'
	1° 20"	180° 01' 10"			

Shasta

Wilson  
Diamond Peak

W. S. Young  
Scott





Date: Sept 2<sup>nd</sup> Monday 1888  
 Station: Mount Shasta Pitt

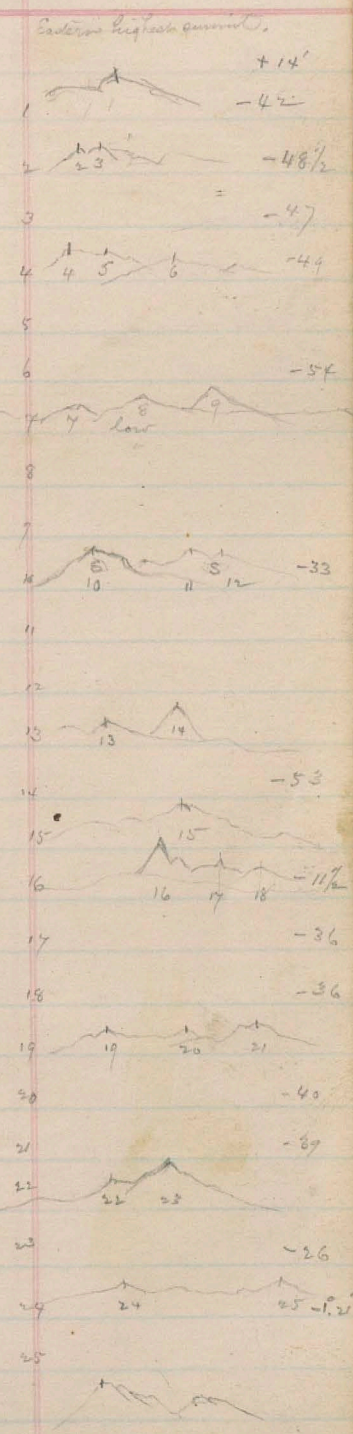
Observer: St Symons  
 Instrument: 146

*44 30 20 19 30 -53  
 { 267 03 00 03 00 -1 03 } True  
 267 55 30*

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
<i>noble</i> Shasta ✓	0 0 0	179 59 40			Eastern highest summit. +14'
	1 52 03 00	04 10			<i>Mohin summit</i> -42'
	2 63 07 50	07 10			-48 1/2
	3 63 15 20	14 30			-47
	4 71 06 50	06 00			-44
	5 71 25 30	24 50			
	6 71 50 20	49 40			
	7 79 23 00	22 30			-54
	8 79 58 45	58 10			
	9 80 44 00	43 20			
<i>N.W. Summit S.W. Summit</i>	10 190 46 00	45 00			-33
	11 191 32 30				
	12 191 38 50				
	13 194 38 50				
	14 195 07 00	06 20			-53
	15 197 06 00	05 00			
<i>Miller's</i> <i>Deane's</i> ✓	16 199 33 25	32 00			-11 1/2
	17 200 15 00	14 20			-36
	18 200 32 10	31 25			-36
	19 202 13 10				
	20 203 54 30	53 20			-40
	21 205 29 00				-69
	22 209 12 10				
<i>Dealy</i> <i>W. Summit</i> ✓	23 209 49 00	46 06			-26
	24 208 20 40				
	25 312 17 50				
Shasta	0 01 20	140 01 10			

209 49 50  
 246 25 00

*Winnifern and Klammath m.*



Date: Monday Sept. 9, 1878

Station: Mount Pelion - Scott

Observer: St Symons

Instrument: 146

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
n. table	n 28 40. W			
Mount Pelion	0 0 0	179 59 40	89 29 50	
28	0° 37' 20"	37 20 0	37 20 0	0 37 30
17	5° 31' 50"	32 05	31 57 1/2	4 54 37.5
18				
76	12° 08' 50"	08 30	08 40	6 36 42.5
80	14° 09' 30" <i>slightly</i>			
77	16° 52' 00"	52 00	52 00	4 43 20
78	17° 08' 30"	08 00	08 15	0 16 15
79	17° 40' 45"	40 15	40 30	0 32 15
80	20° 24' 20"	24 15	24 15	2 43 45
36				
81	21° 14' 30"			
82	21° 41' 30"	41 00	41 15	1 17 00
37				
40	38° 49' 30"			
83	44° 48' 20"	47 20	47 50	23 06 35
41	82° 56'			
44	91° 58' 15"	57 15	57 45	47 09 55
45	97° 59'	58 00	58 30	6 00 45
46	125° 42'	40 50	41 25	27 42 55
47	129° 41'	40 20	40 40	3 59 15
52	146° 07'	06 30	06 45	16 26 05
58	170° 03' 20"	03 30	03 15	23 57 40
63				
67				
68				
69				
Shaw's	194° 12' 30"	11 40	12 05	24 08 40
" "	194° 13' 00"	12 50	12 55	00 00 55

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
	n 28° 45' W				
	120° 00 00	299° 59' 50"	59 55		+02' 30"
	120° 57' 30"	37' 20"	37 25	0 37 30	-22' 00"
					-27' 00"
	132° 09' 05"	08' 50"	08 57 1/2	11° 31' 32.5"	
	134° 09' 20"	09' 00"	09 10	2 00 12.5	<i>Ray with distance</i>
	136° 52' 55"	52 10	52 22 1/2	2 43 12.5	-22'
					-23'
	137° 40' 30"	40 10	40 20	0 47 57.5	-20 1/2'
	140° 14' 05"	14 05	14 05	2 33 45	-28'
	141° 43' 00"	42 10	42 35	1 28 30	<i>Bad Point</i>
					-53'
	164° 48' 50"	48 10	48 30	23 06 05	-34'
					-40'
	211° 58' 20"	57 50	58 05	47 09 35	-42'
					-29'
	245° 40' 50"	40 20	40 45	33 42 40	-31'
					-39'
					-41'
	314° 11' 45"	11 20	11 32 1/2	68 30 47.5	-09'
	314° 12' 00"	12 20	12 10	00 00 37.5	



Date:

Observer:

Station:

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.			READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.			REMARKS.
	Vernier A.	B.					Vernier A.	B.					
Diamond <sup>needle</sup>	n 28 40 W						n 28 35 W						
	0° 0' 0"	180° 00' 20"	00.10				180 0 0	359 59 55	59 59 1/2				
26	5° 37' 00"	37' 25"	37.12 1/2	00	37	02.5	180 37 10	37 00	37 05	00	37	07.5	
17	5° 31' 40"	32' 05"	31.52 1/2	4	54	40							
76	12° 08' 30"	09' 10"	08 50	6	36	57.5							
Invisible 86													
78	16° 52' 10"	52' 30"	52 20	4	43	50	196 51 35	51 45	51 40	16	14	35	
	17° 08' 15"	08' 20"	08 17 1/2	0	15	57.5							
79	17° 40' 00"	40' 50"	40 25	0	32	07.5	197 39 40	39 50	39 45	00	48	05	
80	20° 13' 50"	14' 20"	14 05	2	33	40	200 13 30	13 30	13 30	2	33	45	
82	21° 41' 50"	42' 30"	42 10	1	28	05	201 41 45	42.05	41 55	1	28	25	
83													
44	91° 56' 40"	57' 15"	56 57 1/2	70	14	47.5							Buy Keary
46	125° 40' 35"	40' 15"	40 25	33	43	27.5							
Shasta - 1	194° 09' 40"	09' 30"	09 35	68	29	10	14° 09' 00"	09' 30"	09 15	142	27	20	
✓	194° 10' 30"	10' 50"	10 40	00	11	05	14° 10' 05"	10' 25"	10 15	00	01	00	
Pit	204° 00' 00"	00' 25"	00 12 1/2	9	49	32.5	33 59' 00"	59' 30"	59 15	19	49	00	
Pyramid	248° 05' 35"	05' 55"	05 45	44	04	32.5	68° 04' 20"	04' 40"	04 30	34	05	15	
10	336° 22' 50"	23' 45"	23 17 1/2	88	17	32.5	156 20 40	20 55"	20 47 1/2	88	16	17.5	
Diamond	359° 57' 45"	180° 00' 00"	59 52 1/2	23	36	35	179 58 30	359 58 20"	58.25	23	37	37.5	





Date: Oct 16  
 Station: South Base

Observer: W. Symons  
 Instrument: Shack pole (W)

OBJECTS.	READINGS.			MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.			
North Base	0	0	0	00 00 00 00	
Klikatat Hill	35	58	20	58 50 58 35	35 58 20
Clilo Hill	89	36	05	36 30 36 17.5	53 37 42.5
Ash man	106	46	50	47 10 47 00	17 10 42.5
Dalles Hill	122	21	00	21 00 21 00	15 34 00
North Base	359	59	50	59 55 59 57.5	237 38 57.5
Wedge	40	45	W		359 59 42.5

Dalles Hill	360	00	00	00 00 00 00	
North Base	227	39	00	38 30 38 45	227 38 45
K. Hill	273	38	00	37 30 37 45	35 59 00
C. Hill	327	15	20	15 20 15 20	53 37 35
Ash man	344	26	40	25 40 25 40	17 10 20
Dalles Hill	360	00	10	00 00 00 05	15 34 25
					360 00 05

OBJECTS.	READINGS.			MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.				
	120	00	00	00 20 00 10		
	155	58	50	58 40 58 45	35 58 35	
	209	36	40	36 30 36 35	53 37 50	
	226	46	40	46 30 46 35	17 10 00	
	242	21	15	20 40 20 57.5	15 34 22.5	
	120	00	20	00 40 00 30	237 39 32.5	
					360 00 20.0	

Date: S. Base Oct 16  
 Station:

Observer:  
 Instrument:

OBJECTS.	READINGS.			MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.			
North Base	00	00	00	10 00 05	7"
K. Hill	35	57	20	58 50	
	(3) 107	55	50	56 10 56 00	107 55 55 35 58 38.3
K. Hill	107	55	50	56 10 56 00	
C. Hill	(3) 168	49	40	49 20 49 30	160 53 30 53 37 50
C. Hill	168	49	40	49 20 49 30	
Astr. Mon	(3) 320	20	00	20 00 20 00	51 30 30 17 10 10
Astr. Mon	320	20	00	20 00 20 00	
Dallas Hill	(3) 367	03	00	03 20 03 10	46 43 10 15 34 23.3
Dallas Hill	7	03	00	03 20 03 10	
N. Base	3 359	59	50	0 0 59 55	712 56 45 237 38 55 359 59 56.6

REMARKS.	READINGS.			MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.			
					-17 1/2'
					+4° 33 1/2'
					+1° 52'
					-59 1/2'
					+1° 45'



Date: Oct 16  
 Station: Ast man

Observer: S. Symons  
 Instrument:

OBJECTS.	READINGS.			MEAN OF A. & B.	DIFFERENTIAL ANGLES.		
	Vernier A.	B.					
S. Base	360 00 00	59 50	359 59 55				
	47 01 30						
N. Base	(3) 141 05 10	05 10	05 10	141 05 15			
				47 01 45			
N. Base	141 05 10	05 10	05 10				
K. Hill	194 51 40		(59 46 30)				
	(3) 302 24 40	24 20	24 30	161 19 20			
				53 46 26.7			
K. Hill	302 24 40	24 20	24 30				
C. Hill	363 15 10		(60 50 30)				
	(3) 124 58 15	58 40	58 27.5	182 33 57.5			
	<del>260</del> 484			60 51 19.2			
C. Hill	124 58 15	58 40	58 27.5				
Dallas Hill	162 21 50	37 23 35					
	(3) 437 08 40	07 40	08 10	102 - 09 - 42.5			
				37. 23 14.2			
D. Hill	437 08 40	07 40	08 10				
S. Base	38 05 00	160 56 20					
	23 199 02 30	02 10	02 20	321 54 10			
	<del>549</del> 360	359 59 50	59 40 59 55	492 51 45			
	719	mistake made in sub traction		160 57 15			
				360 00 00.1			

Date: Oct 16  
 Station: ast man  
 Telescopes reversed

Observer: W. Lyons  
 Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
C. Hill	180 00 00	00 10 00	00 05	
D. Hill	217 23 10	22 50 73	00	37 22 55
S. Base	18 20 10	20 45 20	27.5	160 57 27.5
N. Base	<sup>65</sup> (245) 22 30	22 35 22	32.5	147.02 05.0
R. Hill	119 08 30	09 00 08	45	53 46 12.5
C. Hill	180 00 10	00 10 00	10	60 51 25
Needle N 53° E				360 00 05.0

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
	270 00 00	59 50	269 59 55		
	307 23 10	23 00	23 05	37 23 16	
	188 20 00	20 40	20 20	160 57 15	
	155 21 45	22 10	21 57.5	47 01 37.5	
	209 08 30	08 10	08 20	53 46 22.5	
	270 00 00	59 40	59 50	60 51 30	
				359 59 55.0	

N. Base	120 00 00	00 40 00	20		
Klikatat Hill	173 46 30	46 30 46	30	53 46 10	+ 11/2'
Flag staff Rockland	227 20 00				+ 4° 5' 4"
Aliso Hill	734 38 00	37 30 37	45	60 57 15	+ 2° 4'
Dances Hill	270 01 20	01 00 01	10	35 23 25	+ 2° 21'
Flag staff Dallas	(297 12 30)				
Catholic Church Dallas (cont see)					
Southern Base	<sup>72</sup> 432 58 10	58 40 58	25	160 57 15	+ 5 3/2'
North Base	120 00 00	00 50 00	25	47 02 00	

+ must be 272-01-20 + 1

v = bad  
w = worked

Date: Oct 19 1878.  
Station: Klakatal Hill

Observer: W. Symon  
Instrument: 8 + 13 1648

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
Needle	N 73 1/4 E.			
Calico Hill	00	00	00	00 00 00
b	3	59 <sup>(2)</sup>	40	58 10
bys	2	20	23	00
b	3	37	28	50
b	4	42	02	40 03 10
b	5	43	06	20
good	6	52	41	50 42 00
Dallas Hill	60	52	50	53 30 53 10 60 53 10
Whitaker	7	54	38	20
Delant	8	76	10	40
Stacks	9	79	35	20
Flag staff Rockland	10	80	56	10 56 40
	11	88	00	10 00
	11	89	34	40
Get man	92	34	10	34 35 24 22.5 31 41 125
Washington Peak	98	07	30	ward.
Knee S.	100	02	10	02 30
"	100	38	30	38 40
"	100	45	30	46 20
"	100	58	10	58 30 58 20
"	108	33	30	33 45 33 37.5 08 23 57.5
Jefferson	2	108	34	00 34 25 7.30 170
	3	108	45	30 45 40
South Base				
North Base	111	13	00	13 20 13 10 18 38 47.5
	12	120	03	10 10 14 50
	1	133	51	00 51 00
Hard	2	134	00	10 00 10
	3	135	58	40

Dark and mottled black below it.

44 46 15  
50 50



















22

Date: Oct 25  
 Station: Ash man -

Observer: Dr. Symonds  
 Instrument: 1.4.6

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
	170	0 0	0 0	
d. Base	5 21	20 21	40 21 30	
H. mark	45 34	30		40 13 10
	85 46	50		40 12 20
	125 59	20		40 12 30
	166 11	40		40 12 20
	206 24	40		40 13 00
	246 37	20	37 00	37 10
				40 12 20
				40 15 40
				40 12 36.7
H. mark	246 37	20	37 00	37 10
E. mark	249 49	10		11 50
	265 44	30	44 00	44 15
				19 11 05
				3 11 50.8
E. W.	265 48	30	48 00	48 15
? Waller H. } Klikatat }	276 10	10		10 21 40
	327 07	30	07 30	07 30
				62 09 15
				10 21 30.5

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
	Reversed -				
	147	57 30	57 30		
	29 14	30	14 30	14 30	241 17 00
					40 12 50
	29 14	30	14 30	14 30	
	48 25	00	24 50	24 55	19 16 25
					3 11 44.2
	48 25	00	24 50	24 55	
	110 33	10	33 00	33 05	62 08 10
					10 21 22.7

Date: Oct: 25<sup>th</sup> 78

Station: Astronomical Sta; The Dalles -

Observer: St. J. W. Symons -

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
Star	35 24.18	23 40	23 55	
W. mark	28 23 20	24.00	23 40	7-00-15
Star -	35. 20. 00	20.10	20 05	
W. mark	28. 23. 20	24.00	23 40	6-56-25
Star.	42. 10. 00	9.50 <del>10.30</del>	9 55	
W. mark.	42 10 00	9.50	9.55	
Star -	48. 54. 30	54.50	54 40	6-44-45
E. mark.	45. 22. 20	22.20	22 20	
Star	49. 07. 10	07.10	07 10	3-44-50
Reversed				
W. mark	229 07 10	07 10	07 10	
Star	235 <del>40</del> 50 41 20	41.40	41 30	6-34-20

Time taken by St. Symons Watch  
 Searched & found later at Camp

READINGS.	MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
Star	Cor. Time		
8.15.50		8-27-06.34	
8.27.20		8-38-36.34	
8.39.20		8-50-36.34	
8.51.09		9-02-25.34	
9.05.59		9-17-15.34	
9.16.27		9-27-43.34	E. a. S.

(Page 76 Book No 25 Time by S. A. W.)

Date: Oct 29. 1878  
 Station: Ast. Now.

Observer:  
 Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
Dalles Hill				
Hood (1)	131. 16' 30"	15' 40"	59. 30	16' 5"
	(3) 33. 47. 00	47. 40.	47. 20	393 47 35 131 15 56.7
Hood (1)	33° 47' 00"	47' 40"	47' 20"	
Hood (2)	(1) 33° 56' 10"			
	(3) 34° 14' 40"	15' 10"	14' 55"	27 35
Hood (2)	34 14 40	15 10	14 55	
S. Base	(1) 63° 46' 50"	47' 20"	47' 5"	
	(3) 122° 51' 00"	51' 10"	51' 5"	88 36 10 29 32 08.3
S. Base	122° 51' 00"	51' 10"	51' 5"	
Adams (1)	195° 58' 20"			
	(3) 342° 12' 30"	12' 20"	12' 25"	

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
	0 0 0	00. 20	00. 10		
	(3) 33° 48' 00"	48' 30"	48. 15	393 48 05 131 16 01.6	131 15 56.7
	(3) 34° 15' 20"	16. 00	15' 40"	27-25	9' 10"
	(3) 122° 51' 20"	51' 40"	51' 30"	88 35 50 29 31 56.7	29 32 00 29 41 10
	(3) 342° 13' 10"	13' 10"			

made. 4 1/2 7 1/2

Adams

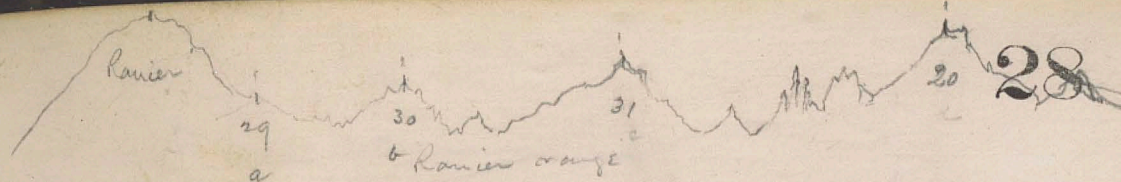
Date:

Station:

Calico Hill

Observer:

Instrument:



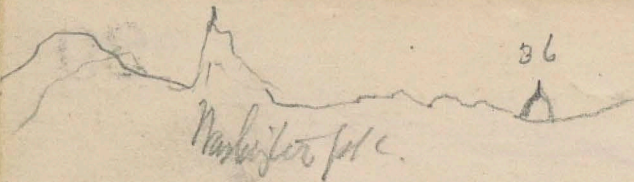
OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
Jefferson 2 <sup>nd</sup>	0 0 0	59 50	59 55	
" 1 <sup>st</sup>	359 58 50	59 10	59 00	
Little Hood 12	19 48 15	48 20	48 17.5	19-49-17.5
Hood 1 <sup>st</sup>	28 54 20	54 20	54 10	28-55-10
Hood 2 <sup>nd</sup>	29 00 20	00 20	00 20	9 05 52.5
-13 :	36 54 10			
15 :	51 18 50	19 00		
15	54 54 20	55 00	54 40	
Klik Hill 1	63 04 30	4 50		
" 2	63 06 50	7 00	06 58.5	63-07-55
16 1/2 :	73 25 50			
17	77 59 20	78 00 00	77 40	
18	78 23 20	23 40	23 30	
27 (2)	79 57 00	59 20	59 10	
28	83 55 30	56 00	55 45	
St. Helens 1 <sup>st</sup>	88 21 20	21 40	21 30	
" 2 <sup>nd</sup>	88 35 40	35 50	35 45	
Adams (1 <sup>st</sup> Hood)	109 56 20	56 30	56 25	
Summit 2 <sup>nd</sup>	110 24 20	24 40	24 30	22 03 00
Little Adams 2 <sup>nd</sup>	113 52 00	52 10	52 05	3-27-35
Little Snow Mountain				
Ranier - good	121 27 20	27 20	27 20	
a 29	122 10 40			
b 36	122 43 40	44 00	43 50	
c 38	123 40 00	40 20	40 10	
d 20	124 53 30	53 50	53 40	

From Klik Hill Ranier just behind Adams

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
					+ 1.45
					+ 9 1/2
					+ 13'
					+ 16'
					+ 36'
					+ 35'
					+ 1° 56'
					+ 50'
					+ 48'
					+ 26'
					+ 29'
					+ 34'







36

Washington pt. c.

Date: April 1  
Station: Celilo Hill

Observer:  
Instrument:

OBJECTS.	READINGS.				MEAN OF A. & B.	DIFFERENTIAL ANGLES.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.					Vernier A.	B.			
Jefferson 2 <sup>d</sup>	120	0	0	0	0						
Wood 1 <sup>st</sup> repeated	206	44	30	43	50						
Water	S. 40° W. 1100										
Wood 1 <sup>st</sup>	206	44	30	43	50						
St. Helens 1 <sup>st</sup>	266	11	50								
	3	25	05	00	05	00	05	00	17	5	
Water	N 80 1/2 W. 54.										
						17	5	00	56	7	
St. H. 1 <sup>st</sup>	25	05	00	05	00	05	00				
Adams 2 <sup>d</sup>	391	11	30	12	00	11	45				
	N. 58 1/4 W.										
						66	06	45			
						22	02	15			
Adams 1 <sup>st</sup>	91	11	30	12	00						
Ramer	3	124	20	10	20	30					
	N. 47 1/2 W.										
Ramer	124	20	10	20	30						
Jefferson 2 <sup>d</sup>	2	53	40								
	3	120	00	50	1	00					
Washington pt. c.	170	0	0	0	20	00	10				
36	114	1	40	2	00	01	50				
Jeff 2 <sup>d</sup>	119	59	10	59	20	59	15				

try over

Mistake in setting up

Date:

Station:

Observer:

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		

The peak that I have called Washington Peak at Kliputat Hill and Celilo Hill. Karl thinks is the northern of the two sisters and that 36 is Washington Hill.

READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
Vernier A.	B.			





Date:

Station:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
K. Hill	0 0 0	0 30	00 15	
Summit Celis Hill	149 51 40	51 50	51 45	
W. l.	184 39 00	38 40	31 50	
W 4 (??)	206 18 00	17 30	17 45	
W 4	229 19 40	19 00	19 20	
" 5	230 33 00	33 00	33 00	
" 6	243 59 40	59 20	59 30	
37	238 58 40			
38	239 19 20			
39	240 18 00			
6	241 51 10	01 10	01 10	
40	242 59 40	59 20	59 30	
40	244 30 00			
9	275 03 50			
25	277 29 40			
Lush Hill	282 32 40			
Prof. 1	296 51 50	51 00	51 05	246.50 50
Prof. 2	296 51 50	51 50	51 50	13 07 50
41	299 53 40	53 20	53 30	459 58 40
Little Wood 12	316 40 20	40 40	40 30	
Dalles Dr	319 35 00	35 00	35 00	2 54 30
Wood.	325 46 10	46 20	46 15	6 11 15
" 2	325 52 00	52 20	52 10	

Very hazy to South

Observer:

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
					- 23'
					- 18' near
					- 4'
					- 6'
					- 8 1/2'
					- 7'
					- 14' near
					- 5'
					- 7 1/2'
					+ 2'
					+ 13'
					+ 48 1/2'
					- 1-54'



Date:

Station:

Observer:

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.		REMARKS.
	Vernier A.	B.				
A.M. mile	333 25 00		335 00			-2° 14 1/2'
S.B.	334 34 50	35 20	35 05	1-10-05		
N.B.	340 44 00	44 20	44 10	6 09 05		
13	343 21 40	22 00	21 50			+12 1/2'
<del>13</del>	<del>344 46 00</del>	<del>45 20</del>				
14	346 28 10					
<del>15</del>	<del>348 10 00</del>					
15	351 46 20	47 00	46 40			+20 1/2'
<del>15</del>	<del>359 58 20</del>	<del>59 00</del>	<del>58 40</del>			
Katal	0 0 0	0 0	0 00 20			
16 1/2	10 19 20	20 00	19 40			+1 1/2'
17	14 53 00	53 50	53 25			+12'
18	15 16 40	17 20	17 00			+13'
bad pt. 27 (?)	16 51 20	51 40	51 20			
28	20 47 50	48 30	48 10			+15' <small>angled</small>
42	24 43 20	44 00	43 40			+23'
St. Helena 1 <sup>st</sup>	25 13 40	14 10	13 55	25 13-55		
2 <sup>nd</sup>	25 27 10	27 40	27 25			
Abanus 2 <sup>nd</sup> sum	47 15 50	16 30	16 10	47 15 50		
Little Abanus	50 43 40	44 20	44 00			
River	58 18 40	19 20	19 00			
30	59 35 00	35 40	35 20			
31	60 31 10	31 50	31 30			
20	61 44 50	45 40	45 45			
21	68 52 20	53 10	52 45			

orw



46  
Craggy butte  
Gray butte

Date: Nov 10, 1870  
Station: No 9 of C hill and also of K hill  
(center from the hill)

Observer:  
Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			Vernier A.	B.			
Needle	n. 70 w								
Wood	241	08 50	8 00	08 25					
Settles Wood (W)	247	57 40	57 00	57 20	6	48	55		
St Helens 1 <sup>st</sup>	258	10 55	9 55	10 25					
" 2 <sup>d</sup>	258	23 30	22 40	23 05					
Adams (2 <sup>d</sup> )	277	45 20	44 50	45 05					
" 2 <sup>d</sup>	282	26 30	25 50	26 10					
Tygh hills (Kas. mon)	290	49 50	49 10	49 30	17	4	25		
Cedar Hill?	301	39 30	39 00	39 15	6	38	50		
No. 22	306	45 40	45 10	45 25					
No. 4	30	18 50	19 00	18 55					
No 39	106	42 40	43 00	42 50					
Gray Butte	141	59 00	59 40	59 20					
No 6	39	56 00	56 05	56 02.5					
No 7 (white mt)	44	48 00	48 10	48 05					
Craggy butte									
Gray butte	111	58 40							



43  
Hood

Date:

Station:

Observer:

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			Vernier A.	B.			
Geog. Center	111 - 58 - 00	58 - 30	58 15						
S.S.	133 - 49 - 00	49 - 20	49 10	21 50 55					
No. 10	148 - 20 - 30	20 - 25	20 27.5	14 31 17.5					
No. 25	154 - 10 - 00			5 49 32.5					
Mt. Jefferson	167 - 26 - 40	26 - 40	26 40	<del>19 6 12.5</del>					
No. 2	167 - 28 - 30	28 - 20	28 25	13 16 40					
No. 25	154 - 10 - 00	-	-	0 11 45					
No. 41	179 - 30 - 20	30 - 00	30 10	01 51 45					
No. 43	220 - 58 - 10	57 - 40	57 55	41 27 45					
Hood	241 - 7 - 20	6 - 30	6 55	20 9 0					
				73 40 15					

Date:   
 Station:   
 Instrument:

Observer:   
 Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
North	0 0 0	59 50	59 55	
Little North	6 - 48 - 20	48 - 20	48 20	6 48 25
St. Helens No 1	17 - 1 - 20	1 - 30	1 25	
" No 2	17 - 14 - 20	14 - 40	14 30	
28	24 - 52 - 00	52 - 20	52 10	
44	26 - 44 - 20	44 - 40	44 30	
Adams	35 - 35 - 40	35 - 50	35 45	55 55 55
Little Adams No 19	38 - 41 - 50	42 - 00	41 55	2 - 05 - 10
No. 20	41 - 16 - 20	16 - 20	16 20	
Lynch H. (Rocks Sta)	49 40 00	39 50	39 55	
Cliff Hill	60 09 00	9 10	09 05	60 - 9 - 10
22	65 36 10	36 30	36 20	
4	149 - 10 - 10	10 - 10	10 10	
45	150 - 20 - 40	20 - 50	20 45	
6	168 - 46 - 40	46 - 40	46 40	
Black No. 7	163 - 39 - 00	39 - 00	39 00	
(No. 1 white)	163 - 53 - 20	53 - 10	53 15	
46	172 - 17 - 00	17 - 00	17 00	
7 47	179 - 41 - 40	41 - 20	41 35	
Grey Butte	220 - 27 - 20	-	27 20	
48	225 - 33 - 30	33 - 10	33 20	
Grey Butte	230 - 50 - 30	50 - 00	50 15	
3.5.	252 - 40 - 20	39 - 40	40 00	
No. 10	267 - 12 - 50	12 - 20	12 35	
No. 25	273 - 8 - 00			
Mt. Ref. No. 2	286 - 21 - 10	20 - 30	20 50	

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
	Instrument Reversed				
	180 - 0 - 0	0 - 30	0 15		+ 1 - 51 - 00
	186 - 48 - 40	48 - 50	48 45	6 - 44 - 20	+ 0 - 46 - 00
	197 - 2 - 00	2 - 10	02 05		+ 0 - 4 - 00
	197 - 14 - 50	14 - 30	14 40		+ 0 - 2 - 00
	204 - 53 - 00	53 - 00	53 00		- 0 - 10 - 00
	206 - 45 - 00	44 - 50	44 55		- 0 - 22 - 00
	216 - 36 - 20	36 - 00	36 10	36 - 36 - 55	+ 0 - 35 - 00
	218 - 42 - 20	42 - 20	42 20	2 06 10	- 0 - 3 - 00
	221 - 17 - 10	17 - 00	17 05		- 0 - 11 - 00
	229 - 40 - 20	40 - 20	40 20		- 21
	240 - 10 - 00	9 - 40	9 50	60 09 35	- 29
	245 - 36 - 40	36 - 00	36 20	<del>60 36 05</del>	- 0 - 1 - 30
	329 - 10 - 10	10 - 20	10 15		- 0 - 4 - 00
	330 - 21 - 40	21 - 30	21 35		+ 0 - 4 - 00
	338 - 48 - 00	48 - 00	48 00		+ 0 - 2 - 00
	343 - 40 - 20	40 - 40	40 30		+ 0 - 2 - 00
	343 - 54 - 20	54 - 30	54 25		- 0 - 2 - 00
	352 - 17 - 50	18 - 10	18 00		- 0 - 2 - 00
	359 - 42 - 40	42 - 40	42 40		+ 0 - 11 - 00
					Top wooded top point
	45 - 34 - 00	34 - 20	34 10		- 0 - 8 - 00
	50 - 50 - 10	51 - 00	50 35		
	72 - 40 - 30	41 - 20	41 25		
					- 1 - 5 - 00
	106 - 21 - 00	21 - 40	21 20		+ 1 - 28 - 00

Date:

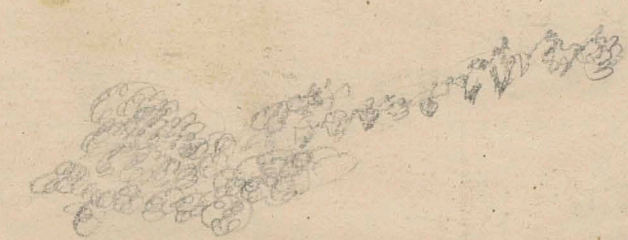
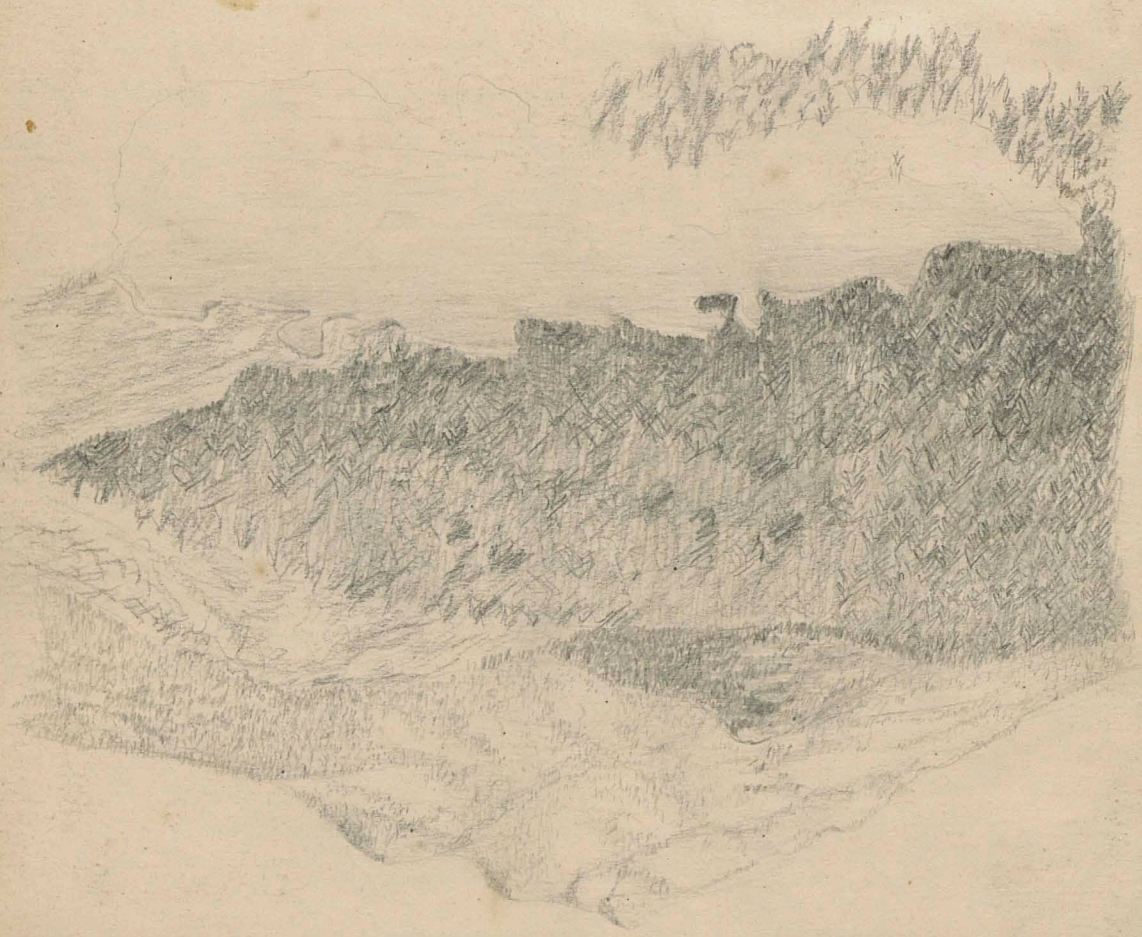
Station:

Observer:

Instrument:

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.
	Vernier A.	B.		
<i>white</i>				
			<i>46 white</i>	
700. 41	298. 23 - 20	22-50	23 05	
700. 43	339. 51 - 20	51-10	57 15	
700. Hood	0 - 0 - 10	0 - 0	00 05	

OBJECTS.	READINGS.		MEAN OF A. & B.	DIFFERENTIAL ANGLES.	REMARKS.
	Vernier A.	B.			
					<i>47 maybe J</i>
	118-28 - 40	24-20	24 30		<i>70 - 50 - 00</i>
	158-51 - 20	51-30	57 25		<i>0 - 0 - 0</i>
	180-00 - 00	00-00	00 00		<i>0 - 0 - 0</i>

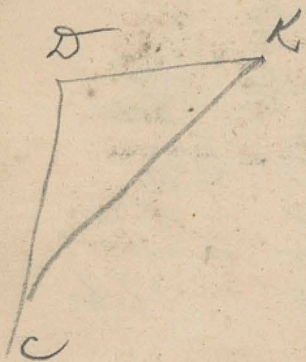


$$\begin{array}{r} 50 \times \frac{4}{5} = \frac{200}{5} \\ 50 \times \frac{6}{5} = \frac{300}{5} \\ \hline 1000 + \frac{600}{15} \end{array}$$

$$\frac{50}{1} + \frac{50}{1} = \frac{50}{\frac{3}{4}} + \frac{50}{\frac{1}{4}}$$

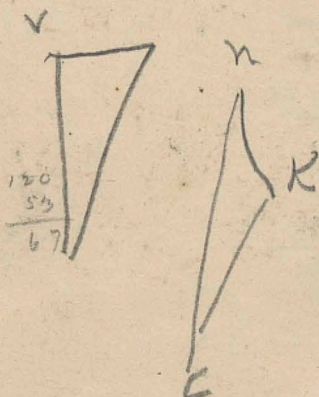
$$\frac{800}{1} = \frac{1600}{15}$$

$$\frac{1500}{15} = \frac{1600}{15}$$

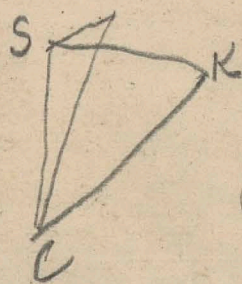


D. 78 42 20  
 R 60 53 31  
 -----  
 139 35 51  
 180

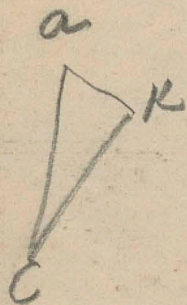
C - 40 24 29  
 319 35  
 -----  
 379 11  
 40 29



338 47  
 K = 111 13  
 n 49 32  
 -----  
 160 45  
 180  
 C 19.15



K 100 58  
 S 53 58  
 -----  
 154 56  
 180  
 C 25.04



a 53 28  
 R 94 34  
 -----  
 146 02  
 180  
 C 33 58

60 51  
 92 34  
 -----  
 153 25  
 180  
 -----  
 26 35  
 360  
 -----  
 333 25

K. 333 25  
 31 41 18  
 98 14 37  
 -----  
 129 55 577  
 180  
 50 04 06.3

170  
 31

319 35  
 120  
 -----  
 439 35  
 79

112 58  
 -----  
 170

47 01 45  
 106 46 38.3  
 26 11 27.5  
 -----  
 199 59 50.8

50 04 40  
 326 02  
 -----  
 120  
 446 02  
 86 12

292

374 56  
 120  
 -----  
 454 56  
 44 56

333 75  
 120  
 -----  
 453 35

9335

342 45  
 120  
 -----  
 460 45

589 35  
 229 35  
 -----  
 603 25  
 243 25

344 45  
 296 52  
 -----  
 47 53  
 1 22  
 -----  
 46 30

needle  
 shute  
 42  
 10  
 14  
 15  
 10  
 14  
 15  
 16  
 17  
 18  
 19  
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 21  
 22  
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 30  
 31  
 32  
 33

604 56 610 45  
 -----  
 344 58 350 45  
 -----  
 26 11 27.5

38 Orange mineral seen from  
 39  
 40  
 41

360 0350  
 275 0350  
 -----  
 84 58 10  
 80 58 55  
 -----  
 165 53 05  
 14 06 55