1-13-1852

Howard, Oliver O. - Papers as Cadet at West Point, N.Y.

O.O. Howard Collection

222 and 223 Left-

The particles of aether in undulating theory are supposed to move in elipses; when by any means one of the components giving rise to this eliptical motion is withdrawn then the particles will move in a straight line and be plane polarized; the two Components giving rise to this Eliptical motion being at right angs. to each other, the Component motions would take place in planes at right angs to each other- This explains why in double refracting crystals the two portions of light are oppositely polarized and why with the reflector, the reflected and transmitted light (portions of) are oppositely polarized. In case of circular polarization, the particles move in Circles

226 and 227 Right-

The agency of 1st surface is shown by the rings disappearing when it is not brought into play in order to reflect a portion of the light-

230 and 231 Left-

In case of dark rings the thickness will be 0 2t 4t &c and the corresponding differences of wave $= 2t + \frac{\lambda}{2}$ will be $2.0 \times t + \frac{\lambda}{2} - \frac{\lambda}{2}$ $2 \times t r + \frac{\lambda}{2} = \lambda + \frac{\lambda}{2} = \frac{3}{2}\lambda$, $2 \times 4t + \frac{\lambda}{2} = r\lambda + \frac{\lambda}{2} = \frac{5}{2}\lambda$ &c &c

In case of dark rings the thickness will be t. 3t. 5t &c, and the corresponding differences of wave $= 2t + \frac{\lambda}{2}$ will be $2.\frac{1}{4}\lambda + \frac{\lambda}{2} = \lambda$, $2.\frac{3}{4}\lambda + \frac{\lambda}{2} = 2\lambda$, $2.\frac{5}{4}\lambda + \frac{\lambda}{2} = 3\lambda$

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finished Jan 13th 1852,

…pen of … O. Howard …det. West Point. O. Howard

(1st Ex.)

The height of Fort 'Pat' above the plain at the play-staff

Upper Station	Lower Station
Att. ther $T' = 58°.5$	$T = 57$ & 61
Det. ther $t' = 59°$	$t_1 = 54$ & 63
$b = 29.64$ in	$b_n = 29.99$ & 30

$b\,(1 + \overline{T - T'}\,0{,}0001) = 30(1 - 4 \times 0{,}0001) = 29.988$

$b_n = \dfrac{29.99 + 29.988}{2} = 29.989$

$t_1 = \dfrac{54 \text{ \& } 63}{2} = 58.5$

$t_1 + t' = 58.5 + 59 = 117°.5$

$T - T' = 57° - 58.5 = -1°.5$

Log. b_n, 29,989	$= 1.476963$
C for $(-1°.5)$	$= 999934$
	1.476897
Sub (log b) 29.64	$= 1.471878$
log	$= ,005019 =$
	3.700617
Add A for $117°.5$	$= 4.805723$
Add B for 41.4	$= .000146$
	$2.506486 = \log$
	320.9 ft

320.9 ft

Upper Station	Lower Station	
$T' = 61°$	$T = 64°$	$T - T' = 3°$
$t' = 61.5$	$t_1 = 66°$	$t_1 + t' = 127.5/10$
$b = 30$	$b_n = 30.193$	

Height of Station at Library above the Level of the river

Log. $30.193 = b_n$	$= 1.479906$
C for $3°$	$= 0.000130$
	1.480036
Sub log $(b = 30)$	$= 1.477121$
	$.002915 = -3.464639$
log g	4.810254
Add A for $127°.5$ =	
Add B. for 41.4	$= 0.000146$
	$2.275039 = \log A$
	188.36 ft

Problem for determining the long. by Lunar Culminating Stars

Stars A.C. Greenwich. Notes.

	h	m	sec.
D's west Limb	13	59	25.76
ξ^2 Libræ	14	48	49.29
$f' =$		49	23.53

West Point moons west Limb $14^h\ 12^m$ —

sec
30.7
46.5
03
20.5
37.4
54.5
10.5
203 1
29.

West Point.

	h	m	sec
D's W. Limb	14	12	29
ξ^2 Libræ	14	51	18.3
		38	49.3

(Clock-rate 06.1 may be neglected for the short interval)

$f_1 = 38^m - 49.3$

$f_1 - f' = 10^m - 34.23^{sec}$

" = 634.23 seconds

$l = 4^h - 55^m - 50^{sec}$ approx. lat

" = 17750 sec

$12^h = 43200$ sec

$\frac{l}{12h} = .4106+$ sec

May 14 L.	13^h	31^m	05.92^{sec}
" 20 U.	13	59	25.76
" 20 L.	14	28	32.85
" 20 U.	14	58	32.74

$28^m - 20.44^{sec}$ — 46.65^{sec}

$29^m - 07.09$ — 52.80

$29\ 59.89$

$\Delta_1 = 29^m - 07.09$

" = 1747.09 sec

$\Delta_2 = \frac{1}{2}(46.65 + 52.80)$

" = 49.72

$\Delta_3 = (52.80 - 46.65)$

" = 6.15 sec

$a = A\frac{l}{12h} + B\left(\frac{l}{12h}\right)^2 + C\left(\frac{l}{12h}\right)^3$

$A = A_1 - \frac{1}{2}\Delta_2 + \frac{1}{12}\Delta_3 = 1722.74^{sec}$

$B = \frac{1}{2}\Delta_2 - \frac{1}{4}\Delta_3 = 23.33$

$C = \frac{1}{6}\Delta_3 = 1.02$

(Observations made May 20. 1853. West Point N.Y.

To determine the lat of West Point.

β Leonis

N. Dec - May 11th 1853 - 15° - 23' - 36".8

Reading on Limb - 116° 45'

Micrometer (A) 35".5/10

" " (B) 33

Zenith Point 142° 45' - 56".5/10

Barometer - 29.925 in

Thermometer 56°

29.925
30
-.075

56
50
+6

142° 45' 56".5
mean - 116 45 33.25
90 - [26 - 0' 23.25]
Alt - 63 - 59 36.75 apparent
28.67
90 - [64° - 00 - 5.42]
25° - 59' - 54".58
15° - 23' 36".8
41' - 23' - 31".38 Lat

28.4
27+
28.67

.95
-.075
475
665
-.07125

.057
6
.342
07125
.27075

γ Ursae Majoris

N Dec. 54° 30' - 53".9

Reading 155° 50' Limb

8' - .02".5 (M) (A)

.02".5 " (B)

155° - 53 - 2".5
142° - 45' - 56".5
13° - 7' - 6"

76° - 52' - 54"
14.53
76° - 53' - 8".53

13° - 6' - 51.47
54 30 53.40
41° 24' - [illegible]

.48
.075
-.036

.029
6
.174
.036
.138

14.4
138
14.53

Respectfully Submitted

O. O. Howard

To

Mr J J Reynolds Cadet U S M A
Lieut Artillery