Date taken from Library	Title of Work.	
Jany. 20 1885	Local Deflections 49 Parallel	Pamphlet
" 20 1885	Regle Geodesie Internacional	"
Feby 4	Journal of Mathematics Jany. '85	"
On Inventory C.S.P. Aug 25 - 1885.	Chisholm's Weighing & Measuring -	
"	Helmert's Geodesie Part 2	
March 27/86	Heis Star Atlas & Catalogue 2 volumes	
	Inventory Jany 1/91 only accounts for 1 vol.	
" 27/86	Seaver Formulae of Trigonometry.	
" 27/86	Wittstein's Gaussians	
Aug 4/88	Helmert's Geodäsie 2 vols	
" 4/88	Astr. Gesellschaft Vol. 21 No. 3.	
" 4/88	Untersuchungen uber die in Innern der Erde	
	Letter of Transmission Aug 4/88 states sent by express. -Express receipt dated - Aug 6/88 - 1 Box -	
Feby 26 1887	Rowland's Photograph Solar Spectrum No. 2.	

Returned to Office.

1886.

Mch. 6. 1 Roll Chron. Sheets, Patagonia Pendulum

" 1 Vol. Geneva Pend. Observations.

Mch. 8. 17 St. Augustine Sheets

" 1 Envelope Patagonia Observations

" 1 " New York Computations.

" 1 " Ebensburg Observations,

" Supplement to Account of Thomstead.

" ~~R. R. Prens. Geo. Inst. Messungleichungen II.~~

" Wolfl – Phot. Beob.

" Comptes Rendus.

Apr. 16. 1 vol. Pend. observations at Smithsonian.

" 41 Chronograph Sheets in Tin Box belonging

" to above observations.

Apr. 22. >2 Pend. Stands 1884 + 5.

>2 " Heads #0 + #3,

>3 Pendulums Nos. 1, 2 + 3,

~~Reading Lens~~ #

> Reading Telescope #300 + Condensing Lens #17.

> Chronograph #VII + Weights.

>1 Microscope + box of objectives.

>2 Chronometer cases.

>1 Atwood flexure wheel

1 Filar Micrometer

>1 Tool Chest.

U. S. COAST & GEODETIC SURVEY,

ELEVATIONS ABOVE TIDE WATER.

U.S. Coast & Geodetic Survey, Elevations above Tide Water.

MARYLAND

	M
Taylor	29.05
Linstid	48.13
Webb	71.91
Harriott	70.02
Agricultural College	70.59
Hill	84.14
Montgomery Blair's house	125.77
Soper	149.03
Stabler	174.00
Sugarloaf	395.46
Maryland Heights	443.01
Fort Franklin, Redoubt or Fort Sumner Kirby	103.83
Fort Franklin Redoubt or Fort Sumner Kirby	105.70
Fort Alexander, Redoubt or Fort Sumner. Davis	105.25
Fort Alexander, Redoubt or Fort Sumner. Davis.	103.08
Redoubt Cross, Fort Ripley or Fort Sumner	100.92
Redoubt Cross, Fort Ripley or Fort Sumner.	99.72
Brick house	65.50
Fort Mansfield	96.22
Fort Mansfield	93.48
House, yellow roof, in Bladensburg	32.80
Bladensburg Meeting house	15.40
Fort Bayard	105.20
Fort Bayard	104.45
Fort Simmons	96.95
Fort Simmons	93.66

Maryland (continued).

Kent Island, north end of base	5.41
Annapolis, bench mark (a)	1.394
Annapolis, bench mark (b)	1.497
Ferry wharf, Severn river north side	6.355
Bench Mark, Governor's house	12.70
(Ann.) Bench Mark, Church on West Street	13.15
(Ann) Odenton	40.06
Patuxent	25.50
Bowie	45.30
Bridge at Wilson	17.09
Hagerstown, Court house	160.340
Mile post 1	171.053
Mile post 2	177.026
Mile post 4 (turnpike Hagerstown to Williamsport)	150.004
Mile post 5	130.394
Williamsport, Aqueduct of Canal	109.110
Dam No. 5 about 7 mls. W. of Williamsport	113.348
2nd Canal lock above dam 5	118.201
6th lock above dam 5	123.203
Overflow at Big Pool, C.O. Canal	123.650
Aqueduct over Licking Creek	126.395
Aqueduct at Hancock	127.245
Lock No. 52, C. & O. Canal	127.537
Lock No. 53, C. & O. Canal	130.225
Lock No. 55, C. & O. Canal at Dam no. 6	135.331
Lock No. 56, C. & O. Canal	137.697
Lock No. 57	138.680
Aqueduct over 15 mile Creek	140.150
Lock No. 58	142.559

Maryland (continued)

Lock No.61 ..... 166.677

North end of Canal Tunnel 102.281

Lock No.67 ..... 164.793

Lock No.73 ..... 179.114

Cumberland, Feed lock of C. & O. Canal 196.165

B. & O. R.R. 5 1-2 miles W. of Cumberland 197.313

B. & O. R.R. about 12 mls. W. of Cumberland 211.532

B.&O.bridge at Bloomington 307.429

B. & O. R.R. bridge 10 3-4 mls. W. of Bloomington 693.364

North of Deer Park 749.650

3 miles E. of Oakland, Bridge of B.& O.RR. 732.718

Rock, 1 mile W. of Oakland 725.614

Bridge over Youghiogheny river 1 1-2 miles W. of Oakland 724.148

Hutton's Switch station, bridge 742.687

District of Columbia.

	m
Navy Yard, tide gauge	0.031
Navy Yard, bench mark	1.44
Navy Yard	11.00
Coast Survey Office, old (top of chimney)	30.00
Coast Survey Office, old (moulding between basement & 1st story)	23.044
Coast Survey Office, now	23.813
U.S. Naval Observatory	40.80
Georgetown College Observatory	63.54
Old Capitol Dome	70.36
Capitol, new dome	115.46
Causten	117.70
Soldiers' Home or Military Asylum	125.63
Soldiers' Home, ground	100.40
Kengley's House (Top of S.E. chimney)	123.31
Kengley's House (Ground at S.E. corner)	110.80
U.S. Insane Asylum (Top of balust. on tower)	77.78
U.S. Insane Asylum (Ground at N. front of tower)	62.95
Blunt's House	133.07
Fort Reno (Parapet at Gun No. 10)	120.75
Fort Reno	131.10
Fort Gaines (Parapet at Gun No. 5)	125.70
Fort Gaines (Ground at flagstaff)	123.11
Battery Cameron	84.37

District of Columbia (continued)

Smithsonian Institute (top of bal. flagpole tower 53.31

Smithsonian Inst.(Ground M. from tower 10.33

New C.S.Office (top of roof at flagstaff) 41.66

[illegible] Bridge 2.40

Capitol, brass benchmark (1884) 27.705

Virginia.

Old [illegible] School 95.38

Old Theological Seminary 102.33

Peach Grove 158.95

[illegible] signal 208.07

Hill [illegible] 419.02

[illegible] Cemetery steeple 113.97

Hill's House 144.05

Temple Church 101.07

Arlington 62.07

Falls Church 110.35

[illegible]'s Hill 116.33

Fort Whipple 69.75

Clark 334.26

Long Mt. 437.68

Mt. Marshall 1023.45 3348

Humpback 1110.36 3643

Fork 1173.71 3851

Spear 492.48

District of Columbia (continued)

Smithsonian Institute (top of bal. highest tower	53.31
Smithsonian Inst. (Ground N. front tower	16.63
New C.S. Office (top of roof at flagstaff)	41.06
Nav. Yard, bridge	2.46
Capitol, brass bench-mark (1884)	87.70

Virginia.

Old High School	95.36
Old Theological Seminary	102.28
Peach Grove	153.95
Leesburg signal	208.07
Bull Run	419.02
New Seminary steeple	119.97
Hall's House	144.05
Langley Church	161.07
Arlington	92.07
Falls Church	116.85
Munson's Hill	110.03
Fort Whipple	99.75
Clark	334.30
Long Mt.	487.68
Mt. Marshall	1023.45
Humpback	1116.36
Fork	1173.71
Spear	402.48

Virginia (continued)

Tobacco Row	800.45	
Flat Top, Peaks of Otter	1019.33	4070
View Tree	891.27	
Potors	556.62	
Ragged	1005.32	3298
Jarman	903.49	
Peaked Mt.	902.70	
Elliot's Knob	1463.35	4175
Cohas	1000.45	3371
Buffalo	1210.00	3971
Smith	622.78	
Bull Mt.	980.14	
Bluff Mt.	1073.50	3522
Willis	350.25	
S.W.Peak of Otter	1100.00	3875
Lynchburg, Court House	342.73	
Amherst, Court House	252.00	
University of Virginia (Charlottesville)	200.24	657
Culpepper Court House	150.00	
Culpepper Baptist Church	102.70	
Sugarloaf Mt.	600.75	

West Virginia.

B.& O.R.R. bridge 1-4 mile E.of Keyser 244,725

2 miles E.of Cranberry Summit station 746,.30

B.& O.R.R. 1 1-2 miles W.of Cranberry Summit ... 747,001

Bridge Salt Lick Creek 405,015

Rawlesburg,B.R.bridge over Cheat River 420,062

Buckhorn wall, 3 1-2 mls. W. of Rawlesburg..... 523,406

Grafton,bridge 2 miles E.of 012,141

Grafton,bridge Taggart's Valley Creek 003,004

Stone 2 1-2 , Parkersburg branch B.& O.R.R. 330,011

B.& O. bridge E.of Bridgeport 208,020

1-4 mile East of West Union 245,807

R.R. bridge No.21 over Middle I. Creek 243,000

Bridge No.26 244,773

Bridge No. 31 211,870

Bridge No. 35 203,160

Bridge over Goose Creek 212,319

Bridge No. 44 211,373

Bridge No. 52 105,264

Parkersburg, corner P.O.& C.H. 107,011

Tidal observations on the south shore of Massachusetts and in Nantucket and Vineyard Sounds. Rept. 1854, app. 29, pp. 35-37.

Description of tide-gauge used at stations on the open seacoast and in situations exposed to strong currents. Rept. 1854, app. 53, pp. 190, 191.

Tidal observations in Nantucket sound. Rept. 1855, app. 33, pp. 222, 223.

Interference tides of Nantucket and Martha's Vineyard sounds. Rept. 1856, app. 37, pp. 261-263.

Tides and currents of New York harbor and its dependencies. Rept. 1856, app. 39, pp. 264-266.

Tides and currents in Nantucket and Martha's Vineyard sounds and in East river at Hell Gate with remarks on the revision of levelings on Hudson river. Rept. 1857, app. 35, pp. 350-354

Tide gauge for deep water. Rept. 1857, app. 50, pp. 403, 404.

Currents in the East river at Hell Gate and Throg's Neck, the sub-currents of New York bay and harbor and levelings on the banks of the Hudson river. Rept. 1858, app. 28, pp. 204-207.

Physical survey of New York harbor and the coast of Long Island. Rept. 1859, app. 26, pp. 311-317.

Implements devised for collecting specimens of bottom in alluvial harbors. Rept. 1860, app. 39, p. 398.

Soundings across the Florida straits. Rept. 1866, app. 5, pp. 35-44.

Preliminary report on the interference tides of Hell Gate, with directions for reducing the soundings. Rept. 1866, app. 6, pp. 44-46.

Tides and currents of Hell Gate, N.Y. Rept. 1867, app. 13, pp. 168-169

Surveys in the Merrimack river, Massachusetts. Rept. 1867, app.14, pp. 170-175.

Report on soundings made to develop the character of the Strait of Florida between Key West and Havana. Rept. 1867, app.15, pp. 176-179.

Notes on Gulf Stream observations. Rept. 1868, app.11, pp.166,167

Reclamation of tide lands and its relation to navigation. Rept. 1869, app.5, pp. 75-104.

(And H. L. Whiting.) Reports concerning Martha's Vineyard and and Nantucket. Rept. 1869, app.15, pp. 236-259.

Method of determining elevations along the course of a tidal river without the aid of a leveling instrument. Rept. 1870, app.11, pp. 98, 99.

On the probable effect of extended piers in modifying the channel facilities of San Francisco bay near Yerba Buena island. Rept. 1870, app. 18, pp. 180, 181.

Harbor of New York, 1873. Rept. 1871, app. 8, pp. 109-133.

Nauset beach and Monomoy peninsula. Rept. 1871, app.9, pp.134-143.

Location of harbor lines. Rept. 1871, app.10, pp.144-153.

Middle-ground shoal, New York harbor. Rept. 1872, app.16, pp. 257-261.

Physical survey of Portland harbor. Rept. 1873, app.8, pp.94-102.

Changes in the neighborhood of Chatham and Monomoy. Rept. 1873, app.9, pp. 103-107.

Changes in the submerged contours off Sandy Hook. Rept. 1873, app. 10, pp. 108-110.

Terminal points of the proposed canals through Nicaragua and the Isthmus of Darien. Rept. 1874, app.12, pp. 136-147.

Recent observations at South pass bar, Mississippi river. Rept. 1875, app.11, pp. 189-193.

Changes in the harbor of Plymouth, Mass. Rept. 1876, app.9, pp. 143-146.

Physical survey of New York harbor. Rept. 1876, app.10, pp. 147-185.

Location of a quay or pier line in the vicinity of the United States Navy-yard at New York. Rept. 1876, app.11, pp. 186-189.

Characteristics of South pass, Mississippi river. Rept. 1876, app.12, pp. 190, 191.

Alleged changes in the relative elevations of land and sea. Rept. 1877, app.8, pp. 98-103.

Physical survey of the Delaware river at Philadelphia. Rept. 1878, app.9, PP. 121-173.

Physical hydrography of the Gulf of Maine. Rept. 1879, app.10, pp.175-190.

Addendum to a report on a physical survey of the Delaware river. Rept. 1879, app.13, pp. 199, 200.

New rule for currents in Delaware bay and river. Rept. 1881, app.18, pp.464-469.

Study of the effect of river bends in the lower Mississippi. Rept. 1882, app.16, pp.433-436.

Estuary of the Delaware. Rept. 1883, app.8, pp. 239-245.

A plea for a light on St. Georges bank. Rept. 1885, app.11, pp. 483-486.

A report on Monomoy and its shoals. Rept. 1886, app.8, pp.258-261.

A report on the delta of the Delaware. Rept. 1886, app.10, pp. 267-279.

Circulation of the sea through New York harbor. Rept. 1886, app.13, pp.409-432.

On the movements of the sands at the eastern entrance to Vineyard sound. Rept. 1887, app.6, pp.159-163.

Addendum to appendix on the estuary of the Delaware. Rept. 1887, app.13, pp. 269-273.

Report on the results of the physical surveys of New York harbor. Rept. 1887, app.15, pp. 301-311.

Temperatures in Room 99

	Dec 17	Dec 18	Dec 19	Dec 20	21
	12 M 21.50	10 am 25.50	10 am 26.15	10 am 25.65	25.90
	1 45 PM 23.20	11,30 am 26.75	12 M 27.00	11 30 26.75	26.65
	2 45 24.32	1 PM 27.50	2 PM 27.35	1 PM 27.40	
	4 PM 24.90	2 30 PM 28.30		2 " 27.70	
		4 PM 28.30		4 PM 28.10	
Means	23.48	27.27	26.50	27.12	

For Pendulum work the temperature would be rather better than this

Besides these means are not strictly comparable except for Dec 18 & 20 for the individual readings do not extend over the same period of time

88

☞ Give here full address to which reply should be sent: .....

$$\begin{array}{r} 10633.0 \\ 6940.8 \\ \hline 3692.2 \end{array}$$

U. S. Coast and Geodetic Survey,

..... 188

M_1 mass of pend at present = 6940.8 6444.06

M_2 mass to be added = 3692.2 4185.94

10633.00

lengths expressed in metres

$x + \frac{1}{4}$ distance of centre of M_2 from middle of pendulum

$M_2 x = \frac{1}{4} M_1$

γ_2 be the radius of gyration of M_2 about axis parallel to knife edge and passing through centre of M_2

γ_1 is the radius of gyration of M_1 etc as above

$$\frac{M_1\left(\gamma_1^2 + \frac{1}{16}\right) + M_2\left(\gamma_2^2 + x^2\right)}{M_1 + M_2} = \frac{3}{16}$$

$T = 1.00894\frac{1}{2}$ = time of oscillation when perfectly reversible

t = time of oscillation at present = 0.889074

$$\frac{t^2}{\pi^2} = 2\gamma_1^2 + \frac{1}{2}$$

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U. S. Coast and Geodetic Survey,

..... 188 .

$$\cancel{M_1 \gamma_1^2} + M_1 \frac{1}{16} + M_2 \gamma_2^2 + \cancel{M_2 x^2} - M_2 \frac{3}{16} = 0$$

$$- M_1 \frac{3}{16} \qquad + \frac{M_1^2}{M_2} \frac{1}{16}$$

$$M_1 \frac{1}{2} \frac{t^2}{T^2} - M_1 \frac{4}{16}$$

$$x = \frac{1}{4} \frac{M_1}{M_2} \qquad x^2 = \frac{1}{16} \frac{M_1^2}{M_2^2}$$

$$\gamma_1^2 = \frac{1}{2} \frac{t^2}{T^2} - \frac{1}{4}$$

$$M_1 \gamma_1^2 = M_1 \frac{1}{2} \frac{t^2}{T^2} - M \frac{4}{16}$$

$$\gamma_2^2 = -\frac{M_1}{M_2} \frac{1}{2} \frac{t^2}{T^2} + \frac{M_1}{M_2} \frac{3}{8} - \frac{M_1^2}{M_2^2} \frac{1}{16} + \frac{3}{16}$$

☞ *Give here full address to which reply should be sent:* .....

U. S. Coast and Geodetic Survey,

.....

..... 188.

Let

l = length } cylinder of brass
and d = diameter }

$$\gamma_2^2 = \frac{1}{12} l^2 + \frac{1}{16} d^2$$

$0.167 = \frac{1}{6}$ $\quad \frac{1}{36}$ $\quad \begin{array}{r} 36 \\ 12 \\ \hline 43.2 \end{array}$ $\quad$ 8.47

0.06 $\quad$ .0036

.0002

.0022

$\gamma^2 = .0024$

.0003

$$\frac{r^2}{4} + \frac{a^2}{3}$$

diameter = 61 mm } weight = 249.12 grammes
length = 10 mm }

100 [illegible]
0.36 [illegible] 23256
.0002

Circuit Paris Berlin [illegible]

						H.e. up	H.e. down	Up	Down	Up	Down		
												10	[illegible]
												20	[illegible]
												30	[illegible]
												40	[illegible]
2.21953	9.05674	6.5012	0.81299	3.12649	3.48728	0338	75	5.6	1.2	0.0	0.0	50	[illegible]
2.19951	8376	9145	3672	5326	3.51405	0423	266	7.0	4.4	1.4	3.2	60	0.10540
2.16870	9.11257	7.3838	6828	8178	4267	0520	488	8.7	8.1	3.1	6.9	70	[illegible]
3284	4343	9209	9877	3.21227	7306	0630	742	10.5	12.4	4.9	11.2	80	[illegible]
2.09961	7666	8.5418	0.93155	4505	3.66584	0758	1035	12.6	17.2	7.0	16.0	90	[illegible]
6363	9.21264	9.2673	6695	8045	4124	0907	1378	15.1	22.0	9.5	22.8	100	[illegible]
2441	5186	10.1257	1.00543	3.31893	7972	1084	1783	18.1	29.7	12.5	28.5	110	[illegible]
1.98127	9500	11.1586	4758	6108	3.72187	1297	2271	21.6	37.8	16.0	36.6	120	[illegible]
3339	9.34288	12.4200	9412	3.40762	6841	1536	2867	25.9	47.8	20.3	46.6	130	[illegible]
1.87958	9672	13.9985	1.14621	3.45971	3.82050	1882	3615	31.4	60.2	25.8	59.0	140	[illegible]
1809	9.45818	16.8239	1.20477	3.51827	7906	2290	4569	38.3	76.1	32.7	74.9	150	[illegible]
1.74648	9.52979	18.7104	7208	8558	3.94637	2851	5838	47.5	97.3	41.9	96.7		

$D_t\varphi$ H.e. Down	$D_\varphi t$ H.e. up	$D_\varphi t$ H.e. down
.0546	8.0	18.3
482	9.0	20.7
423	10.3	23.6
369	11.8	27.1
317	13.8	31.5
269	16.2	37.2
226	19.3	44.2
187	23.4	53.5
151	28.8	66.2
120	36.5	83.3
92	47.4	108.7
68	64.1	147.1

140	10578	2219553	9.05674	6.5012	0.51299	3.12649	3.48728	0338	71	5.6	1.2	0.0	0.0	40	6		
130	10578	2.9451	8376	9145	3548	3326	3.51405	0423	266	7.0	4.4	1.4	3.2	50	8		
120		2.16370	9.11257	7.3838	6858	8178	4257	0520	488	8.7	8.1	3.1	6.9	60	10		
110		3.2844	4343	9209	9277	3.21227	7306	0630	712	10.5	12.4	4.9	11.2	70	12		
100		2.00951	7666	8.54178	0.93155	4505	3.66584	0758	1035	12.6	17.2	7.0	16.0	80	15		
90		6363	9.21264	9.2673	6695	8045	7124	0907	1378	15.1	22.0	9.5	22.8	90	18		
80	10578	2441	5186	18.1257	1.00543	3.31893	7972	1004	1783	18.1	29.7	12.5	28.5	100	22		
70		1.98127	9500	11.1580	4758	6108	3.72187	1297	2271	21.6	37.8	16.0	36.6	110	25		
60		3339	9.34288	12.4200	9412	340762	6841	2556	2867	25.9	47.8	20.3	46.6	120	29		
50		1.87958	9672	13.9985	1.14621	345971	3.82050	2882	3615	31.4	60.2	25.8	59.0	130	33		
40		1809	9.45818	16.8529	1.20477	351827	7906	3290	4569	38.3	76.1	32.7	74.9	140	37		
30	5578	1.74643	9.52979	18.7104	7208	8558	3.94037	3751	5858	47.5	97.3	41.9	96.1	150	42		

	Dφ H.e. up	Dφ H.e. down	Dφt H.e. up	Dφt H.e. down
140	1251	0546	8.0	18.3
130	1107	482	9.0	20.7
120	971	423	10.3	23.6
110	845	369	11.8	27.1
100	727	317	13.8	31.5
90	618	269	16.2	37.2
80	519	226	19.3	44.2
70	428	187	23.4	53.5
60	347	151	28.8	66.2
50	274	120	36.5	83.3
40	211	92	47.4	108.7
30	156	68	64.1	147.1

	84	3244
	4	49
	1	310-35
	25	357-5
	121	352-9
	1	335-8
	4	246-2
	49	351-3
	4	362-4
	1	352-4
	809	347-4
340-9	25	345-5
342-4	121	331-7
347-5	36	330-8
351-8	64	349-1
351-2	4	341-3
353+0	0	340-5
359+6	36	334-4
345-3	64	350+2
357+9	16	348-0
353+0	0	339-9
356-3	09	336-2
350-3	9	353-5
342-5	25	353-5
357+5	25	361+3
360-1	69	346-2
350-5	9	349-1
349-7	16	352-9
359+4	36	335-4
354+1	1	330-8
350+5	25	357-9
344-1	84	359-1
358+2	25	356-8
353+0	0	344-4
357+2	4	359-1
351-2	4	359-1
377-2	16	351-3
349-4	16	343-5
		6
		18

Barometer Readings

Date & Hour	Reading of Bar. reduced to 32°	Date & Hour	Bar. corrected & reduced to 32°	Date & Hour	Bar. corrected & reduced to 32°
June 25th		June 28th/46		July 1st 1846	
10 am	29.927	10 am	30.104	6 40 10 am	29.926
Noon	29.932	Noon	30.071	8 40 Noon	29.920
2 pm	29.932	2 pm	30.035	8 40 2 pm	29.915
4 pm	29.917	4 pm	30.003	10 40 4 pm	29.906
June 26th		June 29th		July 2nd 1846	
10 am	29.944	10 am	29.956	4 44 10 am	29.990
Noon	29.961	Noon	29.932	6 44 Noon	29.990
2 pm	29.958	2 pm	29.913	8 44 2 pm	30.000
4 pm	29.949	4 pm	29.900	10 44 4 pm	30.000
June 27th		June 30th		July 3rd 1846	
10 am	30.154	10 am	29.931	9 48 10 am	30.102
Noon	30.140	Noon	29.930	6 48 Noon	30.084
2 pm	30.132	2 pm	29.918	8 48 2 pm	30.075
4 pm	30.125	4 pm	29.910	10 48 4 pm	30.063

Barometer Readings

Days Hours	Bar. corrected reduced to 32° Fah.	Days Hours	Bar. corrected reduced to 32° Fah.	Days Hours	Bar. corrected reduced to 32° Fah.
July 4th 1846		July 7th 1846		July 10th 1846	
10am	30.040	10am	29.803	10am	29.990
Noon	30.012	Noon	29.792	Noon	29.986
2pm	30.009	2pm	29.785	2pm	29.990
4pm	29.998	4pm	29.764	4pm	30.001
July 5th 1846		July 8th 1846		July 11th 1846	
10am	29.942	10am	29.709	10am	30.216
Noon	29.926	Noon	29.732	Noon	30.240
2pm	29.912	2pm	29.756	2pm	30.258
4pm	29.913	4pm	29.758	4pm	30.279
July 6th 1846		July 9th 1846		July 12th 1846	
10am	30.008	10am	29.983	10am	30.408
Noon	29.994	Noon	29.945	Noon	30.400
2pm	29.970	2pm	29.925	2pm	30.388
4pm	29.947	4pm	29.925	4pm	30.366

M. S. Courtenay. High Temperature Kept at Kew 1878 March 1st to May 1st. Calculated to

Hour	Hours end up 24(P.122)	26(P.225)	24	25	26	30	30	May 2	2	10	10	11	11	Hours end down 9	May 4	5	6	9	May 8
.0356					−46														
26					47		−24.2							032	+38.5			0.3265	+0.4
16							24.2		−24.5					1	38.5			165	0.3
06					43		24.1	+19.7			−30.3		+0.2	30	38.5	+46.5		3065	0.3
295	246.8				45		24.3	19.3	−23.9		30.4		0.1	29	38.5	46.4		295.5	0.5
86	245.5					+20.9	24.1	19.2					0.0	8	38.4	46.3	+58.1	865	0.4
76	245.3			−23.6		21.0	24.0	19.4	23.9	+15.3	30.3	−14.4	0.0	7		46.4		765	0.3
66	244.5			23.5	43	20.9		19.4	23.7	15.1		14.7	0.1	6		46.4	58.4	665	
56	243.8			23.3	44	21.1		19.3			30.2	14.8	0.0	5	38.2		58.4	565	
46	244.3		+17.5	23.4	43	21.0		+18.5		15.2	30.2	14.8		4	38.4	46.8		465	0.6
36		223.6	17.6		44				23.8			14.8		3	38.6	46.9		365	0.7
26		223.2	17.2		43		24.1		23.7				0.0	2	38.7	46.9	58.0	265	0.5
16		222.0			44	21.0	24.1		23.7		30.1		0.1	1	38.9	47.1	58.6	165	0.6
206		222.1		23.0	42	20.9	24.1	19.8	23.6	15.4	30.1	14.6	0.0	20	38.9	47.3	58.9	2065	0.6
196		221.5		23.2	47	21.1	24.1	19.8	23.7	15.3	30.2	14.7	0.1	19	38.7	47.3	59.0	1965	0.5
86		221.2	17.3	23.0		21.2	23.9	20.0	23.4	15.5	30.1	14.6	0.1	8	38.8	47.2	59.2	865	+0.1
76			17.4	23.2	39	21.3	23.9			15.5	30.1	14.6	0.1	7		47.5		765	
66			17.9	23.1	38	21.2		20.0	23.1	15.6	30.2	14.5	0.3	6	39.0		60.1	665	−0.1
56		221.6	17.7		41		23.8	20.2	23.2					5	39.5	47.9	60.6	565	+0.1
46		221.0		22.7	38	21.4	23.8	20.3	23.1	15.7	29.8	14.3	0.3	4	39.4	48.2	60.5	465	0.4
36		222.0	17.7	22.6	38	21.6	23.8		22.9	15.8	29.9	14.3	0.4	3	39.6	48.5	60.5	365	0.5
26		221.7		22.5	35	21.6	23.6		22.6	15.8	29.8	14.2	0.4	2	39.8	49.1		265	0.5
16		222.2	18.0	22.4	33	21.8	23.5	21.2	22.4	16.1	29.6	14.2	0.3	1	39.9			165	0.1
106			18.3	22.4	31	22.2	23.2	21.3	21.9	16.2	29.5	14.0	0.5	10				1065	+0.3
096			18.1		30	22.6	22.8	21.6	−21.6	16.4	29.5	13.8	0.8	09				0965	−0.4
86			18.2	−22.6	−28	22.7	−23.0	21.8		16.4	−29.1	13.7	0.5	8			+59.1		
.0076			+17.9			+22.6		+22.2		+16.6		−13.6	+1.0	.007	+41.9	+51.1			
3	3	3	3/2	3/2	3	3/2	3/2	3/2	4	3/2	3/2	3/2	3	3	3/2	3/2	3/2	3/4	3

U.S. Coast Survey, Hydrom. at Gerum Neigh.
Vine of Sands

Above	Below
1mm $\frac{2}{10}$mm	1mm $\frac{2}{10}$mm
9911 2020	9975 1963

The following measures were made on spectra produced by a narrow slit of glass plate of 681 lines to the millimetre. This gitter was selected as making most easily equal ghosts. The refraction by the glass must sensibly displace the ghosts. The two sodium lines and the D/E Kel line between them were observed. Date: 1879 June 19.

ORDER I.

Order sp. / No. Ghost	Ghost −2	Ghost −1	Ghost 0	Ghost +1	Ghost +2	Means
Line sp.	D_2 9.076, D_1 9.590	D_2 10.405, D_1 10.886	D_2 11.695, D_1 12.164	D_2 12.976, D_1 13.439		
Mean reading						0.481
$D_1 - D_2$	0.513	0.480	0.469	0.463		0.480
Dist. D_2		1.329	1.279	1.281		1.283
Succ. D_1		1.296	1.279	1.275		1.283
ghosts Mean		1.312	1.284	1.278		1.291

ORDER II.

Order sp. / No. Ghost	Ghost −3	Ghost −2	Ghost −1	Ghost 0	Ghost +1	Ghost +2	Means
Line sp.	D_2 5.633, D_1 5.099	D_2 5.451, D 6.531	D_2 6.916, N_1 7.465, D_1 7.981	D_2 8.870, N_1 8.926, D_1 9.439	D_2 9.838, N_1 10.379, D_1 10.897	D_2 11.289, N_1 11.837, D_1 12.345	
Mean reading							6.548
$N_1 - D_2$	1.466 adj.	1.080	0.549	0.556	0.541	0.548	0.514
$D_1 - N_1$			0.516	0.513	0.518	0.508	1.460
Dist. D_2	1.81 Succ.	1.465	1.454	1.468	1.451		1.457
Succ. N_1			1.461	1.453	1.458		1.454
ghosts D_1	1.430 adj.	1.450	1.458	1.458	1.448		1.457
Mean		1.458	1.458	1.460	1.452		

ORDER III.

Order sp. / No. Ghost	Ghost −3	Ghost −2	Ghost −1	Ghost 0	Ghost +1	Ghost +2	Means
Line sp.	D_2 ~~6.822~~, N_1 ~~7.874~~, D_1 ~~8.843~~	D_2 6.822, N_1 7.874, D_1 8.843	D_2 8.671, N_1 9.715, D_1 10.693	D_2 10.515, N_1 11.559, D_1 12.535	D_2 12.365, N_1 13.399, D_1 14.372	D_2 14.192, N_1 15.228, D_1 16.198	
Mean reading							1.044
$N_1 - D_2$		1.052	1.044	1.044	1.034	1.036	0.973
$D_2 - N_1$		0.969	0.978	0.976	0.973	0.970	1.842
Dist. D_2		1.849	1.844	1.850	1.827		1.838
Succ. N_1		1.847	1.844	1.840	1.829		1.839
ghosts D_1		1.850	1.842	1.837	1.826		1.840
Mean		1.847	1.843	1.842	1.827		

ORDER IV.

Order sp. / No. ghost	Ghost −2	Ghost −1	Ghost 0	Ghost +1	Ghost +2	Means
Line sp.	D_2 3.614, D_1 8.222	D_2 6.977, D_1 11.361	D_2 9.939, D_1 14.473	D_2 13.064, D_1 17.581	D_2 16.148, D_1 20.616	
Mean reading						4.542
$D_1 - D_2$	4.608	4.584	4.534	4.517	4.468	3.134
Dist. D_2	3.163	3.162	~~3.125~~	3.125	3.084	3.096
Succ. D_1	3.139	3.112	~~3.108~~	3.108	3.035	3.115
ghosts Mean	3.151	3.137		3.116	3.060	

U. S. Coast and Geodetic Survey.

WE, the undersigned, acknowledge to have received of Prof C. S.

in full for services and allowances for board while

NAMES.	OCCUPATION.	PAY. FROM—	TO—	NO. OF DAYS.	PER DAY.	AMOUNT. Dollars.	Cents.	FROM—	TO—
		1882							
E. D. Preston									
F. B. Hall									
N. M. Tilden		Nov 17	Dec 1st	14	$1.50	21	00		

TOTAL

[E] 11-16-'80-2,000

[Form 41—Party Pay and Subsistence Voucher.]

Peirce ..... the sums set opposite our respective names, being engaged in the U. S. Coast and Geodetic Survey.

BOARD.					PAY AND BOARD.				
TO—	NO. OF DAYS.	PER DAY.	AMOUNT.		AMOUNT.		SIGNERS.	WITNESS.
			Dollars.	Cents.	Dollars.	Cents.		
							N. M. Tilden	E. S. Porter

TAL.....

Date	Obs.	Stand Pend			Stand Pend				Cor. Cor. Clock Temp.	Date	Obs.								Cor. Cor. Clock Temp.
April	P	2022	2512	+490	2[illegible]	[illegible]	[illegible]	+405	0 +405	Mar 22	P	2081	2431	+350	1649	1700	+51	+299	0 +299
	P	1985	2382	+397	2072	1885	-187	+356	0 +356		P	2083	2452	+369	1651	1709	+58	+311	0 +311
	P	1987	2400	+413	2000	1681	-319	+319	0 +319		P	2059	2454	+395	1636	1702	+66	+329	0 +329
April 22	S	1975	2372	+397	2075	2031	-44	+441	+1 +441		P	2062	2445	+383	1648	1698	+50	+335	0 +335
	S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+1 +358		P	2065	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0 +337
	S	[illegible]	2332	+414	2057	[illegible]	[illegible]	+365	+1 +364		P	2058	2451	+393	1648	1690	+42	+351	0 +351
	S	[illegible]	[illegible]	+412	2062	1842	-220	+368	+1 +367	Mar 26	S	1931	2302	+371	1479	1537	+58	+307	0 +307
	S	[illegible]	2170	+366	2067	1773	-294	+394	+1 +394		S	1901	2228	+327	1483	1541	+58	+323	0 +323
	S	[illegible]	[illegible]	[illegible]	2072	1777	-295	+399	+1 +398		P	1911	2289	+378	1521	1492	+59	+319	0 +319
April	S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+1 +361		P	1884	2269	+383	1539	1478	+61	+322	0 +322
	S	1995	2406	+411	2053	1810	-243	+406	+1 +405	Mar 27	P	1833	2147	+259	1964	1908	-56	+315	0 +315
	S	1998	2411	+413	2064	1812	-247	+402	+1 +401		P	1811	2143	+266	1953	1902	-51	+317	0 +317
April 26	S	2027	2217	+190	2079	1886	-193	+385	0 +385	Mar 28	P	2351	2182	-169	2412	1953	-459	+290	+1 +289
	S	2025	2227	+199	2071	1873	-198	+397	0 +397										
	S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-193	[illegible]	0 +380										
	S	2021	2213	+192	2069	1876	-203	+393	+1 +392	June 16	P	1352	1526	+274	1532	1488	-44	+318	0 +318
	S	[illegible]	2212	+199	2081	1899	-182	+371	0 +371		P	1968	2501	+533	2238	2467	+229	+304	-1 +305
	S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0 +380		S	1950	2329	[illegible]	2231	[illegible]	[illegible]	[illegible]	-1 +352
	S	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0 +353		S	1956	2511	+555	2230	2451	+221	[illegible]	-1 +334
	S	[illegible]	2013	[illegible]	[illegible]	1603	-426	+404	+1 +403										
	S	[illegible]	[illegible]	[illegible]	[illegible]	1613	-427	+402	+1 +401										
	P	[illegible]	[illegible]	[illegible]	[illegible]	2317	-432	+372	+1 +371										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+386	+1 +385										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+370	+1 +369										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+350	+1 +349										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1506	[illegible]	+354	+1 +353										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1540	-435	+336	+1 +335										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-441	+335	+1 +334										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-68	[illegible]	0 +342										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	62	[illegible]	0 +324										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	66	[illegible]	0 +341										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0 +369										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+315	0 +315										
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0 +330										

Correction reduced to 1000th line of Pendulum - Metre, ~~[illegible]~~ Mean ~~[illegible]~~ +353
Length of Pendulum ~~[illegible]~~ -2004
~~[illegible]~~ -765.1

Mark

102

U.S. Coast Survey. Pendulum Obs of ? Dec 1877 Calculation of t for each swing Continued

	00 2/8	8	00 1/3	18	00 1/4 23	00 1/3 22	00 1/3	0
9	511.4							501.7
8	513.1	514.1				538.1		502.2
7							502.2	
6	513.0	515.0					503.1	
5	514.3	515.3					503.1	
4	513.7	515.7	543.7	542.7			503.9	
3	514.3	515.3	544.3	544.3		538.3	503.5	
2	513.2	515.2	544.2	546.2		538.2	503.4	
1	513.2	515.2	546.2	548.2		538.2	504.3	
0	514.5	514.5	547.6	548.6			504.4	
9	515.2	515.2	548.2	549.2		538.2	506.7	
8	516.2	517.2	549.2	550.2			507.6	
7	517.2	517.2	550.2	551.2			505.9	
6	517.9	518.9	549.9	551.9			505.4	503.4
5	519.8	519.8					506.5	505.7
4	520.0	520.0	552.0	552.0	637.0		507.8	504.9
3		519.7		553.7	639.7			507.2
2		522.0		555.0	642.0			505.5
1		523.7		556.7	641.7			
0		523.8		558.8	643.8			505.1
9		525.7		559.7	644.7			508.2
8		527.1			647.1			509.8
7		526.4				546.4		502.9
6		529.6				545.6		511.1
5		532.7				546.7		514.7
4		535.9				545.9		510.1
3		538.2				547.2		
2		539.0						
1		538.7		576.7				
0		540.2		580.2				
9				583.4				
8				585.4				
7								
	7			6½	5½	5½	6½	

Date [illegible]
[illegible]
[illegible]
[illegible]
[illegible]
Remarks

Dublin

Observer —
Power —
Position of eyes —

Observed

Date | Time | Station | Observed Reading | Corrected Reading | Height

Sep 2 | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

[illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep 3 | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep 3 | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep [illegible] | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Mean of Sums [illegible]

Between Senaja and Pasu Aru including level & Triangulated Hills either side parallel and ground

Sep [illegible] | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep [illegible] | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep [illegible] | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep [illegible] | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep [illegible] | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep [illegible] | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Sep [illegible] | [illegible] | up | [illegible] | [illegible] | [illegible]
down | [illegible] | [illegible] | [illegible]

Mean of Sums [illegible]

Mean