

APPENDIX.

ROYAL OBSERVATORY, GREENWICH.

RESULTS

OF THE

OBSERVATIONS OF THE TIME OF SWING

OF THE

INDIAN INVARIABLE PENDULUMS.

1889.

OBSERVATIONS OF THE TIME OF SWING

OF THE

INDIAN INVARIABLE PENDULUMS.

1889.

These observations were made at the request of General J. T. Walker, F.R.S., in order "to improve and strengthen the connexion between the Indian series of pendulum operations and other series taken in other parts of the world," under circumstances explained by him in the *Philosophical Transactions*, Vol. 181 A., pages 537-558.

The pendulum under observation was mounted in the Record Room of the Royal Observatory, a brick building with stone floor; the airtight cylinder in which the pendulum was enclosed being 61 ft. East and 11 ft. 6 in. South of the centre of the Transit-Circle, and the point of suspension of the pendulum 158 ft. 10 in. above mean water at Greenwich.

The apparatus was put approximately in position under the superintendence of General Walker on 1889 May 8, but the observations were not begun until June 5.

Mr. Hollis superintended the whole of the work generally, and is responsible for the reductions.

Details of Position of Apparatus.

The clock "Shelton" was fixed rigidly to the south wall of the Record Room. The braced wooden stand carrying the pendulum in its metal cylinder was placed on the stone floor at such a distance north of the clock that the arc-scale was 49 inches distant from the disc on the clock pendulum. The lens which forms the image of disc was placed approximately 11 inches from the scale, its accurate position being determined by trial so as to make the image of the disc as nearly as possible in the plane of swing of the free pendulum.

The observing telescope, which was made specially for these observations, consists of a small telescope fixed vertically on a tripod stand, the feet of which rested in small holes cut in the stone floor. A plane mirror 25 inches vertically below the object-glass of the viewing telescope, and inclined at 45° to the horizon, brought the images of the pendulums into the field of view. The plane mirror was 8 ft. 2 in. distant from the arc-scale.

Method of Observation.

The time of coincidence was found by observing the disappearance and re-appearance of the disc on the clock pendulum at one edge only of the occulting tail piece on the invariable pendulum, the apparent west edge as seen in the telescope. At disappearance the disc is last seen between an even and odd second of the clock, and at re-appearance is first seen between an odd and even second—the even or odd second was noted as the time of disappearance, at the discretion of the observer, according to the size of the portion of the disc last seen, and similarly for the re-appearance. Each pendulum was swung with its marked face both towards and from the observer, the observations in each position being distinguished by the letters M., P. Such observations were made both when the air in the cylinder was at a pressure equal to that of a column of mercury, of height about 2 inches, and also when at a pressure equal to about 27 inches of mercury. For the swings at low pressure it was proposed to start the pendulum at 10 a.m. and observe three consecutive coincidences; to observe three consecutive coincidences at 4 p.m.; and the three final coincidences of the swing at 10 p.m.; then starting the pendulum again to observe one (or three) coincidences, and the final three of that swing at 10 a.m. following.

It was obviously impracticable to carry out this programme strictly, as on the occasions when the pendulum had to be reversed on the agate planes, some time was occupied in exhausting the cylinder, and the pendulum could not be started until much later than 10 a.m.

Determination of Clock-rate.

The rate of the clock "Shelton" was found by comparing it with the Greenwich Sidereal Standard by means of the chronograph. On reducing the clock-rates it was found that there was some personality in these comparisons, and it was therefore inadvisable to use a comparison made by one observer at 10 a.m. with that made by another at 4 p.m. Hence the clock-rates used have been determined by pairs of comparisons made by the same observer.

Temperature.

A specially constructed "Richard" thermograph was mounted on the stand of the pendulum cylinder, the metallic coil of the thermograph being almost in contact with the cylinder. The scale of the record was such that 2° of temperature Fahrenheit covered a linear distance of 1 centimetre, and 2 hours of time also corresponded to 1 centimetre. A comparison was made between the eye-readings of the thermometers attached to the dummy pendulum and the simultaneous record of the thermograph, and a mean correction deduced to reduce the thermograph reading to the reading of the thermometers. A graphic mean of the thermograph record for any period, with

the above correction applied, was used as the mean temperature of the pendulum cylinder for that period.

It may be added that the range of temperature as shown by the thermograph during 24 hours was seldom more than 1° , and that the thermometer readings and thermograph record were very consistent.

Explanation of the Observations.

The general arrangement of the following tables is similar to that on p. 128 of the *Account of the Operations of the Great Trigonometrical Survey of India, Vol. V.*

At the head of each table is given the name of the pendulum and the position of the marked face. There were three pendulums, all of Kater's Invariable Pattern: they are made of brass, with a steel knife edge at the head of each pendulum, and they are of very nearly the same dimensions. One is numbered 4 and another 11; the third has no such distinguishing number, but is marked 1821, presumably the year in which it was constructed; Col. Herschel believes that it is probably No. 6 of the series, and it has here been so designated. Further details are given in the paper by General Walker in the *Philosophical Transactions*, cited above.

Face M. and face P. indicate that the marked and plane face respectively were towards the observer.

Columns 1 and 2 require no explanation. In column 3 the initials A. D., T., L., H., S. D., and R., are those of Mr. Downing, Mr. Thackeray, Mr. Lewis, Mr. Holli-, Mr. Dolman, and Mr. Robinson respectively. In column 4 are given the times by the clock "Shelton" for coincidence of the pendulums, each number being the mean of a time for disappearance and a time for reappearance.

The next seven columns require no further explanation beyond that already given.

In the last column the readings of the "Level on planes" are in divisions of the level scale, each of which represents $10''$. The inclination is thus $2\frac{1}{2}$ times the difference of the sums of the bracketted numbers. It will be seen that the agate planes were sensibly level throughout the operations. The letter D indicates the distance of the scale of the invariable pendulum under observation from the object glass of the telescope with which the coincidences are observed, d its distance from the pendulum, and r its distance from the knife edge.

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER LOW PRESSURE (ABOUT 2 INCHES).

PENDULUM 4.

FACE M.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.			Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections			Corrected Vibrations in a Mean Solar Day.	REMARKS.
												For	Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.	
I. 1889, June 5.	h m 12. 15	SD	1	h m s 5. 4. 48.5	in.	o	in.		1.97	86636.61	86164.30	+0.13	+0.59	+0.16	86165.18	Level on planes. N. 2.2 } 2.4 } S. 2.4 } 2.2 }
			2	10. 56.0												
			3	17. 2.5												
	16. 1	SD	38	8. 51. 3.5	0.40	62.3	1.97		1.97	86636.61	86164.35	+0.05	+0.60	+0.02	86165.02	d. = 0.85 in. r. = 49.90 in. D. = 123 in.
			39	57. 9.0												
			40	9. 3. 17.0												
	21. 36	AD	93	14. 27. 24.0	0.22	62.2	2.03		2.03							
			94	33. 31.0												
			95	39. 34.5												

PENDULUM 4.

FACE M.

II. June 5 and 6.	22. 4	AD	1	15. 2. 25.5	0.64	62.2	2.03									
	23. 5	H	11	16. 3. 34.5	0.61	62.1	2.04	86636.65	86164.38	+0.21	+0.61	-0.02	86165.18			
								86636.65	86164.41	+0.07	+0.62	-0.07	86165.03			
	10. 28	H	122	3. 22. 21.5	0.16	61.6	2.09									
			123	28. 29.5												

PENDULUM 4.

FACE M.

III. June 7.	11. 26	L	1	3. 24. 15.5	0.60	63.8	2.03									
			2	30. 21.5												
			3	36. 28.0												
	16. 2	T	56	8. 59. 50.5	0.32	64.4	2.03	86636.86	86163.57	+0.20	+0.61	+0.89	86165.27			
			57	9. 5. 57.5												
			58	9. 12. 3.5				86636.86	86163.68	+0.03	+0.61	+0.94	86164.94			
	22. 28	L	119	15. 24. 6.0	0.15	63.8	2.04									
			120	30. 11.5												
			121	36. 17.5												

OF THE INDIAN INVARIABLE PENDULUMS, 1889.

7

SWINGS UNDER LOW PRESSURE—*continued.*

PENDULUM 4.

FACE M.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections For Arc of Vibration For Pressure. To Mean Tempera- ture 62°.	Corrected Vibrations in a Mean Solar Day.	REMARKS.
IV. June 7 and 8.	h m	L	1	h m s 15. 46. 47.5	in.	o	in.	86637.24	86163.73	+0.05 +0.60 +0.64	86165.01	
	22. 47		2	52. 54. 0	0.53	63.8	2.02					
			3	59. 1. 0								
	10. 2	H	112	3. 3. 47.5	0.14	63.1	2.02					
			113	9. 55.5								
			115	22. 3.5								
			116	28. 11.5								

PENDULUM 4.

FACE P.

V. June 8.	12. 12	H	1	5. 14. 35°0	0°65	63°8	1°86	86637°22	86163°97	+0°11	+0°59	+0°57	86165°24
			2	20. 40°5									
			3	26. 46°5									
	18. 41	H	65	11. 45. 7°5	0°30	63°0	2°12						
			66	51. 13°5									
			67	57. 19°5									

PENDULUM 4.

FACE P.

VI.														
	10. 53	H	2	4. 6. 25.5										
			3	12. 35.5	0.65	57.6	1.90							
			4	18. 42.5				86637.64	86166.62	+0.14	+0.57	-1.99	86165.34	
June 11.	16. 46	SD	50	9. 0. 44.5										
			51	6. 52.5	0.38	57.7	1.90							
			52	13. 0.5				86637.64	86166.57	+0.04	+0.59	-2.02	86165.18	
	22. 29	L	116	15. 45. 17.0										
			117	51. 30.5	0.17	57.5	2.02							
			118	57. 41.5										

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER LOW PRESSURE—*continued*.

PENDULUM 4.

FACE P.

No. of S t and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.			Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections			Corrected Vibrations in a Mean Solar Day.	REMARKS.
				^h ^m ^s	in.	°					For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.		
VII. June 11-12	22. 49	L	1	16. 4. 53.5											
			2	11. 1.5	0.62	57.5	1.77								
			3	17. 7.0					86637.64	86166.55	+0.08	+0.58	-2.11	86165.10	
	10. 26	H	115	3. 43. 44.5											
			116	49. 52.0	0.18	57.3	1.89								
			117	56. 1.5											

PENDULUM 4.

FACE P.

VIII. June 12.	10. 57	H	1	4. 14. 26.0											
			2	20. 33.5	0.55	57.5	1.91								
			3	26. 41.5					86637.41	86166.24	+0.13	+0.59	-2.06	86164.90	
	16. 27	SD	55	9. 45. 25.5											
			56	51. 32.5	0.34	57.6	2.00								
			57	57. 39.5					86637.41	86166.48	+0.03	+0.59	-2.04	86165.06	
	22. 40	H	116	15. 59. 29.5											
			117	16. 5. 36.0	0.17	57.6	1.91								
			118	11. 44.5											

PENDULUM 4.

FACE P.

IX. June 12-13.	23. 5	H	1	16. 25. 20.0											
			2	31. 28.5	0.65	57.7	1.91								
			4	43. 42.5					86637.50	86166.50	+0.09	+0.60	-1.97	86165.22	
	9. 50	AD	108	3. 21. 25.5											
			109	3. 27. 30.0	0.21	57.7	2.05		86637.50	86166.83	+0.02	+0.60	-1.95	86165.50	
	11. 4	H	121	4. 41. 9.5	0.18	57.8	1.84								

OF THE INDIAN INVARIABLE PENDULUMS, 1889.

9

SWINGS UNDER LOW PRESSURE—*continued.*

PENDULUM 6.

FACE M.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock	Pendulum	Corrections			Corrected	REMARKS.								
								Vibrations in a Mean Solar Day.	Vibrations in a Mean Solar Day.	For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.	Vibrations in a Mean Solar Day.									
X. June 13.	h m 16. 6	SD	1	^h 9. ^m 29. ^s 1'5	in. 0'60	° 59'3	in. 1'80	86637'41	86066'40	+0'10	+0'54	-1'43	86065'61	Level on planes. N. 2'4 } 2'0 } S. 2'0 } 2'4 } d. = 0'83 in.								
			2	34. 5'5																		
			3	39. 7'5																		
	22. 34	AD	78	15. 58. 28'0	0'27	58'7	1'80															
			79	16. 3. 30'5																		
			80	8. 34'0																		

PENDULUM 6.

FACE M.

XI. June 13-14.	22. 53	AD	I	16. 23. 0'5	0'67	58'8	1'80	86637'38	86066'44	+0'08	+0'54	-1'59	86065'47	
	10. 34	H	139	4. 1. 11'0	0'16	58'2	1'80							
			140	6. 14'5										
			141	11. 18'0										

PENDULUM 6.

FACE M.

XII. June 14.	11. 12	H	1	4. 39. 4'0	0'72	58'6	1'80	86637'31	86066'33	+0'16	+0'54	-1'50	86065'53
			2	44. 8'5									
			4	54. 14'5									
	16. 16	SD	61	9. 43. 32'5	0'40	58'7	1'80						
			62	47. 36'5									
			63	52. 39'5									
	22. 33	H	136	16. 1. 58'0	0'17	58'7	1'81						
			137	7. 1'5									
			138	12. 8'5									

B

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER LOW PRESSURE—*continued*.

PENDULUM 6.

FACE M.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.	Corrected Vibrations in a Mean Solar Day.	REMARKS.
XIII. June 14-15.	h m	H	1	h m s 16. 23. 33.0	in. o	58.9	1.81	86637.31	86066.44	+0.06	+0.54	-1.48	86065.56	
	22. 55		2	28. 37.0	0.58									
			3	33. 41.5										
	10. 31	H	139	4. 1. 40.5	0.14	58.6	1.79							
			140	6. 43.5										
			141	11. 46.5										

PENDULUM 6.

FACE M.

XIV. June 15.	13. 39	H	1	7. 9. 32.5	0.42	58.9	1.81	86637.48	86066.54	+0.04	+0.54	-1.41	86065.71
			2	14. 37.0									
			3	19. 41.0									
	20. 54	L	87	14. 24. 32.0	0.16	58.8	1.80						
			88	29. 38.5									
			89	34. 41.0									

PENDULUM 6.

FACE M.

XV. June 16-17.	22. 51	H	1	16. 27. 13.0	0.70	59.1	1.81	86637.54	86066.64	+0.09	+0.54	-1.35	86065.91
			2	32. 16.5									
			3	37. 20.0									
	11. 2	H	146	4. 40. 44.0	0.15	59.0	1.80						
			147	45. 44.0									
			148	50. 47.5									

PENDULUM 6.

FACE P.

XVI. June 19-20.	18. 29	H	1	12. 16. 46 ^o 0	0 ^o 66	59 ^o 4	2 ^o 39	86637 ^o 11	86066 ^o 31	+0 ^o 06	+0 ^o 71	-1 ^o 48	86065 ^o 60	d = 0 ^o 50 in.
			2	21. 49 ^o 5										
			3	26. 52 ^o 0										
	10. 33	H	192	4. 23. 9 ^o 5	0 ^o 09	58 ^o 2	2 ^o 36							
			193	28. 9 ^o 5										
			194	33. 12 ^o 5										

OF THE INDIAN INVARIABLE PENDULUMS, 1889.

11

SWINGS UNDER LOW PRESSURE—*continued*.

PENDULUM 6.

FACE P.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections			Corrected Vibrations in a Mean Solar Day.	REMARKS.
										For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.		
XVII. June 20.	10. 57	H	1	h m s 4. 47. 19.5	in. o 0.71 58.3	in. 2.36	86636.68	86065.85	+0.09	+0.71	-1.48	86065.17		
			2	52. 22.0										
			3	57. 25.0										
	22. 23	H	137	16. 15. 21.0	0.18	59.1								2.36
			138	20. 24.0										
			139	25. 30.0										

PENDULUM 6.

FACE P.

XVIII. June 20-21.	22. 39	H	1	16. 31. 17.0	0.65	59.2	2.37	86636.95	86066.07	+0.08	+0.71	-1.28	86065.58	
			2	36. 20.5										
			3	41. 24.0										
	9. 55	H	135	3. 49. 8.0	0.17	59.1	2.37							
			136	54. 13.5										
			137	59. 15.5										

PENDULUM 6.

FACE P.

XIX. June 22.	10. 0	H	1	3. 58. 21.5	0.68	59.5	2.36	86636.64	86065.52	+0.12	+0.71	-0.97	86065.38
			2	4. 3. 25.0									
			3	8. 27.5									
	16. 28	H	78	10. 27. 42.0	0.29	60.3	2.36						
			79	32. 45.5									
			80	37. 50.0									
	22. 16	H	147	16. 16. 38.0	0.15	60.3	2.37	86636.76	86065.72	+0.03	+0.71	-0.75	86065.71
			148	21. 43.0									
			149	26. 47.5									

B 2

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER LOW PRESSURE—*continued.*

PENDULUM 6.

FACE P.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections			Corrected Vibrations in a Mean Solar Day.	REMARKS.
										For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.		
XX. June 24.	h m 10. 34	H	1	h m s 4. 39. 57.5	in. 0.71	° 60.1	in. 2.37							
			2	45. 1.0										
			3	50. 3.5										
	15. 32	SD	60	9. 38. 3.5	0.41	60.6	2.37	86636.47	86064.87	+0.16	+0.71	-0.64	86065.10	
			61	43. 5.5										
			62	48. 9.5										
	22. 15	L	140	16. 22. 50.0	0.17	60.5	2.36	86636.47	86065.71	+0.04	+0.71	-0.64	86065.82	
			141	27. 54.0										
			142	32. 55.0										

PENDULUM 6.

FACE P.

XXI. June 24-25.	22. 35	L	1	16. 47. 47.0	0.59	60.6	2.36	86636.40	86065.39	+0.06	+0.71	-0.73	86065.43	
	10. 59	H	135	4. 5. 29.5	0.14	60.1	2.36							
			136	10. 33.5										
			137	15. 36.0										

PENDULUM 11.

FACE M.

XXII. June 25.	18. 17	SD	1	10. 31. 41.5	0.57	61.7	1.73							
			2	37. 13.5										
			3	42. 47.5										
	22. 4	AD	63	16. 16. 6.5	0.27	61.3	1.74	86636.21	86116.32	+0.09	+0.52	-0.20	86116.73	Level on planes. N 2.0 { 2.3 } S. 2.6 { 2.2 } d = 0.85 in.
			64	21. 38.0										
			65	27. 11.5										

PENDULUM 11.

FACE M.

XXIII. June 25-26.	22. 19	AD	1	16. 36. 34.0	0.62	61.3	1.73	86636.21	86116.47	+0.07	+0.52	-0.41	86116.65	
	10. 25	SD	131	4. 38. 52.5	0.14	61.1	1.73							
			132	44. 25.5										
			133	50. 1.5										

OF THE INDIAN INVARIABLE PENDULUMS, 1889.

13

SWINGS UNDER LOW PRESSURE—*continued.*

PENDULUM 11.

FACE M.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections			Corrected Vibrations in a Mean Solar Day.	REMARKS.
										For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.		
XXIV. June 26.	11. 28	H	1	5. 41. 36.0										
			2	47. 9.0	0.66	61.3	1.73							
			3	52. 42.5										
	16. 11	SD	52	10. 24. 50.5				86636.21	86116.24	+0.14	+0.52	-0.20	86116.70	
			53	30. 25.5	0.38	61.9	1.72							
			54	35. 57.5				86636.21	86116.23	+0.04	+0.52	-0.05	86116.74	
	22. 49	H	124	17. 4. 48.0										
			125	10. 23.0	0.16	62.0	1.73							
			126	15. 54.5										

PENDULUM 11.

FACE M.

XXV. June 26-27.	23. 7	H	1	17. 22. 51.5										
			2	28. 24.5	0.58	62.1	1.73							
			3	33. 57.0				86636.13	86116.23	+0.06	+0.52	-0.02	86116.79	
	10. 41	SD	126	4. 57. 10.5										
			127	5. 2. 44.5	0.15	62.1	1.73							
			128	8. 17.5										

PENDULUM 11.

FACE M.

XXVI. June 27.	11. 38	H	1	5. 55. 23.5										
			2	6. 0. 56.0	0.71	62.3	1.74							
			3	6. 29.0				86635.81	86115.62	+0.16	+0.52	+0.20	86116.50	
	16. 15	SD	51	10. 32. 57.5										
			52	38. 31.5	0.39	62.8	1.73							
			53	44. 3.5										

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER LOW PRESSURE—*continued*.

PENDULUM 11.

FACE P.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections			Corrected Vibrations in a Mean Solar Day.	REMARKS.
										For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.		
XXVII. June 28.	h m 11. 57	H	1	h m s 6. 18. 24.0	in. o in.	0.67 63.9 2.01	86635.97	86114.51	+0.16 +0.58 +0.79	86116.04	d = 0.45 in.			
			2	23. 55.5										
			3	29. 28.0										
	16. 17	SD	48	10. 38. 40.5	0.44 63.8 1.97	86635.97	86114.93	+0.06 +0.59 +0.77	86116.35					
			49	44. 13.5										
			50	49. 44.5										
	22. 27	L	115	16. 50. 2.5	0.23 63.7 1.96									
			116	55. 33.5										
			117	17. 1. 5.0										

PENDULUM 11.

FACE P.

XXVIII. June 28-29.	22. 43	L	I	17. 11. 49.0	0.57	63.7	1.95	86635.97	86115.06	+0.07	+0.58	+0.70	86116.41	
	10. 14	H	125	4. 39. 13.5	0.17	63.5	1.97							
			126	44. 47.5										
			127	50. 23.0										

PENDULUM 11.

FACE P.

XXIX. June 29.	10. 51	AD	1	5. 16. 58.0	0.66	64.1	1.96	86635.97	86114.79	+0.14	+0.58	+0.86	86116.37
			2	22. 28.0									
			3	28. 1.5									
	17. 1	H	68	11. 28. 13.5	0.37	64.2	1.97	86635.97	86114.79	+0.05	+0.58	+0.99	86116.41
			69	33. 43.5									
			70	39. 15.0									
	22. 6	AD	123	16. 32. 57.0	0.22	64.2	1.96	86635.97	86114.79	+0.05	+0.58	+0.99	86116.41
			124	38. 29.5									
			125	44. 1.0									

OF THE INDIAN INVARIABLE PENDULUMS, 1889.

15

SWINGS UNDER LOW PRESSURE—*continued.*

PENDULUM 11.

FACE P.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections.			Corrected Vibrations in a Mean Solar Day.	REMARKS.
										For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.		
XXX. June 29-30.	h m			h m s	in.	°	in.							
	22. 21	AD	I	16. 53. 50.5	0.61	64.3	1.96	86635.97	86114.58	+0.07	+0.58	+0.95	86116.18	
	11. 14	H	139 140 141	5. 43. 22.0 48. 56.0 54. 29.0	0.17	64.1	1.97							

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER HIGH PRESSURE (ABOUT 27 INCHES).

PENDULUM 11.

FACE P.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections For Arc of Vibration. For Pressure. To Mean Tempera- ture 62°.	Corrected Vibrations in a Mean Solar Day.	REMARKS.
I. July 1.	^{h m} 11. 47 											

PENDULUM 11.

FACE P.

II. July 1-2.	19. 33	H	1	14. 7. 52.5	0.66	65.1	27.11	86636.07	86105.77	+0.07	+8.06	+1.31	86115.21
			2	13. 19.5									
			3	18. 45.5									
	0. 16	H	53	18. 51. 3.0	0.14	64.6	27.08						
			54	56. 30.0									
			55	19. 1. 56.5									

PENDULUM 11.

FACE P.

III. July 3.	10. 20	H	1	5. 1. 14'0	0'61	62'7 27'10	86636'42	86106'62	+0'06	+8'09	+0'44	86115'21	
		R	2	6. 40'5									
		H	4	17. 34'5									
		R	5	23. 2'5									
		R	64	10. 44. 40'0									
	16. 3		65	50. 5'5	0'11	62'7 27'10							
			66	55. 30'5									

OF THE INDIAN INVARIABLE PENDULUMS, 1889.

17

SWINGS UNDER HIGH PRESSURE—continued.

PENDULUM 11.

FACE P.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections.			Corrected Vibrations in a Mean Solar Day.	REMARKS.
										For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.		
IV. July 3.	h m	SD	1	h m s	in.	o	in.	86636.42	86106.70	+0.04	+8.09	0.43	86115.26	
	16. 29		2	11. 11. 11.5	0.56	62.9	27.10							
			3	16. 38.5										
	22. 38	T	70	22. 4.5	0.06	62.8	27.10							
			71	17. 27. 17.5										
				17. 32. 52.5										

PENDULUM 11.

FACE M.

V. July 4.	11. 12	AD	1	5. 57. 26.5	0.66	63.0	27.26	86636.36	86107.46	+0.07	+8.18	+0.36	86116.07	Level on planes. N. 2.3 } 2.3 } S. 2.3 } 2.3 } d = 0.90 in.
			2	6. 2. 54.0										
			3	6. 8. 21.0										
	15. 50	R	52	10. 35. 55.0	0.14	62.6	27.49							
			53	41. 22.0										
			54	46. 48.0										

PENDULUM 11.

FACE M.

VI. July 4.	16. 21	R	1	11. 7. 13.0	0.11	62.9	27.51	86636.36	86107.58	+0.07	+8.27	+0.34	86116.26
			2	12. 40.5									
			3	18. 9.0									
	21. 37	AD	59	16. 23. 57.0	0.10	62.5	27.83						
			60	29. 26.5									
			61	34. 56.0									

PENDULUM 11.

FACE M.

VII. July 5.	10. 14	H	1	5. 3. 33.5	0.65	62.2	27.10	86636.42	86107.81	+0.06	+8.14	+0.16	86116.17	The cylinder was leaking during this swing.
			2	5. 9. 1.0										
			3	5. 14. 28.0										
	16. 3	R	64	10. 47. 49.0	0.09	62.9	27.36							
			65	53. 13.0										
			66	58. 39.5										

C

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER HIGH PRESSURE—continued.

PENDULUM 11.

FACE M.

No. of Set and Date.	Approximate Green- wich Civil Time	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections For Arc of Vibration. For Pressure. To Mean Temperature 62°.	Corrected Vibrations in a Mean Solar Day.	REMARKS.
VIII. July 5.	h m 16. 21	R	1	h m s 11. 10. 53.5	in. o in. 0.68 63.3 27.39							
			2	16. 21.0								
			3	21. 49.5								
								86636.13	86107.42			
		H	69	17. 22. 19.5								
	22. 31		70	27. 45.5	0.08 62.9 27.40							
			71	33. 14.5								

PENDULUM 4.

FACE M.

IX. July 8.	11. 25	AD	1	6. 25. 38.0	0.68	63.1	26.94	86635.97	86155.28	+0.08	+8.07	+0.41	86163.84	Level on planes. N. 2.1 } 2.1 } S. 2.3 } 2.1 }
			2	31. 37.0										
			3	37. 37.5										
	15. 55	SD	46	10. 55. 59.5	0.18	62.9	27.22							
			47	11. 1. 55.5										
			48	7. 59.5										

PENDULUM 4.

FACE M.

X. July 8.	16. 19	SD	1	11. 19. 52.5	0.68	63.2	27.23	86635.97	86155.26	+0.06	+8.18	+0.48	86163.98
			2	25. 52.5									
			3	31. 53.5									
	22. 6	AD	59	17. 8. 20.0	0.09	63.0	27.56						
			60	14. 18.5									
			61	20. 17.5									

PENDULUM 4.

FACE M.

XI.		H	1	5. 24. 30.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
-----	--	---	---	-------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SWINGS UNDER HIGH PRESSURE—*continued.*

PENDULUM 4.

FACE M.

No. of Set and Date.	Approximate Greenwich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections For Arc of Vibration. For Pressure. To Mean Temperature 62°.	Corrected Vibrations in a Mean Solar Day.	REMARKS.
XII. July 9.	h m 16. 16	R	1	h m s 11. 20. 51.5	in. o in. 0.67 64.0 26.83							
			2	26. 53.5								
			3	32. 54.5								
	22. 26	H	63	17. 33. 24.0	0.08 63.6 26.83			86636.06	86155.45	+0.06 +8.00 +0.82	86164.33	
			64	39. 24.5								
			65	45. 27.5								

PENDULUM 4.

FACE P.

XIII. July 10.	11. 21	L	1	6. 29. 51.5	0.64 64.0 26.92							
			2	35. 51.5								
			3	41. 51.0								
	15. 51	SD	46	10. 59. 57.5	0.15 64.3 27.63			88635.96	86154.85	+0.07 8.13 +0.94	86163.99	Level on planes. N. 2.3 2.0 S. 2.2 2.6 d = 0.63 in.
			47	11. 5. 56.5								
			48	11. 11. 59.5								

PENDULUM 4.

FACE P.

XIV. July 11.	10. 38	H	1	5. 50. 45.0	0.67 62.9 26.95							
			2	5. 56. 45.5								
			3	6. 2. 46.5								
	15. 56	R	54	11. 9. 5.5	0.12 63.5 26.95			86635.88	86155.11	+0.07 8.05 +0.55	86163.78	
			55	15. 7.5								
			56	21. 8.5								

PENDULUM 4.

FACE P.

XV. July 11.	16. 14	R	1	11. 26. 54.5	0.73 63.7 26.97							
			2	32. 55.5								
			3	38. 55.5								
	22. 31	H	64	17. 45. 24.5	0.10 63.6 27.03			86635.88	86155.19	+0.07 8.05 +0.76	86164.07	
			65	51. 24.5								
			66	57. 26.5								

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER HIGH PRESSURE—continued.

PENDULUM 4.

FACE P.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections			Corrected Vibrations in a Mean Solar Day.	REMARKS.
										For Arc of Vibration.	For Pressure.	To Mean Tempera- ture 62°.		
XVI. July 12.	10. 26	AD	1	h m s 5. 41. 59.5	in. o 0.67 63.5	in. 26.99	86636.02	86155.10	+0.07	8.05	+0.78	86164.00		
			2	47. 58.5										
			3	54. 0.0										
	15. 49	R	55	11. 6. 13.5	o.11	64.0								26.99
			56	12. 19.5										
			57	18. 11.5										

PENDULUM 4.

FACE P.

XVII. July 12.	16. 13	R	1	11. 29. 47.5	0.70	64.0	26.99	86636.02	86155.03	+0.06	8.05	+0.89	86164.03	Level on planes. N. 1.9 { 2.8 } S. 2.9 { 2.0 }
			2	35. 46.5										
			3	41. 47.5										
	22. 42	AD	66	18. 0. 3.5	0.08	64.0	26.99							
			67	18. 6. 2.0										
			68	12. 2.5										

PENDULUM 6.

FACE M.

XVIII.		H	1	7. 2. 53.5																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
--------	--	---	---	------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

PENDULUM 6.

FACE M.

XIX. July 13.	18. 10	H	1	13. 31. 44'0	0.71	64.9	26.97	86636.08	86055.15	+0.03	+8.03	+1.19	86064.45
			2	36. 44'0									
			3	41. 41'5									
	23. 2	H	60	18. 25. 4'5	0.14	64.4	26.97						
			61	30. 0'5									
			62	34. 57'5									

OF THE INDIAN INVARIABLE PENDULUMS, 1889.

21

SWINGS UNDER HIGH PRESSURE—continued.

PENDULUM 6.

FACE M.

No. of Set and Date.	Approximate Greenwich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Are of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections For Arc of Vibration. For Pressure. To Mean Temperature 62°.	Corrected Vibrations in a Mean Solar Day.	REMARKS.
XX. July 15.	h m 10. 26	T	1	h m s 5. 54. 57.5	in. 0.62	° 63.1	in. 26.86					
			2	59. 55.5								
			3	6. 4. 54.0								
	15. 58	SD	68	11. 28. 11.5	0.10	63.3	26.85	86635.91	86055.32	+0.06 +8.02 +0.53	86063.93	
			69	33. 12.5								
			70	38. 9.5								

PENDULUM 6.

FACE M.

XXI. July 15.	16. 20	SD	1	11. 50. 26.5	0.69	63.5	26.86					
			2	55. 24.5								
			3	12. 0. 22.5								
	22. 43	H	78	18. 13. 35.0	0.07	62.5	26.80	86635.91	86055.51	+0.06 +8.01 +0.51	86064.09	
			79	18. 32.0								
			80	23. 29.0								

PENDULUM 6.

FACE P.

XXII. July 16.	11. 11	H	1	6. 43. 49.0	0.67	62.1	26.89					
			2	48. 46.0								
			3	53. 44.0								
	16. 18	SD	63	11. 52. 3.5	0.13	62.1	26.88	86636.48	86055.63	+0.07 +8.05 +0.02	86063.77	Level on planes. N. 2.1 } 2.3 } S. 2.4 } 2.2 } d. = 0.53 in.
			64	57. 2.5								
			65	12. 1. 58.5								

PENDULUM 6.

FACE P.

XXIII. July 17.	10. 44	H	1	6. 20. 56.5	0.65	61.4	26.87					
			2	25. 53.5								
			3	30. 53.5								
	16. 16	R	68	11. 54. 13.5	0.10	61.4	26.88	86636.46	86055.88	+0.06 +8.05 -0.25	86063.74	
			69	59. 10.5								
			70	12. 4. 7.5								

OBSERVATIONS OF THE TIME OF SWING

SWINGS UNDER HIGH PRESSURE—continued.

PENDULUM 6.

FACE P.

No. of Set and Date.	Approximate Green- wich Civil Time.	Observer.	No. of Coincidence.	Times of Coincidence.	Arc of Vibration in inches.	Mean Corrected Temperature.	Pressure in inches.	Clock Vibrations in a Mean Solar Day.	Pendulum Vibrations in a Mean Solar Day.	Corrections			Corrected Vibrations in a Mean Solar Day.	REMARKS.
										For Arc of	For	To Mean Temperature 62°.		
XXIV. July 18.	h m 10. 17	H	1	h m s 5. 58. 40.5	in. 0.71	° 60.8	in. 26.82							
			2	6. 3. 36.5										
			3	8. 35.5										
	16. 10	SD	72	11. 51. 46.5	0.10	61.1	26.84	86636.52	86055.90	+0.07	+8.04	-0.46	86063.55	
			73	56. 47.5										
			74	1. 44.5										

PENDULUM 6.

FACE P.

XXV. July 19.	h m 10. 25	H	1	6. 9. 55.0	0.66	60.5	26.81							
			2	14. 52.5										
			3	19. 52.0										
	16. 18	SD	72	12. 3. 3.5	0.10	61.0	26.81	86636.58	86056.07	+0.06	+8.05	-0.64	86063.54	
			73	8. 5.5										
			74	13. 8.5										

COLLECTED RESULTS OF PENDULUM SWINGS UNDER LOW PRESSURE
(ABOUT 2 INCHES).

PENDULUM No. 4.

Face M.		Face P.		Means.
Number of Swing.	Vibrations in a Mean Solar Day.	Number of Swing.	Vibrations in a Mean Solar Day.	
I.	86165.08	V.	86165.24	Face M. 86165.06 Face P. 86165.16 86165.11
II.	86165.03	VI.	86165.25	
III.	86165.09	VII.	86165.10	
IV.	86165.02	VIII.	86164.98	
		IX.	86165.25	

PENDULUM No. 6 (1821).

Face M.		Face P.		Means.
Number of Swing.	Vibrations in a Mean Solar Day.	Number of Swing.	Vibrations in a Mean Solar Day.	
X.	86065.61	XVI.	86065.60	Face M. 86065.64 Face P. 86065.47 86065.56
XI.	86065.47	XVII.	86065.17	
XII.	86065.55	XVIII.	86065.58	
XIII.	86065.56	XIX.	86065.54	
XIV.	86065.71	XX.	86065.51	
XV.	86065.91	XXI.	86065.43	

OBSERVATIONS OF THE TIME OF SWING

COLLECTED RESULTS OF PENDULUM SWINGS UNDER LOW PRESSURE—*continued.*

PENDULUM NO. 11.

Face M.		Face P.		Means.
Number of Swing.	Vibrations in a Mean Solar Day.	Number of Swing.	Vibrations in a Mean Solar Day.	
XXII.	86116.73	XXVII.	86116.22	Face M. 86116.68 Face P. 86116.30 86116.49
XXIII.	86116.65	XXVIII.	86116.41	
XXIV.	86116.72	XXIX.	86116.39	
XXV.	86116.79	XXX.	86116.18	
XXVI.	86116.50			

COLLECTED RESULTS OF PENDULUM SWINGS UNDER HIGH PRESSURE
(ABOUT 27 INCHES.)

PENDULUM NO. 4.

Face M.		Face P.		Means.
Number of Swing.	Vibrations in a Mean Solar Day.	Number of Swing.	Vibrations in a Mean Solar Day.	
XXXIX.	86163.84	XLIII.	86163.99	Face M. 86164.11 Face P. 86163.97 86164.04
XL.	86163.98	XLIV.	86163.78	
XLI.	86164.30	XLV.	86164.07	
XLII.	86164.33	XLVI.	86164.00	
		XLVII.	86164.03	

COLLECTED RESULTS OF PENDULUM SWINGS UNDER HIGH PRESSURE—*continued*.

PENDULUM NO. 6 (1821).

Face M.		Face P.		Means.
Number of Swing.	Vibrations in a Mean Solar Day.	Number of Swing.	Vibrations in a Mean Solar Day.	
XLVIII.	86064.47	LII.	86063.77	Face M. 86064.23 Face P. 86063.65 86063.94
XLIX.	86064.45	LIII.	86063.74	
L.	86063.93	LIV.	86063.55	
LI.	86064.09	LV.	86063.54	

Face M.		Face P.		Means.
Number of Swing.	Vibrations in a Mean Solar Day.	Number of Swing.	Vibrations in a Mean Solar Day.	
XXXV.	86116.07	XXXI.	86115.20	Face M. 86116.14 Face P. 86115.22 86115.68
XXXVI.	86116.26	XXXII.	86115.21	
XXXVII.	86116.17	XXXIII.	86115.21	
XXXVIII.	86116.07	XXXIV.	86115.26	

D