

The temperature in the shade at sunrise was  $53^{\circ}$  F., and after transit  $65^{\circ}$  F.

The heliometer used by me on this occasion was constructed by Fraunhofer. One of the halves of the object-glass was used, the line of separation being put normal to the sun's limb at the point of contact, in order to produce the least distortion of image in the direction of the common diameter of the two objects. The focal length of the instrument is nearly 45 inches (English), the aperture 3 inches, and the power used was 97.

Our observatory was situated about half a mile to the southward of Luxor, in lat.  $25^{\circ} 41' 40''$  N., as determined by Wm. Döllén and Professor Auwers, and in longitude  $2^{\text{h}} 10^{\text{m}} 22^{\text{s}}$  E., as fixed by Mahmoud Bey in his late survey of the valley of the Nile.

III. "Preliminary Abstract of Approximate Mean Results with the Invariable Pendulums Nos. 4 and 1821, in continuation of the Abstract published in vol. xix. of the Proceedings." By Captain W. J. HEAVISIDE, R.E. Communicated by Professor STOKES, Sec. R.S. Received February 15, 1875.

*Extract from a Letter from Captain Heaviside to Professor Stokes.*

Dehra, N. W. P., 21st January, 1875.

MY DEAR SIR,—An abstract of approximate results by the invariable pendulums was printed under Captain Basevi's superintendence in 1870. I now enclose an abstract in continuation, bringing the work down to Kew. The formulæ and factors employed by Basevi have been used in the reductions, so that the results in the two abstracts might be directly comparable.

The observations at Meean Meer and at Moré were taken by Basevi, and the reduction to mean sea-level for Moré has been computed in accordance with a memorandum he left, in which he assumed the mountain masses on which Moré stands to compose a cylinder, having a height of 2.92 miles and a radius of 200 miles.

You will see that the results at Kew, from my observations in 1873, differ by 0.38 vibration from those obtained by Mr. Loewy in 1866. My observations were taken in August, at a mean temperature of  $65^{\circ}$ ; his in January, at a temperature of  $54^{\circ}$ .

As the temperature-factor (0.48 vibration for  $1^{\circ}$  Fahr.) here employed is larger than that which will eventually be adopted, the difference between the two results will be still further reduced, and the agreement will be much closer than I expected to obtain, when taking into consideration the varied travels these pendulums went through in the interval. \* \* \*

## Preliminary Abstract of Approximate Mean Results with the Invariable Pendulums Nos. 4 and 1821.

No.	Stations.	Geodetic coordinates.			Mean temperature.	Mean pressure.	Observed number of vibrations reduced to an infinitely small arc.	Corrections.		Corrected vibrations at the level of the station.	Reduction to mean sea-level.	Results.		
		North latitude.	East longitude.	Height in feet.				Reduction to 72° F.	Reduction to a vacuum.			By observation.	By computation in terms of Ponce's ellipticity $= \frac{3}{800}$ .	Computed. — Observed.
31.	MIAN MIR (Mean Meer)	31° 32' 29"	77° 25'	706	79.0	in. 1.50	86026.17	+3.35	+0.43	86029.95	+1.83	86031.78	86036.18	+4.40
22.	MORÉ.....	33 16	77 54	15427	55.0	1.25	85985.81	-8.10	+0.38	85978.09	+41.15	86019.24	86042.43	+23.19
...	Kaliána (1873) .....	29 31	77 42	826	62.3	2.97	86026.02	-4.60	+0.89	86022.32	+2.13	86024.44	86029.16	+4.72
28.	Colába .....	18 54	72 51	35	82.7	1.42	85995.03	+5.11	+0.41	86000.55	+0.09	86000.64	85997.66	-2.98
24.	Aden .....	12 47	45 2	5	87.4	1.44	85979.55	+7.38	+0.41	85987.33	+0.01	85987.35	85984.88	-2.47
32.	Ismailia (Egypt) .....	30 36	32 16	32	79.9	1.33	86027.23	+3.78	+0.38	86031.40	+0.08	86031.48	86032.90	+1.42
...	Kew Observatory (1873).	51 28	...	15	65.1	1.40	86117.22	-3.30	+0.42	86114.34	+0.04	86114.38	86113.55	-0.83
...	Kew Observatory (1866).	...	...	...	54.2	1.57	...	-8.51	...	...	...	86114.03	...	...

Dehra, January 1875.