The third gives the observed flexure of the mean of microscopes VI–VII, or I–III, for that position of the circle, in other words, the value of $a.(R-45°.)$

The fourth gives the observed flexure of the mean of microscopes VI–VIII, or II–IV, for the same position of the circle, or the value of $\beta.(R+45°.)$

The fifth and sixth give the outstanding errors.

R	Flexure by formula.	Observed flexure.		Errors.		R′	Flexure by formula.	Observed flexure.		Errors.	
		V–VII.	VI–VIII.	V–VII.	VI–VIII.			I–III.	II–IV.	I–III.	II–IV.
°	″	″	″	″	″	°	″	″	″	″	″
45	−0.25	−0.19	−0.22	+0.06	+0.03	45	+0.02	−0.05	−0.14	−0.07	−0.16
60	−0.31	−0.41	−0.35	−0.10	−0.04	60	−0.30	−0.27	−0.23	+0.03	+0.07
75	−0.36	−0.38	−0.37	−0.02	−0.01	75	−0.59	−0.63	−0.60	−0.04	−0.01
90	−0.37	−0.24	−0.34	+0.13	+0.03	90	−0.84	−0.77	−0.72	+0.07	+0.12
105	−0.36	−0.38	−0.45	−0.02	−0.09	105	−1.03	−0.98	−0.07	+0.05	+0.04
120	−0.32	−0.34	−0.38	−0.02	−0.06	120	−1.16	−1.09	−1.14	+0.07	+0.02
135	−0.27	−0.28	−0.24	−0.01	+0.03	135	−1.20	−1.24	−1.32	−0.04	−0.12
150	−0.19	−0.20	−0.16	−0.01	+0.03	150	−1.16	−1.16	−1.23	0.00	−0.07
165	−0.11	−0.10	−0.03	+0.01	+0.08	165	−1.05	−1.04	−1.06	+0.01	−0.01
180	−0.01	−0.01	+0.03	0.00	+0.04	180	−0.86	−0.89	−0.86	−0.03	0.00
195	+0.09	+0.11	+0.09	+0.02	0.00	195	−0.61	−0.64	−0.55	−0.03	+0.06
210	+0.18	+0.15	+0.17	−0.03	−0.01	210	−0.32	−0.22	−0.30	+0.10	+0.02
225	+0.25	+0.16	+0.19	−0.09	−0.06	225	−0.02	−0.01	+0.14	+0.01	+0.15

The lower line of the table is, it will be seen, only a repetition of the upper with the sign changed. We always have

$$f.R+f.(R+180°)=0$$

by the fundamental hypothesis of the investigation.

(63) *Values of g z.*—Taking the differences of the K's, we have eight distinct values of 8 $g.z$, the sum of which gives the value of 64 $g.z$, derived from the observation. The mean is as follows:

Z	gz
	″
0	+.01
15	+0.14
30	+0.07
45	−0.02
60	+0.08
75	+0.10
90	+0.03
105	+0.06
120	+0.02
135	−0.04
150	+0.02
165	−0.02

Though these values are quite well marked, indicating a twisting flexure coefficient of 0″.06, I am not at all satisfied of their reality, and have therefore preferred to dispense with their use, and derive the telescope flexure for each end of the axis directly from the observations.

(64) *Flexure of the Telescope.*—The preceding investigation gives the flexure of the circle divisions relatively to the central nucleus of the circle. We next wish to know the flexure of the line joining the micrometer wire, and the optical centre of the object glass relatively to the same nucleus. During the early part of the year 1866, I was greatly troubled by finding a constant difference of a large fraction of a second between the horizontal flexure determined from the opposing and that from the levelled collimators. It seemed to follow from this, that if the axes of the collimators were set optically in the same line, the difference of their level