Microscopes V–VIII being alone employed in astronomical operations, their inequalities were redetermined in March, 1866, with the following result:

$$V. \quad -0''.05 \cos u + 0''.05 \sin u;$$
$$VI. \quad +0 \cdot 24 \cos u + 0 \cdot 25 \sin u;$$
$$VII. \quad -0 \cdot .07 \cos u + 0 \cdot .08 \sin u;$$
$$VIII. \quad +0 \cdot .11 \cos u + 0 \cdot .25 \sin u.$$

The mean of the two results is adopted as the correction for the year 1866.

(55) A rough check upon the general accuracy of the screws is given by the mean distance of the wires as measured in different revolutions of the screw. The following are the distances given by the same measures which determine the inequalities:

	1865.		1866.		Difference.	
	29 rev.	30 rev.	29 rev.	30 rev.	1865.	1866.
	$''$	$''$	$''$	$''$	$''$	$''$
Mic. V .	10.98	11.05	10.80	10.91	+ 0.07	+ 0.11
Mic. VI .	10.88	10.82	10.80	10.95	− 0.06	+ 0.15
Mic. VII .	10.53	10.47	11.85	11.75	− 0.06	− 0.10
Mic. VIII .	10.88	10.87	10.74	10.92	− 0.01	+ 0.18

The method of observing is such that the microscope micrometers are seldom moved through more than a fraction of a revolution. No very accurate investigations have therefore been made to find whether the value of the revolution of any one of them changes progressively; but the measures occasionally made for runs show that the change, if it exists, is entirely inappreciable.

There are, however, outstanding discrepancies, amounting sometimes to three or four tenths of a second, which I have not been able to refer to any law.

(56) *The Declination Micrometer of Telescope.*—Neither the collimators nor the telescope micrometer were originally furnished with double wires; the usual method could not, therefore, be used to determine the inequality of the latter. The plan was, therefore, adopted of measuring successive half revolutions of the telescope micrometer with the microscope micrometers, by setting the wire of the former upon the collimator. The following are the value of eight successive half revolutions, as given by two microscopes of each circle, in one series, and the four microscopes V–VIII in the other:

	First series.				
	Mic. I.	Mic. III.	Mic. VI.	Mic. VIII.	Mean.
$r. \quad r.$	$''$	$''$	$''$	$''$.	$''$
24.0 — 24.5	7.70	7.61	7.91	8.39	7.90
24.5 — 25.0	7.77	7.76	7.85	7.49	7.72
25.0 — 25.5	7.56	7.37	7.66	7.66	7.56
25.5 — 26.0	7.81	7.41	7.45	7.41	7.52
26.0 — 26.5	7.75	7.85	8.00	8.25	7.96
26.5 — 27.0	7.86	7.51	7.63	7.38	7.60
27.0 — 27.5	7.55	7.65	8.03	7.85	7.77
27.5 — 28.0	7.83	7.63	7.61	7.76	7.71

The mean of the odd measures is $7''.80$, and of the even ones, $7''.64$.