

It does not appear to me that the eminent constructors of the instrument have succeeded in this. In order that I might reach a precise conclusion on this point, I asked permission at Strassburg to collect the data and to make the determination necessary for a rough comparison with the Washington circle.

First, as regards errors of division, I found that these errors had been determined for every 5 degrees. The best method of making a numerical estimate of the accidental errors of division seems to be to compare the error of each division with the mean of the errors of the two adjoining ones differing by 5 degrees. I examined the table of errors through a portion of the circle with the result that the mean error as thus determined is $0''.32$, while the maximum is $0''.63$. It will be interesting to compare this with the Washington circle.

On page 37 of the Washington Observations for 1865 is found a table of the errors of the two circles of the Washington instrument. Treating them in the same way, we find:

Washington, circle A: mean error, $0''.28$; maximum, $0''.79$.

Washington, circle B: mean error, $0''.21$; maximum, $0''.31$.

Strassburg circle: mean error, $0''.32$; maximum, $0''.63$.

It will be seen that in angular position the errors of the Strassburg circle are in general about the same as those of circle A of the Washington instrument, but are decidedly inferior to those of circle B, which is the one always used in astronomical observation. The diameter of the Washington circle is, however, about six-tenths greater than that of the Strassburg instrument, thus showing that in linear measure the general accuracy is the same in the Strassburg instrument and the Washington circle B.

I must, in justice to the Messrs. Repsold, call attention to the fact that this comparison refers only to the particular sets of division which are distant 5 degrees, and does not refer to the general excellence of the dividing. Both the Washington circles exhibit a most unfortunate periodic error within each space of 5 degrees, and another within each space of 30 minutes or perhaps one degree. In circle B the maximum amount of this periodic error is $0''.27$, and in circle A, $0''.46$. I am not aware that any such error exists in the Repsold circle. It is proper to remark that the methods of dividing the two instruments were entirely different. In the Washington instrument the original divisions were made to every 5 degrees, and the intermediate ones are all copies of the same small dividing arc used by Messrs. Pistor and Martini for finish-