reutly be larger than the actual variation, whatever this may be. This seems a much more natural and probable cause for the apparent excess of the observed over the theoretical perturbations than that assigned by Hansen. Hansen's factor only increases the coefficient in question by $0^{\prime\prime}.33$; but it seems probable that the variation derived from observations alone would be yet larger than Hansen's increased variation. In fact, in 1867, 1 found, by comparing the errors of the hunar ephemeris when the moon culminated at different times of the day, that the effect of the greater irradiation at night was very strongly marked. During the four years 1862-65 the mean errors of the tables in right ascension at different times of day were as follows:*

Before sunset	- 0.154
After bright daylight in the evening	-0.093
Before bright daylight in the morning	+ 0, 091
After sunrise	+ 0. 153

In the difference between the results for each limb, the effect of increased irradiation seems to be o".o6.

The only remaining term which is large enough to be materially affected by the increase in question is the annual equation, of which the increase is $0''_{-10}$.

A glance at the errors of Hansen's tables, given by meridian observations, will show that the errors about the time of first quarter, and, indeed, during the first half of the hunation, are in the mean less by between 3'' and 4'' than during the second half. Hence, either the semi-diameter, or the parallactic equation, or both, are too large. The parallactic equation used by Hansen corresponds to a value 8''.916 for the solar parallax, which value is too large by probably not much less than 0''.10. The result which I deduced in 1867 from all the really valuable data extant was 8''.848; and the determinations which have since been made, when revised with the hest data, seem to indicate a diminution of this value rather than an increase. These indications are, however, as yet, a little too indefinite to predicate anything npon. I shall therefore contime to use 8''.848, which will diminish Hansen's value by 0''.068. The corresponding diminution in the principal parallactic term will be 0''.96, while there will be two other terms to receive a smaller diminution.

This correction will still leave a difference of about 2'' between the results from the first and second limbs, which will be neconnted for by an error of 1'' in the adopted 'semi-diameter. This correction to the semi-diameter is a priori quite probable, as the improved meridian instruments of the present time give a semi-diameter of the sun 1''less than the older ones from which the diameters adopted in our ephemerides were derived. It is to be expected that the semi-diameter of the moon will exhibit a similar apparent diminution.

* Investigation of the Distance of the Sun, p. 24.

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