

thought himself justified in asserting that the years were always exactly equal, he showed, both by observations of the time when the sun passed the equinoxes, and by eclipses, that the difference of successive years, if there were any difference, must be extremely slight. The observations of succeeding astronomers, and especially of Ptolemy, confirmed this opinion, and proved, with certainty, that there is no progressive increase or diminution in the duration of the year.

3. *Constant Length of Days. Equation of Time.*—The equality of days was more difficult to ascertain than that of years; for the year is measured, as on a natural scale, by the number of days which it contains; but the day can be subdivided into hours only by artificial means; and the mechanical skill of the ancients did not enable them to attain any considerable accuracy in the measure of such portions of time; though clepsydras and similar instruments were used by astronomers. The equality of days could only be proved, therefore, by the consequences of such a supposition; and in this manner it appears to have been assumed, as the fact really is, that the apparent revolution of the stars is accurately uniform, never becoming either quicker or slower. It followed, as a consequence of this, that the solar days (or rather the *nycthemers*, compounded of a night and a day) would be unequal, in consequence of the sun's unequal motion, thus giving rise to what we now call the *Equation of Time*,—the interval by which the time, as marked on a dial, is before or after the time, as indicated by the accurate timepieces which modern skill can produce. This inequality was fully taken account of by the ancient astronomers; and they thus in fact assumed the equality of the sidereal days.

*Sect. 2.—Researches which did not verify the Theory.*

SOME of the researches of Hipparchus and his followers fell upon the weak parts of his theory; and if the observations had been sufficiently exact, must have led to its being corrected or rejected.

Among these we may notice the researches which were made concerning the *Parallax* of the heavenly bodies, that is, their apparent displacement by the alteration of position of the observer from one part of the earth's surface to the other. This subject is treated of at length by Ptolemy; and there can be no doubt that it was well examined by Hipparchus, who invented a *parallactic instrument* for that purpose. The idea of parallax, as a geometrical possibility, was indeed too obvious to be overlooked by geometers at any time; and when the doctrine of the sphere was established, it must have appeared strange