

order to apply this theory to the sun, moon, and planets, and of the other calculations which are requisite, in order to deduce the consequences of this theory, the work is a splendid and lasting monument of diligence, skill, and judgment. Indeed, all the other astronomical works of the ancients hardly add any thing whatever to the information we obtain from the *Almagest*; and the knowledge which the student possesses of the ancient astronomy must depend mainly upon his acquaintance with Ptolemy. Among other merits, Ptolemy has that of giving us a very copious account of the manner in which Hipparchus established the main points of his theories; an account the more agreeable, in consequence of the admiration and enthusiasm with which this author everywhere speaks of the great master of the astronomical school.

In our present survey of the writings of Ptolemy, we are concerned less with his exposition of what had been done before him, than with his own original labors. In most of the branches of the subject, he gave additional exactness to what Hipparchus had done; but our main business, at present, is with those parts of the *Almagest* which contain new steps in the application of the Hipparchian hypothesis. There are two such cases, both very remarkable,—that of the moon's *Evection*, and that of the *Planetary Motions*.

The law of the moon's anomaly, that is, of the leading and obvious inequality of her motion, could be represented, as we have seen, either by an eccentric or an epicycle; and the amount of this inequality had been collected by observations of eclipses. But though the hypothesis of an epicycle, for instance, would bring the moon to her proper place, so far as eclipses could show it, that is, at new and full moon, this hypothesis did not rightly represent her motions at other points of her course. This appeared, when Ptolemy set about measuring her distances from the sun at different times. "These," he<sup>32</sup> says, "sometimes agreed, and sometimes disagreed." But by further attention to the facts, a rule was detected in these differences. "As my knowledge became more complete and more connected, so as to show the order of this new inequality, I perceived that this difference was small, or nothing, at new and full moon; and that at both the *dichotomies* (when the moon is half illuminated) it was small, or nothing, if the moon was at the apogee or perigee of the epicycle, and was greatest when she was in the middle of the interval, and therefore when the first unequal-

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<sup>32</sup> *Synth.* v. 2.