the motions of the sun and moon could be calculated with sufficient exactness for the prediction of eclipses: and some remarkable cycles, or periods of years in which the lunar eclipses return in very nearly the same order, had been ascertained by observation. Considering the extreme imperfection of their means of measuring time and space, this was, perhaps, as much as could have been expected at that early period, and it was followed up for a while in a philosophical spirit of just speculation, which, if continued, could hardly have failed to lead to sound and important conclusions.

(294.) Unfortunately, however, the philosophy of Aristotle laid it down as a principle, that the celestial motions were regulated by laws proper to themselves, and bearing no affinity to those which prevail on earth. By thus drawing a broad and impassable line of separation between celestial and terrestrial mechanics, it placed the former altogether out of the pale of experimental research, while it, at the same time, impeded the progress of the latter by the assumption of principles respecting natural and unnatural motions, hastily adopted from the most superficial and cursory remark, undeserving even the name of observation. Astronomy, therefore, continued for ages a science of mere record, in which theory had no part, except in so far as it attempted to conciliate the inequalities of the celestial motions with that assumed law of uniform circular revolution which was alone considered consistent with the perfection of the heavenly mechanism. Hence arose an unwieldy, if not self-contradictory, mass of hypothetical motions of sun, moon, and planets, in circles, whose centres were carried round in other circles, and these again in others without end,—" cycle on epicycle, orb on orb,"—till at length, as observation grew more exact, and fresh epicycles were continually added, the absurdity of so cumbrous a mechanism became too palpable to be borne. Doubts were expressed, to which the sarcasm of a monarch* gave a currency they might not

* Alphonso of Castile, 1252.