in proportion as it was supported by the authority of all philosophers, and apparently agreeable to metaphysics." But before he attempts to correct this erroneous part of his hypothesis, he sets about discovering the law according to which the different parts of the orbit are described in the case of the earth, in which case the eccentricity is so small that the effect of the oval form is insensible. The result of this inquiry was[8] the Rule, that the time of describing any arc of the orbit is proportional to the area intercepted between the curve and two lines drawn from the sun to the extremities of the arc. It is to be observed that this rule, at first, though it had the recommendation of being selected after the unavoidable abandonment of many, which were suggested by the notions of those times, was far from being adopted upon any very rigid or cautious grounds. A rule had been proved at the apsides of the orbit, by calculation from observations, and had then been extended by conjecture to other parts of the orbit; and the rule of the areas was only an approximate and inaccurate mode of representing this rule, employed for the purpose of brevity and convenience, in consequence of the difficulty of applying, geometrically, that which Kepler now conceived to be the true rule, and which required him to find the sum of the lines drawn from the sun to *every* point of the orbit. When he proceeded to apply this rule to Mars, in whose orbit the oval form is much more marked, additional difficulties came in his way; and here again the true supposition, that the *oval* is of that special kind called *ellipse*, was adopted at first only in order to simplify calculation,[9] and the deviation from exactness in the result was attributed to the inaccuracy of those approximate processes. The supposition of the oval had already been forced upon Purbach in the case of Mercury, and upon Reinhold in the case of the Moon. The centre of the epicycle was made to describe an egg-shaped figure in the former case, and a lenticular figure in the latter.[10]

It may serve to show the kind of labor by which Kepler was led to his result, if we here enumerate, as he does in his forty-seventh Chapter,[11] six hypotheses, on which he calculated the longitude of Mars, in order to see which best agreed with observation.

1. The simple eccentricity.

2. The bisection of the eccentricity, and the duplication of the superior part of the equation.

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[8] *De Stellâ Martis*, p. 194.
[9] Ib. iv. c. 47.
[10] L. U. K. Kepler, p. 80.
[11] *De Stellâ Martis*, p. 228.