of the circular form of the sun's image: but these circular images become larger and larger as they are farther from the hole, while the central image of the hole remains always of the original size; and thus at a considerable distance from the hole, the trace of the hole's form is nearly obliterated, and the image is nearly a perfect circle. Instead of this distinct conception of a cone of rays which has the sun's disk for its basis, Aristotle has the following loose conjecture.[15] "Is it because light is emitted in a conical form; and of a cone, the base is a circle; so that on whatever the rays of the sun fall, they appear more circular?" And thus though he applies the notion of rays to this problem, he possesses this notion so *indistinctly* that his explanation is of no value. He does not introduce into his explanation the consideration of the sun's circular figure, and is thus prevented from giving a true account of this very simple optical phenomenon.

6. Again, to pass to a more extensive failure: why was it that Aristotle, knowing the property of the lever, and many other mechanical truths, was unable to form them into a science of mechanics, as Archimedes afterwards did?

The reason was, that, instead of considering rest and motion directly, and distinctly, with reference to the Idea of Cause, that is Force, he wandered in search of reasons among other ideas and notions, which could not be brought into steady connection with the facts;—the ideas of properties of circles, of proportions of velocities,—the notions of "strange" and "common," of "natural" and "unnatural." Thus, in the Proem to his Mechanical Problems, after stating some of the difficulties which he has to attack, he says, "Of all such cases, the circle contains the principle of the cause. And this is what might be looked for; for it is nothing absurd, if something *wonderful* is derived from something more wonderful still. Now the most wonderful thing is, that opposites should be combined; and the circle is constituted of such combinations of opposites. For it is constructed by a stationary point and a moving line, which are contrary to each other in nature; and hence we may the less be surprised at the resulting contrarieties. And in the first place, the circumference of the circle, though a line without breadth, has opposite qualities; for it is both *convex* and *concave*. In the next place, it has, at the same time, opposite motions, for it moves forward and backward at the same time. For the circumference, setting out from any point, comes to the same point again, so

[15] Problem. 15, διὰ μαθηματικῆς, &c.