

Descartes to Mersenne

October 1637

MY REVEREND FATHER,

1. You have informed me that one of your friends, who has read the *Dioptrics*, found some things objectionable, and primarily doubted whether *the inclination towards motion must follow the same laws as motion itself, since there is as much difference between them as between potentiality and actuality.*

But I am convinced that he formed this doubt because he thought I had doubts about it myself, and because I included these words on page 8, line 24: *“For it is quite easy to believe that the disposition to movement must follow the same laws as motion.”* He thought that, by saying that something is easy to believe, I meant to say that it is only probable. In thinking this, he has strayed far from my intention; for I consider as practically false anything that is *only* plausible, and when I say that something is easy to believe, I do not mean that it is only probable, but rather that it is so clear and so evident, that there is no need to bother myself with demonstrating it. Indeed one could not reasonably doubt that the laws which govern motion, which is action, as he says himself, also hold for the inclination to move, which is the potentiality of that action: for, although it is not always true that that which was in the potential be also in the action, it is nevertheless completely impossible that there be something in the action that was not in the potential.

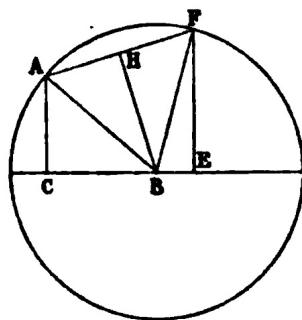
2. Regarding what he says next, *that there seems to be a particular disparity, in that the movement of a ball is more or less violent, accordingly as it is pushed by different forces, whereas light penetrates transparent bodies instantaneously, and seems not to be affected by succession,* I do not at all

understand his reasoning.

He cannot find the disparity in the ball's ability to move more or less violently, since the action that I consider as the propagation of light can also be stronger or weaker; nor can he find the disparity in one being affected by succession and the other not, since I think I have made myself sufficiently understood, by the comparison of the walking-stick of the blind man, and by the comparison of the wine which falls through a vat: although the inclination to move is transmitted from one location to another in an instant, it nonetheless follows the same path by which successive motion must be made, which is all that is in question here.

3. After this he adds a discourse which to me seems to be nothing other than a demonstration. I do not care to repeat his words here, since I have no doubt that you have kept the original; I will simply say that from what I wrote in saying that the determination to move may be divided (I mean divided in reality, not in an imaginary way) into all the parts of which one may imagine it to be composed, he had no reason to conclude that the division of this determination which is made by surface CBE (*fig. 54*), which is a real surface, namely that of the polished body CBE, is an imaginary division. And he has clearly made a manifest paralogism: by assuming that the line AF is not parallel to the surface CBE, he wished that it were possible, despite this, to imagine that this line could designate the direction to which this surface is in no way opposed, without considering that, since the perpendiculars are not on AF drawn by his imagination, but are on CBE, which mark the direction towards which this surface CBE opposes the movement of the ball, therefore only lines parallel to CBE indicate the direction towards which it is not at all opposed.

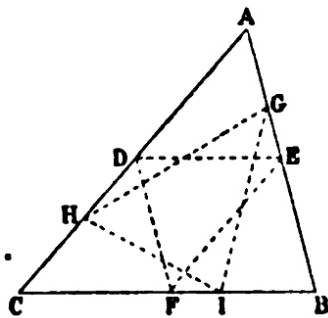
Fig. 54.



4. But, in order to make the difference between our two trains of thought more visible, I wish to apply them to another subject matter. I argue thus:

First, the triangle ABC (*fig. 55*) can be divided into all its imaginable parts. *Second*, it can easily be imagined that it is composed of four equal triangles ADE, FED, EFB, DCF. *Third*, following this it is easy to understand that the three lines DE, EF, FD mark the locations where these four triangles must be joined to produce it. Therefore, if we take these three lines, it [triangle ABC] will really and truly be divided by them into four equal triangles.

Fig. 55.



Now see the way that he argues, or at least the way he wishes I had argued:

Triangle ABC can be divided into all the parts of which one could imagine it is composed. Now, we can imagine that it is composed of four unequal triangles AHG, IGH, HCI, IBG. Therefore, if we draw three lines DE, EF and FD, they will divide the triangle into four others which will be unequal.

I am sure that any reasonable person would not in any way say that these two arguments are similar.

5. But, no matter what the quality is of the objections that are leveled against my writings, you would greatly oblige me, if you would please send them all to me, and I will not hesitate to respond, at least if they or their authors are worth the trouble, and if they agree to my printing them when I have amassed enough to fill a fair volume. For it would become an endless task if I were to satisfy each one of them in particular.

I am, etc.

DESCARTES