

near *Boulogne*, and A the Center of the Earth. Father *Riccioli* in his Geography (*Lib. 5. chap. 33.*) assures us that by many observations made at the times which were least suspected for Refractions he always found the Angle A D I of  $89^{\circ} 26' 13'' 27'''$ . and the Angle A I D of  $90^{\circ} 15' 7''$  supposing that the two terms I and D were viewed by one strait Ray. the sum of these two Angles makes  $179^{\circ} 41' 20'' 27'''$  and by consequence the Angle A, or the Arch B C, is according to this Observation of  $18' 39'' 33'''$ ; but the distance is of 20016 *Bouronian* paces thence by Proportion an intire Degree should be 64363 *Bologne* paces, which make about 62900. Toises of *Paris*.

This Method which was proposed by *Kepler*, appears so much the more simple, for that there was no need of any Cœlestial Observation, and that it supposes only that the Plumb or Perpendicular tends directly to the Center of the Earth, which we have also supposed. But we may demand of Father *Riccioli*, how he could be assured that in his Observations, he had not any thing of Refraction. It was, says he, at Noon, in places very high elevated. But besides, that one of those Places is much higher then the other; the following Experiment joyned to what we have related before, will make one see what Judgment ought to be made of this Method.

In the Month of *August* of the year 1669. the Top of the Hillock of *Mareuil* observed at Noon, from the foot of the Tower of *Montleberie*, appear'd below the Level  $8' 20''$ ; and some days after at the same hour, the foot of the Tower of *Montleberie* reciprocally observ'd from the Top of the Hillock of *Mareuil*, was found below the Level  $13' 40''$ . If there had been no Refraction, these two little Angles together would have made the Angle at the Center of the Earth, between *Montleberie* and *Mareuil* of  $22'$ , but the distance is 25643. Toyses: thence in Proportion a Degree should be 69935. Toyses, which will exceed very much, not only the greatness which we have determined by the Heavens; but even that which Father *Riccioli* has found. The Measure without doubt will yet come forth much bigger in respect to two Objects, that shall be further distant then *Mareuil* and *Montleberie*: In such sort that 'tis evident that this method ought to be intirely rejected as fallacious and uncertain.

It may be said, That Father *Riccioli*, understanding well what Refractions would do, did not wholly content himself with this method; but that he did verify it by Cœlestial Observations. But after what manner soever it is in *Italy*, where the Refractions possibly are not so great as here; We have not at all found that the Observations made for the Measure of the Earth, by the means of the Level did agree with those of the Heavens, which we can confirm by divers like Examples to those which we have produced: As one may see in the Geography of the said Author, (*Lib. 5. cap. 27.*) that of the two Observations of the Heavens, one of which gave him  $19' 19''$ , and the other  $21' 16''$ , of apparent distance between the Zenith of

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