those two opposite forces are equal, each compensates the other, and the planet cannot go nearer to the sun nor further from him than a certain determinate space, and thus appears balanced and floating about him."

This is a very remarkable passage; but it will be observed, at the same time, that the author has no distinct conception of the manner in which the change of direction of the planet's motion is regulated from one instant to another; still less do his views lead to any mode of calculating the distance from the central body at which the planet would be thus balanced, or the space through which it might approach to the centre and recede from it. There is a great interval from Borelli's guesses, even to Huyghens' theorems; and a much greater to the beginning of Newton's discoveries.

(*England.*) It is peculiarly interesting to us to trace the gradual approach towards these discoveries which took place in the minds of English mathematicians; and this we can do with tolerable distinctness. Gilbert, in his work, *De Magnete*, printed in 1600, has only some vague notions that the magnetic virtue of the earth in some way determines the direction of the earth's axis, the rate of its diurnal rotation, and that of the revolution of the moon about it.[20] He died in 1603, and, in his posthumous work, already mentioned (*De Mundo nostro Sublunari Philosophia nova*, 1651), we have already a more distinct statement of the attraction of one body by another.[21] "The force which emanates from the moon reaches to the earth, and, in like manner, the magnetic virtue of the earth pervades the region of the moon: both correspond and conspire by the joint action of both, according to a proportion and conformity of motions; but the earth has more effect, in consequence of its superior mass; the earth attracts and repels the moon, and the moon, within certain limits, the earth; not so as to make the bodies come together, as magnetic bodies do, but so that they may go on in a continuous course." Though this phraseology is capable of representing a good deal of the truth, it does not appear to have been connected, in the author's mind, with any very definite notions of mechanical action in detail. We may probably say the same of Milton's language:

> What if the sun
> Be centre to the world; and other stars,
> By his attractive virtue and their own
> Incited, dance about him various rounds?
>
> *Par. Lost*, B. viii.

[20] Lib. vi. cap. 6, 7.

[21] Ib. ii. c. 19.