

elevated matter to *increase* gravitation. That of mere *elevation* above the sea-level to the height of $\frac{1}{3}$ of a mile (similarly reduced) is, however, one 36000th in the opposite direction, or to diminish it—and the difference or one 180,000 of the whole is effective *not to compensate but to add to* the sea-deficiency.

(17.) To obtain the real length of the normal pendulum then we must go out of our own globe, and ascertain the true co-efficient of gravity from astronomical facts; and, as the only one available for the purpose, compute the distance fallen through by the moon in a second of time towards the earth from a tangent to her orbit. This, it is evident, is independent of the influence of those local inequalities which affect the pendulum measurements. But, on the other hand, it must be remembered—1st, That our knowledge of the distance in question depends on our previous knowledge of the moon's distance, which, in its turn, depends on that of the earth's diameter, and therefore presupposes the metre to be *accurately* known. For any *aliquot* error in the metre will produce an equal *aliquot* error in the moon's distance estimated in metres, and therefore also in the linear deflection per second from the tangent to the orbit. 2d, That this linear deflection, or approach of the moon to the earth in one second of time, is the result of the joint attraction of the earth on the moon and of the moon on the earth, and is in effect the sum of the spaces fallen through by the moon towards their common centre of gravity, in virtue of the earth's attraction, and by the earth towards that point in virtue of the