of the comparative mass of the comet, and of any of the planets; and hence, cannot make any calculation founded on such a comparison. Newton has endeavoured to show how small the resistance of the medium must be, if it exist.* The result of his calculation is, that if we take the density of the medium to be that which our air will have at two hundred miles from the earth's surface, supposing the law of diminution of density to go on unaltered, and if we suppose Jupiter to move in such a medium, he would in a million years lose less than a millionth part of his velocity. If a planet, revolving about the sun, were to lose any portion of its velocity by the effect of resistance, it would be drawn proportionally nearer the sun, the tendency towards the centre being no longer sufficiently counteracted by that centrifugal force which arises from the body's velocity. And if the resistance were to continue to act, the body would be drawn perpetually nearer and nearer to the centre, and would describe its revolutions quicker and quicker, till at last it would reach the central body, and the system would cease to be a system.

This result is true, however small be the velocity lost by resistance; the only difference being, that when the resistance is small, the time requisite to extinguish the whole motion will be proportionally longer. In all cases the times which come under our consideration in problems of this kind, are enormous to common apprehension. Thus Encke's comet, according to the results of the observations already made, will lose, in ten revolutions, or thirty-three years, less than one thousandth of its velocity: and if this law were to continue, the velocity would not be reduced to one-half its present value in less than seven thousand revolutions or twenty-three thousand years. If Jupiter were to lose one-millionth of his velocity in a million years, (which, as has been

* Principia, b. iii. prop. x.