ascertain whether their effect is general; and in pushing the application of our laws to extreme cases.

(177.) For example, a fair induction from a great number of facts led Galileo to conclude that the accelerating power of gravity is the same on all sorts of bodies, and on great and small masses indifferently; and this he exemplified by letting bodies of very different natures and weights fall at the same instant from a high tower, when it was observed that they struck the ground at the same moment, abating a certain trifling difference, due, as he justly believed it to be, to the greater proportional resistance of the air to light than to heavy bodies. The experiment could not, at that time, be fairly tried with extremely light substances, such as cork, feathers, cotton, &c., because of the great resistance experienced by these in their fall; no means being then known of removing this cause of disturbance. It was not, therefore, till after the invention of the air-pump, that this law could be put to the severe test of an extreme case. A guinea and a downy feather were let drop at once from the upper part of a tall exhausted glass, and struck the bottom at the same moment. Let any one make the trial *in the air*, and he will perceive the force of an *extreme case*.

(178.) In the verification of a law whose expression is *quantitative*, not only must its generality be established by the trial of it in as various circumstances as possible, but every such trial must be one of precise measurement. And in such cases the means taken for subjecting it to trial ought to be so devised as to repeat and multiply a great number of times any deviation (if any exist); so that, let it be ever so small, it shall at last become sensible.

(179.) For instance, let the law to be verified be, that *the gravity of every material body is in the direct proportion of its mass*, which is only another mode of expressing Galileo's law above mentioned. The time of falling from any moderate height cannot be measured with precision enough for our purpose: but if it can be repeated a very great multitude of times *without any loss*