to draw water above a certain height. Before his time it had always been supposed that water rose by suction in a pipe, in consequence of a certain natural *abhorrence of a vacuum* or empty space, which obliged the water to enter by way of supplying the place of the air sucked out. But if any such abhorrence existed, and had the force of an *acting cause*, which could urge water a single foot into a pipe, there is no reason why the same principle should not carry it up two, three, or any number of feet; none why it should suddenly stop short at a certain height, and refuse to rise higher, however violent the suction might be, nay even fall back, if purposely forced up too high.

(245.) Galileo, however, at first contented himself with the conclusion, that the natural abhorrence of a vacuum was not strong enough to sustain the water more than about thirty-two feet above its level; and although the true cause of the phenomenon at length occurred to him, in the pressure of the air on the general surface, it was not satisfactorily demonstrated till his pupil, Torricelli, conceived the happy idea of instituting an experiment on a small scale by the use of a much heavier liquid, mercury, instead of water, and, in place of sucking out the air from above, employing the much more effectual method of filling a long glass tube with mercury, and inverting it into a basin of the same metal. It was then at once seen, as by a *glaring instance*, that the maintenance of the mercury in the tube (which is nothing else than the common barometer) was the effect of a perfectly definite external cause, while its fluctuations from day to day, with the varying state of the atmosphere, strongly corroborated the notion of its being due to the pressure of the external air on the surface of the mercury in the reservoir.

(246.) The discovery of Torricelli was, however, at first much misconceived, and even disputed, till the question was finally decided by appeal to a *crucial instance*, one of the first, if not the very first on record in physics, and for which we are indebted to the celebrated Pascal. His acuteness perceived that if the weight of