

at the same time less elastic (in the sense of being subject to vibrations) and less liable to be heated; and in this case, also is not the time taken up by impact less?

What is the proper inference? Is it not that in the case of bodies whose parts are incapable of motion among themselves, the relative velocity after impact will be the same as before impact, and the impact will be instantaneous.

Hence rigidity, instead of being inconsistent with the doctrine of conservation of energy, is the very condition necessary to its existence as regards the relative motions of the bodies as wholes.

From a remark Newton makes in his illustrations of the third law of motion, it seems that Huyghens and Wren held this idea concerning rigid bodies, but since their time it seems to have fallen completely out of view.

The greatest change of form always occurs when relative motion is destroyed. Is it natural to suppose that where no change of form occurs the same result would follow. And yet this has always been assumed.

This conclusion as to rigid bodies is the very foundation of the action by contact theory, without which it would only result in absurdities.

We now proceed to discuss some cases of collision of rigid bodies, but first it will be necessary to gain perfectly clear ideas respecting space, time and motion. What is the difference between the following terms: "A geometrical point," "an indefinitely short line," "an indefinitely small surface," "an indefinitely small solid." It is a difference of kind—they are not homogeneous. No amount of multiplication or division of any one of these will change its kind. An infinite number of geometrical points cannot occupy the smallest part of space of any dimensions; they cannot constitute a line, a surface, or a solid.

The summation of indefinitely short lines, indefinitely small surfaces or solids will produce lines, surfaces and solids respectively, and nothing else. So with time. An instant, in the sense in which we shall use it, corresponds to a geometrical point, separating two parts of a line.

It has no duration, and differs totally from an indefinitely short period of time. An infinite number of instants thus defined can occupy no time.