generalization and application of the rule. James Bernoulli, in 1703, gave "a General Demonstration of the Centre of Oscillation, drawn from the nature of the Lever." In this demonstration[9] he takes as a fundamental principle, that bodies in motion, connected by levers, balance, when the products of their momenta and the lengths of the levers are equal in opposite directions. For the proof of this proposition, he refers to Marriotte, who had asserted it of weights acting by percussion,[10] and in order to prove it, had balanced the effect of a weight on a lever by the effect of a jet of water, and had confirmed it by other experiments.[11] Moreover, says Bernoulli, there is no one who denies it. Still, this kind of proof was hardly satisfactory or elementary enough. John Bernoulli took up the subject after the death of his brother James, which happened in 1705. The former published in 1714 his *Meditatio de Naturâ Centri Oscillationis.* In this memoir, he assumes, as his brother had done, that the effects of forces on a lever in motion are distributed according to the common rules of the lever.[12] The principal generalization which he introduced was, that he considered gravity as a force soliciting to motion, which might have different intensities in different bodies. At the same time, Brook Taylor in England solved the problem, upon the same principles as Bernoulli; and the question of priority on this subject was one point in the angry intercourse which, about this time, became common between the English mathematicians and those of the Continent. Hermann also, in his *Phoronomia*, published in 1716, gave a proof which, as he informs us, he had devised before he saw John Bernoulli's. This proof is founded on the statical equivalence of the "*solicitations of gravity*," and the "*vicarious solicitations*" which correspond to the actual motion of each part; or, as it has been expressed by more modern writers, the equilibrium of the *impressed* and *effective forces.*

It was shown by John Bernoulli and Hermann, and was indeed easily proved, that the proposition assumed by Huyghens as the foundation of his solution, was, in fact, a consequence of the elementary principles which belong to this branch of mechanics. But this assumption of Huyghens was an example of a more general proposition, which by some mathematicians at this time had been put forward as an original and elementary law; and as a principle which ought to supersede the usual measure of the forces of bodies in motion; this principle they called "*the Conservation of Vis Viva.*" The attempt to

[9] *Op.* ii. 930.
[10] *Choq. des Corps*, p. 296.
[11] Ib. Prop. xi.
[12] P. 172.