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An archeology of Galileo's science of motion

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On Page 169 of his treatise Van Dyck comments about an observation made in *The Pendulum Swings Again* as follows:

It is well documented that Galileo kept on experimenting with accelerated motion on inclined planes throughout his Paduan period, but the remaining evidence is often too scarce to enable us to be really sure about the kind of experiments he was performing to what ends. Let me refer to a recent article by Alexander Hahn that studies many of the reconstructions that have been offered and comes to the conclusion that primarily the folio 116v experiments stand out as a successful test of Galileo's principles. In these experiments, Galileo rolled bodies from different heights on an inclined plane and after a short horizontal run with the speed collected on the inclined plane they were projected from the table on which the plane was mounted (cf. figure 6.8 and accompanying explanation). The distances at which the bodies hit the ground are recorded and compared with the heights of the inclined planes on which they collected their speeds. Particularly interesting is the conclusion that Hahn draws:

The discussion ... shows that the experiment tests none of Galileo's insights independently, but that it in fact tests Galileo's account of motion as a whole. Therefore, it tests neither his law of fall nor his principle of inertia directly. Whereas the test of either the law of fall or the principle of inertia necessarily involves the measurement of time, the experiment of 116v bypasses any need to measure this elusive variable.

This precisely mirrors the way he probably found out simultaneously both his principle of inertia as a kinetic principle and the law of fall. Time only enters essentially into the mathematical proportions that bind together the principle and the law. But as we will see in section 6.3, this doesn't imply that for Galileo time had not also a more concrete reality as a physical presence and a mathematical object.