Calibrating Galileo's Tables

1. **For a given initial velocity (i.e. charge, cannonball, and cannon), measure the range for a 45° angle:** *actual-range*$_{45}$

2. **For all other angles, multiply the value in the amplitude vs. angle table divided by 10000 by** *actual-range*$_{45}$

i.e.

$$predicted\ range_\theta = \frac{theoretical\ range_\theta}{theoretical\ range_{45}} \times actual\ range_{45}$$

where

$$actual\ range_{45} = theoretical\ range_{45} - resist\ loss_{45}$$

Therefore, to the extent that *resist-loss*$_\theta$ **is proportional to** *theoretical-range*$_\theta$**, so that the fraction of the theoretical range that is lost to air resistance is always proportional to the range that would occur in the absence of air resistance,** *predicted-range*$_\theta$ **will match** *actual-range*$_\theta$

In other words, Galileo's tables, as formulated in terms of ratios and then "calibrated," can yield more accurate predictions than if they had been formulated in terms of calculated ranges in the absence of air resistance – a standard engineering technique that serves to compensate for, and hence suppress, intractable sources of discrepancy

Question: ***Suppose that the predicted ranges had agreed with observation to a reasonably high degree – i.e. suppose the tables had "worked" in practice; to what extent would that have provided evidence for Galileo's theory of projectile motion in the absence of air resistance?***