progression as the square of the error increases in arithmetical." Now, it is perfectly true that the deviation of the point of incidence from the mark *is error.* But it is something more special. It is error *in that one particular direction* in which the point of incidence lies from the mark aimed at. In estimating, therefore, the probability of striking a target *at a certain definite distance* from the centre aimed at, we must multiply the probability of striking *a determinate point* at that distance from the centre, by the number of points within the extent of the target which actually do lie at that distance from it, without regard to the directions in which they lie: *i.e.*, we have to multiply the fractional number expressing the abstract probability of committing a given error out of an indefinite number of *equally possible* ones, by a number proportional to the *degree of opportunity* which the circumstances of the special case afford for its commission. In this case that degree of opportunity is evidently measured by, and proportional to, the length of the circumference of the circle about whose centre, at the distance specified, an arrow may strike, or a ball drop from a height.

(2.) Reasoning on this (the correct principle in the case of target-shooting), any one conversant with mathematical analysis will find no difficulty in arriving at the following singularly neat and simple formula for the *probability of missing*, in any one single shot, a circular area of given radius (r), at whose centre the shooter aims.*

* The demonstration of this formula is annexed in the form of a note at the end of this essay.