

which arises from the element of *luck* mixing itself in the competition. This it does the more, the fewer the shots allowed to each, nor can it be eliminated, so as to make skill the sole determining power, but on the average of very enormous numbers, such as, for instance, ten or twenty thousand arrows discharged by each marksman. Every shooter, of course, *aims* to the best of his ability, exclusively with a view to hit the centre of the gold ; nor is it conceivable that, having that intention, there should exist in any individual such specialty of aiming as should disperse his shots, failing the gold, so as to strike preferentially (say) the blue, rather than the red ring on one side of it and the black on the other.

(5.) The following table shows the respective numbers of "hits" per 1000 shots, which may be expected to occur on a calculation from our formulæ, within the several coloured areas of the five equidistant rings (considering the central gold as the first ring) into which an ordinary target is divided. Considering its diameter as divided into ten equal parts, the outside diameters of those rings will be respectively 2, 4, 6, 8, 10; their radii, 1, 2, 3, 4, 5; and the areas of their containing circles, in the proportion of the squares of these numbers, 1, 4, 9, 16, 25,—so that the areas of the several coloured spaces form the progression 1, 3, 5, 7, 9. The usual rule of valuation, then, which accords to hits in any of the rings (from the white inwards), values in the proportion of these numbers ; assumes the probability of hitting to be in the simple proportion of the area struck (as would be the case were the shooting entirely at random),