(10.) The same principles apply of course equally to rifle-shooting as to archery, provided the target aimed at be circular. If rectangular, and especially if an elongated rectangle, the same formulæ will not apply; and the appropriate formulæ would be necessarily much more complex and their results proportionably more difficult of calculation. This is a strong argument for the use of circular targets: for, though for the mere decision of the order of merit in a distribution of prizes almost any impartial rule, rough and readily applicable, may suffice, the same cannot be said when the object is to obtain a true numerical measure of the national skill in the use of that great weapon: for which purpose it is highly desirable that the data afforded by our rifle prize meetings should be preserved, collected, and reduced systematically.

## NOTE.

*Demonstration of the formula in* § (2.) *and* (3.)

The probability of committing the specific error $r$ (*all errors presenting equal facility for their commission*) is proportional to $E(-kr^2)$, the characteristic sign $E$ being used to denote the exponential or anti-logarithmic function; and $k$ being some certain constant to be determined or eliminated. And in the case of aiming at the central point of a circular target, the degree of facility afforded for the commission of a lineal error $r$, no matter in what direction, is proportional to $2\pi r$, the circumference of a circle of that radius, or, simply to $r$: so that the probability of planting a shot somewhere *on the circumference* of that circle is measured by $r. E(-kr^2)$, and therefore the probability of making a hit anywhere *within its area* is proportional to $\int rdr. E(-kr^2)$ taken between the limits $o$ and $r$. Representing certainty therefore by 1; this probability (which we have denoted by $H$ in the foregoing pages) will be ex-