

ON A FUNICULAR  
SOLUTION OF BUFFON'S "PROBLEM OF THE NEEDLE"  
IN ITS MOST GENERAL FORM

BY

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— «quaintly made of cords»  
(Two Gentlemen of Verona, act III, sc. 1.)

The founder of the theory of Local Probability appears to have been BUFFON (better known as a Naturalist, but who began his career as a Mathematician). Among a few other questions of a similar kind, which he proposed in his *Essai d'Arithmétique Morale*, the one which has obtained the greatest notoriety is the celebrated one which goes by the name of the *Problème de l'Aiguille*, the purport of which is as follows.

On an area of indefinite extent (say a planked floor) a number of parallel straight lines are ruled at equal distances, upon which a needle, not long enough to cross more than one of the parallels at the same time, is thrown down: the probability is required of its falling in such a position as to be intersected by one of the parallels.

An easier question of the same kind, which BUFFON treats before the other, is when a circle is used instead of the needle. This latter question he solves by simple geometrical considerations too obvious to need recapitulation; to obtain a solution of the former he, and after him LAPLACE, had recourse to a process of integration.

In a question given in the late M<sup>r</sup> TODHUNTER'S *Integral Calculus* (1<sup>st</sup> edition, 1857, p. 268) the solution of the problem is correctly stated for an ellipse, whose major axis is less than the distance between two conse-