

ON THE FOUNDATIONS OF PROBABILITY AND STATISTICS¹

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1. Introduction. The theory of probability and statistics which I have been upholding for more than twenty years originates in the conception that the only aim of such a theory is to give a description of certain observable phenomena, the so called mass phenomena and repetitive events, like games of chance or some specified attributes occurring in a large population. Describing means here, in the first place, to find out the relations which exist between sequences of events connected in some way, e.g. a sequence of single games and the sequence composed of sets of those games or between a sequence of direct observations and the so called inverse probability within the same field of observations. The theory is a mathematical one, like the mathematical theory of electricity, based on experience, but operating by means of mathematical processes, particularly the methods of analysis of real variables and theory of sets.

We all know very well that in colloquial language the term probability or probable is very often used in cases which have nothing to do with mass phenomena or repetitive events. But I decline positively to apply the mathematical theory to questions like this: What is the probability that Napoleon was a historical person rather than a solar myth? This question deals with an isolated fact which in no way can be considered as an element in a sequence of uniform repeated observations. We are all familiar with the fact that, e.g. the word energy is often used in every day language in a sense which does not conform to the notion of energy as adopted in mathematical physics. This does not impair the value of the precise definition of energy used in physics and on the other hand this definition is not intended to cover the entire field of daily application of the term energy.

We discard likewise the scholastic point of view displayed in a sentence of this kind: “. . . that both in its meaning and in the laws which it obeys, probability derives directly from intuition and is prior to objective experience.” This sentence is quoted from a mathematical paper printed in a mathematical journal of 1940. The same author continues calling probability a metaphysical problem and speaking of the difficulties “which must in the nature of things always be encountered when an attempt is made to give a mathematical or physical solution to a metaphysical problem.” In my opinion the calculus of probability has nothing to do with metaphysics, at any rate not more than geometry or mechanics has.

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