considerations of symmetry. For example, the traditional conclusion that a die, i.e., a cube made of a homogeneous material will fall, when thrown to a sufficient height, with equal probability on each of its faces was reached long before there was any systematic accumulation of data to verify it by observation. Systematic experiments of this kind have been carried out in the last three centuries, chiefly by authors of textbooks in the theory of probability, at a time when the theory of probability was already a well-developed science. The results of these experiments were satisfactory, but the question of extending them to analogous cases scarcely arouses interest. For example, as far as we know, no one has carried out sufficiently extensive experiments in tossing homogeneous dice with twelve sides. But there is no doubt that if we were to make 12,000 such tosses, the twelve-sided die would show each of its faces approximately a thousand times.

The basic probabilities derived from arguments of symmetry or homogeneity also play a large role in many serious scientific problems, for example in all problems of collision or near approach of molecules in random motion in a gas; another case where the successes have been equally great is the motion of stars in a galaxy. Of course, in these more delicate cases we prefer to check our theoretical assumptions by comparison with observation or experiment.

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The Calculus of Chance: *"Interest in probability grew, encouraged by the researches of such eminent mathematicians as Leibniz, James Bernoulli, De Moivre, Euler, the Marquis de Condorcet, and above all, Laplace. The latter's epochal work on the analytic theory of probability brought the calculus to the point where Clerk Maxwell could say that it is "mathematics for practical men," and Jevons could wax quite lyrical (quoting without acknowledgement from Bishop Butler) that the mathematics of probability is "the very guide of life and hardly can we take a step or make a decision without correctly or incorrectly making an estimation of probability." And these opinions were uttered even before the calculus had achieved its most brilliant successes in physics and genetics as well as in more practical spheres. It was indeed remarkable, as Laplace wrote, that "a science which began with the considerations of play has risen to the most important objects of human knowledge."*

Edward Kasner and James R Newman, in *Mathematics and the Imagination.*