connected with it the doctrine of averages and the mathematical theory of probabilities.[1] The same great mind

[1] The beginnings of the science and theory of probabilities are not subject to controversy, as were those of the infinitesimal calculus. Pascal and Fermat about the middle of the seventeenth century entered into a correspondence relative to a question in a game of chance, propounded by the Chevalier de Méré, a noted gambler. They agreed in their answer, but could not convince their friend, who moreover made this the occasion of denouncing the results of science and arithmetic. But this comparatively insignificant problem — so different from the great cosmical problems which led to the invention of the infinitesimal calculus about the same time — was the origin of a series of investigations and discussions in which the greatest mathematicians, such as Huygens, James and Daniel Bernoulli, De Moivre, D'Alembert, and Condorcet joined. Most of them did not escape the errors and misstatements which creep in an insidious manner into the discussion and vitiate the conclusions. In fact, the science advanced through the influence of those who depreciated it like D'Alembert, and those who exaggerated its importance like Condorcet. At length, under the hands of Laplace, who defined it as common-sense put into figures and attributed to it a high educational value, it assumed a state wellnigh approaching to that perfection which Euclid gave to geometry and Aristotle to logic. Since the publication of Laplace's celebrated 'Théorie analytique des Probabilités' (Paris, 1812) writers on the subject have found ample occupation in commenting on the theorems or recasting the proofs given in that work, which holds a similar position to that occupied in another department of mathematics by the 'Disquisitiones Arithmeticæ' of Gauss (1801). Up to the present day there exist differences of opinion as to the value of the science, the two opposite views being represented in this country by Mill ('Logic,' 5th ed., vol. ii. p. 62) and Jevons ('Principles of Science,' vol. i.), the latter summing up his opinion as follows: "In spite of its immense difficulties of application, and the aspersions which have been mistakenly cast upon it, the theory of probabilities is the noblest, as it will in course of time prove perhaps the most fruitful, branch of mathematical science. It is the very guide of life, and hardly can we take a step or make a decision of any kind without correctly or incorrectly making an estimation of probability" (1st ed., p. 248). A similar opinion seems to have been held by James Clerk Maxwell (see Life by Campbell and Garnett, p. 143), who called the calculus of probabilities "Mathematics for practical men." In this country A. de Morgan and Todhunter, the former in a popular essay in the 'Cabinet Cyclopædia' and in a profound treatise in the 'Encyclopædia Metropolitana,' the latter in his well-known History (London and Cambridge, 1865), have done a great deal to make this subject better understood. The applications of the theory have gradually increased through numerous mortality and insurance calculations; as also in the estimations of error in astronomical and physical observations, where the well-known method of least squares (first employed by Gauss in 1795, see Gauss, Werke, vol. vii. p. 242; first published by Legendre in 1806, and then proved by Laplace in his 'Théorie,'