Montmort, Pierre Rémond De | Encyclopedia.com

(*b*. Paris, France, 27 October 1678; *d*. Paris, 7 October 1719)

probability.

Montmort was the second of the three sons of François Rémond and Marguerite Ralle. On the advice of his father he studied law, but tired of it and ran away to England. He toured extensively there and in Germany, returning to France only in 1699, just before his father's death. He had a substantial inheritance, which he did not exploit frivolously.

Having recently read, and been much impressed by, the work of Nicolas Malebranche, Montmort began study under that philosopher. With Malebranche he mastered Cartesian physics and philosophy, and he and a young mathematician, François Nicole, taught themselves the new mathematics. When Montmort visited London again in 1700, it was to meet English scientists; he duly presented himself to Newton. On his return to Paris, his brother persuaded him to become a canon at Notre Dame de Paris. He was a good ecclesiastic until he bought an estate at Montmort and went to call on the grand lady of the neighborhood, the duchess of Angoulême. He fell in love with her niece, and in due course gave up his clerical office and married. It is said to have been an exceptionally happy household.

Montmort's book on probability, *Essay d'analyse sur les jeux de hazard*, which came out in 1708, made his reputation among scientists and led to a fruitful collaboration with Nikolaus I Bernoulli. The Royal Society of London elected Montmort fellow when he was visiting England in 1715 to watch the total eclipse of the sun in the company of the astronomer royal, Edmond Halley. The Académie Royale des Sciences made him an associate member the following year— he could not be granted full membership because he did not reside in Paris. He died during a smallpox epidemic in 1719.

It is not clear why Montmort undertook a systematic exposition of the theory of games of chance. Gaming was a common pastime among the lesser nobility whom he frequented, but it had not been treated mathematically since Christiaan Huygens' monograph of 1657. Although there had been isolated publications about individual games, and occasional attempts to come to grips with annuities, the Jakob I Bernoulli's major work on probability, the *Ars conjectandi*, had not yet been published. Bernoulli's work was nearly complete at his death in 1705; two obituary notices give brief accounts of it. Montmort set out to follow what he took to be Bernoulli's plan.

One obituary gave a fair idea of Bernoulli's proof of the first limit theorem in probability, but Montmort, a lesser mathematician, was not able to reach a comparable result unaided. He therefore continued along the lines laid down by Huygens and made analyses of fashionable games of chance in order to solve problems in combinations and the summation of series. For example, he drew upon the game that he calls "treize," in which the thirteen cards of one suit are shuffled and then drawn one after the other. The player who is drawing wins the round if and only if a card is drawn in its own place, that is, if the nth card to be drawn is itself the card n. In the generalized game, the pack consists of m cards marked in serial order. The chance of winning is shown to be

A 1793 paper by Leibniz provided Montmort with a rough idea of the limit to which this tends as *m* increases, but Euler was the first to state it as $1 - e^{-1}$.

The grealest value of Montmort's book lay perhaps not in its solutions but in its systematic setting out of problems about games, which are shown to have important mathematical properties worthy of further work. The book aroused Nikolaus I Bernoulli's interest in particular and the 1713 edition includes the mathematical correspondence of the two men. This correspondence in turn provided an incentive for Nikolaus to publish the *Ars conjectandi* of his uncle Jakob I Bernoulli, thereby providing mathematics with a first step beyond mere combinatorial problems in probability.

The work of De Moivre is, to say the least, a continuation of the inquiries of Montmort. Montmort put the case more strongly—he accused De Moivre of stealing his ideas without acknowledgment. De Moivre's *De mensura sortis* appeared in 1711 and Montmort attacked it scathingly in the 1713 edition of his own *Essay*. Montmort's friends tried to soothe him, and largely succeeded. He tried to correspond with De Moivre, but the latter seldom replied. In 1717 Montmort told Brook Taylor that two years earlier he had sent ten theorems to De Moivre; he implied that De Moivre could be expected to publish them.

Taylor was doing his best work at this time. He and Montmort had struck up a close friendship in 1715, and corresponded about not only mathematics but also general questions of philosophy, Montmort mildly defending Cartesian principles against the sturdy Newtonian doctrines of Taylor. Montmort's only other mathematical publication, an essay on summing infinite series, has an appendix by Taylor. It is notable that in this period of vigorous strife between followers of Newton and Leibniz, Montmort was able to remain on the best of terms with both the Bernoullis and the Englishmen.

BIBLIOGRAPHY

I. Original Works. Montmort's mathematical writings are *Essay d'analyse sur les jeux de hazard* (Paris, 1708), 2nd ed. revised and augmented with correspondence between Montmort and N. Bernoulli (Paris, 1713; 1714); and "De seriebus infinitis tractatus," in *Philosophical Transactions of the Royal Society*, **30** (1720), 633–675. Part of Montmort's correspondence with Taylor is in William Young, ed., Brook Taylor, *Contemplatio philosophica* (London, 1793).

II. Secondary Literature. See "éloge de M. de Montmort," in *Histoire de l'Académie royale des sciences pour l'année 1719* (1721), 83–93.

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