PIERRE RÉMOND DE MONTMORT (October 10, 1678 – October 7, 1719)
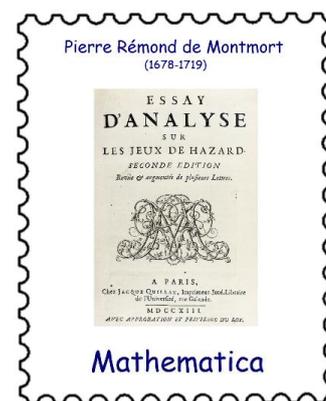
by HEINZ KLAUS STRICK, Germany

According to the wishes of his wealthy parents, the Paris-based couple FRANÇOIS RÉMOND, SIEUR DE BREVIANDE and MARGUERITE RALLU, their second son PIERRE was supposed to study law. Afterwards, his father would then use his influence at court to provide PIERRE with a lucrative judgeship.

This decision of his strict father did not suit PIERRE. Although the 18-year-old began to study law after he left school, he soon abandoned it in boredom and embarked on a journey that first took him to England. Travel was again possible for Frenchmen after the countries involved in the *Nine Years War* agreed to the Peace Treaty of Rijswijk (1697). After his round trip through England, he visited some Dutch and German cities until he finally arrived at his cousin's home in Regensburg. His cousin resided there as a representative of the French crown at the *German Diet*.

In his library he came across the book *De la recherche de la vérité* by the contemporary philosopher and mathematician NICOLAS MALEBRANCHE from Paris. This had been temporarily placed on the "Index of forbidden books" by the Pope because of its contents.

PIERRE RÉMOND was transformed after reading the book. Now 21, he decided to return home, reconcile himself with his father, and study philosophy with MALEBRANCHE. PIERRE had just arrived in Paris when his father died unexpectedly.

His inherited fortune was so great that a life without effort would be possible for PIERRE. But by reading the work of MALEBRANCHE he had become a different man. Inquisitive, he studied the writings of RENÉ DESCARTES, immersing himself in the latest books on algebra and geometry. In 1700, he travelled to London again and met ISAAC NEWTON, among others.

In the meantime, he took over the office of canon at *Notre Dame Cathedral* from his elder brother, though he donated the additional income from this to charity.

In 1704, PIERRE RÉMOND acquired an estate with a château in Montmort (Departement Marne), and since then he used the addition "DE MONTMORT" in his name. In 1706, he married the niece of the Duchess of Angoulême, who lived in a neighbouring château. Because of the marriage, he had to give up his office as a cathedral canon.

In 1708, the first edition of PIERRE RÉMOND DE MONTMORT's *Essay d'analyse sur les jeux de hazard* (Studies on games of chance) appeared.

One might be surprised that the young nobleman, whose outlook on life had been changed by MALEBRANCHE, should concern himself with games of chance of all things.

Since the beginning of the reign of Louis XIV (1638-1715), this kind of "occupation" had been widespread in noble circles, and Montmort observed that many gamblers risked their often high stakes based on absurd superstitious ideas. It was therefore his concern to provide objective information, because "chance has laws that should be known".


In 1657 Christiaan Huygens had published the first book *De Ratiociniis in Ludo Aleae* (On the Calculus of Probability). The motivation for Huygens was the solution of the problems on which Pierre de Fermat and Blaise Pascal had conducted their correspondence but not published.


In his book, Montmort took up five of the problems posed by Huygens and gave his own solutions. Incidentally, he was the first to "connect" the numerical scheme known today as Pascal's triangle with Pascal's name (*Table de M. Pascal pour les combinaisons*). However, the notation he proposed for the coefficients was not widely used.

In 1705, Jacob Bernoulli died before he could finish his work *Ars conjectandi* (Art of Conjecture). His sons showed no interest in completing their father's work, but one of his nephews did. Nicolaus Bernoulli sifted through his uncle's papers and wrote a dissertation on the application of probabilistic aspects to legal decisions.
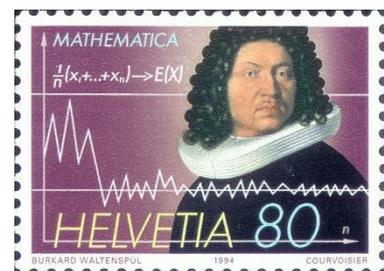

When Montmort's book appeared, Nicolaus Bernoulli contacted him. An intensive correspondence developed between the two, which was not only about Jacob Bernoulli's manuscripts. Then Nicolaus Bernoulli visited his new friend in his château and stayed there for several months. In 1713, his uncle's work, completed by Nicolaus Bernoulli, and the version of Montmort's *Essay d'analyse*, extended to twice its original size, appeared in quick succession.

This second edition comprised five chapters: the first dealt with combinatorial questions, the second with the most popular card games of the time, the third with popular dice games. In the fourth chapter, he took up various tasks on probability theory, including Huygens' problems. The final chapter contained the 150 pages of correspondence with Nicolaus Bernoulli and also with Johann Bernoulli.
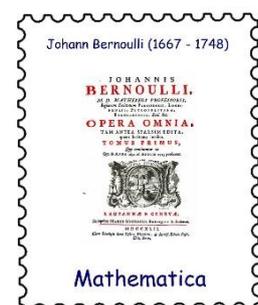
A total solar eclipse in 1715 was the occasion for MONTMORT's third journey to England. He was accepted as a member of the *Royal Society* and made friends with EDMOND HALLEY, BROOK TAYLOR and ABRAHAM DE MOIVRE, among others.
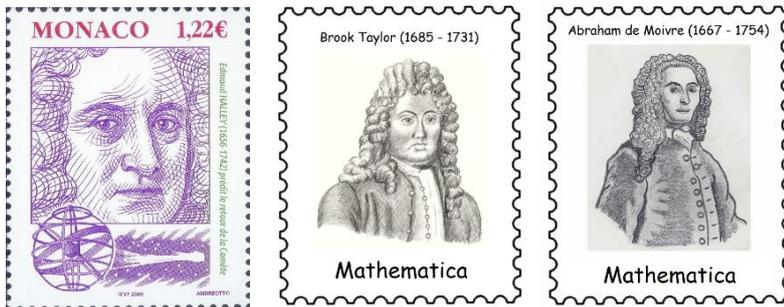
When MONTMORT pointed out certain similarities in DE MOIVRE's book *De Mensura Sortis* (1711) to the first edition of his *Essay d'analyse*, their relationship cooled. DE MOIVRE "returned the favour" by criticising some of MONTMORT 's formulations in his subsequent work *Doctrine of Chance* (1718).

With TAYLOR, on the other hand, MONTMORT exchanged views in a friendly tone. MONTMORT defended DESCARTES' world view while TAYLOR represented NEWTON's views. In MONTMORT's estate there was an essay on infinite series that appeared posthumously together with an addition by TAYLOR.

MONTMORT, who had printed 100 copies of NEWTON's *De Quadratura Curvarum* in 1709 with his own funds, maintained good contacts both with NEWTON's followers and with the LEIBNIZ camp – he did not allow himself to be taken in by either of the two hostile groups.

MONTMORT spent most of his time at his chateau; only occasionally travelling to Paris to attend events of the *Académie Française*, of which he was an associate member (full members could only be persons who lived in Paris).

When Europe was again struck by a smallpox epidemic in 1719, MONTMORT was infected in Paris and he died at the age of 40 at the height of his scientific activities.

In the two editions of the *Essay d'analyse*, MONTMORT showed in many ways that he was able to perform even complicated probability calculations – here are a few examples (formulated in modern notation):

- *Eight cards are drawn at random from a deck of 52 cards (i.e. with 13 different values). What is the probability that these are cards with only four different values, where one value occurs three times, two values occur twice and one value occurs once?*

- *Six ordinary dice are to be thrown until six different numbers fall on one throw. From how many throws is it favourable to bet on this event?*

- *12 cards are drawn at random from a deck of 32 cards. What is the probability that there are no court cards among them (Jack, Queen or King)?*

- *In how many ways can you roll a certain sum a when rolling n fair dice, each with k faces labelled 1, 2, ..., k?*

- *In the* Jeu du Treize (Game with thirteen cards)*, 13 cards are shuffled – one each with the values 1 (Ace), 2, ..., 10, 11 (J), 12 (Q), 13 (K). One after the other, the top card of the deck is turned over. What is the probability of winning if you bet that the number of the card drawn matches the value of the card for any card that is revealed? How many matches can you expect on average if all cards are turned over?*

In 1751, LEONHARD EULER, who was not familiar with MONTMORT's explanations, described the last problem as *Jeu de Rencontre* and thus coined a term that became better known than *Jeu de Treize*. Nevertheless, MONTMORT deserves credit for being the first to formulate and solve the problem.
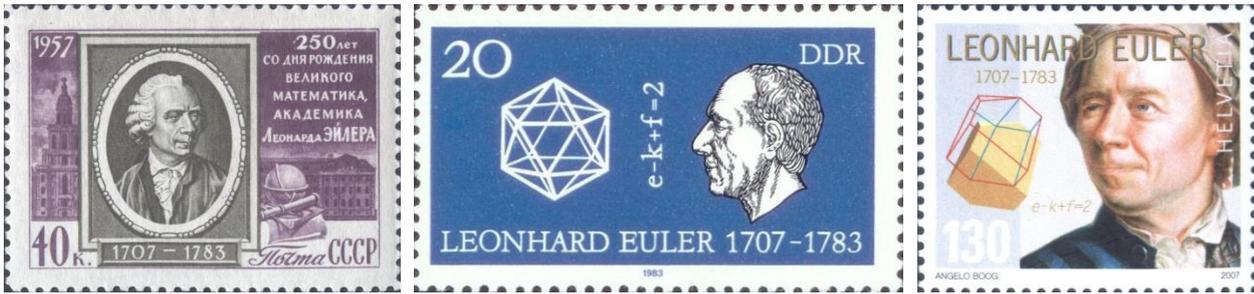
Here an important hint for philatelists who also like individual (not officially issued) stamps. Enquiries at europablocks@web.de with the note: "Mathstamps".