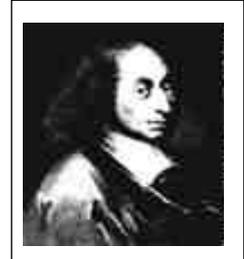## Blaise Pascal (1623 - 1662)

Blaise Pascal was born June 19, 1623 in Clermont-Ferrand, France and died in Paris on August 19, 1662. He was a mathematician, physicist, theologian, and philosopher.

After his mother's death the family moved to Paris in 1631. Blaise's father, who was a mathematician himself, decided to teach his son at home. At the age of 12 or 13 he began attending discussion groups at the *Académie Parisienne* with such renowned scientists such as Pierre de Fermat and René Descartes. By the age of sixteen Blaise Pascal had written two treatises, one being the acclaimed *Essai pour les coniques*, which already contained his geometrical theorem that is often referred to as the "mystic hexagram." When Blaise Pascal presented the *Essai* at the *Académie Parisienne* it was discarded by René Descartes, because of Blaise's young age.

Blaise Pascal then became an assistant to his father, who had been appointed tax collector in Rouen, France. During this time, at the age of eighteen, Blaise Pascal constructed an arithmetical machine that was able to add and subtract numbers, the "Blaise Pascaline," of which he built more than fifty in total. Other inventions by Blaise Pascal include the syringe and the hydraulic press.

Blaise Pascal in 1647 wrote *Expériences nouvelles touchant la vide* (*New Experiments with the Vacuum*), arguing against the predominant notion that there is not a vacuum in nature.

In 1654, Blaise Pascal finished his *Traité du triangle arithmétique* (*Treatise on the Arithmetical Triangle*), which remained unpublished during his lifetime. The treatise was the result of a correspondence with Pierre Fermat over the age-old problem in probability theory, the "gambling problem," concerning the division of stakes. By creating a calculus of probabilities, the two offered a new solution. In turn, the treatise is thus Blaise Pascal's most important mathematical work; it is to be seen as the foundation of the modern theory of probabilities.

In 1655 he went to accompany his sister in Port Royal, it is here that Pascal wrote his most famous works, the eighteen *Lettres provinciales* (original title: *Les Lettres écrites par Louis de Montalte, à un Provincial de ses amis, & aux R.R. PP. Pères Jésuites : Sur le fujet de la Morale, & de la Politique de ces Peres*, 1656/57) and the *Pensées* (actually named *Apologie de la religion Chrétienne*, 1657-1663).

During the last years of his life, Pascal mainly devoted himself to religious issues continuing to defend the Jansenist cause against the Jesuits. As a result, he began his work on the *Apologie de la religion Chrétienne*, which, having remained fragmentary, was published under the title *Pensées* in 1670. As the title suggests, the work represents an apology for Christianity, which for Pascal represented truth alone, and which, highly influenced

by his studies of the mathematics of gambling, contained the famous "wager argument," intended to provide support for the belief in God.

According to Blaise Pascal, human reason cannot sufficiently explain whether or not God exists. This assumption is also reflected in his famous dictum:

> For after all what is man in nature? A nothing in relation to infinity, all in relation to nothing, a central point between nothing and all and infinitely far from understanding either. The ends of things and their beginnings are impregnably concealed from him in an impenetrable secret. He is equally incapable of seeing the nothingness out of which he was drawn and the infinite in which he is engulfed.

Among his last works was another defense of Jansenism: *Écrit sur la signature du formulaire* (1661), though he continued to work in mathematics. From 1658 onwards, Pascal dedicated himself to the examination of cycloid curves, and in the same year he published his last text on Jansenism, and he finished the mathematical-philosophical treatise *De l'Esprit géométrique* (*Of the Geometrical Spirit*) where he affirms that truths should be based on already existing truths. Though such first principles are actually impossible to achieve, he argues in favour of geometry as being the method that comes closest to such perfection. Here, he also comes to the conclusion that such a first principle can be obtained only through intuition, a proposition that would later have a great impact on Henri Bergson.

Shortly before his death, Blaise Pascal designed a public transit system for Paris which was put into operation in 1662. In the same year, and having suffered from poor health throughout most of his life, Pascal died at the early age of 39 in Paris, most likely from a stomach ulcer.

Source:

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