Histoire des mathématiques, concerning Pascal.*

Jules Bienaymé

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Mr. Bienaymé communicated the results of some researches which show that Pascal had carried the applications of the calculus of probabilities much further than one believes it commonly.

The nineteenth letter of the Collection of the Chevalier de Méré makes seen how this wit had had the ingeniousness ideas that Pascal extended completely, by supporting them on the solid bases of mathematics.

In the *Pensées*, Pascal often employed the word *parti*, today replaced by *espérance mathématique*. He applies this term of games to the chances of events of life; and also he forms on the belief in the existence of God and on a future life an argument which has remained celebrated, although one has not been able to approve the elements of it. One knows today by the text of this argument, of which Mr. Cousin has given all the parts, that this morsel had not even written, and that he offers not at all complete mathematical sense.

Whatever it is, one does not recognize less in this imperfect essay all the importance that Pascal attached to the probabilities.

This importance is found established, moreover, by the small tract of Dubois de la Cour, entitled: *Qu'il y a des démonstrations d'une autre espèce et aussi certaines que celles de la géométrie*. This small morsel, despised by Condorcet, proves that Dubois had not understood Pascal, and had not seen that this grand genius attached a geometrical sense to probabilities and to testimonies; but at the same time he sets beyond doubt Pascal communicated to his friends the views and hopes that his new calculus gave to him.

But the most positive authority in this regard is that of Jacques Bernoulli, of whom the famous theorem is remained the foundation of all theory of probabilities. One reads, p. 225 of the fourth part of his *Ars conjectandi*, that his ideas have been suggested to him, partially at least, by chapters 12 and the following of the *Art de penser*, of which he calls the author *magni acuminis et ingenii vir*. Now, this *Art de penser* is nothing other than the *Logique* of Port-Royal, published the same year as the death of Pascal (1662). The last chapters contain true elements of the calculus of probabilities applied

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to history, to medicine, to miracles, to literary criticism, to events of life, etc.; and they are terminated by the argument of Pascal on eternal life.

One would be able to allege that the Logic is due to Arnauld. But one knows that the writings of Port-Royal made willingly by the mutual loans in the views of perfection.

Whatever it is, the same citation of Bernoulli assures to France the entire priority of the invention of the calculus of probabilities: although the treatise that Pascal had written and presented to the Academy of sciences under the title: *Aleae geometria* (t. IV, p. 410 seems lost for ever.