## Communication

# Science and Christian Faith in the France of Pascal and Today



Jean Claude Parlebas

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During my former career as a full-time researcher at the Centre National de la Recherche Scientifique (CNRS, France), I was very much interested in the work and life of Blaise Pascal in addition to my own field of research. Two aspects of his life especially attracted my attention: Pascal was both a magnificent scientist and a Christian thinker with a personal faith. In this communication, I would like to develop two aims. The first aim is to recount a short biography describing Pascal as a foremost mathematician and physicist as well as a Christ-centered dedicated believer. The second one is to explain the influence that Pascal still has in France today.

#### Short Account of Pascal's Life

Born in Clermont-Ferrand, France, on June 19, 1623, Blaise Pascal lost his mother at the age of three. His grandfather, Martin Pascal, like many other French-educated people of the Renaissance time—he was a tax supervisor—had been attracted by Reformation ideas and faith.<sup>1</sup> That attraction lasted until St. Barthelmew's Day massacre of August 24, 1572, the beginning of a wave of violence. Then Martin became frightened and returned to the Roman Catholic religion.

Martin's son, Etienne, was Blaise Pascal's father. Very much interested in mathematics and sciences, Etienne served as a king's civil counselor. Blaise's father did not like the way school was taught at that time. Thus, he taught Blaise and his two sisters at home by himself. He placed special emphasis on studying Latin and Greek. Moreover, he had some pioneer educational ideas, such as privileging observation over scholastic learning.

In 1631, the family moved from Clermont to Paris. Etienne was even more determined to educate his son on his own, since Blaise showed extraordinary intellectual abilities. Blaise Pascal's early aptitudes were probably challenged by his father's frequent conversations with leading scientists of the time.

Pascal's scientific work began when he was no more than eleven years old. By then he had already composed a short treatise on the sounds of vibrating bodies. Moreover, he managed to demonstrate one of Euclid's propositions, on the sum of the angles of a triangle. However, Etienne responded to those early abilities by forbidding his son to study mathematics during the next three years, and by expecting him to focus on the study of Latin and Greek. This ban on mathematics merely served to make Blaise even more interested in that forbidden subject. At twelve years old, he began to work on geometry. At the age of sixteen, Pascal wrote a book, Essay on Conics. In addition, he is among the first to develop what is now called "projective geometry."

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In 1638, it happened that Etienne was opposed to the tax laws promulgated by the French prime minister. Thus he left Paris with his family to escape prison. Fortunately, two years later, this conflict was resolved. The family moved to Rouen, where Etienne became responsible for raising taxes. Blaise worked very hard to help his father. Meanwhile, he also managed to progress with his own scientific research. He developed a new theorem at the edge of his favorite field of geometry. This theorem was the foundation for an important and almost entirely undeveloped branch of mathematics, that of probabilities.

At the age of nineteen, Pascal created the concept and development of the Pascaline. It was a machine capable of performing addition and subtraction, especially designed to assist his father. Although the Pascaline was a commercial failure due to its high cost, it was, however, a starting point for further research on mechanical calculating machines. Pascal himself improved the design of his machine for another ten years and built about twenty Pascaline copies. This shows that Pascal was both an excellent theoretical thinker and a smart experimental engineer, building both theoretically and experimentally. Actually, his Pascaline concept remained up-to-date, in its field, until about the year 1920!

From 1650 on, Pascal became interested in various forms of infinitesimal calculations. Indeed, at that time and in the upper-class society, gambling games were very popular, sometimes associated with bets. Also, people involved in hazardous commercial transactions wished to know more about the risks they were about to take. All these situations prompted Pascal to use mathematics in a new way. Basically, he understood that among a large number of disordered and chaotic situations, it is possible to discover laws of statistical and repetitive order. His Treatise of Arithmetic Triangle was an important preparation to Gottfried Leibniz's own work. Furthermore, using Pascal's results, Christiaan Huygens was able to publish a Handbook of Probabilities as early as 1657. Pascal's method was a radically new one and led him to expand the differential and integral calculus a few years later. Finally, let me just mention that what would be called the "Gaussian curve" was actually another way of applying the famous Pascal triangle. Indeed, Pascal can be considered the father of the mathematical theory of probability and combinatorial analysis.

Around Pascal's time, much of the intellectual knowledge of Western Europe was not original but was derived from classical antiquity. In that context, Pascal's contribution to modern science was to adopt a new scientific method as compared to using a past scholastic point of view.

From Aristotle to Descartes, the field was held by an abstract, deductive approach. Instead, Pascal concentrated exclusively on fact, experimental observation and then rigorous analysis as the sole tests of truth. His new approach to science was then dominated by the idea of objective, as opposed to philosophical interpretations of nature.<sup>2</sup>

One example of Pascal's new approach to science is given by his experiments to study the phenomenon of a vacuum. Furthermore, Pascal provided the essential link between the mechanics of fluids and rigid bodies. With his knowledge of hydrostatics, he successfully participated in draining marshes in the French Poitiers area at the request of his friend, the Duke of Roannez. Pascal also invented the syringe and the hydraulic press, both based on "Pascal's principle." These are all examples of theories resulting in applied and concrete actions. Pascal was definitively a pioneer of rigorous modern scientific research when he claimed the following basic principle:

In order to show that a given hypothesis is evident, it is not sufficient that a lot of phenomena are in accord with the considered hypothesis. Instead, if only one phenomenon disagrees with it, it must be regarded as wrong.<sup>3</sup>

With Pascal, a new science was confirmed, namely experimental physics, in agreement with only a very small number of scientists of that time.

In 1646, Pascal's father had an accident and was confined to his house. Some neighbors who were Jansenists came to visit and help him. The Jansenists were a spiritual Catholic group, following Cornelius Jansen. In some aspects, they were moved by a kind of "evangelical way of thinking," especially pointing out Augustine's doctrine of grace and stressing "inner life" within the Roman Catholic religion. Their beliefs were very different from the teachings of the Jesuits, who were the most influential group at that time and had a relativist point of view as far as faith and life were concerned. The whole Pascal family began adopting a Jansenist-inspired faith. Even though Pascal kept going throughout what he called a "worldly period" for a few more years, the above-mentioned experience had been crucial for him as a spiritual first step. Furthermore, due to his family inheritance, he could enjoy a relatively high standard of living. However, since his father's death, Pascal faced a kind of inner and spiritual vacuum which he was unable to fill. Within that dramatic personal situation with feelings of emptiness, neither his scientific works nor any kind of entertainment could help him. Pascal sought further spiritual guidance to try to find truth and peace. Finally he cried out to God:

My God, I turn to you to ask you a special gift that all creatures, altogether, fail to provide to me .... Since the conversion of my own heart, which I expect from you, is a too difficult task for natural efforts, I can only turn to the Author and almighty Master of my natural heart. To whom shall I cry, to whom shall I have recourse, except to you? Anything which is not God is unable to bring me fulfilment. God himself, I ask and look for. To you only, my God, I address myself in order to win you to my case. Open my heart, Lord.<sup>4</sup>

God responded to the above prayer on November 23, 1654, after Pascal had experienced a serious coach accident. Pascal managed to escape, but he remained terrified of having been so close to death. Several days later, after recovering, Pascal had an intense spiritual vision around midnight. He immediately wrote his vision on a small piece of paper. This paper, called "The Memorial," was discovered a few days after his death sewn within his own coat. In summary, it contains the following words:

1654, Monday November 23, Fire, God of Abraham, God of Isaac, God of Jacob. Not the God of philosophers or scholars. Certainty. Certainty. Feeling. Joy. Peace. God of Jesus Christ. My God and your God. Your God shall be mine. Forgetfulness of this world and of everything, except of God. He can only be found through the ways taught in the Gospel ... Highness of a human being. Righteous Father, the world did not discover you, but I did. Joy, joy, joy, tears of joy ... My God, shall you go away from me? May I not be eternally separated from you! Eternal life is to know you as the only true God and the One you sent, Jesus Christ. Jesus Christ. Jesus Christ. I turned away from him. I ran away from him. I renounced him. I crucified him. May I never be separated from him!

He can only be kept through the ways taught in the Gospel. Total and kind renunciation. Submission to Jesus Christ and to my supervisor. Eternally in joy after a crucial day on earth. Amen.<sup>5</sup>

From that moment on, Pascal held without any reserve to the truth of the Gospel, both intellectually and in experience. Pascal's theology was centered on the person of Jesus Christ as Savior and based on a personal meeting with a living Christ. It is within this framework that his *Pensées*, a defense of Christianity, must be understood.

The penetrating intelligence Pascal applied to spiritual thoughts was tied to his personal discovery of God, the God of the Bible, incarnate in Jesus Christ. Faith, which expresses a personal decision to say yes to God through Jesus Christ, leads to reconciliation and peace. But of faith are also born a transformed life and a total consecration to God. This is why Pascal was so opposed to the relativism of the Jesuits. His beliefs were rigorous and his morality uncompromising.<sup>6</sup>

The writer Antoine Arnauld had been condemned for heretical teaching inspired by Jansen and Augustine, and for opposing the standard beliefs of the Roman Catholic Church. Using a pseudonym for security reasons, Pascal wrote a series of pamphlets that were published underground. At that point, Pascal also became a pioneer of modern times since his pamphlets were a kind of early newspaper. These pamphlets were supposed to look like letters between two friends, one in the city and one in the countryside. They came to be known as "The Provincial Letters." They were very popular and afforded Pascal a good opportunity to criticize Jesuit dialectics. Let us recall that King Louis XIV himself had banned the Port Royal Jansenist movement as early as 1661. In a similar way, he banned the Reformed faith from France several years later in 1685. Furthermore, in 1712, this same king expelled all the Anabaptists belonging either to Mennonite or Amish movements.

After his Christian conversion at the age of thirtyone, Pascal did not stop working scientifically until the time when serious illness prevented any kind of intellectual work. Also, his scientific research did not hinder him from loving and serving his God. With Roannez, Pascal imagined and developed the last of his achievements that perfectly reflected his desire

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for concrete social actions. He set up and promoted the first "buslines" of shuttle coaches, ferrying passengers within Paris on a fixed schedule and given routes. The coaches were equipped with several seats, and five *sols* (comparable to five dollars) were asked for one carriage. This last example illustrates the significant contribution that Pascal made to the emergence of a modern spirit of applied science and engineering with important social implications. However, more should be said about that first pioneer coach company: the profits of the company were intended to help poor people living in the French city of Blois. This last detail envisaged by Pascal was, of course, a way of applying his Christian faith to concrete charity actions.

Unfortunately, Pascal suffered increasingly from headaches that began when he was a young man. Especially after 1658, he fell seriously ill. In 1662, Pascal's illness became more virulent. Aware that he was unlikely to survive, he sought to find a hospital for incurable diseases, but his doctors declared him not transportable. On August 3, Pascal communicated his last will and testament to a solicitor. In this testament, Blaise is expecting and praying that "God will forgive his sins through the merit of the precious blood of our Savior and Redeemer." On August 17, Pascal experienced serious convulsions that warned him that death was near. Pascal died on the morning of August 19, 1662, at the age of only thirty-nine. His last words were, "May God never surrender me!"7 In spite of his deficient health, Pascal left an example of a magnificent persevering Christian and scientist.

## Influence of Pascal in France Today

As a former full-time CNRS researcher in theoretical material physics, I can give the following testimony. What was expected from our quantum mechanical model and related computing calculations was either to explain already-existing experimental data concerning a given material property, or, alternatively, to predict systematic results which would require experimental verification in the future. This way of practicing research was directly inspired by Pascal's pioneering concept of modern science. In the foreword of my doctoral thesis (in the field of solid state physics), I wrote the following: "As a tribute of respect to the great example of Blaise Pascal, a man of faith and genius."<sup>8</sup> Several decades later, I briefly recall here why Pascal was both a scientific genius who significantly contributed to modern science, and a dedicated Christian thinker who still urges every seeker of God, especially in France but also around the world, to experience a personal faith in the Lord Jesus. I accepted the biblical Gospel through the testimony of an InterVarsity group in Strasbourg. However, the example of Pascal, whom I knew as early as high-school level, prepared me to do so.

Let me briefly explain references to Pascal still found in France today. First, before France adopted euro currency, one of the highest bank notes (around one hundred dollars) exhibited Pascal's picture. Jacques Attali, representative of the present French intelligentsia, is fascinated by the great figure of Pascal.9 Jean Brun, a foremost evangelical Christian thinker, wrote a small but pertinent book on Pascal's philosophy.<sup>10</sup> Moreover, as far as a link can be analyzed between Pascal's science and Christian faith, Dutch professor Reijer Hooykaas (history of sciences) offered a view still recognized in France today.<sup>11</sup> Several years ago, the theologian Henri Blocher taught a training course about how to introduce the Gospel, particularly in the French cultural context. Blocher concluded his course as follows:

Blaise Pascal is a topmost scientist and believer, as well as a highly elegant writer, centered upon his relation to Jesus Christ. If Descartes is representative of France in general, Pascal is the very evangelist within the French context.<sup>12</sup>

More recently and before an audience of engineering students, Frédéric Baudin treated the important question of philosophy and truth according to Pascal.<sup>13</sup> For a critical and very interesting commentary of each word in "The Memorial," we refer to a recent book that is also representative of Pascal's attraction for a certain French intelligentsia with a Roman Catholic background.<sup>14</sup> We should also mention the Blaise Pascal Association, a Roman Catholic association concerned with *science versus belief* questions.

Quite recently, David Brown, who was a longtime general secretary and is now chairman of the French InterVarsity groups, imagined a dialogue with Pascal in order to ask him how he sees life and faith.<sup>15</sup> Brown's book is aimed at helping French students discover basic questions and try to find solutions following the great example of Pascal. Furthermore, after having recalled the strong influence of both Catholicism and philosophy in today's specific French cultural background, Brown, in a recent paper about French culture, concludes by asking: "When shall we ever see an 'evangelical Voltaire' in France?"<sup>16</sup> The question is still valid for today, but we must also remember that about one century before the famous French eighteenth-century philosopher, there had already been a kind of "evangelical Voltaire" named Pascal. Within the framework of French InterVarsity groups and with the help of a US foundation, Brown brought Veritas Forum meetings to the French universities.

A few years ago, I was asked to speak at such a Forum at the University of Strasbourg on the following subject: "What is a successful professional life?" In my conclusion, I was led to call attention to the example of Pascal who had been both a successful scientist and a leading Christian. Also, Brown in conjunction with Lydia Jaeger, director of the Nogent Bible Institute, France, started a yearly meeting of French-speaking evangelical scientists. I had the privilege of addressing the first of those meetings, with a talk entitled "Can science be neutral?" In my talk, I could not prevent myself from citing Pascal's famous words:

The last step of our own reason process is to admit that there are a lot of things still above our present understanding.<sup>17</sup>

Pascal has definitively been, for me, a great source of inspiration! In January 2013, the title of the abovementioned annual meeting was "Christian Scientists from Yesterday to Nowadays." Of course, Pascal was among the past scientists whose work, life, and faith were recalled during the conference.<sup>18</sup>

#### Conclusion

In this communication, I have tried to explain how Pascal has made and can make a difference. Pascal was the father of many new and basic developments in both physics and mathematics. Pascal's novel approach to science was dominated by the idea of careful observation of the studied object or phenomenon as opposed to a philosophical interpretation of the considered study in a subjective way. Furthermore, Pascal's spirit of innovation and risk was also an important contribution to the emergence of modern applied science and engineering.

When it came to Christian thinking, Pascal applied the same principle. The concrete (experiment) must complete the abstract (theory). In the question of knowing God, experience is a determining contribution, as Pascal experienced for himself after having been confronted by the written word of God, that is, the Gospel of the Bible. Pascal's Christ-centered faith is summarized in his following statement: "Jesus is a God whom we can approach without pride and before whom we can humble ourselves without despair."19 Faith flows from the heart, which, for Pascal, stands as a necessary complement to human reason. God is not to be proved; he is to be experienced.<sup>20</sup> Up to now, the *Pensées* has been a powerful defense for Christ-centered faith and apologetics, especially among scientific and educated people.

Concerning a Christian testimony, Pascal's contribution is undeniable in the following sense. Christian faith is known (for example, among French InterVarsity groups) to be based on (1) a historical and objective event, namely the life, death, and resurrection of Jesus Christ, accomplished once for all time, and (2) a subjective personal experience which can still be reproduced, once in a life, namely a personal meeting with God through Jesus Christ. I am sure that Pascal would agree with that statement. His influence among general readers, either those scientifically oriented or those searching for the truth, is still going on today in France and around the world, and is of significant importance.

I specifically mentioned a few recent challenges and opportunities among French graduate students and colleagues. Everyone is challenged to experiment with Pascal's wager, which is to personally meet God through the Gospel of Jesus Christ. The gist of the wager is that one cannot come to the knowledge of God's existence through reason alone, so the wise thing to do is to live as if God does exist because such a life has everything to gain and nothing to lose. If we live as though God exists, and he does indeed exist, we have gained heaven. If he does not exist, we have lost nothing. If, on the other hand, we live as though God does not exist and he really does exist, we have gained hell and have lost heaven and bliss.

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If one weighs the options, clearly the rational choice is to live as if God exists, the better of the possible choices.<sup>21</sup>

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#### Notes

<sup>1</sup>J. Attali, *Blaise Pascal, ou le génie français* (Paris: Fayard, 2000).

<sup>2</sup>M. Baude, "Blaise Pascal," in *The Lion Handbook of Christian Belief*, ed. A. E. McGrath and J. I. Packer (Herts, England: Lion, 1982), 445.

<sup>3</sup>Ibid.

<sup>4</sup>A. Kuen, *Ils sont nés deux fois* (St-Légier, Switzerland: Emmaüs, 2008), 31.

<sup>5</sup>Ibid.

- <sup>6</sup>Baude, "Blaise Pascal," 445.
- <sup>7</sup>Attali, Blaise Pascal, ou le Génie Français, 355.

<sup>8</sup>J. C. Parlebas, Interaction Effects between Impurities on the Electronic Structure of Transition Metals, PhD diss., Université Louis Pasteur, Strasbourg, 1976.

<sup>9</sup>Attali, Blaise Pascal, ou le génie français.

- <sup>10</sup>J. Brun, *La philosophie de Pascal* in the collection *Que sais-je?* (Paris: Presses Universitaires de France, 1992).
- <sup>11</sup>R. Hooykaas, "Pascal: His Science and His Religion," Dutch Classics Tractrix 1 (1989): 115–39.
- <sup>12</sup>H. Blocher, "Proclamer l'évangile en tenant compte du contexte français," (paper, Formation à l'évangélisation, séminaire de formation, Mission Mondiale, Billy Graham, Béziers, France, 1995).
- <sup>13</sup>F. Baudin, "Philosophie et vérité chez Blaise Pascal" (paper presented at the Culture-Environnement-Médias [CEM] Conférence, 2008).
- <sup>14</sup>X. Patier, Blaise Pascal: La nuit de l'extase (Paris: Cerf, 2014).
- <sup>15</sup>D. Brown, "On parie combien?," de la série Question sui-
- vante GBU (Marne-la-Vallée, France: Editions Farel, 2011). <sup>16</sup>D. Brown, "Culture et communication de l'évangile: La culture française," *Les cahiers de l'école pastorale* 82 (2011): 63.
- <sup>17</sup>J. C. Parlebas, "La science peut-elle être neutre?," in *Quelles conditions pour une science en bonne santé*?, ed. L. Jaeger (Marne-la-Vallée, France: Editions Farel, 2010), 43.
- <sup>18</sup>D. Brown and A. Lombet, "Des scientifiques chrétiens à travers les siècles" (paper, Le chrétien dans la science: Journée du Réseau des Scientifiques Evangéliques, Paris, 2013).
- <sup>19</sup>B. Pascal, *Pensées et opuscules*, ed. L. Brunschvicg (Paris: Hachette, 1909), 144

<sup>21</sup>Brown, *On parie combien*?

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<sup>&</sup>lt;sup>20</sup>Baude, "Blaise Pascal."