

Blaise Pascal – Mathematician, Mystic, Disciple

Tim Rogalsky
Assistant Professor of Mathematics
Canadian Mennonite University

Blaise Pascal was a 17th century, French, Roman Catholic, thinker (1623-1662), who made significant contributions in mathematics, science, philosophy, and theology. Foreseeing modernity's overemphasis on the autonomous, rational being, he has much to say today, to a culture many suggest is in the midst of a paradigm shift. Pascal is able to hold holistically, in dynamic tension, faith and reason, belief and practice, personal and communal spirituality, in ways relevant to “modern pagans” (Kreeft, 1993).

I will tell his story with anecdotes from his life, and with quotes from his well-read *Pensées* (Penguin Books, 1995). The book we now call Pascal's *Pensées* is really just a collection of his thoughts, recorded over several years. He had intended that they would become an apologetic for the Christian faith, but he died before he could organize them. After his death they were collected and published, in a more or less arbitrary order. This fragmentary nature of *Pensées* lends itself well to meditation, a spiritual discipline that is being reaffirmed (and in some cases rediscovered) by the church today.

Pascal the mathematician, understood the *value* of reason in religious belief. Pascal the mystic, understood the *limitations* of reason in religious belief. And Pascal the disciple, understood that, for Christians, "religious belief" is but a way of saying "life, ethics, and practice." That is, in the spirit of Matthew 25 and James 2, to believe is to follow; to have faith is to put it in action.

Blaise Pascal's mother died when he was three years old, and his father, Étienne, took the unusual step (for that time) of resigning his post in the civil service, to raise and home-school his three children.

Étienne was an amateur mathematician, but believed that his children should be firmly grounded in the classical languages before being introduced to mathematics (which ought not to happen until 15 or 16). All math books in the house were locked away, and Étienne would not permit any discussion of math in the house.

This math censorship bred an insatiable curiosity in the young boy. After much pestering, Étienne finally told his son what mathematics was, defining it as the means to make accurate figures and determine the proportions within them. But the prohibition against all mathematical study was strictly maintained. Blaise, however, simply could not resist, and began, in secret, to draw circles, triangles, rectangles, and to think about ratios of lengths and relationships between angles. In secret, he created his own definitions, determined axioms, and deduced theorems, until at the age of twelve, he was caught by his father, working out a geometric theorem. Anger at the youth's disobedience turned quickly to amazement when Étienne realized that, completely unaided, his son had deduced Euclid's 32nd proposition, that the sum of angles in a triangle is

equal to the sum of two right angles. At that moment, Étienne set aside his pedagogical principles, gave his son Euclid to read, and permitted mathematical conversations in the home.

Soon Blaise joined his father at a weekly discussion group with some of the greatest mathematicians and scientists in Paris. At the age of 16, he presented a paper on conic sections. Eight years later, Blaise would expand these ideas into a full-blown Latin treatise, which has now been lost except for fragments quoted by Leibniz.

Among his other mathematical and scientific achievements, Pascal, with Pierre de Fermat, developed the foundations of probability theory; he performed scientific experiments on hydrostatics; he was one of the first to demonstrate the existence of a vacuum, in an age when conventional wisdom claimed that a vacuum cannot exist in nature; and, when his father took a job as a tax collector, Pascal developed an adding machine to assist with the computations, a precursor to the modern computer. In his late thirties, while battling a severe toothache, he found that thinking about the cycloid soothed his pain, and investigated properties of the cycloid that led to developments in integral calculus.

My point in sharing these accomplishments, is simply to demonstrate the value that Pascal placed on reason and the mind. His well-known thought, number 423, "the heart has its reasons of which reason knows nothing" should thus not be interpreted as an anti-intellectual bias, or an indication that emotions and spirit are superior in some way to the mind. We humans have been created whole beings, and so there is a place, in religion, for both mind and heart:

The way of God, who disposes all things with gentleness, is to instill religion into our minds with reasoned arguments and into our hearts with grace, but attempting to instill it into hearts and minds with force and threats is to instill not religion but terror. (Pensées, 172)

(Aside from noticing the value Pascal placed on reason, here is another helpful and timely perspective: Christianity is invitational at its core. Force and coercion, by their very nature, destroy the message.)

Reason has value, but also limitations. Descartes' rationalistic philosophy of human existence ("I think, therefore I am") has influenced "modern pagans" to elevate reason, glorifying the enlightened, autonomous, rational, decision-making individual. Pascal, a contemporary of Descartes, takes issues with this rationalism:

Write against those who probe science too deeply. Descartes. (Pensées, 553)
Descartes useless and uncertain. (Pensées, 887)

Long before postmodernism was exploring the limitations of the "Cartesian monad," Pascal was doing the same.

What, then, is the relationship between reason and the heart? It is analogous to Platonism in mathematics. Certain basic principles are self-evident – they are foundational *to* reason, but cannot be grasped *by* reason.

We know the truth not only through our reason but also through our heart. It is through the latter that we know first principles, ...

For knowledge of first principles, like space, time, motion, number, is as solid as any derived through reason, and it is on such knowledge, coming from the heart and instinct, that reason has to depend and base all its argument. The heart feels that there are three spatial dimensions and that there is an infinite series of numbers, and reason goes on to demonstrate that there are no two square numbers of which one is double the other...

Would to God, on the contrary, that we never needed [reason] and knew everything by instinct and feeling! But nature has refused us this blessing, and has instead given us only very little knowledge of this kind; all other knowledge can be acquired only by reasoning. (Pensées, 110)

Thus he reserves a *place* for the mind, but *not* one of absolute privilege. Pascal concludes with this last enigmatic statement

That is why those to whom God has given religious faith by moving their hearts are very fortunate, and feel quite legitimately convinced, but to those who do not have it we can only give such faith through reasoning, until God gives it by moving their heart, without which faith is only human and useless for salvation. (Pensées, 110)

This is, in fact, his own testimony. Pascal's first conversion, at the age of 22, was based on a reasoned explanation of the Christian faith. In the years that followed he lost some of his intellectual fervor for the faith, until, at 30, he had a mystical experience, in which God finally spoke to his heart. His testimony goes like this.

In the Pascals' rural town of Clermont, lived two brothers named Deschamps, who had been converted to Jansenism. Otto Jansen, the bishop of Ypres (1585-1638), had spent his life studying Augustine, and attempting to recover Augustine's teachings. By 1645, when at 22 Pascal came to know the Deschamps, Jansenism had become a small renewal movement within the Catholic church. They emphasized the utter depravity of humanity, teaching that we are incapable of doing good without the grace of God, and that there is nothing we can do to earn that gift. Salvation and sanctification are entirely at God's initiative, and God will choose (predestine) whom God will choose. Their theology, though similar in some respects to Calvinism, included no assurance of salvation. This led Jansenists to a life of radical piety – caring for the sick and poor, taking the sacraments very seriously, and spending much time in prayer and confession.

The Deschamps brothers had devoted their lives to caring for the sick, and were invited to live with the Pascals when Étienne fell and dislocated a thigh bone. Over the next three months, Blaise became convinced that the radical Christianity of the Jansenists was of more value than his own, nominal, Catholicism. This "first conversion" led to an increased participation in the life of the Catholic church, but he did not yet have the passion for Christ that would later consume him.

Over the next years, Pascal slipped into a lifestyle that his older sister would later call “worldly.” He continued his math and science, but spent much of his time living with some gentlemen friends, whose primary pursuit in life was gambling. It was in an attempt to help his friends improve their gaming odds that Pascal was inspired to develop the foundations of probability theory, including his famous “triangle” for binomial expansions.

He was somewhat dissatisfied with his life during this “worldly period.” Trying to capture his discontent, he wrote the following in a tract that he called "On the Conversion of the Sinner,"

It is one thing to begin to know God and to want to reach him. It is quite another to bring these aspirations to fulfillment when the soul remains ignorant of how to do so. If his yearning for conversion is genuinely sincere, the sinner will imitate a traveler who has lost his way. He will have recourse to those who have precise knowledge of the road to take and who can therefore conduct him securely to the God whom for so long he had neglected. (O'Connell, 1997, p93)

And imitate a lost traveler, he did. He continued to seek spiritual counsel from the Jansenists, and in particular from his younger sister, who had joined a Jansenist monastery.

Then, at the age of 30, Pascal had a mystical experience, known as the "Night of Fire." He recorded the experience on paper, then later edited and transcribed it onto parchment. He told no one of the experience, but sewed both copies into the inside of his doublet, where they were found upon his death. It reads almost as a private journal entry. After giving the date and time, he writes

*Fire.
The God of Abraham, the God of Isaac, the God of Jacob.
Not of the philosophers and intellectuals.
Certitude, certitude, feeling, joy, peace.*

And so it continues. Clearly, in this experience of the heart, he received an assurance and a certainty of faith that his mind alone had never given him:

*Oh just Father, the world has not known you,
but I have known you.
Joy, joy, joy, tears of joy. (O'Connell, 1997, p96)*

There's a great story about a near-death experience that may have been related to this spiritual vision. When the parchment came to light after his death, friends recalled an accident occurring at about the same time. They were near Paris, in a horse-drawn carriage, crossing the River Seine on a bridge. Something spooked the horses and they plunged over the side of the bridge. The carriage caught on the railing, leaving the horses dangling over the water. Just as the carriage was about to tip over into the river, the traces broke, sending the horses plunging to their death, but leaving the carriage and its occupants safe on the bridge. Whether or not this event in some way precipitated the "Night of Fire," we'll never know.

Pascal's intellectual assent to a way of life and thought had finally been confirmed. God had spoken directly to his heart, and that changed everything, because,

It is the heart which perceives God and not the reason. That is what faith is: God perceived by the heart, not by the reason. (Pensées, 424)

For Pascal the mathematician, faith is rational; for Pascal the mystic, faith is also a gift of God. But in neither case does faith stop there. For Pascal the disciple, Christian faith is a life well-lived. Belief, ethics, and practice are all integral parts of the same whole. Faith is a way of life that involves important habits, for

We are as much automaton as mind...

Proofs only convince the mind; habit provides the strongest proofs and those that are most believed. It inclines the automaton, which leads the mind unconsciously along with it...

With no violence, art or argument [habit] makes us believe things, and so inclines all our faculties to this belief that our soul falls naturally into it. (Pensées, 821)

This is the heart of his famous "Wager." To wager on God is a rational decision to develop Christian habits. The heart will follow. The Wager, thought 418, is one of the few thoughts that Pascal worked out in some detail, into an extended argument. He begins by arguing that reason cannot prove the existence of God, because

If there is a God, he is infinitely beyond our comprehension, since, being indivisible and without limits, he bears no relation to us. We are therefore incapable of knowing either what he is or whether he is. (Pensées, 418)

If there is no guarantee, then we must gamble – either for or against God. He proceeds to use the concept of "expected value" from his recently developed probability theory:

Let us weigh up the gain and the loss involved in calling heads that God exists. Let us assess the two cases: if you win you win everything, if you lose you lose nothing. Do not hesitate then; wager that he does exist...

Our argument carries infinite weight, when the stakes are finite in a game where there are even chances of winning and losing and an infinite prize to be won. (Pensées, 418)

Unfortunately, this is about as far as the popular understanding of "Pascal's Wager" goes. Thus it can easily be misinterpreted – and misused – as a simplistic "fire insurance" version of Christianity, demanding little from the convert. Just decide to bet on God, and you'll be fine. Say the right words, and you'll avoid hell when you die, or at the very least pass into nothingness like the rest of humanity. Read carefully, however, Pascal teaches us that the wager, while it does begin with a decision of the intellect and the will, is really all about discipleship.

He continues the argument by creating the following dialogue. A hypothetical unbeliever says,

'Yes, but my hands are tied and my lips are sealed; I am being forced to wager and I am not free; I am being held fast and I am so made that I cannot believe. What do you want me to do then?'

In other words, “But Pascal, reason alone compels me to accept your argument. Surely that cannot be true belief?” To which Pascal responds,

You want to find faith, and you do not know the road. You want to be cured of unbelief, and you ask for the remedy. Learn from those who were once bound like you and who now wager all they have. These are people who know the road you wish to follow, who have been cured of the affliction of which you wish to be cured: follow the way by which they began. They behaved just as if they did believe, taking holy water, having masses said, and so on. That will make you believe quite naturally. (Pensées, 418)

Clearly, then, to wager is a moral, ethical, and communal decision. It is a decision to learn a lifestyle from those who have already wagered, and it is in that lifestyle-learning, which might also be called discipling, that the heart learns true belief. Pascal "did not intend his wager argument to issue in an immediate *belief* in God, as a direct result. He intended it only to issue in a certain form of behavior, which would erode obstacles to belief, obstacles to be found in our emotions, attitudes, passions, and habitual ways of thinking and acting" (Morris, 1992, p124). Belief cannot be separated from practice.

Note also that the practice of the Christian faith, for Pascal, goes well beyond a list of “don’ts.” Morality, ethics, and discipleship, for Pascal, was a list of “do’s”:

Do participate in the liturgy of the church, “taking holy water, having masses said, and so on.” Do live in community with those that you call church, discovering from them "the road you wish to follow." In the last years of his short life, Pascal spent much time living at Port Royal des Champs, a former convent where about twenty-five men of the Jansenist movement lived as a religious community. A priest lived with them as their spiritual director, and the group developed a monastic lifestyle that included liturgical and private prayer, study of the scriptures and the church fathers, and manual labor. Pascal spent much time in conversation with the spiritual director of the community, and developed much of his *Pensées* during these years.

Do preach Good News to the (literally) poor. Pascal devoted much time and money to charity. When he was not living at Port Royal, he visited the poor and the sick in the slums of Paris. On one such day, meeting an orphan girl on the street, he brought her to the local priest, and gave him enough money to see to her care, all – in the tradition of the Good Samaritan – without revealing his own identity.

In the last year of his life, at the age of 39, though extremely ill, he nonetheless welcomed a homeless family into his Paris home. He amended his will so that his house would be passed on to them upon his death, which occurred a short time later. Also in that last year, realizing that only the wealthy could travel freely throughout Paris, he conceived a plan that would empower the poor to travel as well. With some of his gentlemen friends, he formed a company that operated several horse-drawn carriages. For a modest fare they would convey passengers along a set route through the city. Any profits the company made were designated to charity. Thus was born Paris's first mass-transit system, and thus his life ended, serving the poor.

Pascal's apologetic work intended for the intellectual elite remained incomplete, but his collected thoughts have inspired generations of thinkers – Christian and non-Christian alike. Today, he inspires us to combine reason and emotion, individual and community, belief and practice, into the holistic human existence craved by so many in our generation.

Postscript

Some readers will especially appreciate thought 170, in which Pascal describes his ideal human as: part skeptic, part mathematician, and part Christian. The skeptic knows when to doubt; the mathematician knows when to affirm; the Christian knows when to submit.

Submission. One must know when it is right to doubt, to affirm, to submit. Anyone who does otherwise does not understand the force of reason. Some men run counter to these three principles, either affirming that everything can be proved, because they know nothing about proof, or doubting everything, because they do not know when to submit, or always submitting, because they do not know when judgement is called for.

Skeptic, mathematician, Christian; doubt, affirmation, submission. (Pensées, 170)

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Blaise Pascal. ~%lie Cartan. Archytas of Tarentum. He and his students (the "Pythagoreans") were ascetic mystics for whom mathematics was partly a spiritual tool. (Some occultists treat Pythagoras as a wizard and founding mystic philosopher.) Pythagoras was very interested in astronomy and seems to have been the first man to realize that the Earth was a globe similar to the other planets. Aristotle's disciple and successor Theophrastus was also a great scientist, as was Theophrastus' successor Strato of Lampsacus. Although Aristotle was probably the greatest biologist of the ancient world, his work in physics and mathematics may not seem enough to qualify for this list. But his teachings covered a very wide gamut and dominated the development of ancient science.

Pascal's Mystic Hexagram. One of the first applications of modern mathematics to emerge during the Renaissance was the study of perspective for the purposes of painting and architecture. This led naturally to a consideration of projection, i.e., the mapping of images from one plane surface S to another plane surface S' by projection from a point O . The point p on S maps to a point p' on S' such that O , p and p' are colinear. This theorem was first stated in 1640 by Blaise Pascal (1623-1662) when he was just 16 years of age. His father, Etienne, had retired from his civil service job in 1631 to devote himself to the education of Blaise and his two older sisters. At the age of 14 Pascal joined his father as a member of the group of mathematicians and scientists associated with Marin Mersenne.

Blaise Pascal. Profession: Mathematician, Physicist and Philosopher. Nationality: French. Why Famous: Pascal contributed widely to mathematics and the physical sciences by laying the foundation for the modern theory of probabilities, inventing an early calculator (the Pascaline), and for his work on the nature and principles of hydraulic fluids. During his experiments on hydrodynamics, Pascal formulated Pascal's law of pressure and invented the syringe and the hydraulic press. In the 1970s, the Pascal (Pa) unit was named in his honor in recognition of his work on understanding atmospheric pressure.