BLAISE PASCAL

The Wager, FROM *Pensées*

Who Was Blaise Pascal?

Blaise Pascal (1623–62) was a French scientific prodigy, one of the most important mathematicians of the seventeenth century, and a Catholic theologian. He was born in France's Auvergne region and his mother died when he was three. The family moved to Paris in 1631, where Pascal and his siblings were educated entirely by his father Étienne (who never remarried). Pascal was a brilliant child, especially interested in mathematics, and even before he was sixteen was developing new proofs and corresponding with some of the leading mathematicians of his day—some of whom, such as René Descartes, initially refused to believe they were reading the work of a child.

When Pascal was 16 the French government, enmeshed in the very expensive Thirty Years' War, defaulted on the government's bonds where the Pascals' money was invested, and the family was suddenly plunged from living in relative comfort to hard times. To make matters worse, Pascal's father soon had to flee Paris, leaving his children behind, because of his (understandable) opposition to the government's fiscal policies. For several months Blaise and his two sisters were in the care of a neighbor, Madame Sainctot, a society beauty who ran one of the most glamorous 'salons'—regular intellectual gatherings/parties—in Paris.

Pascal's father was eventually able to find an appointment as the king's tax collector for the city of Rouen, and began to rebuild the family's financial fortunes. But Rouen's tax records were in complete disarray because of recent failed popular uprisings, and the job of rebuilding those records was a tedious and grinding one. In order to help his father with the endless calculations required, the 18-year-old Pascal built the first of a series of mechanical calculators, capable of addition and subtraction, which he developed and refined over the following decade. There was a prior abortive attempt by Wilhelm Schickard in Germany in the 1620s to build a mechanical calculator, but Pascal's machine was probably the first properly functional calculator ever built; it would be another 200 years before the study of mechanical calculation took a further jump forward, including the work of Charles Babbage and his difference engine, and eventually became modern computer engineering.

In mathematics, Pascal's role in the development of probability theory was his most influential contribution. Originally applied to gambling—as we see in this selection—his ideas, partly developed in correspondence with the French lawyer and mathematician Pierre de Fermat, have strongly influenced the development of modern economics, actuarial science, and social science, and were an important basis for Leibniz's formulation of the calculus.

In addition to his achievements in mathematics, Pascal did important work in the experimental sciences, especially on the properties of fluids and air pressure, and he created influential experiments which sought to demonstrate the then-controversial existence of a vacuum.

In 1654, when he was 31, Pascal—already dabbling with religion after the illness and death of his father and the departure of his younger sister, Jacqueline, to a convent—had an intense night-time religious vision that changed his life. He followed his sister in converting to a theological movement within Catholicism that emphasized original sin and human depravity, and hence the necessity of divine grace for salvation, as well as the doctrine of predestination, which holds that the fate of individual human souls has already been decided by God.* It was at this time that Pascal began his reli-

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* This movement was known by its detractors as Jansenism, after the Dutch theologian Cornelius Jansen (1585–1638). It was suppressed by the French monarch, King Louis XIV, and by the mainstream of the Catholic church, including Pope Alexander VII and the Jesuits.

gious writings, though he also continued his mathematical work.* During this period he was also increasingly plagued by painful poor health—based on an autopsy performed after his death, it's clear he had a brain lesion, but it is speculated that he may also have had both tuberculosis and stomach cancer—and he lived frugally and abstained from sensual pleasures. What he published in this period—including the *Lettres provinciales* (The Provincial Letters, 1656–57)—established Pascal's reputation as one of the greatest writers of French prose.

What Is the Structure of This Reading?

Pensées ('Thoughts') is a collection of fragments of writing that Pascal had been preparing to put together as a major defense of Christianity. He died, aged 39, before the book, his life's work, could be completed. Over the centuries since his death several editors and translators have published different arrangements of the material, but the proper order of the fragments is disputed.

The fragment reprinted here is the most well-known section of the *Pensées*, and is part of a series of thoughts where Pascal argues that we do not require certainty in order to believe in religion—and that such a certainty is unavailable because of our limited and finite understanding. It is rational to believe in God even though we cannot be certain of God's existence and nature, Pascal argues, because this is a question on which we are forced to make a choice (with major consequences for how we should live), and since we must choose an option, the rational choice is to believe in God and the Christian religion.

Some Useful Background Information

1. Although Pascal became a fervent defender of Catholicism, and was an internationally known scientist and mathematician with many aristocratic friends, he was not really a member of the establishment and many of his ideas were radical and unsettling at the time. After his conversion to a brand of Catholicism rather like his sister's

'Jansenism,' Pascal became embroiled in a public and legal battle with the powerful Jesuit order. His *Provincial Letters* contained scathing—and humorous—criticisms of Jesuit casuistry and had to be published anonymously, or Pascal was in real danger of prosecution.

2. Pascal's Wager is often described as an example of what has come to be called decision theory, which is the branch of probability theory that examines how to make decisions in situations of uncertainty. The two key concepts of decision theory are *preferences* and *prospects*: how much do you want different outcomes to occur, and how likely are those outcomes? At its simplest, combining weightings for preferences with judgments of prospects will produce an *expected value* for each possible option, and then the rational agent will choose the option with the highest expected value.

Suppose that you are considering playing a betting game where you toss a fair coin twice and if heads comes up both times you win $8, but on any other result you must pay $2. We can represent the values of the different outcomes in a table:

Option	You win	You lose
1. You bet	$8	-$2
2. You don't bet	$0	$0

Consider option 1. The probability of getting two heads is 1/4. The probability of *not* getting two heads is therefore 3/4. The expected value of choice one, betting, is therefore ($8 x 1/4) + (-$2 x 3/4) = $2 + -$1.50 = $0.50.

If you choose option 2 and don't place a bet, then you are guaranteed to neither gain nor lose money, and so your expected value is $0. The expected value of option 1 thus exceeds the expected value of option 2, so—in this simple version of decision theory—you should take the bet.

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* Pascal also found time to inaugurate what is probably the first bus line in history, when his plan for a many-seated carriage to move passengers around Paris was implemented.

The Wager, FROM *Pensées**

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...We know that there is an infinite, and are ignorant of its nature. As we know it to be false that numbers are finite, it is therefore true that there is an infinity in number. But we do not know what it is. It is false that it is even, it is false that it is odd; for the addition of a unit can make no change in its nature. Yet it is a number, and every number is odd or even (this is certainly true of every finite number). So we may well know that there is a God without knowing what He is. Is there not one substantial truth, seeing there are so many things which are not the truth itself?

We know then the existence and nature of the finite, because we also are finite and have extension.† We know the existence of the infinite, and are ignorant of its nature, because it has extension like us, but not limits like us. But we know neither the existence nor the nature of God, because He has neither extension nor limits.

But by faith we know His existence; in glory‡ we shall know His nature. Now, I have already shown that we may well know the existence of a thing, without knowing its nature.

Let us now speak according to natural lights.§

If there is a God, He is infinitely incomprehensible, since, having neither parts nor limits, He has no affinity to us.¶ We are then incapable of knowing either what He is or if He is. This being so, who will dare to undertake the decision of the question? Not we, who have no affinity to Him.

Who then will blame Christians for not being able to give a reason for their belief, since they profess a religion for which they cannot give a reason? They declare, in expounding it to the world, that it is a foolishness, *stultitiam*;** and then you complain that they do not prove it! If they proved it, they would not keep their word; it is in lacking proofs, that they are not lacking in sense.†† "Yes, but although this excuses those who offer it as such,‡‡ and takes away from them the blame of putting it forward without reason, it does not excuse those who receive it." Let us then examine this point, and say, "God is, or He is not." But to which side shall we incline? Reason can decide nothing here. There is an infinite chaos which separated us. A game is being played at the extremity of this infinite distance where heads§§ or tails will turn up. What will you wager? According to reason, you can do neither the one thing nor the other; according to reason, you can defend neither of the propositions.

Do not then reprove for error those who have made a choice; for you know nothing about it. "No, but I blame them for having made, not this choice, but a choice; for again both he who chooses heads and he who chooses tails are equally at fault, they are both in the wrong. The true course is not to wager at all."

Yes; but you must wager. It is not optional. You are embarked. Which will you choose then? Let us see. Since you must choose, let us see which interests you least. You have two things to lose, the true and the good; and two things to stake, your reason and your will, your knowledge and your happiness; and your

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*   From *Pensées*, trans. W.F. Trotter (E.P. Dutton & Co., 1958).

†   "We also are finite and have extension": we are limited beings with spatial boundaries.

‡   In heaven, after death.

§   "According to natural lights": in accord with the power of reasoning we all have by virtue of being human.

¶   No similarity or commonality with us.

**   This is a reference to the Bible, 1 Corinthians 1:18: "For the message of the cross is foolishness to those who are perishing, but to us who are being saved it is the power of God." *Stultitiam* is Latin for being a fool.

††   "It is in lacking proofs, that they are not lacking in sense": it is by being without proof that they show that they are not without sense.

‡‡   Propose it without giving a reason.

§§   The word Pascal uses for heads is *croix*, which subtly relates the gambler's choice to the Christian message of the cross referenced just above.

nature has two things to shun, error and misery. Your reason is no more shocked in choosing one rather than the other, since you must of necessity choose. This is one point settled. But your happiness? Let us weigh the gain and the loss in wagering that God is. Let us estimate these two chances. If you gain, you gain all; if you lose, you lose nothing. Wager, then, without hesitation that He is.—"That is very fine. Yes, I must wager; but I may perhaps wager too much."—Let us see. Since there is an equal risk of gain and of loss, if you had only to gain two lives, instead of one,* you might still wager. But if there were three lives to gain, you would have to play (since you are under the necessity of playing), and you would be imprudent, when you are forced to play, not to chance your life† to gain three at a game where there is an equal risk of loss and gain. But there is an eternity of life and happiness. And this being so, if there were an infinity of chances, of which one only would be for you,‡ you would still be right in wagering one to win two, and you would act stupidly, being obliged to play, by refusing to stake one life against three at a game in which out of an infinity of chances there is one for you, if there were an infinity of an infinitely happy life to gain. But there is here an infinity of an infinitely happy life to gain, a chance of gain against a finite number of chances of loss, and what you stake is finite. It is all divided;§ wherever the infinite is and there is not an infinity of chances of loss against that of gain, there is no time to hesitate, you must give all. And thus, when one is forced to play, he must renounce reason to preserve his life, rather than risk it for infinite gain, as likely to happen as the loss of nothingness.¶

For it is no use to say it is uncertain if we will gain, and it is certain that we risk, and that the infinite distance between the *certainty* of what is staked and the *uncertainty* of what will be gained, equals the finite good which is certainly staked against the uncertain infinite. It is not so, as every player stakes a certainty to gain an uncertainty, and yet he stakes a finite certainty to gain a finite uncertainty, without transgressing against reason. There is not an infinite distance between the certainty staked and the uncertainty of the gain; that is untrue. In truth, there is an infinity between the certainty of gain and the certainty of loss. But the uncertainty of the gain is proportioned to the certainty of the stake according to the proportion of the chances of gain and loss. Hence it comes that, if there are as many risks on one side as on the other, the course is to play even;** and then the certainty of the stake is equal to the uncertainty of the gain, so far is it from fact that there is an infinite distance between them. And so our proposition is of infinite force, when there is the finite to stake in a game where there are equal risks of gain and of loss, and the infinite to gain. This is demonstrable; and if men are capable of any truths, this is one.

"I confess it, I admit it. But, still, is there no means of seeing the faces of the cards?"—Yes, Scripture and the rest, etc. "Yes, but I have my hands tied and my mouth closed; I am forced to wager, and am not free. I am not released, and am so made that I cannot believe.†† What, then, would you have me do?"

True. But at least learn your inability to believe, since reason brings you to this, and yet you cannot believe.‡‡ Endeavour then to convince yourself, not by increase of proofs of God, but by the abatement

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* "To gain two lives, instead of one": to stand to win two lives instead of one.

† To bet your life.

‡ "If there were an infinity of chances, of which one only would be for you": even if there were an infinite number of outcomes where you lose and only one where you win.

§ It is already mathematically determined.

¶ "Infinite gain, as likely to happen as the loss of nothingness": an infinite gain which is just as likely to happen as a loss which (by comparison) amounts to nothing.

** "The course is to play even": the odds are even.

†† "I am not released, and am so made that I cannot believe": I am not free to choose (what I believe) and I am built in such a way that I cannot believe in God.

‡‡ "But at least learn your inability to believe, since reason brings you to this, and yet you cannot believe": but at least realize that if you can't believe it is not because reason prevents you, since it doesn't (but because your emotions or prejudices do).

of your passions. You would like to attain faith, and do not know the way; you would like to cure yourself of unbelief, and ask the remedy for it. Learn of those who have been bound like you, and who now stake all their possessions.* These are people who know the way which you would follow, and who are cured of an ill of which you would be cured. Follow the way by which they began; by acting as if they believed, taking the holy water, having masses said, etc. Even this will naturally make you believe, and deaden your acuteness.†—"But this is what I am afraid of."—And why? What have you to lose?

But to show you that this leads you there, it is this which will lessen the passions, which are your stumbling-blocks.

The end of this discourse.—Now, what harm will befall you in taking this side? You will be faithful, honest, humble, grateful, generous, a sincere friend, truthful. Certainly you will not have those poisonous pleasures, glory and luxury; but will you not have others? I will tell you that you will thereby gain in this life, and that, at each step you take on this road, you will see so great certainty of gain, so much nothingness in what you risk, that you will at last recognise that you have wagered for something certain and infinite, for which you have given nothing.

"Ah! This discourse transports me, charms me," etc.

If this discourse pleases you and seems impressive, know that it is made by a man who has knelt, both before and after it, in prayer to that Being, infinite and without parts,‡ before whom he lays all he has, for you also to lay before Him all you have for your own good and for His glory, that so strength may be given to lowliness.

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The heart has its reasons, which reason does not know. We feel it in a thousand things. I say that the heart naturally loves the Universal Being, and also itself naturally, according as it gives itself to them; and it hardens itself against one or the other at its will. You have rejected the one, and kept the other. Is it by reason that you love yourself? ■

Suggestions for Critical Reflection

1. "[Y]ou must wager. It is not optional." Why do you think Pascal insists on this? Is he right?

2. "And so our proposition is of infinite force, when there is the finite to stake in a game where there are equal risks of gain and of loss, and the infinite to gain. This is demonstrable; and if men are capable of any truths, this is one." This is arguably the heart of Pascal's Wager: what exactly is he saying here? How persuasive is it?

3. Some may object that, while it is all very well to say that we should choose to believe in God, beliefs are not the sort of thing we can simply choose to have or not have. This kind of objection has been made to Pascal's Wager many times. How adequately do you think he deals with the problem? Imagine that somebody offered you $100 if you would sincerely believe that all the dogs and cats on earth were controlled by aliens on the planet Zarkon. Could you sincerely believe it? Suppose we can bring ourselves to believe in something, by a process other than reasoning (i.e., by a process other than relying on evidence or argument): how authentic would such a belief be?

4. Pascal was a scientist and a mathematician, and one of the key figures in the development of the scientific method; in science, reason is supreme in the pursuit of truth and the emotions or presumptions have no role. Yet in the *Pensées* he argues (using

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* "Stake all their possessions": wager all they have.

† Pascal uses the word *abêtira*, which implies becoming more like an unthinking, instinctive animal than a human being, who is separated from the beasts by possessing the (in this case unhelpful) capacity to reason.

‡ Indivisible.

reason) that reason has no role in the apprehension of religious truth. This can seem to have an air of paradox. Is it in fact paradoxical? What do you think is going on here?

5. Although Pascal's Wager can seem fairly straightforward as an argument, there is disagreement among commentators as to what it is actually supposed to show. Is it intended to establish that *the only rational option* is to bet that God exists (to choose to be religious)? Or is it really meant to show that logical reasoning *cannot support either* faith or a lack of faith and that therefore, since there is no good reason to choose one over the other, we need some other principle to allow us to decide (since we have no choice except to decide)? Think carefully about the difference between these two interpretations. Which do you think is the right one? Irrespective of what Pascal actually intended, which do you think is the more plausible argument?

6. Suppose Pascal persuades us that we should choose to be religious. Which religion should you choose, and how would you make this decision?

7. What are the limits of reason?