

BLAISE PASCAL

B. PASCAL was born in 1632 at Clermont, in a distinguished family of magistrates, where religious tradition went hand in hand with scientific preoccupations. Little Blaise was brought up in a circle of researchers, such as mathematicians Fermat, Roberval, Desargues, – and as early as the age of twelve he was admitted at the meetings of what later on would become the French Academy of Sciences. This privilege was the result of a touching episode: on the base of a simple definition of Mathematics as the science helping to build correct, exact figures, and to find proportions among them, he formulated all by himself the fundamental theorems of Geometry, demonstrating them after he had also found the corresponding axioms and definitions. Without having really created Geometry, as the legend goes, he spontaneously discovered the deductive method. Attending the circle of mathematicians lead by Père Mersenne, Descartes's friend, helped him develop his exceptional skills. At the age of fifteen, he had a treatise on *Conical Sections* published. In it, the need for synthesis on the one hand, and the need for covering truth on all its facets, on the other hand, proved his foregoers the child's genius. The same needs lead him to discovering the computation machine. There were at the moment Napier's "sticks"; Pascal succeeds in making the subtractions mechanically. The discovery would be done by rationalizing and on the basis of the hypothesis that the various computations hide a sole movement of the reason and one should find a correspondent in mechanical movement to the dynamism of mathematical thinking. In spite of his opposition to Descartes, supported by Fermat and Roberval, he proves to belong to the family of modern idealists, whose standard bearer was Descartes.

0 His meeting the two Jansenist gentlemen and thinkers from Port Royal lead to his first conversion. The theory of grace and predestination would not drive him out of his preoccupations as a mathematician, completed at the moment by his research on the vacuum. God, in which he had always believed, became just a logical need.

Père Mersenne had brought from Italy the rumor of Toricelli's experiments on the vacuum. Pascal performed a series of experiments at Puy-de-Dôme and in Paris, at Tour Saint-Jacques also, whose results were published in 1647 in *Nouvelles Expériences touchant le Vide*¹, where he contradicted Aristotle and supported the existence of the vacuum. Although the experiment had been copied, although the problem had been approached before, he came up with a great novelty: he contradicted in the name of facts a theory supported in the name of reason and proclaimed experiment as the only

acceptable proof to confirm a hypothesis. Secondly, within a particular problem, Pascal discovered a universal principle, for the experiments on the vacuum lead him to establishing a complete analogy between the pressure of the atmosphere and that of liquids. In 1651 he formulated the first modern theory on hydrostatics, with the fundamental principles clearly worded and illustrated. His father's death made him seek consolation in more earthly preoccupations. In the glamorous salons of Paris he met libertines like Miton, Epicureans like Des Barreau and above all, that most accomplished type of gentleman, "honnête homme"², who was de Méré. The companionship of this man of the world had a great influence upon Pascal, as he opposed to the logic and scientific spirit, the flexibility of common sense. The famous *Traité sur les Passions de l'Amour*³ dates back to this epoch.

Besides the spirit for geometry, Pascal came to recognize the spirit of fineness as well. There were rumors about a love affair and his decision of getting married. His interest in Mathematics increased. The year 1653–54, important for his definitive conversion, was also the year of his intense preoccupation with the Indivisibles. Reason proved to be insufficient for explaining mathematical reality. In *Lettres de Dettonville* (his literary pseudonym) the old geometrical conception is considered to be insufficient and the Indivisibles, which so defied reason, i.e. old mathematics and common sense, surpass their limits and reveal a still unknown realm. Pascal foresaw new methods of investigation, in accordance with the new realities. But the balance attained rationally was undermined at the moment by his preoccupations about the irrational, both in Mathematics and in life. His relation with an abstract and philosophical God started to hurt him.

His clear and self-possessed consciousness overflow through a great sentiment. The influence of Sister Jacqueline, the one whom he had vainly tried to dissuade from joining the Port-Royal convent, was preparing in his soul a new crystallization, hurried by Father Singlin's preach. On the night of November 23 1654, Pascal had a clear vision upon the whole truth. Thrilled by it, he put on paper a series of interjections, like words torn from his soul. It was like an inspiration flooding the whole of his being and raising him to a new sort of knowledge. The marvelous healing of his own niece determined him to withdraw to Port-Royal.

There, in that hideaway and place of meditation, the problems tormenting both Pascal the mathematician and Pascal the man increased in acuteness. Together with Arnauld, Nicole and other thinkers, whose fervor purified French spirituality, he deepened the philosophical attitude up to religiousness.

Without properly retiring from the world, Pascal stood aside from noisy life, watching it carefully, but with his consciousness away from it. Under the pseudonym of Louis de Montalte he published a series of 18 letters, *Lettres à un Provincial*, in which he defended the faith of those in Port-Royal, demolishing with an amazing richness of arguments and an unsurpassed humor the Jesuit argumentation. Basically, this fight is nothing than the opposition between two moral systems, out of which Pascal defends the

purser one. He proved in these letters, highly appreciated by his contemporaries, to be France's greatest polemist and also its great prose writer, who also established the classic principles.

Continuously ill, he lived either all by himself, in a small hotel in Paris, under a false name, or with his sister, Mrs. P  rier, and was permanently pre-occupied by mathematical problems, as well as by the preparation of an "Apology of Christianity".

A more and more convinced anchorite, he gave up altogether not only the pleasures of life, but also even the most common joys, and died at the age of 39.

Pascal's philosophy is systematically formulated only in two treatises of exact science methodology: *Traite sur le Vide*⁴ and *L'Esprit de G  om  trie*⁵. Otherwise, it is spread among the reflections taken down by chance inspiration and meant to be used in a synthesis work. They were all published after his death, in 1669, by Port-Royal, under the title: *Pens  es sur la Religion et sur la Morale*⁶. Organized according to a plan which Pascal had presented long before in a circle of friends, they sketch the structure of an "Apology to Christianity", which Pascal had intended as a crowning of his research. Illness and premature death impeded him from accomplishing it.

Among the works of scientific methodology and reflection upon man's fate and salvation, he wrote the famous *Discours sur les Passions de l'Amour*⁷, which for a long time was not even considered as Pascal's.

In *Pr  face du Traite sur le Vide*⁸ and in *L'Esprit de G  om  trie*, which are the first treatises of modern science philosophy, Pascal mentions the nature and mechanism of the scientific method. Different from the historical and theological method, which have no other foundation than tradition and authority, the scientific method bases its knowledge on demonstration and experiment. The latter is actually the supreme way of verifying a hypothesis.

Pascal's modern consciousness is also betrayed by the daring statement that, even in a theological discussion, proof is more important than the Pope's authority.

The study on emptiness gives him an opportunity to deny not only Aristotle's physics, but also the whole obsolete methodology of Scholastics, that misses the scientific spirit because it takes the "real" for the "discourse". The blow is directed towards Descartes, for Pascal finds the intellectualizing geometry of the algebraist suspect and considers it as empty formalism.

In fact, the difference between the two was striking, since for Descartes, the spirit makes up its own principles, before meeting nature, while for Pascal, on the contrary, the development of the spirit starts from the knowledge of nature.

He only acknowledged the injustice done to his predecessor towards the end of his life, but this was just another proof of the attention paid by modern man to scientific truth, keeping it away from purely nominal definitions and basing it on decisive experiments only.

In the two treatises, Pascal determines and establishes the method of modern sciences, with the clear consciousness that it is he, the physicist alone, who can do it.

The old geometrical spirit was dreaming of a science based on demonstrations only; Pascal himself acknowledges that there is an inner contradiction in this Claim. The fact that the first principles of geometry are no longer to be demonstrated since they are obvious, does not bother him; on the contrary, he admires in this an effect of nature "*qui seule est toute bonne et toute saine*".⁹

Geometry is certain, although it departs from the order of ideal mathematics, even if less convincing than this, as it is forced to stop in front of principles that can no longer be demonstrated.

But the irrational is not only a negative limit of reason; it is also a positive trait of the very mathematical object. For instance: the infinite is irrational, which means it is of a different nature than reason, without being absurd. Pascal keeps on insistently repeating: "*ce qui n'est pas compréhensible, ne laisse pas d'être*".¹⁰ Actually, the irrational fits into the rational by the very decision of our reason: "*la dernière démarche de la raison est de reconnaître qu'il y a une infinité de choses qui la surpassent*"¹¹. Beyond reasonable knowledge, there are "*les pensées qui viennent du coeur*"¹². One example of such thinking, coming from the heart, is given by Pascal in connection with the intuition of the three-dimensional space. As clear and evident as they may be, even if impossible to prove, we recognize in these "thoughts coming from the heart" or "irrational thoughts", the intuitions that would become with Kant the a priori intuitions. Terminology cannot lead us so far astray as to interpret the irrational element as having a sentimental nature. For Pascal clearly distinguishes these thoughts both from imagination and from sensitive intuition, as well as from the feeling proper. We therefore recognize in them the new tool of modern mathematics and we realize that Pascal, being keen on making the difference between the reason that uses demonstration and the "reason that comes from the heart" ("*le coeur a des raisons que la raison ne connaît pas*"¹³) distinguishes only the synthetic thinking from the analytical one. And when, alongside with the mathematical infinite, he gives God as an example of such irrationality, we can not consider that he introduces a mystical element in mathematics, but through this analogy, he enlarges the horizon of knowledge, opening new perspectives towards a new field of research.

The theory of knowledge is oriented through Pascal towards exact science. This is one of the two fundamental characteristics of his philosophy.

But the problem of science and the theory of knowledge got complicated when entangled with the psychological and moral problem, as a result of a period of mundane life, when Pascal got near people, whom he knew very little, having looked at them without any particular attention and who were suddenly raising his passionate interest. On the other hand, the influence of

Jansenism made him discover in man at least as ardent a need as the one for truth: the keen need of happiness.

Pushed by his religious interest, he concentrated all his attention on the aim of life. This requested a prior examination of human nature.

As a psychologist, he took advantage of Montaigne's rich heritage, of the vast material for observation and personal experience, as well as the one gathered from others by his predecessor. The objective finding of the contradiction defining Montaigne's man, in his double condition of angel and beast, is changed by Pascal into a tragic feeling that forces him out of the quietness of rational understanding. In order to force his chance of redeeming in the excruciation which the original sin has thrown man into, he advises him to abandon himself to the adventure of the irrational "action" of loving God. This is the famous "bet" in which the philosopher demonstrates, with the pathetic accent of a great poet, that man, caught within an irremediable contradiction, can only be saved by betting on the existence of God.

Pascalian psychology, entirely dominated by the contradiction between man's aspiration towards happiness and the impossibility of reaching it, between the thirst for God and the impossibility of knowing him, is meaningless in itself, as with Montaigne; it is nothing but the preparing knowledge, which should lead man to faith. For, it is only the theory of the original sin that can, according to Pascal, explain man's double nature. Yet, the religious foundation of psychology does not prevent him from observing man with the same attention with which he observes natural phenomena, and from introducing the same precision in the study of life. He thus enriches psychology proper with a number of valuable observations. In *"Discours sur les Passions de l'Amour"*, he points out the psychical mechanism and describes with subtle shades the fineness characteristics of the spirit, which goes deep down into the farthest consequences of principles. He also reveals its spirit of geometry that unmistakably distinguishes among the principles. One gives a glimpse of the profoundness, the other on the vastness of the spirit. In the same study, preceding the *"Pensées"*, Pascal proclaims love as man's root and destiny, *origin and target*. If this seems to contradict the passages from the *"Pensées"* where the essence of man is found in thinking, the contradiction disappears in the definition that Pascal gives to love, as moving thinking (*"de la pensée en mouvement"*). Pascal's psychology is finally just a proof, a confirmation of the necessity and validity of Christian religion. For the aim of man being outside him, in God, Pascalian psychology does not even prepare a moral realm proper, but a religion.

Moral itself is nothing but the shortcut from science to religion, for although it is based on the principle *"bien penser"*¹⁴ it is not fulfilled and it does not attain its target otherwise than within Christian revelation. The religious base explains in fact its two characteristics: 1. It is an individualist moral, in which individuality is restricted up to being singularity (*"puisqu'on meurt seul, il faut vivre seul"*¹⁵) and 2. Human solidarity appears beyond individual consciousness, in the focus everyone strives for – in God. Human

community is understood as the spiritual community of the saints and believers, excluding the pagans, whose virtues are nothing to learn from. Such a conception would reveal Pascal as being reactionary with respect to the humanitarian conceptions of the epoch, if the meaning of all these assertions did not round up and clarify his religion.

Everything human being can do by its own powers is to look for God, that is the absolute truth. But finding God, as well as the redeeming, is not up to him, it is something given. In spite of the pessimism of such a vision, Pascal's moral stays dynamic. Searching is man's only fate and possible happiness on earth: "rien ne donne le repos que la recherche sincère de la vérité"¹⁶.

But salvation is outside man's means: God saves whoever He wants; thus, moral has an anchor in the theory of grace and predestination. But Christian religion, based on the belief in a mediator between God and man, places all its hopes in Jesus Christ the Redeemer. However great man's repentance would be, his sin has no other solution than the redemption through the Redeemer. Pascal opposes the belief that man is preparing his own eternity by his deeds also, by the Jansenist belief that it is only divine grace that decides.

His giving up understanding and willing acceptance of mystery is often considered as an abdication from the rationalism of science. Whatever had been obtained by young science up to him, seems to be compromised by the affirmation that "*God can only be an aim because He is a principle*". That is why many critics consider there is an irremediable scission between Pascal the mathematician and physician on the one hand and Pascal the mystic on the other hand. But a closer look at the religious chapters in the "Pensées", as well as the irrational introduced in Mathematics, reveals the logical articulation of Pascal's two characteristic moments: science and faith.

Science is the rational and experimental search for truth. But the real search is only the one that never stops. Christianity is another method of searching. If Pascal only accepts as being a sincere one the painful search for truth, the search paid with the whole of one's being, – "*chercher en gemissant*"¹⁷, this does not mean he despises rational, objective research. The opposition of the two is more the expression of a methodical difference than that of a predilection. The methods of research and knowing had to be set some boundaries to; if mathematics is a tool for knowing the universe, faith – "*la foi*" – is the means of searching for God. And Pascal is keen on the necessity of a precise separation of the two methods, as well as between their two fields. Not for a moment does Pascal support the idea of a science about God, as he can not think of faith as a way of knowing the universe. In fact, faith itself is not a way of finding God, but just of looking for Him. For what faith reveals is not God, but man himself. It is striking how this connotation has escaped the critics. Faith discovers, or more exactly explains the human depths. As for God, no method of research, not even the faith-love can reach Him. God gives Himself to the one He Himself chooses; revelation is beyond

any research. Man can elevate himself by searching, from the discovery of the relative up to the feeling of the absolute. But knowing the absolute is an absurdity. Faith, love, humbleness – all these attitudes of the soul in which Pascal keenly sees an irrational character – prepare man for the revelation; but he has no active part in it. They are nothing but the way towards the absolute but untouchable Truth. Because it stays outside irrational, as well as rational knowledge.

Faith is intuition proper, which is neither anti-, nor sur-rational: “elle est au-dessus, et non pas contre”¹⁸. Yet, if Pascal keeps on humiliating reason and the truth revealed by it, he only does it in order to prevent inertia, and the turning of the truth discovered by our mind into an idol. Whatever truth we have revealed can only be a step towards the absolute truth.

Not only that man is unable to discover the whole truth by any means, but even when this is revealed to him, he cannot keep it. The only attitude that makes him capable of living is submission. For Pascal, submission of thinking does not mean its darkening or stupidity, but an intensification of thinking as inspiration. Actually not only that he does not deny the role of reason and science, but he even assigns them an important part to play in the economy of consciousness. “Il faut savoir douter où il faut, assurer où il faut, se soumettre où il faut; qui ne fait ainsi, n’entend pas la force de la raison”¹⁹ and further on “en doutant de tout, en se soumettant à tout, on manque de savoir où il faut juger”²⁰. And then he defines Christianity itself as a means of knowing, in which reason and obedience have, each, its own place: “soumission ou usage de la raison: en quoi consiste le vrai christianisme”²¹.

Therefore, man’s breaking with rational order, his introduction through faith into a new, spiritual order is not a blow given to positive science, but the affirmation of an infinite chain of levels of knowing, to which one can not get by argumentation, but by repeated leaps of consciousness from the known into the unknown. Love is the word in which Pascal concentrates all this dynamism of the spirit, and through which he stresses the action of thinking, opposing it to the passive, non-creative one. “L’amour est de la pensée en mouvement”²². During his religious conversion, he did not deny scientific activity, but transposed his mathematical discovery in all the registers of consciousness. Similar to the different grades of indefinites which are not connected by continuity since the passage from an inferior grade to a superior one is not a gradual one, but it is made by leaps, one can not pass from scientific, rational knowing to faith, from the relative to the absolute truth by accumulation and continuity of proofs, but by a leap of consciousness from demonstrative thinking to love as creative knowing.

The demonstration leading to the probability of God is a means that lowers faith to an inferior human level. It is only love, which is knowing of a different order, that places man on the level of holiness. However far man would advance on the intellectual path, he can not find a superior achievement, which is of a spiritual order, and neither can he fulfill himself unless he lives the other kind of knowing as well, i.e. faith. Far from being

approached sentimentally, it is nothing but a new register of thinking itself, it is inspired thinking. For, after all, thinking has always been the mark of human dignity and nobleness.

The legend of the split between Pascal the mathematician and Pascal the Christian has been spread by his sister, Mrs. Périer. In her desire to show Pascal in the light of perfect orthodoxy and of a holiness that protected his memory against any blame from the Catholic Church, she insisted more than necessary on the indifference shown by Pascal to exact science in his last years. Today, it is known that, although ill, he was preoccupied by the calculation of probabilities up to his last days and that the famous conversion of 1654 coincides with his keenest interest in the indivisibles. Naturally, the asceticism of the great thinker also touched his intellectual assets, blaming their vanity, but pointing out their relative character and not demolishing them. Under the apparent despise for science he just stressed its relative character, thus strengthening by clarification the very imperative of modern spirit, which, humbly, abandons the haughtiness of the absolute: "il n'y a rien de si conforme à la raison que ce désaveux de la raison"²³. Being a believer, he introduced mystery as a new dimension of modern scientific consciousness and saved it from the spiritual sin which is the halt, even if this is done within a probable truth.

Actually, the approach, even in those of the "Pensées" where Pascal's mysticism is manifest, is still the rational-geometric one.

If Pascal discovered in man an incurable contradiction, and proclaimed, with a deep tragical feeling, his hopeless fate, since he is waiting for salvation without any certitude that it will be given by God's impenetrable will, this very uncertainty turned into a horizon with infinite possibilities for the Christian mathematician. After reason had lead Pascal to its limits, urging him to take the step into faith, the latter, in its turn, opened the endless horizon that calls one's mind to search.

Pascal is a particularly outstanding figure in the history of thinking. He embodied the universal genius of Renaissance that does not stop at certain faculties and fields, but surpasses the usual limits of thinking, enlarging them and covering even its contrary meanings. By accomplishing an overwhelming synthesis of the most irreconcilable contrasts, he prepared the way to a future culture, whose extremely large horizon would include new fields of research.

Considered for a long time as an isolated branch in the history of philosophy, abandoned to the scientific and literary history, Pascal returns today in the foreground of philosophic interest. He is the thinker in which all the fundamental trends of the sixteenth century meet, the one who achieves the superior synthesis of an epoch's genius, and who, above all, is the representative type of human genius.

(1937)

NOTES

1. *New Experiments On the Vacuum*. French in the original. Note of the translator.
2. "Honest man" or "decent man". French in the original. Note of the translator.
3. *Treatise On the Passions of Love*. French in the original. Note of the translator.
4. *Treatise On the Vacuum*. French in the original. Note of the translator.
5. *The Spirit of Geometry*. French in the original. Note of the translator.
6. *Meditations On Religion and On Morals*. French in the original. Note of the translator.
7. *Discourse On Love's Passion*. French in the original. Note of the translator.
8. *Preface to the Treatise On the Vacuum*. French in the original. Note of the translator.
9. "which is the only good and perfect thing". French in the original. Note of the translator.
10. "the incomprehensible still exists". French in the original. Note of the translator.
11. "the final act of reason is to acknowledge that there is an infinity of things that surpass it". French in the original. Note of the translator.
12. "The things coming from the heart". French in the original. Note of the translator.
13. "the heart has reasons that reason does not know". French in the original. Note of the translator.
14. "think proper". French in the original. Note of the translator.
15. "since we die alone, we should live alone". French in the original. Note of the translator.
16. "there is nothing more comforting than the sincere search of the truth". French in the original. Note of the translator.
17. "groaning while searching ". French in the original. Note of the translator.
18. "it is above and not anti". French in the original. Note of the translator.
19. "One has to doubt when necessary, be sure, when necessary, obey when necessary; the one who does not do like that does not understand the force of reason". French in the original. Note of the translator.
20. "by doubting everything, by obeying to everything, one fails to know when one has to judge". French in the original. Note of the translator.
21. "obedience or usage of one's reason: this is what real Christianity consists in". French in the original. Note of the translator.
22. "Love is moving thinking". French in the original. Note of the translator.
23. "there is nothing so reasonable as this disapproval of the reason". French in the original. Note of the translator.

(A. B.)