PASCAL, BLAISE (1623-1662), French religious philosopher and mathematician, was born at Clermont Ferrand on the 19th of June 1623. His father was Étienne Pascal, president of the Court of Aids at Clermont; his mother’s name was Antoinette Bégon. The Pascal family were Auvergnats by extraction as well as residence, had for many generations held posts in the civil service, and were ennobled by Louis XI. in 1478, but did not assume the de. The earliest anecdote of Pascal is one of his being bewitched and freed from the spell by the witch with strange ceremonies. His mother died when he was about four years old, and left him with two sisters—Gilberthe, who afterwards married M. Perier, and Jacqueline. Both sisters are of importance in their brother’s history, and both are said to have been beautiful and accomplished. When Pascal was about seven years old his father gave up his official post at Clermont, and betook himself to Paris. It does not appear that Blaise, who went to no school, but was taught by his father, was at all forced, but rather the contrary. Nevertheless he has a distinguished place in the story of precocious children, and in the much more limited chapter of children whose precocity has been followed by great performance at maturity, though he never became what is called a learned man, perhaps did not know Greek, and was pretty certainly indebted for most of his miscellaneous reading to Montaigne.

The Pascal family, some years after settling in Paris, had to go through a period of adversity. Étienne Pascal, who had bought some of the hôtel-de-ville rentes, protested against Richelieu’s reduction of the interest, and to escape the Bastille had to go into hiding. He was, according to the story (told by Jacqueline herself), restored to favor owing to the good acting and graceful appearance of his daughter Jacqueline in a representation of Scudéry’s Amour tyrannique before Richelieu. Mme d’Aiguillon’s intervention in the matter was perhaps as powerful as Jacqueline’s acting, and Richelieu gave Étienne Pascal (in 1641) the important and lucrative [879] though somewhat troublesome intendantship of Rouen. The
family accordingly removed to the Norman capital, though Gilberte Pascal shortly after, on her marriage, returned to Clermont. At Rouen they became acquainted with Corneille, and Blaise pursued his studies with such vehemence that he already showed signs of an injured constitution. Nothing, however, of importance happened until the year 1646. Then Pascal the elder was confined to the house by the consequences of an accident on the ice, and was visited by certain gentlemen of the neighborhood who had come under the influence of Saint-Cyran and the Jansenists. It does not appear that up to this time the Pascal family had been condemners of religion, but they now eagerly embraced the creed, or at least the attitude of Jansenism, and Pascal himself showed his zeal by informing against the supposed unorthodoxy of a Capuchin, the Père Saint-Ange.

His bodily health was at this time very far from satisfactory, and he appears to have suffered, not merely from acute dyspepsia, but from a kind of paralysis. He was, however, indefatigable in his mathematical work. In 1647 he published his *Nouvelles expériences sur le vide*, and in the next year the famous experiment with the barometer on the Puy de Dome was carried out for him by his brother-in-law Perier, and repeated on a smaller scale by himself at Paris, to which place by the end of 1647 he and his sister Jacqueline had removed, to be followed shortly by their father. In a letter of Jacqueline’s, dated the 27th of September, an account of a visit paid by Descartes to Pascal is given, which, like the other information on the relations of the two, give strong suspicion of mutual jealousy. Descartes, however, gave Pascal the very sensible advice to stay in bed as long as he could (it may be remembered that the philosopher himself never got up till eleven) and to take plenty of beef-tea. As early as May 1648 Jacqueline Pascal was strongly drawn to Port Royal, and her brother frequently accompanied her to its church. She desired indeed to join the convent, but her father, who returned to Paris with the dignity of counsellor of state, disapproved of the plan, and took both brother and sister to Clermont, where Pascal remained for the greater part of two years. E. Fléchier, in his account of the Grands tours at Clermont many years after, speaks of a “belle savante” in whose company Pascal had frequently been a trivial mention on which, as on many other trivial points of scantily known lives, the most childish structures of comment and conjecture have been based. It is sufficient to say that at this time, despite the Rouen “conversion,” there is no evidence to show that Pascal was in any way a recluse, an ascetic, or in short anything but a young man of great intellectual promise and performance, not indifferent to society, but of weak health. He, his sister and their father returned to Paris in the late autumn of 1650, and in September of the next year Étienne
Pascal died. Almost immediately afterwards Jacqueline fulfilled her purpose of joining Port Royal—a proceeding which led to some soreness, finally healed, between herself and her brother and sister as to the disposal of her property. It has sometimes been supposed that Pascal, from 1651 or earlier to the famous accident of 1654, lived a dissipated, extravagant, worldly, luxurious (though admittedly not vicious) life with his friend the duc de Roannez and others. His *Discours sur les passions de l’amour*, a striking and characteristic piece, not very long since discovered and printed, has also been assigned to this period, and has been supposed to indicate a hopeless passion for Charlotte de Roannez, the duke’s sister. But this is sheer romancing. The extant letters of Pascal to the lady show no trace of any affection (stronger than friendship) between them. It is, however, certain that in the autumn of 1654 Pascal’s second “conversion” took place, and that it was lasting. He betook himself at first to Port Royal, and began to live a recluse and austere life there. Mme Perier simply says that Jacqueline persuaded him to abandon the world. Jacqueline represents the retirement as the final result of a long course of dissatisfaction with mundane life. But there are certain anecdotic embellishments of the act which are too famous to be passed over, though, they are in part apocryphal. It seems that Pascal in driving to Neuilly was run away with by the horses, and would have been plunged in the river but that the traces fortunately broke. To this, which seems authentic, is usually added the tradition (due to the Abbé Boileau) that afterwards he used at times to see an imaginary precipice by his bedside, or at the foot of the chair on which he was sitting. Further, from the 23rd of November 1654 dates the singular document usually known as “Pascal’s amulet,” a parchment slip which he wore constantly about him, and which bears the date followed by some lines of incoherent and strongly mystical devotion.

It must be noted that, though he lived much at Port Royal, and partly at least observed its rule, he never actually became one of its famous solitaries. But for what it did for him (and for a time his health as well as his peace of mind seems to have been improved) he very soon paid an ample and remarkable return. At the end of 1655 Arnauld, the chief light of Port Royal, was condemned by the Sorbonne for heretical doctrine, and it was thought important by the Jansenist and Port Royal party that steps should be taken to disabuse the popular mind. Arnauld would have undertaken the task himself, but his wiser friends knew that his style was anything but popular, and overruled him. It is said that he personally suggested to Pascal to try his hand, and that the first of the famous *Provinciales* (*Provincial Letters*, properly *Lettres écrites par Louis de Montalte à un*
provincial de ses amis) was written in a few days, or, less probably, in a day. It was printed without the real author’s name on the 23rd of January 1656, and, being immensely popular, and successful, was followed by others to the number of eighteen.

Shortly after the appearance of the Provinciales, on the 24th of May 1656, occurred the miracle of the Holy Thorn, a fragment of the crown of Christ preserved at Port Royal, which cured the little Marguerite Perier of a fistula lacrymalis. The Jesuits were much mortified by this Jansenist miracle, which, as it was officially recognized, they could not openly deny. Pascal and his friends rejoiced in proportion. The details of his later years after this incident are somewhat scanty. For years before his death we hear only of acts of charity and of, as it seems to modern ideas, extravagant asceticism. Thus Mme Perier tells us that he disliked to see her caress her children, and would not allow the beauty of any woman to be talked of in his presence. What may be called his last illness began as early as 1658, and as the disease progressed it was attended with more and more pain, chiefly in the head. In June 1662, having given up his own house to a poor family who were suffering from small-pox, he went to his sisters house to be nursed, and never afterwards left it. His state was, it seems, mistaken by his physicians, so much so that the offices of the Church were long put off. He was able, however, to receive the Eucharist, and soon afterwards died in convulsions on the 19th of August. A post mortem examination was held, which showed not only grave derangement in the stomach and other organs, but a serious lesion of the brain.

Eight years after Pascal’s death appeared what purported to be his Pensées, and a preface by his nephew Perier gave the world to understand that these were fragments of a great projected apology for Christianity which the author had, in conversation with his friends, planned out years before. The editing of the book was peculiar. It was submitted to a committee of influential Jansenists, with the due de Roannez at their head, and, in addition, it bore the imprimatur of numerous unofficial approvers who testified to its orthodoxy. It does not appear that there was much suspicion of the garbling which had been practiced—garbling not unusual at the time, and excused in this case by the fact of a lull in the troubles of Port Royal and a great desire on the part of its friends to do nothing to disturb that lull. But as a matter of fact no more entirely factitious book ever issued from the press. The fragments which it professed to give were in themselves confused and incoherent enough, nor is it easy to believe that they all formed [880] part of any such single and coherent design as that referred to above. But the editors
omitted, altered, added, separated, combined and so forth entirely at their pleasure, actually making some changes which seem to have been thought improvements of style. This rifacimento remained the standard text with a few unimportant additions for nearly two centuries, except that, by a truly comic revolution of public taste, Condorcet in 1776 published, after study of the original, which remained accessible in manuscript, another garbling, conducted this time in the interests of unorthodoxy. It was not until 1842 that Victor Cousin drew attention to the absolutely untrustworthy condition of the text, nor till 1844 that A.P. Faugère edited that text from the MS. in something like a condition of purity, though, as subsequent editions have shown, not with absolute fidelity. But even in its spurious condition the book had been recognized as remarkable and almost unique. Its contents, as was to be expected, are of a very chaotic character—of a character so chaotic indeed that the reader is almost at the mercy of the arrangement, perforce an arbitrary arrangement, of the editors. But the subjects dealt with concern more or less all the great problems of thought on what may be called the theological side of metaphysics the sufficiency of reason, the trustworthiness of experience, the admissibility of revelation, free will, foreknowledge, and the rest. The peculiarly disjointed and fragmentary condition of the sentiments expressed by Pascal aggravates the appearance of universal doubt which is present in the Pensées, just as the completely unfinished condition of the work, from the literary point of view, constantly causes slighter or graver doubts as to the actual meaning which the author wished to express. Accordingly the Pensées have always been a favorite exploring ground, not to say a favorite field of battle, to persons who take an interest in their problems. Speaking generally, their tendency is towards the combating of skepticism by a deeper skepticism, or, as Pascal himself calls it, Pyrrhonism, which occasionally goes the length of denying the possibility of any natural theology. Pascal explains all the contradictions and difficulties of human life and thought by the doctrine of the Fall, and relies on faith and revelation alone to justify each other.

Excluding here his scientific attainments (see below), Pascal presents himself for comment in two different lights, the second of which is, if the expression be permitted, a composite one. The first exhibits him as a man of letters, the second as a philosopher, a theologian, and simply a man, for in no one is the color of the theology and the philosophy more distinctly personal. Yet his character as a man is not very distinct. The accounts of his sister and niece have the defect of all hagiology; they are obviously written rather with a view to the ideas and the wishes of the writers than with a view to the actual and absolute personality of the
subject. Except from these interesting but somewhat tainted sources, we know little or nothing about him. Hence conjecture, or at least inference, must always enter largely into any estimate of Pascal, except a purely literary one.

On that side, fortunately, there is no possibility of doubt or difficulty to any competent inquirer. The Provincial Letters are the first example of French prose which is at once considerable in bulk, varied and important in matter, perfectly finished in form. They owe not a little to Descartes, for Pascal’s indebtedness to his predecessor is unquestionable from the literary side, whatever may be the case with the scientific. But Descartes had had neither the opportunity, nor the desire, nor probably the power, to write anything of the literary importance of the Provinciales. The first example of polite controversial irony since Lucian, the Provinciales have continued to be the best example of it during more than two centuries in which the style has been sedulously practiced, and in which they have furnished a model to generation after generation. The unfailing freshness and charm of the contrast between the importance, the gravity, in some cases the dry and abstruse nature, of their subjects, and the lightness, sometimes almost approaching levity in its special sense, of the manner in which these subjects are attacked is a triumph of literary art of which no familiarity dims the splendor, and which no lapse of time can ever impair. Nor perhaps is this literary art really less evident in the Pensées, though it is less clearly displayed, owing to the fragmentary or rather chaotic condition of the work, and partly also to the nature of the subject. The vividness and distinction of Pascal’s phrase, his singular faculty of inserting without any loss of dignity in the gravest and most impassioned meditation what may be almost called quips of thought and diction, the intense earnestness of meaning weighting but not confusing the style, all appear here.

No such positive statements as these are, however, possible as to the substance of the Pensées and the attitude of their author. Hitherto the widest differences have been manifested in the estimate of Pascal’s opinions on the main questions of philosophy, theology and human conduct. He has been represented as a determined apologist of intellectual orthodoxy animated by an almost fanatical “hatred of reason,” and possessed with a purpose to overthrow the appeal to reason; as a skeptic and pessimist of a far deeper dye than Montaigne, anxious chiefly to show how any positive decision on matters beyond the range of experience is impossible; as a nervous believer clinging to conclusions which his clearer and better sense showed to be indefensible; as an almost ferocious ascetic and paradoxer affecting the credo quia impossibile in intellectual matters and the odi
quia amabile in matters moral and sensuous; as a wanderer in the regions of doubt and belief, alternately bringing a vast though vague power of thought and an unequalled power of expression to the expression of ideas incompatible and irreconcilable. An unbiased study of the scanty facts of his history, and of the tolerably abundant but scattered and chaotic facts of his literary production, ought to enable any one to steer clear of these exaggerations, while admitting at the same time that it is impossible to give a complete and final account of his attitude towards the riddles of this world and others. He certainly was no mere advocate of orthodoxy; he as certainly was no mere victim of terror at skepticism; least of all was he a freethinker in disguise. He appears, as far as can be judged from the fragments of, his Pensées, to have seized firmly and fully the central idea of the difference between reason and religion. Where the difficulty rises respecting him is that most thinkers since his day, who have seen this difference with equal clearness, have advanced from it to the negative side, while he advanced to the positive. In other words, most men since his day who have not been contented with a mere concordat, have let religion go and contented themselves with reason. Pascal, equally discontented with the concordat, held fast to religion and continued to fight out the questions of difference with reason. Surveying these positions, we shall not be astonished to find much that is surprising and some things that are contradictory in Pascal’s utterances on “les grands sujets.” The influence exercised on him by Montaigne is the one fact regarding him which has not been and can hardly be exaggerated, and his well-known Entretion with Sacy on the subject (the restoration of which to its proper form is one of the most valuable results of modern criticism) leaves no doubt possible as to the source of his “Pyrrhonian” method. But it is impossible for anyone who takes Pascal’s Pensées simply as he finds them in connection with the facts of Pascal’s history to question his theological orthodoxy, understanding by theological orthodoxy the acceptance of revelation and dogma; it is equally impossible for any one in the same condition to declare him absolutely content with dogma and revelation. It is of the essence of an active mind like Pascal’s to explore and state all the arguments which make for or make against the conclusion it is investigating.

To sum up, the Pensées are excursions into the great unknown made with a full acknowledgment of the greatness of that unknown. From the point of view that belief and knowledge, based on experience or reasoning, are separate domains with an unexplored sea between and round them, Pascal is perfectly [881] comprehensible, and he need not be taken as a deserter from one region to the other. To those who hold that all intellectual exercise outside the sphere of
There are few writers who are more in need than Pascal of being fully and competently edited. The chief nominally complete edition at present in existence is that of Bossut (1779, 5 vols., and since reprinted), which not only appeared before any attempt had been made to restore the true text of the *Pensées*, but is in other respects quite inadequate. The edition of Lahure, 1858, is not much better, though the *Pensées* appear in their more genuine form. An edition promised for the excellent collection of *Les Grands écrivains de la France* by A.P. Faugère has been executed as far as the *Pensées* go by Léon Brunschvig (3 vols., 1904), who has also issued a one-volume edition. The *Oeuvres complètes* appeared in three volumes (Paris, 1889). Meanwhile, with the exception of the *Provinciales* (of which there are numerous editions, no one much to be preferred to any other, for the text is undisputed and the book itself contains almost all the exegesis of its own contents necessary), Pascal can be read only at a disadvantage. There are five chief editions of the true *Pensées* earlier than Brunschvig’s: that of Faugère (1844), the *editio princeps*; that of Havet (1852, 1867, and 1881), on the whole the best; that of Victor Rochet (1873), good, but arranged and edited with the deliberate intention of making Pascal first of all an orthodox apologist; that of Molinier (1877-1879), a carefully edited and interesting text, the important corrections of which have been introduced into Havet’s last edition and that of G. Michelant (Freiburg, 1896). Unfortunately, none of these can be said to be exclusively satisfactory. The minor works must chiefly be sought in Bossut or reprints of him. Works on Pascal are innumerable: Sainte-Beuve’s *Port Royal*, Cousin’s writing on Pascal and his *Jacqueline Pascal*, and the essays of the editors of the *Pensées* just mentioned are the most noteworthy. Principal Tulloch contributed a useful little monograph to the series of *Foreign Classics for English Readers* (Edinburgh and London, 1878). Recent handlings are, in French, E. Boutroux’s *Pascal* (Paris, 1903) and, in English, an article in the *Quarterly Review* (No. 407) for April 1906. (G.Sa.) = George Saintsbury, LL.D., D.C.L.
physicist is not even greater. In his two former capacities all will admire the form of his work, while some will question the value of his results; but in his two latter capacities no one will dispute either. He was a great mathematician in an age which produced Descartes, Fermat, Huygens, Wallis, and Roberval. There are wonderful stories on record of his precocity in mathematical learning, which is sufficiently established by the well-attested fact that he had completed before he was sixteen years of age a work on the conic sections, in which he had laid down a series of propositions, discovered by himself, of such importance that they may be said to form the foundations of the modern treatment of that subject. Owing partly to the youth of the author, partly to the difficulty in publishing scientific works in those days, and partly no doubt to the continual struggle on his part to devote his mind to what appeared to his conscience more important labor, this work (like many others by the same master hand) was never published. We know something of what it contained from a report by Leibniz, who had seen it in Paris, and from a résumé of its results published in 1640 by Pascal himself, under the title Essai pour les coniques. The method which he followed was that introduced by his contemporary Girard Desargues, viz. the transformation of geometrical figures by conical or optical projection. In this way he established the famous theorem that the intersections of the three pairs of opposite sides of a hexagon inscribed in a conic are collinear. This proposition, which he called the mystic hexagram, he made the keystone of his theory; from it alone he deduced more than 400 corollaries, embracing, according to his own account, the conics of Apollonius, and other results innumerable.

Pascal also distinguished himself by his skill in the infinitesimal calculus, then in the embryonic form of Cavalieri’s method of indivisibles. The cycloid was a famous curve in those days; it had been discussed by Galileo, Descartes, Fermat, Roberval, and Torricelli, who had in turn exhausted their skill upon it. Pascal solved the hitherto refractory problem of the general quadrature of the cycloid, and proposed and solved a variety of others relating to the center of gravity of the curve and its segments, and to the volume and center of gravity of solids of revolution generated in various ways by means of it. He published a number of these theorems without demonstration as a challenge to contemporary mathematicians. Solutions were furnished by Wallis, Huygens, Wren, and others; and Pascal published his own in the form of letters from Amos Dettonville (his assumed name as challenger) to Pierre de Carcavy. There has been some discussion as to the fairness of the treatment accorded by Pascal to his rivals, but no question of the fact that his initiative led to a great extension of our knowledge
of the properties of the cycloid, and indirectly hastened the progress of the differential calculus.

IN yet another branch of pure mathematics Pascal ranks as a founder. The mathematical theory of probability and the allied theory of the combinatorial analysis were in effect created by the correspondence between Pascal and Fermat, concerning certain questions as to the division of stakes in games of change, which had been propounded to the former by the gaming philosopher De Mere. A complete account of this interesting correspondence would surpass our present limits; but the reader may be referred to Todhunter’s History of the Theory of Probability (Cambridge and London, 1865), pp. 7-21. It appears that Pascal contemplated publishing a treatise De aleae geometria; but all that actually appeared was a fragment on the arithmetical triangle (Traité du triangle arithmétique, “Properties of the Figurate Numbers”), printed in 1654, but not published until 1665, after his death.

Pascal’s work as a natural philosopher was not less remarkable than his discoveries in pure mathematics. His experiments and his treatise (written before 1651, published 1663) on the equilibrium of fluids entitle him to rank with Galileo and Stevinus as one of the founders of the science of hydrodynamics. The idea of the pressure of the air and the invention of the instrument for measuring it were both new when he made his famous experiment, showing that the height of the mercury column in a barometer decreases when it is carried upwards through the atmosphere. This experiment was made by himself in a tower at Paris, and was carried out on a grand scale under his instructions by his brother-in-law Florin Périer on the Puy de Dome in Auvergne. Its success greatly helped to break down the old prejudices, and to bring home to the minds of ordinary men the truth of the new ideas propounded by Galileo and Torricelli.

Whether we look at his pure mathematical or at his physical researches we receive the same impression of Pascal; we see the strongest marks of a great original genius creating new ideas, and seizing upon, mastering, and pursuing farther everything that was fresh and unfamiliar in his time. We can still point to much in exact science that is absolutely his; and we can indicate infinitely more which is due to his inspiration. (G. Ch. = George Chrystal, M.A., LL.D., Encyclopedia Britannica, Eleventh Edition (1911), Vol. 20: 881

Philosopher and Mathematician (881) G.Ch. = George Chrystal, M.A., LL.D. 

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