## Fontenelle, Bernard Le Bouyer (or Bovier) De l Encyclopedia.com

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(b. Rouen, France, 11 February 1657; d. Paris, France, 9 January 1757)

dissemination of knowledge, mathematics, astronomy.

Fontenelle's father, François Le Bouyer, écuyer, sieur de Fontenelle, was originally from Alençon; his mother, Marthe Corneille, sister of Pierre and Thomas Corneille, came from Rouen. The family was of modest means and lived in rented quarters in Rouen. His father, *sous-doyen des avocats* in the Parlement of Rouen, was "a man of quality but of mediocre fortune" and practiced his profession "with more honor than fame," according to Trublet. Fontenelle was said to resemble his mother, a woman of great intellect, who was also pious and exhorted her children to virtue. Two of them died at an early age, before Bernard was born; two more, Pierre and Joseph Alexis, were born after him—both were to become ecclesiastics. Bernard's two maternal uncles, especially his godfather Thomas Corneille, had a great influence on him; they often invited him to Paris, before he moved there permanently around 1687, and introduced him to the world of the French Academy, the theatre, the salons of the *précieuses*, and the *Mercure galant*, which was directed by a friend of Thomas's, Donneau de Visé

About 1664 the child was placed in the Jesuit collège in Rouen, where his uncles had studied. He was, according to his teachers, "a well-rounded child in all respects and foremost among the students." The logic and physics that he was taught seemed to him devoid of meaning: according to Trublet, "He did not find nature in them, but rather vague and abstract ideas which, so to speak, skirted the edge of things but did not really touch them at all." The Jesuits wished to make him one of their own, but Fontenelle did not have a vocation. In deference to his father he became a lawyer, but he pleaded only one case—which he lost—and quit the bar to devote himself to literature and philosophy, which were more to his taste.

Although his parents had dedicated him to St. Bernard and to the Virgin and had made him wear the habit of the Feuillants until the age of seven, Fontenelle never displayed any strong devotion. He maintained the appearance of a Catholic, however, especially toward the end of his life, and in 1684 won the Academy's prize for eloquence with a *Discours sur la patience* that would not have been out of place in a collection of sermons (but did he not take this as a joke?). Nevertheless, his scientific attitude led him to a certain skepticism toward religion. The spirit of tolerance animated him; he had, after all, Protestant paternal ancestors, and in Normandy, where Reformed churchgoers were numerous, he had friends such as the Basnages, to whom he remained faithful after the revocation of the Edict of Nantes.

Fontenelle was born with a very fragile constitution; in his childhood he spat blood and was forbidden to take any violent exercise. He was sparing and careful of himself all his life; this is undoubtedly why he was accused of egotism and of indifference toward others. Although self-centered and considering himself responsible only for his own actions, he was not at all insensitive to the needs of others; on the contrary, he was obliging toward his friends (Mlle. de Launy and Brunel, for example). He was eventempered—perhaps that is the secret of his longevity. He loved the company of women but never married. Even as a nonagenarian he still frequented their salons, particularly that of Mme. Geoffrin, whom he made his general legatee. In his youth he had been received by Ninon de Lenclos and, from 1710 to 1733, by Mme. de Lambert, at whose home he met men of letters and scholars, such as Houdar de La Motte, Marivaux, Montesquieu, and Mairan. He also attended the duchesse du Maine at her court at Sceaux and was a frequent guest of Mme. de Tencin. He was affable and witty; his all-embracing curiosity made him an excellent listener. Above all, he prized his friends min and independence in his relations with men of rank, like the regent, Philippe d'Orléans, who honored him with his friendship, lodged him in the Palais Royal (until 1730), and awarded him a pension.

Fontenelle received every possible academic honor, although he was refused four times before being accepted into the French Academy in 1691. On 9 January 1697 he entered the Académie des Sciences *as secrétaire perpétuel* and was confirmed in office on 28 January 1699. He was *sous-directeur* in 1706, 1707, 1719, and 1728; *directeur* in 1709, 1713, and 1723; and was made *pensionnaire vétéran* on 9 December 1740. He became a member of the Académie Royale des Inscriptions et Belles-Lettres in 1701 and requested veteran status in 1705. In 1733 he was elected a member of the Royal Society of London. In 1740 he contributed to the foundation of the Académie des Sciences, Belles-Lettres et Arts of Rouen, which received its charter in 1744 and of which he then became an honorary member. He became a member of the Berlin Academy on 4 December 1749, the Accademia dei Arcadi of Rome, and the Academy of Nancy. In 1702 he joined the society formed by the Abbé Bignon to direct the publication of the *Journal des sçavans*.

Commencing with his studies at the Jesuit *collège*, Fontenelle began to write poetry. In 1670 he competed for the prize of the Académie des Palinods of Rouen, writing in Latin on the Immaculate Conception, and his work was judged worthy of printing and was published that year in the *Revue des palinods*. In 1674 he translated an ode by his teacher P. Commire, addressed to the Grand Condé "on the fact that he is subsisting only on milk" (*Mercure galant*, July 1679). In 1677 the *Mercure galant* published his "L'amour noye" with a very flattering introduction of the author as "nephew of the two Corneille poets." On several occasions Fontenelle competed for the poetry prize of the French Academy, but without great success. His operas, written under the name of Thomas Corneille and set to music by Lully, *Psyché* (1678) and *Bellérophon* (1679), were no more successful; even less so was his tragedy *Aspar* (1680), which was ridiculed by Racine. Under the name of Donneau de Visé he produced a comedy in 1681, *La comète*, inspired by the appearance of the comet of 1680 (the same referred to in Bayle's *Pensées sur la comète*). In it Fontenelle presents—obviously, in an amusing manner—various contemporary explanations of comets, including the most popular as well as the Cartesian theory; and the antiquated notions surrounding these celestial phenomena are held up to ridicule. In the work one can see the dawn of what was to make Fontenelle famous: his taste for the exposition of scientific ideas and his censorious and mocking attitude toward everything that seemed to him to be preconception or myth.

His "Lettre sur la Princesse de Cléves," which appeared in the *Mercure* of May 1678, revealed his talent as a literary critic sensitive to feelings, although he presented himself from this time on as a *géomètre*, with a "mind completely filled with measurements and proportions." Nevertheless, the first work of his period in Rouen was not a scientific one: it was, rather, the *Nouveaux dialogues des morts*, in two volumes, which he published anonymously in 1683. This was followed in 1684 by the *Jugement de Pluton* on the two parts of the first work. Fontenelle sometimes arranged the dialogues between the ancients, sometimes between the moderns, and sometimes between members of the two groups. From occasionally comical situations he draws subtle moral observations in a lively style. One can also find interesting considerations regarding the sciences, all of which have their chimera "which they run after without being able to seize . . . but on the way they trap other very useful knowledge" (dialogue between Marcus Apicius and Galileo) and on the difficulty of discovering the truth (dialogue between the third Pseudo-Demetrius and Descartes).

At the same time as this work, which invites serious consideration despite its light touch, there appeared the *Lettres diverses de* M. *le Chevalier d'Her* \* \* (or *Lettres galantes* . . ., depending on the edition), which were attributed to Fontenelle, who disavowed them. No one was deceived, for they clearly bear the mark of his style and his mind and reveal his ability to scrutinize a woman's soul.

In 1685 Fontenelle displayed his taste for mathematical reflection with the publication in the *Nouvelles de la république des lettres*, under the title of "Mémoire composé par M.D.F.D.R. [M. de Fontenelle de Rouen] contenant une question d'arithmétique," of a two-part article on the properties of the number nine. It was only a simple game that did not demonstrate the author's genius in these matters. Yet, if he did not solve the problem, he did pose the question for scholars; the *Nouvelles* published a reply by de Joullieu in February 1686 and a "Démonstration générale de la question . . . touchant les nombres multiples," by J. Sauveur, in October 1686.

This first, scarcely scientific essay was followed in 1686 by Fontenelle's most famous and most frequently published and translated work, *Entretiens sur la pluralité des mondes*. In five "Evenings" (*Soirs*), then six in the 1687 edition, Fontenelle undertook to set forth to a marquise who questioned him during evening promenades in a garden the different astronomical systems: those of Ptolemy, Copernicus, and <u>Tycho Brahe</u>. He spoke to her of the moon and the other worlds—Venus, Mercury, Mars, Jupiter, Saturn, the fixed stars—and discussed the possibility that they might be inhabited. He explained, in terms that could be understood by an intelligent but untrained mind, recent discoveries in the world of the stars, displaying a strong Cartesian bent in his account. In choosing this subject Fontenelle was undoubtedly inspired by a growing interest in the heavenly bodies, as well as by a work that appeared in Rouen in 1655, *Le monde de la lune* (a translation of the *Discovery of a New World* of John Wilkins), and by the *Discours nouveau prouvant la pluralité des mondes* of Pierre Borel (1657), not to mention two books by Cyrano de Bergerac, *L'autre monde: L'histoire comique des états et empires du soleil* (1662).

Fontenelle was not an astronomer, and the earliest editions contained a number of errors which he continued to correct until 1742 in order to bring his text into agreement with the scientific data provided him by the members of the Academy of Sciences. The book offered him an opportunity to discuss problems that fascinated him: the relativity of knowledge and the desacralization of the earth—and hence man—attendant upon the recognition of a nongeocentric universe. Our world is not privileged: others might be inhabited, and our present knowledge is limited but grows unceasingly in the course of time. "The art of flying has only just been born; it will be brought to perfection, and someday we will go to the moon" ("Second Evening").

The work's success resulted from the author's having treated supposedly difficult subjects in a light style, playfully and with a touch of affectation that detracted nothing from the seriousness of the given explanations. All this was done in a slightly fictionalized from that permitted a certain lyricism on the enchantment of a summer evening and the immensity of the universe. It is the first example in French of a learned work placed within the reach of an educated but nonspecialized public. It is certainly to these aspects of his work that Fontenelle owed his later academic positions.

Meanwhile, he was active in other fields. He published "Éloge de Monsieur Corneille" in January 1685 in the *Nouvelles de la république des lettres*. (Revised as "Vie de Monsieur Corneille," it appeared in the 1742 edition of his *Oeuvres*.) This was followed in 1686 by *Doutes sur le système physique des causes occasionnelles*, on the theory that Malebranche had presented in the *Recherche de la vérité*. Also in 1686, the self-styled "author of the *Dialogue des morts*," again under the veil of anonymity, published the *Histoire des oracles*. Actually, he had already set forth his reflections on history: he had sketched the treatise "Sur l'histoire," passages from which were to appear in *De l'origine des fables* (1724). Published along with them were several pages, "Sur le bonheur," also written much earlier and undoubtedly one of the best expressions of Fontenelle's practical philosophy, a human morality independent of religion.

In his reflections on history and on the origin of fables Fontenelle appears as one of the first to treat the history of religion comparatively. He espoused a critical history not only of human events but also of myths, legends, and religions. He studied their formation, showing the role of imagination and how "marvelous" phenomena can be explained by nonsupernatural causes. He found ideas similar to his in *De oraculis ethnicorum dissertationes duae*, a work published in 1683 by the Dutchman A. Van Dale, and he decided to translate it; in the end he preferred to rewrite it entirely in his own manner. This was again done under the cover of anonymity, of course, for it was dangerous to attack superstitions: it led to casting doubt on miracles—fundamental ideas of Christianity that do not agree with scientific truths discovered through reasoning and experiment. Thus, Fontenelle was later attacked by the Jesuits, in particular by Jean-François Baltus, in 1707 and 1708, following the fifth edition of the *Histoire des oracles*; in accordance with his temperamental dislike of dispute and perhaps counseled by his friends as well, he did not reply.

Fontenelle was not content, in 1686, to publish only this dangerous work. He had sent to his friend Basnage in Rotterdam (in order to forward it to Bayle, who published it in the *Nouvelles de la république des lettres* of January) a "Relation curieuse de l'Isle de Bornéo," a so-called extract from a "letter written from Batavia in the <u>East Indies</u>." Involved was a letter between two sisters, Mreo and Eenegu, who were, one quickly discovered, none other than Rome and Geneva. In other words, just after the revocation of the <u>Edict of Nantes</u>, Fontenelle stigmatized the struggle between Catholics and Protestants, besides making a clear allusion to an event of which he deeply disapproved. If he had not at this time had protectors as powerful as the lieutenant of police Marc René de Voyer de Paulmy, marquis d'Argenson, he would have received the <u>lettre de cachet</u> that Le Tellier, confessor to Louis XIV, attempted to obtain against him for his unorthodox writings.

Fontenelle settled in Paris around 1687 and resumed his literary activities, publishing in that year *Poésies pastorales de M.D.F., avec un. traité sur la nature de l'églogue et une digression sur les anciens et les modernes.* Fontenelle belonged to the party of the moderns, the men of progress, together with his friend Houdar de La Motte, <u>Charles Perrault</u>, and the circle of the *Mercure galant*, in opposition to the party of the ancients, the men of tradition, among whom were Racine, Boileau, and La Bruyére. His relationship with the Corneille family obviously reinforced his hostility toward the partisans of Racine, but it is certain that the *Digression*, leaving aside the question of personalities, shows Fontenelle's reflections concerning science: it is owing to its progress that humanity is improved. Moreover, is not the notion of ancients and moderns really very relative?

Fontenelle wrote another libretto, for the opera *Enée et Lavinie* (1690), and a tragedy, *Brutus* (1691), under the pseudonym of Mlle. Bernard. Received into the French Academy two years before La Bruyére, who in the eighth edition of the *Caractères* (1694) was to mock him under the name of Cydias, Fontenelle published the *Recueil des plus belles pièces des poètes françois, depuis Villon jusqu' à Benserade, avec une préface et des petites vies des poètes* (1692) and the *Parallèle de Corneille et de Racine* (1693).

Thanks to his compatriot and friend Varignon, Fontenelle made the acquaintance of the Parisian scientific circle and became friendly with Nicolas de Malézieu and Guillaume de L'Hospital. For the latter's *Analyse des infiniment petits pour l'intelligence des lignes courbes* (1696), he composed a preface that might have been taken for the author's but which everyone was quite aware was by Fontenelle. In it are displayed his interest in the notion of infinity and his talent as a historian; in a few pages he retraces the history of the mathematical study of curved lines from Archimedes to Newton and Leibniz.

Fontenelle was a friend of the Abbé Bignon and of Pontchartrain, patrons of the Academy of Sciences; and his *Entretiens* was admired for its clear and elegant style, in contrast to the ponderous Latin of the Academy's secretary, Jean-Baptiste du Hamel. In 1697 Fontenelle was invited to replace the latter. The Academy's new statutes of January 1699, of which Fontenelle was in part the author, defined the role of the *secrétaire perpétuel:* he was required to publish each year the memoirs of the academicians drawn from the records, preceded by a sort of *histoire raisonnée* of the Academy's most remarkable accomplishments. He was also to deliver the *éloges* of those academicians who had died during the year and was to publish them in the *Histoire*.

Thus, under the facile pen of a writer who could simplify and clarify and who—without being a specialist—had sufficient knowledge in all areas of science to present its results without distortion, the works of the academicians could become accessible to a cultivated society that balked at Latin. From 1699 to 1740 Fontenelle devoted himself almost exclusively to his task of editing the *Histoire de l'Académie royale des sciences … avec les mémoires de mathématique et de physique pour la même année, tirés des registres de cette Académie*. The volume for the year 1699, which appeared in 1702, opens with an untitled preface usually called "Préface [sometimes "Discours préliminaire"] sur l'utilitë des mathématiques et de la physique et sur les travaux de l'Académie," which contains essential material on the philosophy of science and is a sort of bridge between Descartes's *Discours de la méthode* and <u>Claude Bernard</u>'s *Introduction à l'étude de la médecine expérimentale*. Here

one finds the first literary expression of the idea of the interdependence of the sciences and of the constancy of the laws of nature. In 1733 there appeared the history of the early years of the Academy, under the title *Histoire de l'Académie royale des sciences*. *Tome I<sup>er</sup>*. *Depuis son établissement en 1666, jusqu'à 1686*. Fontenelle covered only the years until 1679 but composed a preface that is an excellent history not only of the founding of the Academy but of the state of contemporary science as well.

Fontenelle eventually published forty-two volumes of the *Histoire de l'Académie*, containing sixty-nine *éloges*. He had already had some experience with this literary genre in the "Éloge de Monsieur Corneille" and especially in the "Éloge de Mons. <u>Claude Perrault</u> de l'Académie royale des sciences et docteur en médecine de la Faculté de Paris . . ." (*Journal des sçavans*, 28 February 1689). The first *éloges* read to the Academy were short, and one senses that Fontenelle had not yet attained complete mastery of the field in which he later proved to be without equal. His ability, evident as early as the *éloge* of Viviani (1703), was still apparent in the last one, that of Du Fay (1739).

No one before him had been able to evaluate so well the works of others nor to report on a life with such verve, nor to sprinkle his text with such subtle psychological and moral observations. The *éloges* were Fontenelle's greatest glory. They remain an astonishing—occasionally unique—source of biographical information on the scientists of the epoch. If one can sometimes reproach Fontenelle for being biased or too Cartesian at a time when science was already Newtonian, he was a good mirror of his times; and one finds in his writing what is undoubtedly the best approach in French to the works of Malebranche, Leibniz, Newton, Johann I Bernoulli, Jean-Dominique Cassini, Varignon, and Boerhaave, to cite only a few names.

The *éloges* enjoyed such success that Fontenelle saw the necessity, as early as 1708, of collecting them in a separate volume under the title *Histoire du renouvellement de l'Académie royale des sciences en M.DC.XCIX et les éloges historiques de tous les académiciens morts depuis ce renouvellement, avec un discours préliminaire sur l'utilite des mathématiques et de la physique*. In 1717 he brought out an edition with seventeen new *éloges*, in 1722 one with eleven more, and in 1733 the *Suite des éloges des académiciens . . . morts depuis l'an M.DCC.XXII*. Finally, in 1742, volumes V and VI of his *Oeuvres* contained the whole series of *éloges*.

As a member of the Academy of Sciences, Fontenelle also wished to do work of his own. In 1727, as a "Suite des mémoires de l'Académie royale des sciences," he published the *Élémens de la géométrie de l'infini*. Some doubted whether it was really the work of a mathematician, but the author believed it was and attached great value to it. He had worked on it for a long time, probably since the period of his preface to the *Analyse des infiniment petits*. The term *élémens* is to be understood in the sense of "first principles." According to Fontenelle, none of the geometers who had invented or employed the calculus of infinity had given a general theory of it; that is what he proposed to do. The work is divided into a preface relating the history of this branch of calculus and into two main parts: "Système général de l'infini" and "Différentes applications ou remarques." The author discusses "the infinite in series or in progressions of numbers" and then examines "the infinite in straight and curved lines," in the words of the Abbé Terrasson, who reviewed the work in the *Journal des sçavans* (July-October 1728).

There was a great deal of discussion in the scientific community about this work, in which mathematicians found numerous paradoxes. Johann I Bernoulli, for example, in his correspondence with Fontenelle allowed his criticisms to show through his praise: he did not understand what was meant by *finis indéterminables*. Fontenelle attempted to defend his theory and above all his distinction between metaphysical infinity and geometric infinity: one must ignore the metaphysical difficulties in order to further geometry, and the *finis indéterminables* ought to be considered "as a type of hypothesis necessary until now in order to explain several phenomena of the calculus" (letter to Johann I Bernoulli, 29 June 1729). "The orders of infinite and indeterminable quantities, like the magnitudes that they represent, are only purely relative entities, hypothetical and auxiliary. The subject matter of mathematics is only ideal," according to the terms of a "Projet de rapport" of Dortous de Mairan to the Academy on this work.

In 1731 the third edition of Thomas Corneille's *Dictionnaire des arts et des sciences* appeared, revised and augmented by Fontenelle with many scientific terms. When he retired from the Academy of Sciences, Fontenelle was feted at the French Academy on the fiftieth anniversary of his election to that body, and for this occasion he composed a "Discours sur la rime" (1741).

In 1743 a small, anonymous volume entitled *Nouvelles libertés de penser* appeared in Amsterdam; it included two articles believed to have been written by Fontenelle: "Les réflexions sur l'argument de M. Pascal et de M. Locke concernant les possibilités d'une vie à venir" and "Traité de la liberté," both of which are completely in accord with his way of thinking.

In 1752 Fontenelle published anonymously through his friend the physician Camille Falconet (who provided a preface) his *Théorie des tourbillons cartésiens avec des réflexions sur l'attraction*. Many were astonished to see the appearance at this time of a work conceived some years previously, and they tried to explain why Fontenelle had decided to present to the learned public a thoroughly outmoded scientific theory. Fontenelle agreed with Newton and the Newtonians to the degree that they did not attempt to give a meaning to "attraction" and contented themselves with calculations. Newton linked formulas with formulas; his method yielded results that corresponded to the facts, but he explained nothing in the sense that Fontenelle would wish, that is, through principles. Fontenelle wished to understand by going back to causes. It was all very well to take "attraction" as a simple word or a sign; one should not, however, endow it with content, and Newtonians who do this return to Scholastic notions and to "occult forces." If Fontenelle remained faithful to the Cartesianism of the *Entretiens*, it was certainly not owing to the stubbornness of age but to a profound conviction of the value of a mechanical explanation in Descartes's

sense. This conviction, moreover, was supported by certain works that he analyzed at the Academy of Sciences, in particular those of Privat de Molieres, who defended, with some modifications, the theory of vortices (*tourbillons*).

"One must always admire Descartes and on occasion follow him" (*Éloge d'Hartsoëker*): Fontenelle followed him in the matter of the vortices but not in such matters as his theory of animal machines. In his horror of systems that lull thought to sleep, he understood that the important thing is not the results acquired, which are always provisional, but the method of thinking, which consists in completely rejecting all "marvelous" facts, in questioning everything, and in believing only what reason supported by experiment clearly shows. This is the intellectual attitude inherited by the Encyclopedists that characterized the Enlightenment.

In most respects a man of the seventeenth century, Fontenelle was, in others, a man of the eighteenth—perhaps even of the twentieth—century in his unflagging intellectual curiosity and in his belief in the limitless progress of knowledge in a world in which everything must be open to rational explanation.

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