

Castel, Louis-Bertrand | Encyclopedia.com

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(*b.* Montpellier, France, 15 November 1688; *d.* Paris, France, 11 January 1757),

physics, mathematics.

Castel was probably the most vociferous opponent of Newtonian science during the second quarter of the eighteenth century in France. He failed to block the gradual acceptance of Newton's ideas because the Cartesian rationalism that he tried to establish found diminishing favor with French scientists, more and more influenced by the merits of the experimental approach.

The second son of Guillaume Castel, a physician, Louis-Bertrand received his early education at the Jesuit school of Toulouse and entered the Jesuit order at the age of fifteen. His obituary in the Jesuit periodical *Journal de Trévoux* states that Castel's early writings came to the attention of Fontenelle, the eminent Cartesian philosopher and scientist, who is credited with influencing Castel to leave Toulouse for the more intellectual climate of Paris in 1720. His being immediately chosen an associate editor of the *Journal de Trévoux* clearly indicates that Castel had already shown promise as a scholar. While working on the monthly, Castel was associated with the faculty of the Jesuit school in the rue Saint-Jacques, the present Lycée Louis-le-Grand, where he taught physics, mathematics, specialized courses in infinitesimal calculus, and mechanics. Once installed at Louis-le-Grand, he never left Paris except for one trip to southern France toward the end of his life. The political philosopher Montesquieu honored him with his friendship, did not hesitate to submit his manuscripts to him before publication, and even chose him to be his son's tutor for a time, a post that made Castel inordinately proud.

Upon his arrival in Paris, Castel's first article was published in the *Mercure de France*. The "Lettre à M. de****" stressed that truth was one, and that therefore astronomy and religion could never come into conflict because both are true. In 1724 his *Traité de la pesanteur* attracted a great deal of attention, particularly because it was hostile to Newton. In 1730, through his friendship with the English oculist J. T. Woolhouse, Castel was elected to the [Royal Society](#) of London. He entered the Bordeaux Academy in 1746, and in 1748 he was elected to the academies of Rouen and Lyons.

Although Castel published a creditable anti-Newtonian scientific theory that succeeded in delaying the acceptance of Newton's ideas in France, he is remembered as the spokesman of French scientists who saw in Newton a threat to the prestige of their national hero, Descartes, and a threat to their religious faith. While Descartes's metaphysical system had generally been abandoned by the thinkers of the Enlightenment, Newton's growing prestige brought about a gradual rally to the physics and astronomy of Descartes. Even as late as 1738 most French scholars still supported Descartes; with the exception of Maupertuis and Clairaut, the Academy of Sciences was composed entirely of Cartesians. Even though Castel felt competent to refute Cartesian science, he never abandoned Descartes's a priori, rationalistic approach to science—hence his impatience with a science based on experimentation rather than on a logical process. Pascal's fundamental objection to Cartesian physics, almost a century before Castel's system, was that Descartes had reasoned a priori in physics instead of observing and experimenting. It was the latter approach to science that so many physicists and astronomers of the eighteenth century, with Castel at their head, found repugnant. As a consequence of this attitude, Cartesian physicists had rendered the French scientists indolent; they preferred an attractively reasoned system, with daring ideas based on the logical process, to seeking scientific truth painfully and laboriously. The net result of the Cartesian approach was the relative stagnation of research in France.

This leads one to appreciate Castel's reaction to Newton: he complained about the numerous experiments that formed the basis of Newton's theories because they were not within the reach of the common man, and he reproached Newton with wanting to reduce man to "using only his eyes." Physics, for Castel, must be based on reason instead of observations. Hence his contempt for the "complicated laboratories" of the disciples of Newton. Castel's second brief against Newton was that his system of the world was suspect to the religious man because it smacked of materialism. Castel's accusation was clearly expressed in *Journal de Trévoux* (July 1721, pp. 1233, 1236): influenced by Democritus and Epicurus, Newton sought to give a philosophical basis to materialism by substituting the void for divine intelligence. On the other hand, Voltaire was genuinely persuaded that Newton's discoveries of nature's secrets conclusively proved the existence of God.

There is little point in presenting an outline of the system Castel proposed to replace Newton's. It was an attempt to harmonize philosophy, scientific curiosity, and religious dogma by means of rationalism. Newton gradually secured a foothold in France, and Voltaire was not the last of the propagandists on his behalf.

Castel's ocular harpsichord helped to spread his fame much more than his scientific reputation did. The best sources available for an explanation of his invention are two articles in the *Journal de Trévoux* (1735): "Nouvelles expériences d'optique et d'acoustique" and "L'optique des couleurs fondée sur les simples observations." It was a scheme for making colors and

musical tones correspond. By 1742 the fame of Castel and of his invention had reached as far as [St. Petersburg](#) and had been brought to the attention of the empress. The instrument was completed in July 1754, and on 21 December of the same year Castel gave a private demonstration of it before fifty guests. The spectators were enthusiastic and applauded several times (*Mercur de France* [July 1755], p. 145). The idea of the color organ did not die with him, since several varieties of it have appeared in Europe and in the [United States](#) at various times.

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Castel and his work are discussed in Jean Ehrard, *L'idée de nature en France dans la première moitié du XVIIIe Siècle* (Paris, 1963), pp. 117–121; 155–156.

A. R. Desautels