Le Tenneur, Jacques-Alexandre | Encyclopedia.com

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(*b*. Pairs, France; *d*. after 1652),

Mathematics, Physics.

Described as a patrician of Paris on the title page of his principal book, little else is known of Le Tenneur, friend of Mersenne and correspondent of Gassendi. Probably a resident of Paris until the mid-1640's, he was at Clermont-Ferrand (near Puy-de-Dôme) late in 1646, and in 1651 he was counselor to a provincial senate. C. De Waard identifies him as counselor to the Cour des Aydes of Guyenne, but without indicating dates.

All modern authorites agree in attributing to Le Tenneur the *Traité des quantitez incommensurables,* whose author identified himself on its title page only by the letters I.N.T.Q.L.[1] Mersenne mentioned the *Traité* as in preparation on 15 January 1640 and sent a copy to Haak on 4 September, indicating that it was "by one of my friends." It was directed against Stevin's L'arithmétique (Leiden, 1585; ed. A. Girard, 1625), particularly opposing Stevin's treatment of unity as a number. Although Le Tenneur's arguments now seem elementary and conservative, they go to the heart of the foundations of algebra, standing as a final attempt to preserve the classical Greek separation of arithmetic from geometry that Descartes abandoned in 1637. The basic question is whether the unit may properly be considered as divisible. Against Stevin's affirmative answer, Le Tenneur took the view that this would in effect either merely subsitute a different unit or deny the existence of any unit relevant to the problem at hand. The bearing of this analysis on the problems of indivisibles and infinitesimals that were then coming to the fore is evident; but a rapid and widespread acceptance of algebraic geometry doomed the classic distinctions, and the book was neglected. Aware of Viète's work and of the need to give symbolic treatment to incommensurables in the classic sense, Le Tenneur included a paraphrase of book X of Euclid's Elements, in which he gave the symbolic operations for each proposition. The book ends with an essay, addressed to the Académie Française, proposing that French should be used in science and outlining methods for the coining of terms, reminiscent of Stevin's earlier argument for the use of Dutch.

In January 1648 Mersenne wrote to Le Tenneur asking him to perform the barometric experiment at Puy-de-Dôme later done by F. Perier at Pascal's request. Le Tenneur, who had moved to Tours, replied that it could not be done in winter and expressed the view that, in any event, the level of mercury would not be changed by the ascent.

The importance of Le Tenneur to the history of science, however, depends on another book, De *motu naturaliter accelerato*... (1649), in which he showed himself to be the only mathematical physicist of the time who understood precisely Galileo's reasoning in rejecting the proportionality of speeds in free fall to the distances traversed. This subject was hotly debated in the late 1640's between Gassendi and two Jesuits, Pierre Cazré and Honoré Fabri. In 1647 Fermat, who had previously questioned the validity of Galileo's odd-number rule for distances traversed, wrote out for Gassendi a rigorous demonstration of the impossibility of space proportionality, believing that Galileo had deliberately withheld his own. Le Tenneur, who appears not to have seen Fermat's proof, perceived and illustrated the nature of Galileo's use of one-to-one correspondence between the speeds in a given fall from rest and those in its first half.

Le Tenneur's interest in the matter began with a request from Mersenne for a discussion of Cazré's *Physica demonstratio* (1645), which in turn had arisen from his letters to Gassendi opposing the latter's *De motu impresso a motore translato* of 1642. Le Tenneur's critique of Cazré took the form of a *Disputatio physico-mathematicus* sent in manuscript form to Mersenne, probably in mid-1646, and also sent to Cazré or forwarded to him by Mersenne. Gassendi published his own reply to Cazré as *De proportione qua gravia decidentia accelerantur* (1646) and sent a copy to Le Tenneur. Writing on 24 November 1646 to acknowledge this gift, Le Tenneur sent Gassendi a copy of his *Disputatio*. Gassendi replied on 14 December, and on 16 January 1647 Le Tenneur wrote him that Mersenne had mentioned some other Jesuit than Cazré. This was Honoré Fabri, whose *Tractatus physicus de motu locali* (1646) acknowledged the correctness of Galileo's rules for sensible distances only, explaining this in terms of the space-proportionality of insensible quanta of impetus. Baliani had (also in 1646) advanced a similar hypothesis. Two days later, Le Tenneur wrote that Cazré had meanwhile replied to his earlier *Disputatio* and sent the reply to Gassendi with his own rebuttal.

On 12 April 1647 Le Tenneur wrote out a refutation of Fabri's position in the form of a long letter to Mersenne. Fabri contended that the hypotenuse in Galileo's triangle was in Ultimate reality a discrete step function (a denticulated line, as he called it) and that the space quanta traversed in true physical instants progressed as the positive integers rather than as the observed odd numbers. Le Tenneur opposed any analysis by physical instants (the medieval *minima naturalia)* on the grounds

that if indivisible, such instants implied Galileo's law, whereas if divisible, they fell under Galileo's phrase "in any parts of time" and excluded Fabri's hypothetical increments of velocity added discretely *(simul)*.

Mersenne appears to have communicated this letter to Fabri, who published it as an appendix to a new book in 1647, with critical comments. Finally, Le Tenneur wrote out a long reply to Fabri and composed a further treatise of his own in support of Galileo's laws against all his opponents. On 1 January 1649 he submitted it to Gassendi with the idea of publishing it together with his previous writings on the subject if Gassendi approved. Gassendi had meanwhile moved to Aix-en-Provence for his health and did not receive the material until Easter. His enthusiastic letter of endorsement was sent to Le Tenneur on 17 May 1649 and was included as the final item in *De motu accelerato*.

Of all the participants in this wordy dispute, only Le Tenneur correctly reconstructed Galileo's original argument. His book is of further interest for its inclusion of a strictly mathematical derivation of Galileo's odd-number rule be the young Christiaan Huygens, which had been sent by his father to Mersenne. Le Tenneur published it together with a postil predicting great things from Huygens. *De motu accelerato* is of further historical importance for its refutation of Fabri's dictum that no physical instant could be identical with a mathematical point in time, the last stand of orthodox Aristotelian physics and impetus theory against the continuity concept introduced by Galileo. Even Descartes had rejected the idea that in reaching any given speed from rest, a body must first have passed through every lesser speed. His letters to Mersenne on this point may have been the occasion for its having been called to the attention of Le Tenneur.

The only other books by Le Tenneur related to controversies with Jean-Jacques Chifflet over French history and royal genealogy. He sent one of these to Gassendi and in an accompanying letter seems to have considered himself more a historian than a scientist, despite his valuable if neglected contributions to fundamental issues of mathematics and physics in the seventeenth century.

NOTE

1. The attribution, although probably correct, is not yet certain. No early reference to this book includes more than the family name of the author, and the title page suggests the possibility that there may have been an I. N. (or J. N.) Le Tenneur; Gassendi mentioned a brother of Jacques-Alexandre who has not been identified. In the preface, the author expressed his intention of identifying himself after hearing comments on his book; if the same author wrote *De motu accelerato*(1649) mention of the earlier book would be expected in it. Moreover, the vigorous argument for the use of French hardly fits J.-A. Le Tenneur, who thereafter published only in Latin.

BIBLIOGRAPHY

I. Original Works. Le Tenneur's writings are *Traité des quantitez incommensurables* (Paris, 1640); *De motu naturaliter accelerato tractatus physico-mathematicus* (Paris, 1649), one section of which had appeared under the author's initials in H. Fabri (P. Mousnier, ed.), *Metaphysica demonstrativa* (Lyons, 1647); *Veritas vindicata adversus… Joan. Jac. Chifletii* (Paris, 1651); and *De sacra ampulla remensi tractatus apologeticus adversus Joan. Jac. Chifletum*(Paris, 1652). Some correspondence between Gassendi and Le Tenneur was published in Gassendi, *Opera omnia,* VI (Lyons, 1658). See Adam and Tannery, eds., *Oeuvres de Descartes,* V (Paris, 1903); L. Brunschvig and P. Boutroux, eds., *Oeuvres de B. Pascal,* II (Paris, 1908). Some of Le Tenneur's letters are preserved at Vienne, France, and at the Bibliothéque Nationale, Paris.

II. Secondary Literature. For references to and note about Le Tenneur see *Correspondance* du P.*Marin Mersenne*, P. Tannery and C. De waard, eds., IX–XI; most letters between the two men have not yet been published and were not accessible for this article. See also H. Brown, *Scienntific Organization in 17th Century France* (New York, 1967), PP. 54–56;S.Drake in Isis, **49** (1958),342–346;49 (1958),409–413; *British Journal of the History of Science*,**5** (1970),34–36;and Galileo Studies (Ann Arbor, Mich,1970),235–236; W.E.K.Middleton, *History of theBarometer* (Baltimore, 1964), 40, which gives references to papers on the Pascal controversy published by Felix Matthieu in the *Revue de Paris* (1906).

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