

BRUNET ON THE NEWTONIAN MOVEMENT

L'Introduction des Théories de Newton en France au XVIIIe Siècle. Avant 1738.

By Pierre Brunet. Paris, Blanchard, 1931. vii+355 pp. 55 francs.

The author of this work, already well known for his treatise on the Dutch physicists of the 18th century (1926) and his biography of Maupertuis (1929), has here entered upon a new and important field of investigation. In it he carries his studies of Newton's theories (chiefly gravitation) up to the date of the publication of Voltaire's *Éléments de la Philosophie de Newton* (1738, 2 edns.), planning to cover the period from 1738 to the end of the century in a second volume now in process of completion. He thus brings the study, for the moment, up to the period when Newton began to become more generally known in France owing largely to the influence of Maupertuis and Voltaire, an influence which later led to the work of du Châtelet (posthumously published in 1759) and to the appreciation of the discoveries of the British savant by the remarkable coterie of French mathematicians which appeared in the half century following. The study is especially valuable in that it shows the nature, the source, and the intensity of the French opposition to the theories of Newton in the period under discussion. It is divided into five chapters, the nature of which may briefly be stated as follows:

Chapter I considers the Cartesian opposition (1700–1720), beginning with the *Nouveau Système ou Nouvelle Explication du Mouvement des Planètes*; by Abbé Villemot (Lyon, 1707), which was an outgrowth of the well known theory of vortices, and which led to some interesting correspondence between Leibniz and Jean Bernoulli. After referring to the discussions of Fontenelle and Cassini I, M. Brunet proceeds to review the Cartesian theory as considered by Saurin (1702–1709), Fontenelle (1708, following his earlier contributions to the history of the Académie des Sciences), Cassini I (1710 and later), Saulmon (1709), and the Italian scientist Poleni in his *Dialogus de Vorticibus Coelestibus*; which was published at Padua in 1712. No one of these men had the scientific ability to handle the problem, and the arguments of Poleni and others were immediately confuted by Cotes in the preface to the second edition of the *Principia* (1713).

Chapter II discusses "Les préliminaires du débat,"—the years 1720–1728 when the *Optics* of Newton and the works of Gregory (*Astronomiae Physicae et Geometriae Elementa*, Oxford, 1702) and Keill (*Introductio ad Veram Physicam*, Oxford, 1700) were beginning to be appreciated across the Channel. The latter work was edited by s'Gravesande in 1725, and Newton's *Optics* was translated by a new and powerful protagonist, Coste, whose edition appeared in 1720. The battle was now beginning.

Chapter III, "L'effort des grands cartésiens (1728–1732)," describes what would seem to a modern scientist reminiscent of the Eastern battle of the pigmies and the giants; but the Cartesian cause, in so far as it was anti-newtonian, was already lost, although the enemy did not realize the fact.

Chapter IV, "Les premiers travaux newtoniens (1732-1734)," describes the real beginning of the Newtonian advance. A new comet had appeared above the horizon in the person of the young Pierre-Louis Moreau de Maupertuis, a man who knew more mathematics than any of the anti-newtonians, perhaps excepting Jean Bernoulli, and who had the daring and the vigor of youth. The story of his early championship of Newton's theories is told by Fontenelle in his *Histoire de l'Académie des Sciences* (1732, p. 132), and it was this championship that placed him at the head of the Lapland expedition as one of the "earth flatteners." It was not without a recognition of the danger of his position that he took a stand that "me fit des ennemis personnels dans ma patrie." D'Alembert later recalled these words and wrote: "Le premier qui ait osé parmi nous se déclarer ouvertement newtonien est l'auteur du *Discours sur la Figure des Astres*, qui joint à des connaissances géométriques très étendues cet esprit philosophique avec lequel elles ne se trouvent pas toujours et ce talent d'écrire auquel on ne croira plus qu'elles nuisent quand on aura lu ses ouvrages." It is here, then, that the first decided step was taken to make Newton's philosophy known in a country that has usually shown some hesitancy in accepting the views of her western neighbors. The second step was taken by the greatest of the early French admirers of Newton, Voltaire, whose *Lettres Anglaises* (1732, published in 1733) first called the attention of the intelligentsia of Paris to the nature of the former's works.

Chapter V, "La préparation des grandes controverses (1735-1737)," closes the epoch which preceded the publication of Voltaire's work on the subject and the beginning of the labors of du Châtelet and others who gave to France at first hand, and in the vernacular, the work of the great English genius. It was more than twenty years before the publication of du Châtelet's work that Voltaire saw "a professor of mathematics, only because he was great in his vocation," buried "like a king who had done good to his subjects."

The author has supplied a good bibliography of French and Latin works upon the subject omitting any reference to works in English (and perhaps excusably), and gives a helpful "Table des matières;" but, as usual in such publications from the Paris presses, there is no index,—a feature which is always a great desideratum in works of reference.

DAVID EUGENE SMITH