CAJORI'S EDITION OF NEWTON'S PRINCIPIA

Sir Isaac Newton's Mathematical Principles of Natural Philosophy. Translated into English by Andrew Motte in 1729. *The translations revised, and supplied with an historical and explanatory appendix.* By Florian Cajori. University of California Press, 1934. xxxvi+680 pp.

The *magnum opus* of Newton, the *Principia*, is too well known to the scientific world to justify any elaborate description in a review of this nature. Suffice it to recall the fact that the first edition appeared in 1687 and that the errors and imperfections were numerous. Out of 494 pages W. W. Rouse Ball found that 397 were modified or corrected in the second edition—the one due to Cotes, of whom Newton remarked "If Cotes had lived, we had known something." After the second edition appeared Newton sent to Cotes a list of twenty errata, to which the latter added an equal number and remarked, "I made some Hundreds, with which I never acquainted You." Newton's only comment seems to have been, "Its impossible to print a book without some faults." All this goes to show that even the gods can err, and that a new edition of a classic of 1687 was justified nearly two and a half centuries later. It may also be remarked that Bentley, Master of Trinity, suggested that Cotes should include in the second edition "An alphabetical Index." Had Professor Cajori lived to see his own edition through the press, he might have recalled Bentley's good advice, especially as concerns the appendix. He died, however, before his manuscript was sent to the printer and, as the editor of the present revision, Professor R. T. Crawford, tells us, he left only the manuscript of the notes which form the appendix, even a preface being lacking.

This edition is a revision of Motte's translation from the third (Latin) edition (1726), use being made of Thorp's later translation (ed. 2, 1802). The only changes made in the text are such as relate to the symbolism and the phraseology, these being limited to such as are necessary to express the original ideas in modern form.

The work consists of the English text (626 pp.) and Professor Cajori's appendix (54 pp.). In the front matter are included Halley's "Ode Dedicated to Newton," translated into English by Professor Leon J. Richardson, and the prefaces to the first three editions, the one to the second edition, by Cotes (pp. xx–xxxiii), being of major importance. It is concerning the appendix, which contains the new material, however, that the reader will wish for information. A few of the most important items will therefore be mentioned, the space allowed for this purpose being limited.

In this appendix Professor Cajori discusses (p. 629 seq.) at length and with thoroughness the preface which Cotes wrote for the second edition, and in particular the theory of vortices which Descartes had published in 1644, more than twenty years before the *Principia* appeared. This theory had soon thereafter been made known in England by such scholars as Henry More (Cambridge) and Joseph Glanvill (Oxford) and by the publication (London, 1682) of Bonet's Latin translation of Rohault's French textbook on physics. Professor Cajori calls attention to the popular nature of this theory as compared with