

ship a couple of years later. He died in 1841, but before then had published some ten papers, each of which marked a definite advance. They were mainly applications of the celebrated theorem, known by his name, to various problems in wave motion. His college, feeling that his ability and publications had not met with the recognition they deserved, commissioned Ferrers to collect them in a volume which appeared in 1871. This so thoroughly fulfilled its object that for many years a copy has only been obtainable at second-hand book stores. The present edition is a facsimile reprint by a process reproduction, so that the collection will, owing to the enterprise of A. Hermann, be available to readers and libraries in exactly the original form. Most of the papers appeared in the *Cambridge Philosophical Transactions*, the early volumes of which are not found in a large number of American libraries. As might be expected, the printing has suffered slightly in the reproduction but the defect is in its general appearance; in no case will there be the least trouble from this cause to the reader.

ERNEST W. BROWN.

Problems in Astrophysics. By AGNES M. CLERKE. A. and C. Black, London, 1903.

THIS book has only an indirect bearing on mathematics and thus does not call for an extended notice in the BULLETIN. And yet it is one which the student of mathematical physics cannot altogether afford to neglect, for it contains much material which may be useful to him. Just as in bygone days the celestial motions furnished many problems to mathematicians and were indeed often the means of suggesting those problems, so in modern times the new astronomy has raised a new set of less exact and more difficult questions to be undertaken. As facts accumulate, and the phenomena begin to be grouped, the time comes when theories may be rightly broached, so that the problems enter within the range of the mathematician. He can find enough of them in this volume. The laws of rotation of the sun, the behavior of a mass of fluid or gas under its own attraction, the whole history of stellar development, the various forms of nebulae, are some of them. The problem of the light curve of β Lyræ may perhaps belong to the older astronomy. The well-known work of G. H. Darwin on cosmical origins, and of Johnstone Stoney on atmospheres are instances of the new methods, and Schuster

has shed a light on current ideas as to the existence of periodicity in various phenomena which may have the effect of clearing up many doubtful points in sunspot and other periods.

All these matters are here set forth. While giving in each case a concise story in which references to the original sources form a conspicuous element, Miss Clerke has at the same time made the volume eminently readable. It constitutes a valuable complement to her well-known work on the history of astronomy.

ERNEST W. BROWN.

Opinions et Curiosités touchant la Mathématique. (Deuxième Série.) Par GEORGES MAUPIN. Paris, C. Naud, 1902. 332 pp.

THE first volume of the *Opinions et Curiosités* appeared in 1898, and was reviewed in the *BULLETIN*, Volume 6 (1900), page 255. The present volume is made up of two parts. The first contains miscellaneous extracts from works mainly of the sixteenth and the seventeenth century, touching such subjects as the rotundity of the earth, the number of chemical elements, the nature of comets, the figure of the moon, ancient navigation, the capacity of Noah's ark, origin of the notion of the infinite, the squaring of the circle, etc.

The second part, covering 162 pages, is given up to biographical notes on Simon Stevin and Albert Girard, and to extracts from the *Oeuvres Mathématiques* of Stevin, edited by Girard and printed in 1634. The great historical importance of Stevin's book, as well as its rarity, justify this course. We find here quotations giving Stevin's argument "que l'unité est nombre," which are of value in tracing the development of the number concept. Several extracts exhibit Stevin's notation in decimal fractions and other parts of arithmetic. His great independence of thought is shown in his protest against calling incommensurable numbers like $\sqrt{8}$ "absurds, irrationnels, irréguliers, inexplicables, sourds, etc." A number of physical and mechanical subjects are also touched upon, notably those relating to the tides, the formation of rain, the size of the earth, the center of gravity, the equilibrium of bodies.

The two parts of Maupin's book, taken together, make an interesting and entertaining volume. It is of value in exhibiting vividly certain stages in the progress of thought. It is good supplementary reading in a course on the history of mathematics and of physical science.