

any place in Italy can be found when the hour of central Europe (used for civil purposes in that country) is known. Much astronomical information is also given. The map of Italy, which is divided into four parts for convenience, deserves especial commendation. The geographical details are very full and red lines drawn at intervals of a quarter of a degree of longitude, or one minute of time, show at a glance the local time difference between any two places.

ERNEST W. BROWN.

Formulario scolastico di matematica elementare. Per MARCO AURELIO ROSSOTTI. Milan, M. Hoepli, 1899. 18mo, pp. xvi + 191.

THIS compendium is prepared for use in the secondary schools of Italy; in the author's opinion it is representative of their methods, needs, and requirements; it thus possesses interest to the American reader in addition to the intrinsic value of its material. Its contents fall into four parts occupied with arithmetic, algebra, geometry, and trigonometry, respectively. As is indicated by the title, formulæ and results alone are given; the book is in no sense didactic and all demonstrations are excluded.

The first part contains numerous tables, among which are those of all primes less than ten thousand; of the minimum divisors of integers less than ten thousand and not divisible by two, three, five, or eleven; of the eight perfect numbers less than the twenty-fourth power of ten; of the first twenty-six pairs of amicable numbers; of the squares and cubes of all integers from one to one thousand; of the first fifty powers of two, three, and five; of the square and cube roots, to five places of decimals, of all the integers up to one thousand. The great convenience to be gained by the universal adoption of the metric system in Italy is evidenced by the fact that twelve pages of the seventy devoted to this part are sacrificed to the different tables of weights and measures of twelve Italian states. This section concludes with various theorems in ratio and proportion, and the rules of interest, alligation, and false position.

The second part presents initially the laws of the operations of ordinary algebra. There is a curious inversion in notation when $b + ai$ appears as the symbol of the complex number. The elaborate tabular discussions of the solutions of linear and quadratic equations are so exhaustive as to be almost painful in their details. The usual properties of progressions, permutations, probabilities, indeterminate, exponential, and binomial equations are accompanied by col-

lections of theorems relative to inequations, maxima and minima, and continued fractions, together with an eleven-place table of decimal logarithms of the first one hundred and fifty prime numbers (the last one is eight hundred and fifty-nine). The binomial theorem of Newton terminates this part, which concludes with the one hundredth paragraph and the one hundred and thirteenth page of the book.

The first eighteen sections of the part dealing with geometry are taken up with the elements of the simple regular and irregular polygons. The details of the geometry of the circle and the computation of π follow; the series of Wallis, Leibnitz, Brounker, Lacroix, and Bernouilli, and the value of π to one hundred places of decimals are given. The remainder of the third part is devoted to the geometry of space and the sphere, concluding with a concise résumé of the characteristic properties of the conic sections.

The extent of the syllabus of trigonometry, which fills the last forty-two pages of the book, is indicated by the presence of De Moivre's theorem and its corollaries and the elements of the circles associated with a spherical triangle.

The above volume is the two hundred and eightieth number of the scientific series of the collection of manuals now in course of publication by M. Hoepli, of Milan. Up to the present there have been issued six hundred different numbers of these manuals devoted to subjects in science, technology, literature, law, and art. Of the various volumes relating to mathematics the following may be mentioned: Aschieri's analytical geometry, descriptive geometry, and projective geometry; Bagnoli's statics; Cattaneo's thermodynamics; Panizza's practical arithmetic, rational arithmetic, exercises in arithmetic; Pascal's differential calculus, integral calculus, calculus of variations and finite differences, exercises in the infinitesimal calculus, determinants and their applications, elliptic functions, repertorium of higher mathematics; Pincherle's elementary algebra, algebraic analysis, exercises in algebra, elementary geometry, exercises in geometry; Scarpis's theory of numbers; and translations of Ball's mechanics and Lockyer's astronomy.

EDGAR ODELL LOVETT.

Lectures on Elementary Mathematics. By JOSEPH LOUIS LAGRANGE. Translated by THOMAS J. McCORMACK. Chicago, The Open Court Publishing Company, 1898. xvi + 156 pp.

THE English language is notably deficient in translations into it of standard or classical mathematical works, ancient