

## CELEBRATED PROBLEMS OF GEOMETRY.

*Sur les Problèmes célèbres de la Géométrie élémentaire non résolubles avec la Règle et le Compas.* Par F. GOMES TEIXEIRA. Coïmbre, Imprimerie de l'Université, 1915.\* 4to. 132 pp.

THERE have been many historical surveys of the three famous problems of the ancients. One such was Montucla's anonymous work of 1754 on the history of the problem of the squaring of the circle with a supplement concerning the problems of the duplication of the cube and the trisection of an angle.† But a more adequate history of the problem of the duplication of the cube was published by Reimer in 1798.‡ An accurate and still more elaborate presentation which took due account of later research was published about a century later by Ambros Sturm.§ A. Conti's account of the problems of duplication of the cube and trisection of an angle occupied about 70 pages of the second part of Enriques's *Fragen der Elementargeometrie*, which appeared in 1907. This same work contained B. Calò's chapter (60 pages) on transcendental problems, especially that of squaring the circle. These chapters underwent some revisions in the new Italian edition: *Questioni riguardanti le Matematiche elementari* (1914).|| Prior to Calò's article, one of the best sketches of the history of the problem of squaring the circle was by Rudio, 1892;¶ Vahlen's discussion\*\* (1911) is also valuable; Hobson's most readable history appeared in 1913.

Such are some of the chief historical surveys. The most

\* Also published as an Appendix to Gomes Teixeira's *Obras sobre Mathematica*, vol. 7, 1915, pages 285-412.

† *Histoire des recherches sur la quadrature du cercle*. Paris, MDCCLIV. 47 + 304 pp. + 8 plates. Nouvelle édition revue et corrigée (par S. F. Lacroix). Paris, 1831. 16 + 300 pp. + 4 plates.

‡ N. T. Reimer, *Historia problematis de cubi duplicatione*. Gottingæ, MDCCXCVIII. 16 + 222 pp. + 2 plates.

§ A. Sturm, *Das Delische Problem*, Linz, 1895-1897. 140 pp.

|| Vol. 2, Bologna, 1914. Pp. 185-335.

¶ F. Rudio, *Archimedes, Huygens, Lambert, Legendre. Vier Abhandlungen über die Kreismessung*. Deutsch herausgegeben und mit einer Uebersicht über die Geschichte des Problems von der Quadratur des Zirkels, von den ältesten Zeiten bis auf unsere Tage. Leipzig, 1892. History, pp. 1-69.

\*\* T. Vahlen, *Konstruktionen und Approximationen*. Leipzig, 1911. Pp. 175 ff. and 306 ff.