

ing and suggestive. The general plan seems admirable ; and the student should have mastered in the end not only the usual collection of time-honored facts about conics, but a few of the well-known theorems such as Desargues's, Brianchon's, and Pascal's, as well as an introductory idea, at least, of that most important geometric concept, — the group of all projective transformations.

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Tratado de las Curvas Especiales Notables. By F. GOMES TEIXEIRA. Madrid, "Gaceta de Madrid," 1905, ix + 632 pp.

THIS volume had its inception in a prize problem proposed in 1892, and repeated in 1895, by the Royal Academy of Sciences of Madrid, requiring "An orderly list of all the curves of every kind to which definite names have been assigned, accompanying each with a succinct exposition of its form, equations and general properties, and with a statement of the books in which, or the authors by whom, it was first made known." This programme our author has closely adhered to except in one particular. To attempt to give the properties of all such curves would be extremely difficult and would make the resulting work unwieldy, he has therefore wisely limited himself to a list of over one hundred curves so selected as to include almost all of especial importance.

This treatise and Loria's work, "Spezielle algebraische und transcendente ebene Kurven," which appeared a little earlier, cover almost the same field. Both authors seem to have taken their suggestion from the theme of the Royal Academy. Teixeira, however, has followed that programme more closely. Loria's work is arranged in a more satisfactory manner and is somewhat more advanced in treatment. Teixeira's has the advantage of giving a considerable discussion of space curves.

The first two chapters (98 pages) of Teixeira's treatise are devoted to a detailed exposition of the properties of the most important cubic curves. In the third, fourth, and fifth chapters (158 pages) he treats of quartics and in the sixth chapter (68 pages) of algebraic curves of order higher than the fourth. He considers in the seventh chapter (39 pages) a number of transcendental curves, most of them of considerable physical importance. The spirals are considered in Chapter VIII (47 pages), the parabolas and hyperbolas $y = a^{1-k}x^k$ in Chapter IX (10 pages), and the cycloidal curves in Chapter X (56