sary and sufficient condition that the quadratic (9) be satisfied by any two values of t_2 is expressed by equating to zero the coefficient of each power of t_2 in (9). The determinant of these three equations equated to zero is

$$(10) \qquad \begin{vmatrix} 3\,|abx| & 3\,|acx| & |adx| \\ 3\,|acx| & |adx| + 9\,|bcx| & 3\,|bdx| \\ |adx| & 3\,|bdx| & 3\,|cdx| \end{vmatrix} = 0,$$

and this is the equation of the R^3 as the locus of a point x_i which coincides with a point of the R^3.

The method of finding the equation of the line determined by the points of the R^n whose parameters are t_1 and t_2 requires no formal statement. If this equation is represented symbolically by

$$(11) \qquad n|abx|t_1^{n-1}t_2^{n-1} \cdots = 0,$$

by arranging (11) as a binary $(n - 1)$-ic in t_2 and equating the coefficients of the powers of t_2 to zero n equations are obtained, and the determinant of these equations equated to zero is the equation of the R^n.

PENNSYLVANIA STATE COLLEGE,
November, 1915.

THE PHYSICIST J. B. PORTA AS A GEOMETER.

BY PROFESSOR GINO LORIA.*

IN his remarkable and entertaining Budget of Paradoxes, of which a new edition has just been published under the editorship of David Eugene Smith, Professor De Morgan speaks of the work entitled "Io. Baptista Portae Neapolitani Elementorum curvilineorum Libri tres. In quibus altera de Geometriae parte restituta, agitur de Circuli Quadratura (Romæ, MDCX)," in the following words: "This is a ridiculous attempt, which defies description, except that it is all about lunules."

Such a scornful judgment forms an evident contrast to the opinion expressed by M. Chasles, who in his Aperçu Historique†

* Translated from the author's manuscript by Madelaine A. Batta.
† Second edition, Paris, 1875, p. 216.