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Author(s): F. S. M.

Review by: F. S. M.

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is in practical mathematics is well—an engineer can appreciate the intellectual state of an engineer student.

He rightly upholds the importance of directness and naturalness of method. Many students regard the suggestion of putting $\sqrt{a^2+x^2}=z-x$ in order to integrate $\frac{1}{\sqrt{a^2+x^2}}$ as an outrage and a fraud, and so it is if put forward as a natural way of working out an unknown integral. We have the fullest sympathy with the author's desire to systematize methods of integration, and with every wish to acknowledge that an argument which would make the editors of the *Quarterly Journal* (let us say) stare and gasp, may convince a student in whom the more closely reasoned logical proof would merely produce suspicion, confusion, and dislike. But where is the student who finds comfort in the following extract from Professor Webb's introduction?

p. 2—"If then -1 be recognised as a quantity, $\sqrt{-1}$ must also be a quantity, for it is inconceivable that the quantitative nature of -1 can be destroyed by the operation of finding its square root when this operation has no such effect on other quantities."

This is a fair specimen of the value of the introduction.

Professor Gunther's share in the book is accurately written, but his choice of substitutions is not always judicious. Thus at p. 59 he integrates $\frac{1}{(a^2-x^2)\sqrt{b^2-x^2}}$ by putting $x=a \sin \theta$ when $x=b \sin \theta$ is more natural and also more effective.

C. S. JACKSON.

Cinq études de géométrie analytique. By DR. M. STUYVAERT, Répétiteur à l'Université de Gand. (Librairie scientifique E. van Goethem, Rue des Foulons, 1, Gand.)

The sub-title is "Applications diverses de la théorie des matrices et de l'élimination," and this gives a fair idea of the contents of the work. If the finding of the equation of a surface locus in space comes to the elimination of a parameter t between two equations, the expression of the condition that the equations in t should have more than one root common leads to the equations of singular lines on the surfaces. This condition, and consequently the equations of the singular lines, are expressed in the form of a matrix, whose elements are polynomial functions of the co-ordinates. The author investigates some of the properties of curves and other varieties in space of three or more dimensions whose equations can thus be expressed by the vanishing of a matrix; but he does not go far, and the work does not appear to present any great novelty.

F. S. M.

Il Passato ed il Presente delle principali Teorie Geometriche. By GINO LORIA. 1907. (Carlo Clausen Hans Rinck Succ., Torino.)

The name of the Professor of Higher Geometry at the University of Genoa ranks deservedly high among those of the erudite of European reputation, and a third edition of his volume on the past and present of geometrical theories will not be welcomed the less because he has added a sketch of the developments of the last ten years. It is fortunate that those to whom the book will be of use will be no more than irritated by the appalling frequency of misprints in the titles of papers and memoirs, for otherwise the value of the work would be very considerably impaired. Misprints have been detected after a cursory perusal on pp. 25, n., 30, 37, 47, 48, 75, 85, 93, n., 94, 105, 114, 121, 129, 145, and n., 161, 171, n., 185, 192, 193, 195, 200, 201, 230, 233, 234, 235, 289, 324, 332, 355, 357, 358, 365, 393, 394, 425, 427, 429, 431, 440, 445, 447. "Poincaré" appears again and again, but is spelled correctly in the index. *En revanche*, "Russel" appears in both text and index, as does "Richemond." W. H. and F. S. Macaulay are confounded. The "tree cusped hypocycloid" reminds us of a similar delightful misprint we once noticed in the *Bulletin de Mathématiques Spéciales*, now defunct, "*hypocycloïde à trois remboursements*." We suppose it is inevitable that in dealing with large masses of papers written in practically all European tongues that there should be some misprints, but there lurks in one's mind the suspicion that careful investigation will here discover a multitude. The sketch of recent developments extends to 130 pages.

W. J. G.