Three Lectures on Fermat's Last Theorem by L. J. Mordell
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REVIEWS.

Three Lectures on Fermat's Last Theorem. By L. J. MORDELL. Pp. viii + 31. Price 4s. net. 1921. (Cambridge University Press.)

With one exception the arithmetical results stated by Fermat, such as the fact that every prime number of the type $4n+1$ is expressible as a sum of two squares (*e.g.* $113 = 7^2 + 8^2$), were proved within a hundred years of his death in 1665. The solitary exception, which has achieved fame as the *Last Theorem*, states that, when n exceeds 2, there exists no triad of positive integers x, y, z, such that $x^n + y^n = z^n$.

The truth of the last theorem has been demonstrated for certain smaller values of n (omitting only 37, 59, 67 as far as 100), but none of the proofs has led to a complete generalisation as yet. Additional prominence has been given to this theorem during the last few years through the establishment of a prize of 100,000 marks for the first complete proof that Fermat's statement is either true or untrue.

Mr. Mordell, in the course of three public lectures delivered at Birkbeck College in 1920, gave an account of the present state of knowledge concerning the Last Theorem. These lectures (with some amplifications), now printed for the benefit of a wider public, give a very lucid account of what has been done, and trace the fallacies in some of the better known and obvious attempts to prove the theorem.

In view of the considerable erroneous literature on the subject, it is to be hoped that any one proposing to make a serious study of the Last Theorem will make himself acquainted with Mr. Mordell's pamphlet and equally with the last chapter in Vol. 2 of Prof. L. E. Dickson's *History of the Theory of Numbers*. For the sake of those desiring to complete the proof, it is only fair to say that it has been unsuccessfully attempted by the greatest of mathematicians during the last two centuries, including Euler, Legendre, Gauss, Cauchy and Kummer, and has several times been made the prize question of learned societies.

W. E. H. B.

Real Mathematics. By E. G. BECK. Pp. viii + 306. 15s. 1922. (Henry Froude, Hodder and Stoughton, Oxford Technical Publications.)

This does not profess to be a text-book, and, "so far as the Author is aware, no such treatment of mathematics has been published previously." Its objects, as stated in the preface, are "to offer assistance to practical engineers and engineering students in the acquisition of a real, serviceable, and sound mathematical equipment," "to augment the standard text-books and orthodox methods of study," and to provide "a standpoint from which the subject may be studied throughout in the light of simple and straightforward human reality." The portions of the subject selected for treatment are: arithmetic (including logs.), algebra (mainly factors, equations and graphs), trigonometry, and the fundamental ideas of the calculus, concluding with a chapter on "Units, Fundamental and Derived."

The preface and introduction—and indeed the whole book—are full of moral precepts. The introduction is almost psycho-analytic, and we are presented with a harrowing picture of the engineer suffering from a buried complex, due to his lack of power of self-expression in mathematics. This is diagnosed as the effect of the "old trouble, the glorification of technique into an end, instead of its utilisation as means to an end." There is a deal of truth in this, as anyone who has had to teach mathematics to engineering students will agree. Most mathematical text-books are written by mathematicians, who are more concerned with the principles of the subject than with its applications. Engineers are perforce practical, and that which is not practical does not appeal to them; moreover, they have little time to "waste" on non-essentials. Convince them of its usefulness, and let them see how and to what it can be applied, and they will be found to be as keen on mathematics as anyone. There is still ample scope for someone who understands and appreciates the mental outlook of both mathematicians and engineers, to present mathematics in such a manner that the acquisition