This edition of these very valuable lectures will be welcomed.

The whole field of functional calculus is a new territory but recently open for settlement, though an adventurous investigator occasionally explored small parts of it in the past century. The important extensions of mathematics have come from the problems of inversion, such as the Galois theory, theory of ideals, differential equations, integral equations, and now the calcul fonctionnel. These developments of Professor Volterra are of the highest importance mathematically aside from all of their physical interest, for the reason that they furnish a very practical path of entry into this new field and occupy a considerable part of the field itself. Fortunately we can follow them more in detail in the two recent courses of his lectures, Leçons sur les fonctions des lignes, and Lecons sur les équations intégrales.

JAMES BYRNIE SHAW.

SHORTER NOTICES.

Mysticism in Mathematics. By HASTINGS BERKELEY. Henry Frowde, Oxford University Press, 1910. vi + 264 pp.

IT may be well to begin by stating what Mr. Berkeley's thesis is not. The kind of mysticism which he thinks he detects in mathematics is not any of the kinds of mysticism that one encounters in the history and philosophy of religion. It is not contended that devotion to mathematics begets or tends to beget in the devotee a sense of an immediate and ineffable union or identification with deity. It is not argued that there is any essential likeness between Euclid and Timæus or between Gauss and Angelus Silesius. What Mr. Berkeley calls mysticism in mathematics is, he says, so called by him because no other name seems to him so appropriate. It appears to be impossible to state with mathematical precision what the thing is. Of course the author is not to be blamed for that. He succeeds in the difficult enterprise of making the matter as clear to the reader as it is to the writer, and that is all that can be reasonably expected.

As nearly as we have been able to make it out, the thesis may be broadly stated to be that, owing to a kind of reaction of language and especially of highly symbolic language upon