

While beginning with the elements of the calculus, it carries the reader to the point where he is prepared to use original sources and extracts from ϵ -proofs the underlying thought. When the future historian inquires how the calculus appeared to the mathematicians of the close of the nineteenth century, he may safely take Professor Goursat's book as an exponent of that which is central in the calculus conceptions and methods of this age.

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HARVARD UNIVERSITY,
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SHORTER NOTICES.

Niedere Zahlentheorie. Erster Teil. By Dr. PAUL BACHMANN. B. G. Teubner's Sammlung von Lehrbüchern auf dem Gebiete der mathematischen Wissenschaften mit Einschluss ihrer Anwendungen. Band X, 1. Leipzig, 1902. x + 402 pp.

IN view of the ambitious series of volumes by Bachmann, giving a comprehensive exposition of number theory, a series not yet completed, the appearance of a new volume on the elements of the subject, quite independent of the series mentioned, will doubtless cause some surprise. When the invitation came to the author to contribute to Teubner's Sammlung a text upon the subject on which he is so eminent an authority, he hesitated long, fearing that a text on the elements of number theory ran the risk of conflicting with his Elementen. The author has attempted to avoid this conflict in two directions: first by the addition of much important material; second, by employing a method of construction different at least in essential points. The author believes that the present book, both in contents and in foundation, may well be considered as a supplementary volume to his former series. As indicating in detail parts differing essentially from the Elementen, there may be mentioned the chapter on the different euclidean algorithms, including Farey's series, the theory of binomial and general congruences, the exhaustive treatment of the known proofs by elementary number theory of the quadratic reciprocity law and the interrelations of these proofs. The theory of higher congruences is appropriately introduced, even in the Niedere Zahlentheorie, both by way of climax to the elementary parts and to afford a satisfactory insight into the means employed by Gauss in his seventh proof of the reciprocity law.