# SHORTER NOTICES

*Introduction to the Mathematical Theory of the Conduction of Heat in Solids.* By H. S. Carslaw. Second edition, completely revised. London, Macmillan and Co., 1921. xii + 268 pp.

The first edition of Professor Carslaw's work appeared in 1906 under the title *Introduction to the Theory of Fourier's Series and Integrals and the Mathematical Theory of the Conduction of Heat.* This book, which was reviewed in volume 15 of this BULLETIN, was divided into two parts corresponding to the two principal topics in the above title. It had been out of print for some time, and the author wisely decided to rewrite the entire book in such fashion as to take account of the progress that has been made in the theories involved since the appearance of the first edition. The very considerable expansion of size inevitably involved in such a rewriting has led naturally to the replacing of the two parts of the first edition by the two volumes of the second edition.

The first volume, which was entitled *Introduction to the Theory of Fourier's Series and Integrals*, was reviewed in volume 28 of this BULLETIN. As pointed out in that review, it showed extensive rewriting and considerable expansion as compared with the first part of the original edition. The present volume likewise exhibits considerable alteration from the second part of the first edition. Chapters I–VI, which contain substantially the same material as the corresponding chapters of the first edition, have been extensively revised; chapters VII–X contain much new material; chapters XI and XII are entirely new.

The first edition of the book was particularly noteworthy from the fact that it was the first work in English in which a large group of the standard problems that arise in the theory of the conduction of heat were dealt with systematically in a rigorous fashion. In addition to this group, however, certain other problems were introduced where the possibility of a rigorous treatment was merely indicated instead of being carried out. This was probably due partly to considerations of space, and partly to a desire to keep the book sufficiently elementary to be palatable to the student of applied mathematics, the omitted proofs being in many cases long and difficult. In some cases the omission was perhaps due to the fact that no completely rigorous discussion was available in the literature. In the present edition such of the missing proofs as are not unusually lengthy are supplied, as for example in sections 17 and 31; in most other instances, where the complete discussion is not given, suitable references are furnished which will enable the reader, if so disposed, to find a rigorous discussion in the literature. One rather noteworthy exception to this rule may be found in section 51, where the possibility of the expansion of an arbitrary function of three variables in a triple Fourier's series is assumed. The omission of any reference in this case is quite understandable, as in spite of the very extensive literature on the ordinary Fourier's series, the reviewer is unaware of any discussion of the triple Fourier's series in existing literature which would supply the missing proof in the section mentioned.