As a text for class-room use it will be found very suitable except perhaps for those whose interests center mainly in the geometrical aspects of the subject. Some of the analysis in Chapter IV may possibly be found rather difficult by immature students, but by suitable omissions no trouble would be experienced. Not only the author but the publishers as well are to be congratulated on their part in the production of the book.

HOWARD H. MITCHELL.

SHORTER NOTICES.

Elliptic Integrals. By HARRIS HANCOCK. New York, Wiley, 1917. 104 pp.

THIS volume is number 18 of the well-known series of Mathematical Monographs edited by Mansfield Merriman and Robert S. Woodward. It was prepared in response to a request from the editors for a work of about one hundred octavo pages on elliptic integrals which should "relate almost entirely to the three well-known elliptic integrals, with tables and examples showing practical applications." The monograph is confined to the Legendre-Jacobi theory and the discussion is limited almost entirely to the elliptic integrals of the first and second kinds.

After a short introduction (pages 5–8), mostly historical, there follows in Chapter I (pages 9–23) an elementary discussion of the three kinds of elliptic integrals and the Legendrian transformations. The Jacobi elliptic functions are treated in Chapter II (pages 24–40). Chapter III (pages 41–64) is devoted to elliptic integrals of the first kind and Chapter IV (pages 65–87) to numerical computation of the elliptic integrals of the first and second kinds and to Landen's transformations. Several miscellaneous examples and problems are given in Chapter V (pages 88–91). In the sixth and last chapter (pages 92–101) are three five-place tables as follows: Table I, the complete integrals of the first and second kinds, page 93; Table II, elliptic integrals of the first kind, pages 94–97; Table III, elliptic integrals of the second kind, pages 99–101.

A few misprints should be mentioned: On page 6, line 4, "*Application*" is printed for "*Applications*"; on page 12, line 6 below, "within" is printed for "in"; on page 24, second exposed line, supply lower limit of integration 0, and in the third line below this replace "written" by "wrote"; at the middle of page 26, supply lower limit of integration 0; on page 30, line 4, replace "real" by "pure imaginary"; on page 32, line 3 below the figure, "rectangles" is preferable to "parallelograms."

There is lack of consistency in the use of a_0 on page 10. It gives a jolt to the reviewer to read (page 20, lines 6 and 5 below) "F_1 increases from $\frac{1}{2}\pi$ to logarithmic infinity." There is no difference between the infinities approached by $\log x$ and x itself; the difference is in the way in which this infinity is approached. It is not clear how one may "observe" the transcendental nature of K and K' by considering the series exhibited on page 26. The grammatical connections in the author's sentences are not always felicitous, as one may verify (for examples) by noticing the sentence beginning near the foot of page 59 and that beginning near the foot of page 76.

We have now done our worst in the criticism of this monograph. It has many merits to commend itself to our interest. It affords in small compass an introduction to certain portions of the theory of elliptic integrals and functions, portions which in this concise exposition will be useful to a considerable number of individuals. It certainly covers very well just the ground which the editors asked the author to cover.

Perhaps it is never proper for a reviewer to quarrel with the author for not having written a different book from the one which he did write, especially when he has carried out a request from the editors of a series. But, in the present instance, one can hardly avoid raising the question as to which is likely to be more useful now, a hundred-page monograph on elliptic integrals such as the one under consideration or a like monograph on elliptic functions approaching them from the fascinating function-theoretic points of view. There seems little room to doubt that the latter would prove of more service and have a wider distribution. It is to be hoped, therefore, that the appearance of the monograph now before us will not prevent the preparation and publication of a similar one on elliptic functions.

R. D. CARMICHAEL.