

of these. The book is an unusually good one. Throughout there are excellent figures to illustrate points in the text. The figure exhibiting the reason for the ambiguity in sign of the derivative of  $\sin^{-1}x$  is one that will be found especially helpful to the student. Indeterminate forms are assigned to a note at the end of the book. This seems to be far more in keeping with the relative importance of the subject than the treatment usually given in American text-books.

The chapter on infinite series is certainly an excellent one. It is more extensive than the corresponding one in many elementary books. The discussion of term-by-term differentiation and integration of infinite series is especially to be praised. The chapter on Taylor's theorem maintains the same standard. This chapter is put much later than usual.

There is a short chapter on differential equations, and an appendix in which hyperbolic functions, intrinsic equations, indeterminate forms, and applications to mechanics are discussed. After a set of questions and exercises and a table of integrals, some of the more common curves with their equations are given.

This latest and most extensive of Professor Murray's books is at the same time much the best one.

WILLIAM BENJAMIN FTEE.

*Elementary Algebra.* By J. H. TANNER. New York, American Book Company. x + 364 pp.

THE present work is an attempt to solve a problem whose difficulties only those have realized who have seriously and conscientiously attempted to outline a course of instruction in elementary algebra which shall be teachable in the first place, but which on the other hand shall not constantly offend one's sense of rigor. There is a middle course here between Scylla and Charybdis; between the rigor of a work like Stolz and Gmeiner's *Theoretische Arithmetik* and the conventional algebras, whose authors draw their ideas from an age mathematically as remote as the age of stone and bronze.

Where does the best course lie between these grave perils? We do not know. *A priori* reasoning is of little avail here; it is a question which must be worked out by actual experience.

The present volume is a noteworthy and precious contribution in this direction. With ample knowledge of the founda-

tions of the subject, with wide experience of the needs of the pupil and above all with a rare mathematical tact which here is a *sine qua non*, Professor Tanner has written a work which has afforded us a very sincere pleasure in reading and which seems to us superior to any elementary English or American book on this subject which we have yet seen.

What strikes one most noticeably is the thoroughly scientific spirit of its author, the seriousness of his purpose and the simplicity and clearness of his exposition. We believe it must be a dull pupil who is not interested by the author's quiet but fascinating style. The work is indeed a veritable little classic in this respect. The usual course of the author is to begin each new topic with an introduction which gives the reader an idea of the discussion to follow. The new notions are then presented as simply as possible and illustrated with well chosen examples. By this means the reader is put in position to see the principles involved which are now stated precisely and accompanied by correct demonstrations. Problems are abundant and frequent recapitulations and review questions emphasize the main results acquired, and serve to retain them in his memory. Scattered through the book are a goodly number of notes touching on the nicer points and which no doubt will stimulate bright students to further thought and perhaps help the teacher over some hard places.

JAMES PIERPONT.

*Annuaire pour l'An 1905, publié par le Bureau des Longitudes, Paris, Gauthier-Villars.*

In a long notice "Explication élémentaire des Marées," M. Hatt continues his article on the tides. The first part, printed in the *Annuaire* for 1904, consisted of an account of the forces producing the phenomena and the general effects produced. In the present part, the specialized effects, time and height of the tide at any particular place, are set forth with much detail. After explaining the "forced" periods of the various lunar and solar tides, the writer goes into the methods of harmonic analysis and synthesis, especially those of Darwin, by which the tide at any particular spot can be found. Although M. Hatt has not sacrificed clearness of exposition to brevity, there are pages here and there which the reader not previously instructed in the subject (and it is for such a reader that the