$.\frown.$, *simultaneous affirmation*
$2 < x < 7 . \frown . 4 < x < 9 : = : 4 < x < 7$

$.\smile.$, *alternative affirmation*
$2 < x < 7 . \smile . 4 < x < 9 : = : 2 < x < 9$

$\sim$, *negation* of what follows to a stoppoint
$\sim (8 + 3 = 10), \quad 6 \sim = Np$

$\exists$, *there are some* $\exists[N^2 \frown (N^2 + N^2)]$

Cls, class of (taken in extension).

Elm, class of only one element.

After explaining the significance of these signs, the author considers the properties of certain logical relations, such as equality, appurtenance, inclusion, implication, etc. The possible transformations of logical statements are considered, the figures of the syllogism developed, and finally he shows that all the other symbols can be defined by means of three, namely $=$, $\frown$, and $\ni$, in other words, in terms of the notions of *identity*, *largest common subclass*, and *such that*. Although such definition is possible, it is inconvenient to use nothing but these symbols, so that the others ought to be retained for convenience. The style of the treatise is clear and very simple, and as an introduction to the study of mathematical logic, can scarcely be excelled.

JAMES BYRNIE SHAW.

*Elements of Plane and Spherical Trigonometry.* By JOHN GALE HUN and CHARLES RANALD MACINNES. New York, The Macmillan Company, 1911. vii + 101 pp., with tables, pp. 102–205.

IN writing this book, the authors have undertaken "to present in as brief and clear a manner as possible the essentials of a short course in trigonometry." This aim they appear to have kept constantly before them. The language of the book is simple, concise, and interesting. The subject matter is brief enough to be covered by a class in somewhat less time than that usually required, and still comprehensive enough to take in all that is usually regarded as essential.

The authors have included one subject not often treated in a text book in trigonometry, namely, the drawing of graphs of equations in polar coordinates. For this, they give the

following two reasons: "Firstly, because such problems aid in giving the student a clearer idea of the way in which the trigonometric functions vary as the angle is changed, and secondly, because of a very common lack of sufficient knowledge of polar coordinates on the part of students beginning the study of calculus." This work is introduced early in the book—earlier, indeed, than seems advisable, as it precedes the treatment of the relation of the functions of angles differing by 90° and 180°, a working knowledge of which would render the process of graphing far less difficult.

In the explanation of logarithms and the use of tables of logarithms and trigonometric functions, the authors have avoided the rather common error of being so brief as to be fully intelligible only to one already understanding the subject. Their treatment is clear and explicit, supplemented by problems for the student to solve.

CORA B. HENNEL.

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## NOTES.

THE twentieth annual meeting of the American Mathematical Society will be held in New York City on Tuesday and Wednesday, December 30–31, 1913. At this meeting Professor H. B. FINE will deliver his Presidential Address, on "An unpublished theorem of Kronecker respecting numerical equations." Titles and abstracts of papers intended for presentation at the annual meeting should be in the hands of the Secretary by December 13.

THE opening (September) number of volume 15 of the *Annals of Mathematics* contains the following papers: "Singular point transformations in two complex variables," by G. R. CLEMENTS; "On the projective differential geometry of plane anharmonic curves," by S. W. REAVES; "On the rank of a symmetrical matrix," by L. E. DICKSON; "Note on the rank of a symmetrical matrix," by J. H. M. WEDDERBURN; "On the numerical factors of the arithmetic forms $\alpha^n \pm \beta^n$," by R. D. CARMICHAEL.

THE concluding (October) number of volume 35 of the *American Journal of Mathematics* contains the following