

sumptions. Consequently one has the sensation of the oft quoted traveler who is aware that he is going, but who does not know his destination. Possibly and probably such discussions are necessary as a preliminary clearing of a field. They give one a feeling for the significance of a question and may help to formulate the essential problems. But they can never be conclusive in character. To obtain real insight in the foundations of mathematics, mathematical methods have to be used.

ARNOLD DRESDEN

*Tafeln der Besselschen, Theta-, Kugel-, und anderer Funktionen.* By Keiichi Hayashi. Berlin, Julius Springer, 1930. 125 pp.

*Fünfstellige Funktionentafeln.* By Keiichi Hayashi. Berlin, Julius Springer, 1930. 176 pp.

The title of the first of these volumes indicates its principal contents, the other tables referred to being for the most part subsidiary to those named. An idea of the scale on which this useful compilation has been made can be had from the table for  $J_0(x)$  and  $J_1(x)$ . From 0.000 to 0.110 the entries are carried to sixteen places; from 0.12 to 0.50, to fourteen places; and from 0.50 to 25.10, to twelve places. Among the less usual functions included in this collection are  $1/(n!)^2$ ,  $n=1, 2, \dots, 70$ , and the arithmetic-geometric mean between 1 and  $k'$ ,  $(k')^2=0.00000$  to 0.00300. The presence of these two tables illustrates the intention of the author to provide the computer with means of amplifying, if necessary, the primary tables of this volume. A convenient appendix of four-teen pages gives the analytic expressions for the functions tabulated.

In *Fünfstellige Funktionentafeln*, we find an even greater variety of tables. Besides abbreviated forms of the tables found in the volume which we have just mentioned, there are included in the forty-nine tables listed such functions as the gamma function, tables of powers and factorials, values of the probability integral as a function of its upper limit, the solutions of eight transcendental equations such as  $\tan x=x$ , and many other items for which the computer will be grateful.

As for the physical make-up of these books it would be sufficient to point out that they are from the press of Julius Springer, were it not for the fact that to users of tables this is matter of special importance. The reviewer wishes to record that he has never seen tables in which the general appearance of the printed page is more pleasing to the eye.

T. H. RAWLES

*Statistical Résumé of the Spearman Two-Factor Theory.* By Karl J. Holzinger. Chicago, The University of Chicago Press, 1930. 43 pp.

An interesting and clearly expressed review of Spearman's theory that every mental ability may be resolved into two linear components, of which one contains a factor common to all abilities, and the other a factor specific to the given ability. Some original mathematical discussion has been added, and the theory is amply illustrated. Much of the data for the illustrative material was gathered by the author.

B. H. CAMP