United States Life Tables: 1910. Prepared in the Division of Vital Statistics of the Bureau of the Census under the supervision of JAMES W. GLOVER. Washington, D. C., Bureau of the Census, 1916. 65 pp.

THIS work includes twenty-five life tables derived from twenty-five classes of persons of the population of the original registration states. The statistical data for these tables are obtained from the estimated population within these states as of July 1, 1910, and from the corresponding deaths in the calendar years 1909, 1910, and 1911. Osculatory interpolation retaining fifth differences was employed in distributing into yearly age groups the numbers given in quinquennial age groups. The first table in the book (pages 16–17) is derived from the entire population of the original registration states. The remaining twenty-four tables are obtained by classifications of this population into male and female, white and negro, rural and urban, native born and foreign born, and by preparing distinct tables for the following states: Indiana, Massachusetts, Michigan, New Jersey, and New York.

There has been urgent need of an application of mathematico-statistical methods to derive reliable results on mortality among the general population, and among various classes of that population. Both from an examination of the present work and through correspondence with Professor Glover, the reviewer is much impressed with the thoroughgoing methods employed in deriving these tables. The results are based on the part of the population of the United States on which we have, in general, more reliable mortality data than on other parts of the country. It is a very important feature of this work that separate tables of infant mortality are prepared, which show the mortality by age intervals of one month for the first year of life, and that the method used in preparing the tables for the first five years of life is the very commendable one used in constructing the German life tables for the decennium 1891–1900. An explanation of the meanings of various columns of the tables is given, with concrete examples, which will make the tables easily understood even by persons who are not particularly familiar with the language in which mortality rates, populations living at given ages, and expectations of life are expressed. One may easily draw from these tables rather striking information in regard to comparative mortality rates of different classes of persons. For

example, of the classes considered, the negro males have the highest mortality, and the white females from the rural population have the lowest mortality. The tables give as the complete expectation of life at birth for the male negro 34.05 years and for the rural female 57.35 years. The average death rate per thousand of the total population of the former is 29.37 while that of the latter is 17.44. As another striking illustration, we note that white males in cities have a complete expectation at birth of 47.32 years and an average death rate per 1,000 of 21.13, while the rural white males have a corresponding expectation of 55.06 years, and an average death rate per thousand of 18.16.

These tables may well become standard for certain civil purposes, such as the valuation of life estates, where there does not exist the selection of lives such as is involved in the data on which life insurance tables are based.

H. L. RIETZ.

NOTES.

THE March number (series 2, volume 18, number 3) of the *Annals of Mathematics* contains the following papers: "Symmetric functions formed by systems of elements of a finite algebra and their connection with Fermat's quotient and Bernoulli's numbers," by H. S. VANDIVER; "The generalized Lagrange indeterminate congruence for a composite ideal modulus," by H. S. VANDIVER; "On the congruence $cx^\lambda + 1 \equiv dy^\lambda$ in a Galois field," by H. H. MITCHELL; "On the geodesics and geodesic circles on a developable surface," by W. C. GRAUSTEIN; "Note on representations of the partial sum of a Fourier's series," by DUNHAM JACKSON; "Acknowledgment," by FRANK IRWIN; "Certain general properties of functions," by HENRY BLUMBERG.

Under an arrangement by which the Mathematical Association of America will contribute to its financial support, the *Annals* will enlarge its annual volume by 100 pages, which will be devoted to expository and historical papers. The subscription price, beginning with volume 19, will be $3.00, with a reduction of one half to members of the Association.

THE November, 1916, number (volume 2, number 11) of the *Proceedings of the National Academy of Sciences* contains