Contributions à l'Étude du Coefficient de Déformation des Fonctions Non Sinusoïdales. By Ernest Abason. Bucarest, Institut National Roumain, 1927. 125 pp.

General formulas are derived for the coefficients in the Fourier series expansion of a function $f(x)$ formed by joining a finite number of arcs, each of which may be represented by a polynomial in x. The results are expressed in terms of the discontinuous changes or "sauts" in $f(x), f'(x), f''(x), \cdots$, which occur at the abscissas at which adjacent arcs are joined. The calculations require the summation of finite trigonometric series, and this may be performed either numerically or graphically. Illustrative applications are given where $f(x)$ is a function formed by joining straight lines and also where the function $f(x)$ is used as a device to approximate a wave such as might be obtained by an oscillographic record of a physical phenomenon. It is pointed out (e.g., page 106) that in applications of the former type, the method is less complicated than the classical method of computing Fourier series coefficients, which, of course, is to be expected since the classical method requires in effect for the special cases considered a repetition of the integrations performed by the author in deriving his method. This work should be of considerable interest to those concerned with empirical harmonic analyses of waves.

W. R. BENNETT

The Size of the Universe. By L. Silberstein. Oxford University Press, 1930. viii+215 pp.

The aim of this book is to show that Einstein's assumption as to the metric of space-time is not valid, and to indicate what is the curvature of the alternative de Sitter metric in which space-time is supposed to have constant negative curvature. The first part (52 pp.) of the book gives a brief account of tensor analysis and elementary projective geometry. The second part (32 pp.) deduces Einstein's and de Sitter's solutions. Part III (17 pp.) is a somewhat bitter criticism of Hubble's estimate of the radius of space. Part IV (25 pp.) treats the geodesics and light rays of a de Sitter space-time. Part V discusses the Doppler effect and attempts to arrive at an estimate of the radius of curvature. The procedure adopted is not very convincing. A certain formula is arrived at, giving the Doppler effect of a star and involving two undeterminable constants, namely, the distance r of the star, and its perihelion distance r_0. Since nothing is known about r and r_0 a lot of observations are made, and it is assumed that all values of the ratio r_0/r in the interval 0 to 1 are equally probable. This logic is reminiscent of the argument that since we do not know at all whether Mars is inhabited or not, the probability that it is inhabited is $\frac{1}{2}$. Anyhow, the author arrives at the estimate $6.27 \cdot 10^6$ light years for the radius of elliptic space (from an examination of the data from 459 stars). The book is well printed and bound, and makes stimulating reading, but a conservative reader may be pardoned for thinking, on laying it down, that as regards the size of the universe, one man's guess is as good as another's. Anyone interested in the topics discussed in this book would be well advised to read the authoritative and readable report by Robertson, which appeared in the January, 1933, issue of Reviews of Modern Physics. It is stated in this report that Silberstein's estimates are generally regarded as impossibly low.

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