

## SHORTER NOTICES

*L'Univers en Expansion.* By Henri Mineur. (Actualités Scientifiques et Industrielles, No. 63.) Paris, Hermann, 1933. 41 pp.

This monograph is a good collection of the results obtained by the Lemaitre-Eddington-de Sitter line of development of the theory of the "expanding universe." Like those whose work he reports, he is apparently unaware of the existence of Friedmann's 1924 article in the *Zeitschrift für Physik* on open spaces, and is unfamiliar with the reviewer's 1929 treatment of the subject in the Proceedings of the National Academy of Sciences.

H. P. ROBERTSON

*La Théorie de la Relativité.* By A. Einstein. Translated into French by Maurice Solovine. Paris, Hermann, 1933. 109 pp. +1 plate.

This pamphlet is a translation into French of three articles, two of which were published in German and the third of which was written by Einstein expressly for this collection. The first two, occupying the first 98 pages, are Einstein's fundamental 1916 article in the *Annalen der Physik* and the 1931 Einstein-Mayer *Sitzungsberichte* paper on the ("5-vector") unified field theory. The remaining article is an exposition of the general Friedmann universe (with the usual erroneous attribution of the open-space cases to Heckmann), with special emphasis on the case in which the cosmological constant and the curvature of space are both taken as zero.

H. P. ROBERTSON

*Gleichgewichtfiguren Rotierender Flüssigkeiten.* By Leon Lichtenstein. Berlin, Springer, 1933. viii+175 pp.

This important work of the late Professor Lichtenstein was published not long before his death. In it he has given a somewhat brief historical account of work done on the problem by his predecessors, and a fuller account of the contributions made by himself and his students during the last few years. Since he presupposes on the part of his readers a familiarity with the theory of the newtonian potential function and of integral equations, together with a good grasp of other branches of analysis, geometry, and celestial mechanics, the book is not easy to read, but the results are so significant that it should be carefully studied by everyone who is seriously interested in the mathematical treatment of the problem of figures of equilibrium of rotating fluid bodies.

Suppose a body of fluid occupying a region  $T$  bounded by a surface  $S$  is rotating about an axis with an angular velocity  $\omega$ . Under what circumstances will it be in relative equilibrium assuming that its parts attract each other according to the newtonian law? The importance of this problem from the point of view of the theoretical shape of heavenly bodies and of their evolution is obvious. It has been studied by a long line of famous mathematicians, including conspicuously Newton, Maclaurin, Jacobi, Clairaut, Tschebyscheff, Poincaré, G. H. Darwin, Liapounoff, Wavre, and the author of this book. If  $V$  is the newtonian potential of the body at a point  $P$ , and if  $R$  is the