distance geometry available at this moment and it is certainly useful to have a survey of the results obtained so far in the geometric study of metric spaces.

J. HAANTJES

Exterior ballistics. By E. J. McShane, J. L. Kelley, and F. V. Reno. The University of Denver Press, 1953. 834 pp., 15 figures, 24 plates. $12.00.

This book forms a welcome addition to the very limited number of works on exterior ballistics; had there been many more competitors I suspect its welcome would have been equally warm.

The first chapter, roughly one-sixth of the book, is devoted to mathematical and physical preliminaries and is intended "to make the book intelligible to anyone who has had a reasonably good undergraduate course either in mathematics or physics." This chapter discusses vectors, the equations of rigid body motion, dimensional analysis (including an original proof of the Buckingham II theorem) and appropriate parts of statistics. I feel that it is impossible in a single chapter, even a chapter as long as this, to provide an adequate background to exterior ballistics and am of the opinion that the authors were over-ambitious to attempt it. Any complete background picture must contain the elements of aerodynamics as well as of dynamics, and any such inclusion would no doubt have made the space required entirely prohibitive. Leaving aside the desirability of such a chapter and its sins of omission I found the presentation of the material selected very satisfying and feel that the authors are to be congratulated on it, save on one point. This point concerns the equations of motion of a rigid body which are proved on the sweeping assumption that the internal forces between any two points of the body lie in the line joining them (for a discussion of this point see, for example, Jeffreys and Jeffreys, *Methods of mathematical physics*, Cambridge University Press, pp. 76 and 294).

Coming now to exterior ballistics proper the treatment starts in Chapter II by a discussion of the aerodynamic forces acting on the projectile; two force coefficients (K_{XF} the Magnus cross force due to cross spin and K_S the cross force due to cross spin) and a moment coefficient (K_{XT} the Magnus cross torque due to cross spin) are added to "complete" the system considered in the classical treatment of Fowler, Gallop, Lock and Richmond (Philos. Trans. Roy. Soc. London vol. 221 (1921) p. 295). The equations of motion (both C.G. and yawing) are then derived relative to axes fixed in the projectile—one along the projectile axis; the equations in the two directions