in a simple and appealing manner. The reviewer's only regret is that Professor Bliss did not have occasion to include various other topics in the calculus of variations in which he has been interested and to which he has made numerous contributions. The book is a valuable addition to a mathematician's library.

M. R. HESTENES

The theory of potential and spherical harmonics. By W. J. Sternberg and T. L. Smith. (Mathematical Expositions, No. 3.) The University of Toronto Press, 1944. 312 pp. $3.35.

This is a book on a classical field of analysis treated in the classical way and restricted to classical theorems. Potential theory in the 19th century sense is no longer a familiar subject in a mathematical curriculum, and so the value of such a publication is to be considered with respect to a rather special audience. Its needs might equally well be served by a compact presentation in English covering the fundamental notions similar, for instance, to that in Courant-Hilbert, volume 2 (which actually presents a more complete picture as well) or the third volume of Goursat's *Cours d'analyse* with its illuminating problems. The preface suggests the research worker may find some ideas here but this is not borne out by the contents.

The chapter headings indicate the topics taken up: The Newtonian law of gravity, concept of the potential, the integral theorems of potential theory, analytic character of the potential, spherical harmonics, behavior of the potential at points of the mass, relation of potential to theory of functions, the boundary value problems of potential theory, the Poisson integral in the plane, the Poisson integral in space, the Fredholm theory of integral equations, general solution of the boundary value problem. The last chapters deserve commendation, especially for the excellent presentation of the Fredholm theory. The Riemann integral is used exclusively, and only an elementary acquaintance with real variable theory and the rudiments of functions of a complex variable is needed as a prerequisite. The book can be read by the first year graduate student in an American university.

The exposition is notably lucid, and in fact almost conversational in its naturalness, though there is little emphasis. Perhaps the principal results could have been singled out and more said about the power and generality of these theorems. The preface remarks on a "consistent" use of vector analysis. Without implying any criticism, it should be noted, however, that the treatment is not vectorial in spirit. The vectors are usually brought in as shorthand notations for the more complicated Cartesian expressions actually manipulated.