occasional dropping of the dot in the scalar product of two vectors, and so on, there may be found logical errors which may be corrected by changing a "the" to an "a" or to "certain," or "both" to "the two" (pp. 53, 55), and errors such as "a virtual displacement is said to be every displacement of the point A . . . " (pp. 470, 471). Such slips are, however, not numerous enough to be very serious. An error of another kind arises from the inclusion of a factor 1/6 in a formula for the volume of a parallelepiped (p. 13).

The most serious blunder which the reviewer noted is the statement (p. 144) that if the density of the earth is distributed symmetrically with respect to the center of mass then it can be proved that the force of attraction is directed constantly toward the earth's center of mass. It is a vitally important fact in celestial mechanics that this is not so; the conclusion is incorrect even for a homogeneous oblate spheroid. It is an interesting problem to determine for what surfaces and what laws of density the attraction of a body for a particle exterior to it is constantly directed toward the center of mass of the body. The appropriate vector equation, equivalent to three scalar equations, is an integral equation for the density function, has an unknown function in an equation of the surface of the body, and a third unknown proportionality function. Solutions to this problem are known, but they do not agree with the one in the book.

We must express our appreciation to the author, to the translator, and to the publisher for adding this fine book to the collection of works on classical mechanics.

E. J. MOULTON

The theory of the Riemann zeta-function. By E. C. Titchmarsh. Oxford University Press, 1951. 6+346 pp. $8.00.

The zeta-function was introduced almost 100 years ago by Riemann in his famous memoir on the number of primes less than a given number. While since then enough has been discovered about the zeta-function to justify its use in analytic number theory, the question raised by Riemann about the location of its zeros remains unanswered. The milder hypothesis of Lindelöf that $\zeta(1/2+it)=O(t^\epsilon)$ for every $\epsilon>0$ also remains unsettled. The zeta-function continues to be a major challenge to mathematicians.

The author in his well known Cambridge Tract of 1930 gave a remarkably comprehensive and concise account of the zeta-function. Now he has given an expanded account in order to include recent results of which the most notable are due to A. Selberg. The sole prerequisite for reading this treatise is a knowledge of the funda-