sional slip of this kind.

Again the continual use of the phrase *the necessary and sufficient condition* instead of *a necessary and sufficient condition* in the statement of theorems is rather irritating. After all, the definite article is out of place until after the particular necessary and sufficient condition under consideration has somehow been uniquely characterized, and this is almost never the case prior to the statement of such theorems. The theorems themselves perform this function.

The book is well equipped with clearly designated summaries at the end of most of the sections.

There is a short bibliography at the end. The reviewer regrets that one of his favorite treatises on the subject has been omitted from this bibliography, namely *Lezioni di meccanica razionale* by Levi-Civita and Amaldi.

D. C. Lewis

The theory of valuations. By O. F. G. Schilling. (Mathematical Surveys, no. 4.) New York, American Mathematical Society, 1950. 8+253 pp. $6.00.

In the words of the author, the theory of valuations may be viewed as a branch of topological algebra. In fact, historically speaking, it represents the first invasion of topology, more precisely, of early metric topology, into the domains of algebra. The introduction of metric methods into algebra has been so fruitful that today many of the deeper algebraic theories carry their mark. In this regard, one should distinguish between the classical use in algebra of the natural metric of the real or complex number fields, such as in proving the "fundamental theorem of algebra," and the much more recent use of the far less evident metrics which are derived from arithmetic notions of divisibility and which constitute the principal notion of valuation theory. Such a metric occurs for the first time in Hensel's construction of the p-adic numbers, dating from the beginning of this century.

The first abstract definition of a valuation was given by Kürschák in 1913. The systematic development of valuation theory is due chiefly to Ostrowski and Krull to the continuation of whose work the author of the present book has made considerable contributions. From about 1920 onwards, valuation theory has played an important part in the theory of algebraic numbers, for instance in the reformulation and completion by Artin, Chevalley, and Hasse of the class field theory, and in the classification of the simple algebras over algebraic number fields by Hasse and Albert. Valuation theory proper and closely related other topological methods have played a funda-