are offered: The first is the sentence quoted above and the second is a metric space with a fixed metric. Since in finite dimensional Euclidean spaces all sets of finite diameter happen to be totally bounded the inexperienced are tempted to see something of importance in sets having finite diameter. On page 22 we find: "A set is called *bounded* if it is contained in some neighborhood." And on page 32: "A set E is *nowhere dense* if its closure contains no neighborhood." (Neighborhoods are introduced on page 22.) These unfortunate aspects are heavily outweighed by the wealth of useful information and in case of a second edition could be easily eliminated.

The book is clearly written by a man who knows mathematics, has something to say and is able to communicate with others. Undergraduates and promising high school students could profit a great deal by reading it.

I. S. GÁL

Commutative algebra, Vol. II. By O. Zariski and P. Samuel. Van Nostrand, New York, 1960. 10+414 pp. $7.75.

In this, the second volume of their treatise on commutative algebra, the authors have presented the basic facts and concepts of commutative ring theory essential to the practice of algebraic geometry as epitomized by the authors' work in the subject. The main topics covered are valuation theory, ideal theory in polynomial and power series rings, and local algebra. The volume ends with a series of seven appendices, some of which are devoted to generalizations and alternate routes to results given in the book proper and some of which are devoted to the introduction of new concepts. The prime example of the latter is the notion of a complete ideal in a noetherian domain (in the sense of integral closure) and Zariski's impressive theory of such ideals in regular local rings of dimension two.

As far as expositional style is concerned, the authors have fortunately seen fit to maintain the same leisurely manner established in their first volume, even though the material presented here is more technical and specialized. Many examples are given and they have not hestiated to give different proofs for the same theorems in those cases where this is appropriate due to the unique features of the various proofs. Also their practice of presenting the same theorems or theories in varying degrees of generality gives a sense of continuity and tentativeness to their development of the material which strongly encourages the reader to try his hand at seeing if he can push things further. It is a pity that there are not more books written by masters of their subject who are as successful as Zariski and Samuel in resisting the temptation of stifling the reader under an undue burden of authoritarianism and slickness.

The authors in their preface to this volume intimate that this is not intended as an exhaustive treatment of the subject and this is indeed the case. Under these circumstances there is bound to be some controversy concerning the particular selection of topics made. Since the authors were clearly motivated in their choice of topics by geometric and not purely algebraic considerations, it might have been better if they had not included some of the purely algebraic sections (such as the section on chains of syzygies which is extremely sketchy and never used in an intrinsic way except in Appendix 7) and had used the space instead for giving geometric motivation and interpretation for more of the notions now presented in a purely formal setting, such as regular local rings, multiplicity theory, etc. Also some of the geometric interpretations given are so sketchy as to be almost meaningless, except to those already familiar with the subject from a geometric point of view. Since the authors are so admirably equipped to initiate the untutored into the connections between commutative algebra and geometry, it is a pity that they did not do more along these lines in this volume.

From the point of view of abstract algebra, or at least from the point of view of homological algebra, there is a glaring omission in this book. Modules are either not mentioned at all or just as a technical device in some few instances. The authors readily acknowledge this lack in their preface and I suppose their decision to play down this aspect of the subject can be defended on two grounds: (a) There are only a limited number of things you can have in a book; (b) module theory is not as central as ideal theory to their view of algebraic geometry. However, in the light of recent developments in both algebraic geometry and abstract algebra, I think a case can be made for having a book available which would approach commutative algebra from both the ideal theoretic and module theoretic points of view. While this treatise by Zariski and Samuel may not be as universal as one would like, it none the less does meet the need for an up-to-date book on ideal theory admirably and therefore deserves a wide audience.

M. AUSLANDER

Continuous transformations in analysis. By T. Radó and P. V. Reichelderfer. Springer-Verlag, Berlin, 1955. 7+442 pp. DM 59.60.

Any undergraduate student of calculus is aware of the fact that, if called upon to integrate a function of x, he may replace x by a