BOOK REVIEWS

A primer of real functions. By R. P. Boas, Jr. Carus Monograph No. 13. Wiley, New York, 1960. 13+189 pp. $4.00.

Long before this book was published Professor Boas told me of his plans to write a new Carus monograph on a less specialized topic than those presented in the last few volumes. He had already decided to write a first introduction to real variable theory and in order to have a guiding line he planned to include everything which is necessary to formulate and prove the following proposition:

Suppose the continuous real valued function f of a real variable x has derivatives of all orders everywhere and for each x there is an order $n(x)$ such that the $n(x)$th derivative of f vanishes at x. Then f is a polynomial function.

The material is divided into two chapters entitled "Sets" and "Functions", respectively. The text begins with the introduction of naive set theoretic notions such as unions, intersections, complements, countability and one-to-one mappings. This is followed by the definition of a metric space and a discussion of the elementary topological concepts associated with a metric. This includes open and closed sets, intersections, boundary and cluster points, the notion of connectedness, dense and nowhere dense sets, separability, compactness and convergence. Several useful results are stated as exercises which abound not only in the beginning, but in almost every part of the book. The lively discussion touches upon several applications of the set theoretic and topological concepts; these range from the existence of transcendental numbers to lion hunting. It is good to see several fundamental results which are often ignored in the more systematic general topology texts. For instance, the structure of the open sets on the real line is explicitly formulated. In the preface the reader is advised to skip the harder parts and it seems that after reading the first eight paragraphs the beginner should switch to the second chapter and get acquainted with the concepts of continuity, boundedness and derivatives before reading §§9, 10, and 11 in the first chapter. In these last sections first and second category sets are introduced and Baire's theorem is proved. Among the applications we find a proof of the proposition mentioned in the beginning of this review and the proof of the existence of nowhere monotonic functions and of nowhere differentiable functions of a real variable.

A great deal of valuable material is presented in the second chap-