BOOK REVIEWS

BERGE, C., *Topological Spaces*, translated by E. M. Patterson (Oliver and Boyd, 1963), xiii+270 pp., 50s.

It is difficult to detect a consistent purpose behind the writing of this book, or a substantial class of readers for whom it is intended. The first half of the book is in some respects an excellent introduction to general topology, and I particularly like its thoroughness over elementary matters and its unusually explicit use of quantifiers. On the other hand, its utility for the beginner is surely greatly reduced by the author's insistence on allowing functions to be many-valued. The main feature of the second half of the book is a long chapter on convex sets and convex functions in Euclidean space. This is an excellent account of many of the fundamental properties of convex sets, and is virtually independent of the rest of the book. The final chapter on topological vector spaces is so short that I doubt its utility. I think that this book should have been written as three books instead of one: an elementary text book on general topology, a research monograph on multi-valued functions, and a short text book on convex sets and convex functions.

Apart from this possible lack of single-minded purpose, the book is a model of clear mathematical writing, and it will be highly valued for the elegant treatment of many points of detail. The translation and printing are of the highest possible standard.

F. F. BONSALL

GRAY, J. F., *Sets, Relations and Functions* (Holt, Rinehart and Winston, London, 1962), 143 pp., 20s.

This elementary account of the subjects mentioned in the title, and of related topics, was written primarily for secondary school teachers and students, but also for a wider group of readers such as " liberal adults who are tired of merely reading *about* modern mathematics and seek some readable and illustrative contact with modern mathematics ". It fulfils these functions excellently. The pace is leisurely and the number of examples is so extensive that no student should find any difficulties. This has its own dangers, however, and it is to be hoped that students will not attempt to solve *all* the exercises included. The multiplication of artificial examples is, if anything, even less illuminating and valuable in set theory than in old-fashioned subjects such as trigonometric identities.

In addition to the usual standard terminology, the author introduces the useful word " co-domain ", which is the set *into* (not *onto*) which a function maps its domain. As a minor criticism one may doubt whether the basic reason why human beings have the same number of fingers on each hand is that they can be put into one-to-one correspondence with each other. The printing is excellent (except for the " contained in " sign for which an unsuitable fount of type is used) and there are numerous diagrams.

R. A. RANKIN

KUBILYUS, Ĭ. P. AND KUBILIUS, J., *Veroyatnostnye metody v teorii čisel* (2-oe Izd.) (Gos. Izd. politiceskoĭ i naučnoĭ literatury Litovskoĭ SSR, Vil'nyus (Vilna), 1962), 220 pp., 82 Kopeks.

At first no two subjects could seem more essentially remote than numbertheory and statistics. The number-theoretician tries in vain to prove results for which there