Combinatorics of Permutations. *Miklós Bóna.* Chapman & Hall/CRC, Boca Raton, Florida, 2004. ISBN 1-58488-434-7, Hardcover. 400 pp., $89.95.

Permutations are a central topic in combinatorics and have applications in many fields, such as sorting algorithms in computer science and permutation groups in group theory. Many monographs study permutations, each with its own emphasis and perspective. And many important results in this area are spread across the research literature of many different fields. This book aims to round up any topic related to the combinatorial nature of permutations and present it between one set of covers. For topics that are presented carefully in other texts, the coverage is more of an overview, exposing the reader to the main ideas and then pointing the way where one can learn more. For topics that are new, obscure, or neglected by more specialized works, the author is more comprehensive. Throughout the book, there are frequent references to the excellent bibliography of more than two hundred research articles and books.

It is clear that the author finds his topic to be full of "serious fun." This enthusiasm is conveyed in the conversational and engaging style of the writing. The titles of the eight chapters provide an indication of this style, and of the topics covered: In One Line and Close. Permutations as Linear Orders. Runs.; In One Line and Anywhere. Permutations as Linear Orders. Inversions.; In Many Circles. Permutations as Products of Cycles.; In Any Way But This. Pattern Avoidance. The Basics.; In This Way, But Nicely. Pattern Avoidance. Followup.; Mean and Insensitive. Random Permutations.; Permutations vs. Everything Else. Algebraic Combinatorics of Permutations.; Get Them All. Algorithms and Permutations. Each chapter concludes with a set of about thirty or forty problems of a theoretical nature (as opposed to being computational), with solutions and notes for each odd-numbered problem appearing in a section at the end of the book. These problems are then followed by a "Problems Plus" section containing about ten or fifteen more difficult theoretical problems. These extra problems are followed immediately by a short discussion of each. These discussions usually lead with a reference to a research article or monograph, which provides an indication of the difficulty level.

Unfortunately, it would appear that not much care was taken in proofreading this text. In the limited amount of close reading performed by this reviewer, there was an index reference that was two pages away from its target ("log–concave"), a figure that was inaccurate (Figure 7.3), a proof where a key explanation had the expression a_i replaced by simply i (Theorem 2.3), a definition whose lead-in text directly contradicts the subsequent definition (Definition 2.1), and a theorem whose conclusion contains a typographical error that is obvious simply from the form of the statement (Theorem 1.4, on page 4!). Searching on the Internet did not locate any listings of errata.

This book is written to be used in a graduate level topics course. For that purpose it is ideally suited. It would also be an excellent choice for a graduate student to use independently before initiating a research program in this area, though such a student should be alerted to the possibility of frequent errors. Experienced researchers in combinatorics will find the book useful as a guide to the literature on permutations. For graduate students with advanced interests in any field of combinatorics, the faculty who work with these students, or the libraries that support them, this book is an excellent choice.

ROBERT A. BEEZER
UNIVERSITY OF PUGET SOUND