

ACROSS the BOARD

The Mathematics
of Chessboard
Problems



16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

John J. Watkins



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Across the Board is the definitive work on chessboard problems. It is not simply about chess but the chessboard itself—that simple grid of squares so common to games around the world—and, more importantly, the fascinating mathematics behind it. From the Knight's Tour Problem and Queens Domination to their many variations, John Watkins surveys all the well-known problems in this surprisingly fertile area of recreational mathematics.

Each main topic is treated in depth from its historical conception through to its status today. Many beautiful solutions have emerged for basic chessboard problems since mathematicians first began working on them in earnest over three centuries ago. But now such problems, including those involving polyominoes, have been extended to three-dimensional chessboards and even to chessboards on unusual surfaces such as toruses (the equivalent of playing chess on a doughnut) and cylinders. Using the highly visual language of graph theory, Watkins gently guides the reader to the forefront of current research in mathematics.

Showing that chess puzzles are the starting point for important mathematical ideas that have resonated for centuries, *Across the Board* will captivate students and instructors, mathematicians, chess enthusiasts, and puzzle devotees.

"This book is extremely well written and is, no doubt, the best exposition of the connection between the chessboard problems and recreational mathematics. The author surveys all the well-known problems about chess and the chessboard. . . . The problems are treated in depth from their beginnings through to their status today."

—Mohammed Aassila, *MAA Review*

"Torus-shaped boards, three-dimensional boards, a shape called the Klein bottle—the simple checkerboard pattern proves to be creatively malleable when Watkins puts his mind to his hobbylike subject. Watkins' invitational tone ensures attention from the finite but enthusiastic audience for mathematical recreation."

—*Booklist*

"Watkins offers an excellent invitation to serious mathematics."

—*Choice*

John J. Watkins is Professor of Mathematics at Colorado College where, in 2005, he was given the Boettcher Award for Faculty Excellence in the Sciences. He is the coauthor of *Graph Theory: An Introductory Approach*.