BOOK REVIEWS

JOHN GRANT McLoughlin

1000 Play Thinks: Puzzles, Paradoxes, Illusions and Games
Reviewed by Amar Sodhi, Sir Willred Grenfell College, Corner Brook, NF.

During the Edo period (1603-1867) in Japan, many a shrine or temple would have, hanging from its roof, a wooden tablet engraved with a beautifully drawn coloured drawing. The drawing would describe a problem in geometry and people from all walks of life would take delight in attempting to solve the problem. The wooden tablet was called a Sangaku and it was the Sangaku which inspired Ivan Moscovitch to create the book 1000 Play Thinks.

A typical Play Think consists of a problem accompanied by a colourful drawing which has the potential to intrigue anyone with an interest in recreational mathematics; so in this sense a Play Think is similar to a Sangaku. However, unlike a Sangaku, a Play Think is not restricted to theorems in geometry. A number puzzle, a logic problem, or even an optical illusion, can be considered Play Thinks. Most of the activities in this vast collection of exercises for the mind are puzzles which can be solved using clever reasoning and perhaps the use of pen and paper. However, there are also puzzles which require the reader to show dexterity in manipulating figures as well as a selection of games having some underlying mathematical theme. Challenging problems in the book include three Sangakus (Play Thinks 2, 259 and 339) and Apollonius' Problem (Play Think 242).

Play Thinks is divided into fourteen chapters. The first and last chapters contain a miscellaneous selection of Play Thinks, but the other chapters are more thematic. For example, a chapter on graphs and networks exposes the reader to Hamiltonian and Eulerian graphs, crossing numbers and Ramsey's Theorem. There are various chapters devoted to themes in geometry. Patterns and symmetry are all explored, and there is a wealth of number puzzles for those who enjoy challenges of an arithmetic nature. A diligent reader of the book will discover theorems in geometry and topology such as Pappus' Theorem (Play Think 135) and the Jordan Curve Theorem (Play Think 134). Scattered through each chapter are vignettes which provide a gentle digression from problem solving. Through the vignettes, the reader is given a glimpse of certain mathematical concepts, discoveries and insights pertinent to problem solving.

Anybody who enjoys puzzles should enjoy this book. Of course, an experienced solver of mathematical puzzles will find many old friends in this work, but old friends in a new setting are always welcome. The book itself is eye-catching and will feel at home on any coffee table as it waits for people of all ages to peruse its large colourful pages. People with a more professional interest in mathematics will find this book a useful resource; a teacher who wishes to conduct a mathematics workshop for primary to high-school students should gain many ideas from the pages of this book.
The Zen of Magic Squares, Circles, and Stars: An Exhibition of Surprising Structures across Dimensions
Reviewed by Monte J. Zerger, Adams State College, Alamosa, Colorado.

If you have read any of Pickover's numerous books (for example, Keys to Infinity, The Loom of God, Wonders of Numbers), you know he is a remarkably creative thinker, from whom you quickly grow to expect the unexpected. His writings have often subtly revealed that he has a mystical side, but this book even more clearly demonstrates it. If you don't pick up that clue from the title, you surely will when you read that the book is dedicated "not to a person but to a meditative aid, the Durga Mantra, to which numbers can be applied in magic ways."

When most of us hear the term magic square we think of an $n \times n$ square array whose $n^2$ cells are filled with the numbers from 1 to $n^2$ in such a way that the sum of the numbers in each row, column, and the two main diagonals are the same. However, as this book quickly reveals, that is only the tip of the iceberg. Pickover goes on to define and discuss many forms of magic squares, as well as magic cubes, circles, spheres, stars, hexagons, etc., and even four-dimensional magic tesseracts.

Readers are not only taught how to construct, classify, and "play with" magic squares, but also treated to the rich and colorful history which surrounds them. As Pickover skillfully points out, throughout history many were convinced that magic squares held the secret of the universe. Although a classic work on the subject (Magic Squares and Cubes by Andrews) exists, Pickover's work expands, augments, enlivens, and probably most importantly, updates that book. Pickover has a way of presenting the material which will engage a wide variety of readers. One does not have to be a mathematician, or even have dabbled in magic squares before, to understand and appreciate the contents.

I sometimes wonder if Pickover writes too rapidly, often a problem with highly creative people who would rather go on to their next challenge than to refine and carefully hone their present one. The book often seems disjointed, reading a bit like a collection of notes, too hastily thrown together. I believe the contents could have been more carefully arranged, and then presented in a smoother, more continuous, flowing manner. This is surely the most comprehensive book on this subject in decades, and will probably become the standard encyclopedia for the subject. As the esteemed mathematician Sherman Stein put it, "Every generation seems to demand its own updated book dedicated to magic squares." Pickover's work meets the needs of the present generation.