Hypothesis, and even Fermat’s Last Theorem. The book contains a wealth of conjuring lore, including some closely guarded secrets of legendary magicians. It discusses the mathematics of juggling, and shows how I Ching, an ancient Chinese fortune-telling book, connects to the history of probability and tricks both old and new. Stories underlying some tricks of eccentric and brilliant inventors of mathematical magic are discussed. Copious colourful illustrations and pictures are provided to illustrate the text.

Readers are sure to enjoy this brilliant book. Their interest in magic will get kindled if it is not already there. They will get introduced to little-known mathematical theorems. The book will certainly become a classic.

Unsolved Crux Problem

As remarked in the problem section, no problem is ever closed. We always accept new solutions and generalizations to past problems. Recently, Chris Fisher published a list of unsolved problems from Crux [2010 : 545, 547]. Below is a sample of one of these unsolved problems:


Let \( p_n \) denote the \( n \)th prime, so that \( p_1 = 2, p_2 = 3, p_3 = 5, p_4 = 7, \) etc. Prove or disprove that the following method finds \( p_{n+1} \) given \( p_1, p_2, \ldots, p_n \).

In a row list the integers from 1 to \( p_n - 1 \). Corresponding to each \( r \) (\( 1 \leq r \leq p_n - 1 \)) in this list, say \( r = p_1^{a_1} \cdots p_{n-1}^{a_{n-1}} \), put \( p_1^{2a_1} \cdots p_{n-1}^{2a_{n-1}} \) in a second row. Let \( \ell \) be the smallest odd integer not appearing in the second row. The claim is that \( \ell = p_{n+1} \).

Example. Given \( p_1 = 2, p_2 = 3, p_3 = 5, p_4 = 7, p_5 = 11, p_6 = 13 \).

\[
\begin{array}{cccccccccccc}
1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12 \\
\downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow & \downarrow \\
1 & 3 & 5 & 7 & 15 & 11 & 27 & 25 & 21 & 13 & 45
\end{array}
\]

We observe that \( \ell = 17 = p_7 \).