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Steve Richardson/Stave Puzzles
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Introducing Mechanical Puzzles

by Jerry Slocum © 2001

Introduction

Mechanical puzzles, ancient and modern, have mystified, intrigued, educated and entertained throughout recorded history. Mechanical puzzles are hand-held objects that must be manipulated to achieve a specific goal. The goal may be to put the pieces together to form a specific pattern, as with a Chinese Tangram; take the object apart, as with a puzzle lock; or rearrange it, as with a Rubik's cube. They pose deductive reasoning problems that frequently require unorthodox thinking to solve. Solving a puzzle can provide an exhilarating experience.

This is the first in a series of articles introducing the wide variety of mechanical puzzles to the membership of the AGPC. Each article will discuss and illustrate one or more classes of mechanical puzzles. This series of articles was adapted for an essay in the Catalog of the Katonah Museum of Art's exhibition, *The Art of the Puzzle: Astounding and Confounding*. The exhibition in Katonah, New York, was held from October 15, 2000 to January 7, 2001 and included mechanical puzzles from Jerry Slocum's collection and jigsaw puzzles from Anne Williams's collection.

Art in Puzzles

Beautiful design, craftsmanship and decoration serve to stimulate and engage people in the visual and tactile pleasures of solving a puzzle. Elegant Chinese ivory puzzles, exquisitely carved with intricate scenes, stimulate the imagination as well as decorate the puzzle. (Figure 1 - Ivory Tangram) Early in the nineteenth century the Chinese were so enthralled with the elegance

Figures for this article are in the separate insert to allow printing in color.

of the Tangram that they even made beautifully decorated ceramic and cloisonne bronze dishes (Figure 2 - Tangram Dishes). In 1817 the French Tangram craze produced beautiful picture problems. (Figure 3 - French Tangram Problem) Late in the nineteenth century French color lithography provided attractive and imaginative boxes for hundreds of dexterity and wire puzzles (Figure 4 - Auto Club). Modern puzzle sculptures by the Spanish artist Miguel Berrocal dramatically combine art and puzzles. (Figure 5 - Manolete) And polyhedral puzzles, designed and made by Stewart Coffin, demonstrate that wooden puzzles can also be objects of art. (Figure 6 - Saturn)

Puzzles and Education

Although puzzles are invented mainly to entertain, they also instruct. In the early 20th century in Italy, Maria Montessori made use of puzzles in nursery schools, stressing the importance of trial and error in learning. Chinese Tangrams are used in countless elementary schools in the US, Europe and Asia to teach Geometry and many other subjects, while the students have fun. A Los Angeles High School teacher finds that the best way to teach teen-age criminals in jail is by using a variety of puzzles. At an advanced level, there may be no better way of teaching mathematical group theory than by the use of Rubik's cube. Philosopher-logician Raymond Smullyan tells of a phone call from a friend whose son was enjoying one of Smullyan's puzzle books. "He loves your book", the friend said in a conspiratorial tone, "but when you speak to him, don't let him know he's doing math. He hates math!"

Puzzles, Science and Mathematics

It should not be surprising that many top mathematicians and scientists have been fascinated by puzzles for centuries. Math is solving abstract puzzles and science is solving the puzzles of nature. Geometric puzzles, such as the *Stomachion of Archimedes*, (Figure 7 -

Stomachion of Archimedes) were studied, and perhaps designed, by Archimedes in the third century B.C. A Nobel Prize winning physicist, Richard Feynman, feels his great contributions to quantum mechanics are a result of his lifelong passion for puzzle solving. Topology and graph theory had their origins in Leonhard Euler's 18th century analysis of a popular puzzle about traversing the seven bridges of Königsburg, Germany, without going over the same bridge twice.

Puzzles and Life

Puzzles reflect what French historians have called, the *mentality* of their times. They show patriotism (Figure 8 - Preparedness), historic events (Figure 9 - NY-Paris race), cultural and racial prejudice (Figure 10 - 10 little Nigger Boys) and family life (Figure 11 - Wire).

Mechanical Puzzle Classification

Even though mechanical puzzles have been around for centuries, they were first described at length by Professor Hoffmann in his classic book, *Puzzles Old and New*, published in London in 1893. He noted the difficulty of classifying puzzles and then described about 400 mechanical, mathematical and word puzzles in detail and provided the solutions.

(Continued on page 14)



Jerry Slocum amidst his puzzle collection.

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Figure 1. Chinese ivory Tangram, circa 1818.

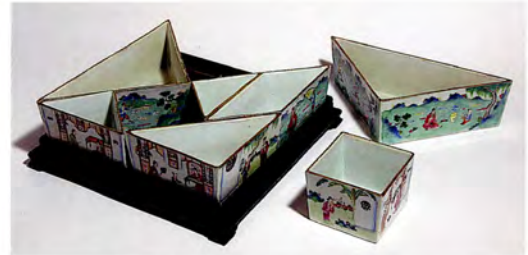


Figure 2. Chinese Tangram dishes, decorated with folk legends, circa 1840.

Figure 3. French Tangram picture problem, King Henry IV, 1818.



Figure 4. French dexterity puzzle, circa 1910.



Figure 5. *Manolete*, a puzzle sculpture with 26 pieces, by Miguel Berrocal, 1977.



Figure 6. Stewart Coffin's *Saturn* puzzle consists of twelve pieces like the one on the left.



The 14 piece *Stomachion of Archimedes*, described by Archimedes in the third century, B.C.

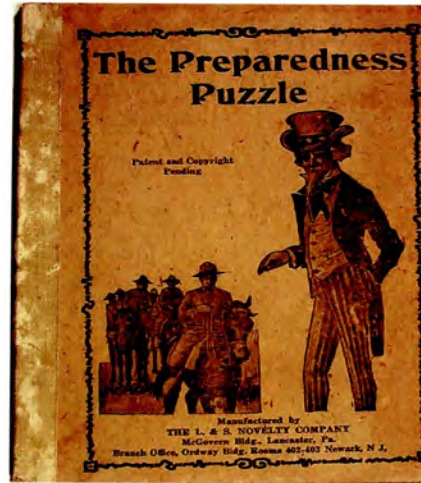


Figure 8. *The Preparedness Puzzle* from WWI.



Figure 9. *New York to Paris Aero Race*, won by Lindy.

Figure 10. *Ten Little Nigger Boys Puzzle*, from England, 1893.

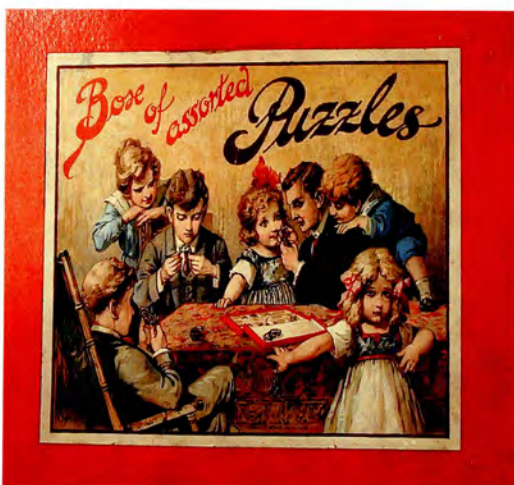


Figure 11. *Box of Assorted Puzzles*, from Germany, circa 1915.

Polyhedral puzzles by Stewart Coffin in multiple woods. See article on page 13 this issue.



Sphinx Puzzle



A collection of polyhedral puzzles made of various contrasting woods.