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PUZZLES

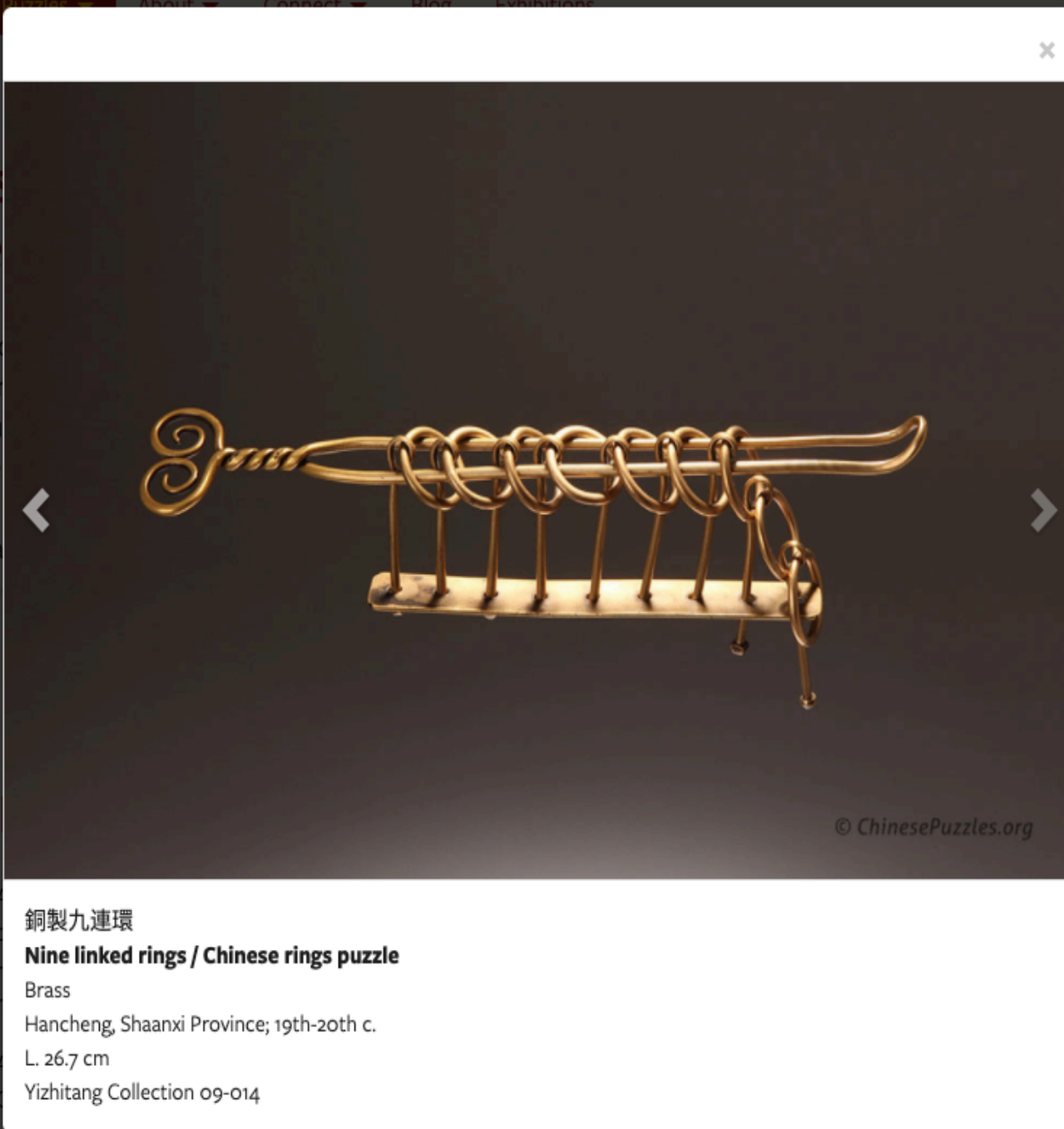Home   Puzzles ▾   About ▾   Connect ▾   Blog   Exhibitions   中文

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Nine linked rings / Chinese rings puzzle
Brass
Hancheng, Shaanxi Province; 19th-20th c.
L. 26.7 cm
Yizhitang Collection 09-014

emissary to present a set of jade linked rings to the Empress Dowager of the Qi Kingdom. The king's message said,
"The Qi people are quite intelligent, but can they untangle these rings?" The Empress showed the rings to her
ministers, but none of them could untangle the rings. The Empress then took a hammer and broke the rings. She

Chinese Nine Linked Rings Puzzle

The nine linked rings puzzle (*jiulianhuan* 九连环)—also called the Chinese rings puzzle—is perhaps China's greatest mechanical puzzle. The puzzle consists of a long loop with a handle on one end that is interlocked with nine rings. The objective is to disentangle the long loop from all nine rings, and the solution takes 341 moves, so lots of patience is required. But there's a method to the solution—*and once one learns to solve the puzzle, it's hard to forget!*

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Linked Rings in Antiquity

Although it hasn't been determined when linked rings puzzles were invented, the concept of untangling linked rings has been embedded in Chinese culture at least as far back as the Warring States period (475–221 BCE), when philosopher Hui Shi (ca. 380–305 BCE) declared, "Linked rings can be separated." Hui Shi's explanation has been lost, but we know his concise paradox through the writings of others.

A Han dynasty (206 BCE–220 CE) history of the Warring States period contains a story that involves King Zheng of the Qin kingdom, the man who would later become Qin Shi Huang, the first emperor of China. King Zheng sent an emissary to present a set of jade linked rings to the Empress Dowager of the Qi Kingdom. The king's message said, "The Qi people are quite intelligent, but can they untangle these rings?" The Empress showed the rings to her ministers, but none of them could untangle the rings. The Empress then took a hammer and broke the rings. She

Baguenaudier

From Wikipedia, the free encyclopedia

Baguenaudier (also known as the **Chinese Rings**, **Cardan's Suspension**, **Cardano's Rings**, **Devil's needle** or **five pillars** puzzle) is a disentanglement puzzle featuring a loop which must be disentangled from a sequence of rings on interlinked pillars.[1] The loop can be either string or a rigid structure.

It is thought to have been invented originally in China. The origins are obscure. The American ethnographer Stewart Culin related a tradition attributing the puzzle's invention to the 2nd/3rd century Chinese general Zhuge Liang.[2][3] The name "*Baguenaudier*" is French for "time-waster".[1] It was used by French peasants as a locking mechanism.[1]

Variations of this include *The Devil's Staircase*, *Devil's Halo*[4] and the *Impossible Staircase*. Another similar puzzle is the *Giant's Causeway* which uses a separate pillar with an embedded ring.

A baguenaudier

Mathematical solution [edit]

The 19th-century French mathematician Édouard Lucas, the inventor of the Tower of Hanoi puzzle, was known to have come up with an elegant solution which used binary and Gray codes, in the same way that his puzzle can be solved.[2] The minimum number of moves to solve an *n*-ringed problem has been found to be:

$$a(n) = \begin{cases} \frac{2^{n+1}-2}{3}, & \text{when } n \text{ is even,} \\ \frac{2^{n+1}-1}{3}, & \text{when } n \text{ is odd.} \end{cases} \quad [1]$$
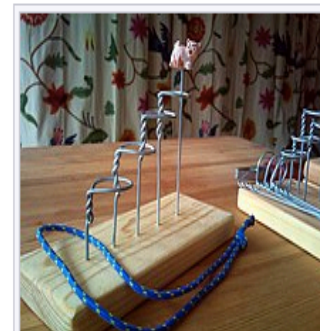
For other formulae, see OEIS A000975.

Diagrammatic representation of a four-ring baguenaudier

See also [edit]

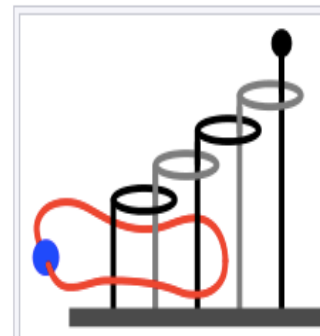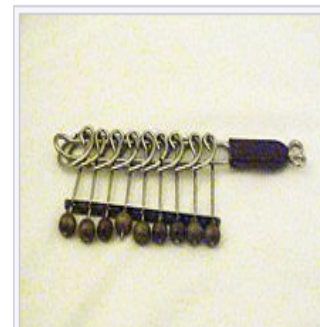- Disentanglement puzzle
- Towers of Hanoi

References [edit]

1. ^ *a b c d* Weisstein, Eric W. "Baguenaudier". *MathWorld*.
2. ^ *a b* David Darling — encyclopedia
3. ^ Hinz, Andreas M.; Klavžar, Sandi; Milutinović, Uroš; Petr, Ciril (2015). *The Tower of Hanoi — Myths and Maths*. Birkhäuser. p. 4. ISBN 978-3034807692.
4. ^ The Devil's Halo — The Puzzle Museum

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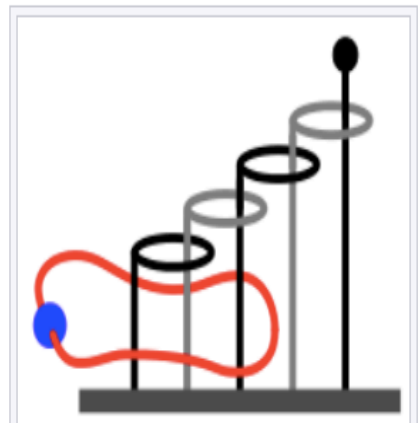

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