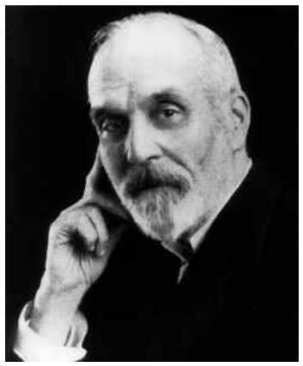
Épreuve de section européenne

Henry Ernest Dudeney

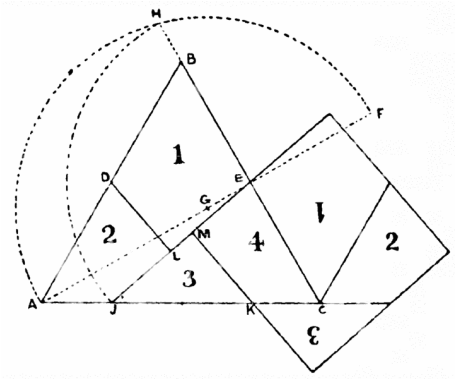
Henry Ernest Dudeney was born in April 1857 in the village of Mayfield, East Sussex, England. His grandfather, John Dudeney, was a self-taught mathematician: he was much admired by his grandson. Dudeney learned how to play chess at an early age, and continued to play frequently throughout his life. This led to a marked interest in mathematics and the composition of puzzles. Chess problems in particular fascinated him during his early years.

Although Dudeney spent his career in the Civil Service, he continued to devise various problems and puzzles, to create puzzles for publications such as The Weekly Dispatch, The Queen, Cassell's Magazine and, for twenty years, The Strand.

In April 1930, Dudeney died of throat cancer in Lewes, where he and his wife had moved.



H.E. Dudeney



Dudeney's solution to the Haberdasher's Puzzle

Some of Dudeney's most famous innovations were his 1905 success at solving the Haberdasher's Puzzle (see the picture on the left) and publishing the first known cross number puzzle, in 1926.

In addition, he has been credited with inventing verbal arithmetic and discovering new applications of digital roots.

A Dudeney number is a natural number that is a perfect cube such that the sum of its digits is equal to the cube root of the number. There are exactly six such integers.

For instance, 4913 is one of them: 4913 is the cube of 17, which is equal to the sum of its digits $4 + 9 + 1 + 3$.

Adapted from various sources

Questions

1. Sum up Henry Dudeney's life in a few words.
2. Chess and puzzles led Dudeney to an "interest in mathematics". Can you explain that?
3. According to the picture, can you explain what the Haberdasher's Puzzle consists in?
4. The text gives one Dudeney number: 4913. Here are six other numbers: 512, 1589, 5832, 17576, 20551 and 19683. Four of them are Dudeney numbers. Which ones?
5. There is one more Dudeney number, and it is less than 10. Find it.
6. We can generalize the condition and allow any exponent greater than 3. Here are the generalized Dudeney numbers for 4 : 1 ; 2401 ; 234256 ; 390625 ; 614656 ; 1679616. Explain.