EXPLORING FIBONACCI MAGIC SQUARES

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Magic squares have long had a strong appeal to people mathematically inclined — and so have Fibonacci numbers. When we put the two ideas together, what do we get: harmony or conflict?

Just to make the problem perfectly clear, the two concepts involved will be delimited as precisely as possible for the purpose of this investigation. A magic square will be considered as a square array of distinct positive integers such that the sums of all rows and columns as well as of the two main diagonals is the same. A common example of a three-by-three magic square is:

6	7	2
1	5	9
8	3	4

By Fibonacci numbers we shall understand the positive elements of the sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ... Again let it be noted that the elements of the magic square must be distinct integers so that, for example, it would not be allowable to use 1 twice on the plea that it is two different Fibonacci numbers.

Two possibilities present themselves: (1) Either it will be possible to create one or more magic squares with the Fibonacci numbers; or (2) It will be possible to prove that no such magic squares may be formed.

The investigation may be generalized in various ways; (1) If we allow both positive and negative integers; (2) If we take as elements the terms of the generalized Fibonacci sequence: a, b, a+b, a+2b, 2a+3b, etc.

The results of this exploration will be published in the February 1963 issue of the Fibonacci Quarterly.

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