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A bent for magic. (English)

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http://dx.doi.org/10.2307/27642897
http://www.maa.org/pubs/mathmag.html
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A Franklin magic square of order n is an $n \times n$ matrix with constant sum along each of the n rows, columns, and four bent rows, where a bent row consists of the entries making up half of each of the two main diagonals (including the middle entry if n is odd). These squares are named for Benjamin Franklin who is believed to be the first person to construct magic squares with "bent rows" rather than diagonals. The author has written several papers on Franklin's contributions and provides further historical comments here. A natural square is one whose entries are $1, 2, \ldots, n^2$, and a Franklin magic square is called panfranklin if every bent row can be translated in the direction of its vertex and the sum of the resulting entries remains the same. Among other results, the author shows that 8 is the smallest even order for which a natural panfranklin square exists, and establishes that, up to rotation and reflection, there are 912 natural Franklin magic squares of order 4. He also presents a natural Franklin magic 4-cube.

Chester J. Salwach (Easton)

Keywords : Franklin magic square; panfranklin magic square; Franklin magic cube

Classification :

∗05B15 Orthogonal arrays, etc.
05-03 Historical (combinatorics)
01A70 Biographies, obituaries, personalia, bibliographies