TEN CARD MAGIC SPELL

by Jeremiah Farrell and Connor Hofmeister

We introduce our ideas with a simple four card magic spell using the ten, jack, queen and king of clubs which are placed face down on the table and well mixed. The magician secretly writes a prediction down on a slip of paper which is folded and handed to the subject to safeguard. The magician says "We are going to place the cards randomly at the points of the compass NSEW. Please select one for NORTH." The procedure continues until the four cards are arranged NSEW. The subject is then asked to turn over any one card. Suppose it is the jack. "As you know", notes the magician, "the jack can be regarded as the eleventh card and I want you to either count 11 or spell 'jack of clubs' and proceed either clockwise or counterclockwise around the compass." The spectator does so and arrives at a second card and then repeats the instructions as often as he can.

He soon finds that he is "under a spell" and cannot escape from the queen of clubs. This matches the magician's prediction on the paper.

METHOD: The trick is self-working provided the ten is opposite the queen. We maneuver this with slight markings on the backs of the two cards. We will explain later a mathematical theory that does not require the marking of the cards.

THE TEN CARD MAGIC SPELL

The ten cards are stacked as in the diagram. The cards are flaired to show the subject what appears to be a random collection. Also at this time, the "Joker" and "Magic Spell" cards are noted.

The stack is repeatedly cut by the subject or the magician and when satisfied, the magician asks "Shall we have the stack face down or face up?" In either case the top card is noted and placed on the bottom. Using this card, he asks the subject whether he wants to spell or count (the ace can count as either one or eleven) and the magician deals the cards to the bottom, arriving at a new card. The instructions are repeated until the subject finds himself stuck at the "Magic Spell" card. Of course, that card and the Joker can only be spelled.

This effect is self-working and need not require any sleight-of-hand but some skilled magicians may choose to employ some special skulduggery.

We can regard either magic spell trick as a mathematical object called an absorbing Markov chain (Reference 1.). If clockwise or counterclockwise motions are chosen at random, it is possible to arrange the cards themselves at random and still be absorbed at the key card. We have checked every arrangement of four-card and found that the average number of steps until inevitable absorption never exceeds five moves.

This paper relies on "Celestial Magic" in the Nov. 2011 *Word Ways* by the first author. That article is a variation of a spelling trick by Jim Steinmeyer (Reference 2.).

R1: *Introduction to Finite Mathematics*, 2nd ed. by J. Kemeny, J. Snell and G. Thompson, 1966, Prentice-Hall, Inc.
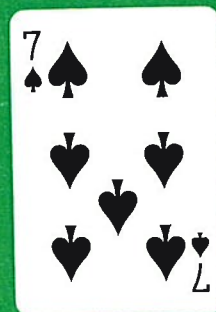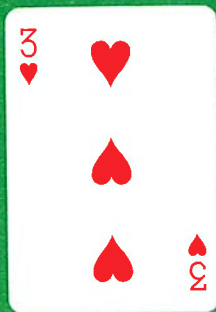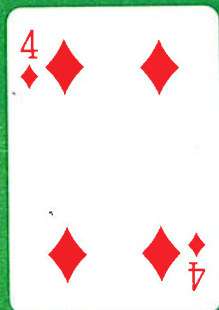
R2. *Subsequent Impuzzibilities* by Jim Steinmeyer, 2008, Hahne.

MAGIC
SPELL

TEN

CARD

MAGIC

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JOKER