

A CARD TRICK MNEMONIC REVISITED

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In the November 1968 and the May 1977 *Word Ways*, I described the use of the words BIBLE ATLAS GOOSE THIGH as a mnemonic for performing a bit of card-reading "magic". Twenty playing cards are dealt face down in ten pairs and, while the magician's back is turned, the subject looks at and memorizes the cards of one pair. The twenty cards are then gathered into one pile, preserving the pairs, and dealt face up in a four-by-five array according to the mnemonic: the first two cards in the first and third positions of the first row (the two B's in BIBLE), the next two cards in the second position of the first row and the third position of the fourth row (the two I's in BIBLE and THIGH), etc. The subject is then asked in which row or rows his two cards appear. Since each pair is uniquely identified by this, it is easy for the magician to identify the cards. (Of the ten pairs, four appear in a single row, and the other six in two different rows - first and second, first and third, first and fourth, second and third, second and fourth, third and fourth.)

One can generalize this card trick to work for 15 or 21 pairs, using the mnemonics LIVELY RHYTHM MUFFIN SUPPER SAVANT or MEACOCK RODDING GUFFAWS TWIZZLE RHYTHMS KNUBBLY.

In the above realizations of the card trick, all possible locations of two cards in n rows are exploited, and as a consequence the fewest possible number of words are used in the mnemonic. However, this is not a necessary part of the card trick; one can equally well decide **not** to use certain pairings. For instance, one can arrange nine pairs of cards according to the mnemonic WAD SET CON DEN CAT SOW. In this realization, no card-pairs appear in a single row, and furthermore there are no card-pairs in the first and second, first and third, second and third, fourth and fifth, fourth and sixth or fifth and sixth rows.

This mnemonic can be rewritten as a double transposal square, discussed in detail in the May 1980 *Word Ways*. In a transposal square, the letters in each row and column can be rearranged to form words; the square corresponding to WAD SET CON DEN CAT SOW is shown at the left. It is easy to construct a double transposal square of four-letter words: the one at the right yields

D A W
E T S
N C O

E I T R
K L A B
D P N O
U M G S

the mnemonic TIRE BALK POND GUMS DUKE LIMP TANG ROBS, which can be used to identify the proper card-pair out of sixteen. However, it is a well-nigh-impossible task to arrange 25 different letters in a transposal square. In the February 1969 *Word Ways*, Charles W. Karns proposed the square at the left, which yields the nine words FIXED BLOWN JUMPS GRAVY KETCH HOMEY PRINT FLASK BUDGE - and the nonsense letters XWJVC. Instead, one can elect to construct an incomplete transposal square. For example, one can predict the location of any of twenty card-pairs by using the mnemonic GRAB JEST WIND LOCK HUMP WOMB JUNK HERD CAPS GILT which corresponds to the transposal square on the right.

E	I	F	X	D
O	N	L	W	B
M	P	S	J	U
Y	R	A	V	G
H	T	K	C	E

N	D	.	I	W
K	.	C	L	O
.	R	A	G	B
U	H	P	.	M
J	E	S	T	.

It may be possible to construct an incomplete transposal square with two blanks in each row and column which would predict the location of any one of 24 card-pairs. However, it seems more profitable to abandon the special constraints that make a transposal square possible, and allow some of the card-pairs to be identified in a single word. In fact, it turns out to be surprisingly easy; one mnemonic, omitting Q and V, is LYNS CRUX JOHN WICK PARD EGGS MYTH JAZZ BUFF WOMB DITS KELP. All words but DITS can be found in the Merriam-Webster Pocket Dictionary.

Encouraged by the simplicity of this solution, I decided to try for the ultimate goal: a mnemonic which would enable me to predict any one of 26 pairs from a full deck of cards. (Is it not fortunate that the number of cards in a deck is exactly twice the number of letters in the alphabet?) I realized at the outset that one of the thirteen four-letter words would have to be vowelless, even rationing the vowels AEIOUY one apiece to each word. The worm CWM, one of the only two vowelless words in Webster's Tenth Collegiate (the other is NTH), can be readily pluralized to CWMS. Q, ordinarily requiring U and another vowel, is the most recalcitrant consonant, but SHOQ and WAQF are both in the Second Edition of the Merriam-Webster Unabridged (below the line). Once past these hurdles, it was a surprisingly simple task to form the list: CWMS WAQF SHOQ LYNX TYPP HADJ JINK VUGG CRUX FIZZ VELD BOMB TREK. Chris McManus, relying on QOPH and QATS in the second edition of the Official Scrabble Players Dictionary, constructed a set restricted to that source: QOPH JAZZ HYMN JINX VEXT WORD BUFF PLED BYRL KICK CWMS QATS VUGG.

Double pangram lists have appeared before in *Word Ways*, three in February 1972 and six in November 1978. However, none of these qualifies as a mnemonic because in each list two words have the same letter-pair (XY in jynx and xyst, ER in prex and very, AJ in hadj and jazz). Two pangrammatic word lists containing all different words are likely to fail for the same reason; a set of six different pangram lists in November 1983 failed to generate a legitimate mnemonic among the fifteen possible pairs.