

PIGPEN-CIPHER-INVERTIBLE SQUARES

JOHN BULTEN

Boynton Beach, Florida

In "Maggie Had a Little Pigpen" in the May 1991 *Word Ways*, Peter Newby pointed out that if a 3-by-3 word square was encoded using the pigpen cipher and inverted, it might be possible to read off another 3-by-3 square upon decoding. To ascertain how common such squares might be, I first prepared a list of the 80 pigpen-cipher-invertible words in the Official Scrabble Players Dictionary (first edition). These were then used to construct 24 families of invertible 3-by-3 squares, listed below; the original square is at the left and the decoded inverted square, at the right.

1AD OAF	CAR HAJ	FEU LOT	2AB HAH	GAL 3AP	NEB NTH
ANI ANI	ANI ANI	ELM OPE	ANI ANI	ANI ANI	E4U T4E
DIM FI1	RIB JIG	UMP TED	BIB HI2	LI3 PIC	BUN HEN

OPE 5OE	OPE PEE	PAN PAN	PEE 5OE	TIE 5OE	VAS VAV
PAM OIL	PEE EEL	ANI ANI	ELM OPE	ISM OVA	ANI ANI
EM5 ELM	EEL ELM	NIL NIL	EM5 EEL	EM5 EAU	SIS VIS

1 = CFHPW/GDBLZ 2 = GLN/CPN 3 = BNP/HNL 4 = AM/IO 5 = SU/VT

There are 55 four-letter words in the OSPD that are pigpen-cipher-invertible to other OSPD words; these are listed below. The ones in boldface are self-invertible. However, no invertible 4-by-4 word squares could be constructed from these.

AMIN	BUMF	BUMP	DEAD	DOTH	EGAD	EGAL	EPIC	EVIL	FAIL	FEAL
FEED	FEEL	FICE	FIEF	GALE	GAUM	GNAW	JAIL	JEEP	JEER	JEES
JEEZ	LEER	LEES	LIEN	LOTH	NAIL	NAOI	NEAP	OTIC	PAID	PAIL
PAIN	PAIR	PASE	PEED	PEEL	PIAL	PIAS	PICE	PIED	PIES	THEW
TINT	TUTU	UNAU	VEAL	VEEP	VEER	VEES	VIAL	WEER	ZEBU	ZINC