

5-BY-5 PALINDROMIC WORD SQUARES

M. D. McILROY
Bernardsville, New Jersey

A 5-by-5 palindromic word square is one in which the first word is a reversal of the fifth word, the second is a reversal of the fourth, and the third is a palindrome. The most famous of these squares, the Latin one given at the right, can be translated "Arepo the begetter (or sower) holds the wheels with care". It has been found on ancient walls and on amulets for safe childbirth; there is an extensive literature discussing its religious or mystical significance (see, for example, pp. 207-210 of Dmitri Borgmann's Language on Vacation (Scribner's, 1965)).

S A T O R
A R E P O
T E N E T
O P E R A
R O T A S

When I first came upon this celebrated square, I was instantly impelled to set my indefatigable machine seeking comparable incantations in English. Imagine my thrill when the square at the right issued almost immediately, using only words from Webster's Collegiate Dictionary: "Household gods anoint, witness unctuous Elena". Mystic connections between the two squares loom on every side: LARES, the household protectors, with childbirth; ELENA with OPERA (Verdian); the supporting cross that REFERS us to the commanding TENET -- believe! What more Latinate square could one encounter? What stronger bonds could link a Roman charm to an English whimsy?

L A R E S
A N E L E
R E F E R
E L E N A
S E R A L

Wondering what other mysteries were locked in the Collegiate, I instructed my servant to try derivatives of three- and four-letter words as well as straight five-letter words:

C A R E S	H A L E S	S A T E S	L A T E S
A N E L E	A N E L E	A N E L E	A N E L E
R E F E R	L E V E L	T E N E T	T E N E T
E L E N A	E L E N A	E L E N A	E L E N A
S E R A C	S E L A H	S E T A S	S E T A L

The first two squares are surely legitimate, but purists may feel squeamish about SETAS (properly setae) in the third square and LATES (endowed with a nominal meaning, as in "the earlys out-bloom the lates") in the fourth. Two additional squares can be generated by replacing TENET with TEBET.

The following square, which I am sure all cultured Yalies will

endorse, seems to say something about a lady judge anointing the winners of a race on a flat track in New Haven, or perhaps it is a command to pass the word to barmaid Elena to flatten a well-oiled reveler at Morey's. (If you're really generous about derived words, try YALÉD -- secured with a strong lock -- in place of YALER.)

R E L A Y
E L E N A
L E V E L
A N E L E
Y A L E R

Let us all anele Elena, whose opera Arepo's rival!

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The first three word squares cited above exhaust the legitimate possibilities of Webster's Collegiate, and even they get the crucial ELENA from an appendix. If one throws in words from the Second Unabridged as well (more accurately, that subset of the Unabridged on a computer tape prepared by the Air Force more than a decade ago), one finds over 350 palindromic squares, mostly dull checkerboards of vowels and consonants. But one square stands out. Not only does it break the vowel-consonant checkerboard, but it also holds the logologist's favorite SNARK, snared so tightly that no change is possible without destroying the entire fabric of the square.

S N A R K
N I N E R
A N A N A
R E N I N
K R A N S

Aside from the SNARK square, the best of the Unabridged offerings are these. The first one is also an isolate; no simple change turns it into any other square:

G N A T S	A S S A M	A S S A M	D A R T S
N O N E T	S H A M A	S N O G A	A P A R T
A N A N A	S A G A S	S O L O S	R A D A R
T E N O N	A M A H S	A G O N S	T R A P A
S T A N G	M A S S A	M A S S A	S T R A D

The more typical palindromic square is one in which all the words (not just the third one) are palindromic. Five squares (of which the two at right are representative) use three different letters to form only two different words.

S A S A S	S U S U S
A L A L A	U L U L U
S A S A S	S U S U S
A L A L A	U L U L U
S A S A S	S U S U S

Palindromic squares can read differently across and down. Though the Romans probably wouldn't find them as perfectly mystical as the SA-TOR square, these interlocking patterns of two different palindromes are much less common than those with row-column symmetry, and so they ought to be more highly prized.

A N A S A	S A M A S
N O L A S	A L A L A
A R A R A	R A D A R
S A L O N	A L A L A
A S A N A	S A M A S

My helper was unable to find the ultimate word square of this type --

one with all ten words different. Two such squares, using words in Webster's Unabridged not on the Air Force computer tape, are given in Dmitri Borgmann's previously-mentioned book.

The full collection of palindromic word squares is presented in two parts -- a basic list of 36 squares, and a supplementary list of word substitutions that can be made to generate additional squares. A substitution marked (1), (2) or (3) means it must be made only when the word appears in first, second or third position among the five words of the square. Substitutions for the third word must be made across and down simultaneously; when a first (or second) word is changed, a complementary change has to be made in the fifth (or fourth) word. Squares marked with an asterisk are unsymmetrical. If all words in boldface type in Webster's Unabridged (including the Biographical Section and the Gazetteer) had been used, this list would be several times as long.

anasa, nolas, alala, salon, asana
 anasa, nolas, arara, salon, asana*
 anasa, nolas, alala, solon, asana
 anasa, noras, arara, saron, asana
 apart, paler, alala, relap, trapa
 assam, shama, sagas, amahs, massa
 assam, snoga, solos, agons, massa
 assed, saute, sulus, etuas dessa
 assed, slime, sidis, emils, dessa
 assed, spale, sagas, elaps, dessa
 assed, spole, solos, elops, dessa
 camus, amelu, mesem, ulema, sumac
 daraf, alala, radar, alala, farad
 darts, apart, radar, trapa, strad
 demal, elena, mesem, anele, lamed
 gnats, nonet, anana, tenon, stang
 hakam, alala, kayak, alala, makah
 hales, anele, level, elena, selah
 kayak, alala, yaray, alala, kayak
 krans, renin, anana, niner, snark
 lamas, alala, madam, alala, samal
 lares, anele, refer, elena, seral
 larum, amelu, refer, ulema, mural
 nasus, amelu, refer, ulema, susan
 rated, anele, tenet, elena, detar
 samas, alala, radar, alala, samas*
 sasas, alala, sagas, alala, sasas
 sasas, alala, susus, alala, sasas*
 sasas, alala, yaray, alala, sasas*
 sasas, alula, sulus, alula, sasas
 sasas, ululu, sasas, ululu, sasas*
 sasas, ululu, sulus, ululu, sasas*
 sayas, alala, yaray, alala, sayas
 spart, paler, alala, relap, traps
 susus, ululu, sulus, ululu, susus

yaray, alala, radar, alala, yaray

alala = acara, agama, amapa, anasa, ajaja, anana, arara (2)

kayak = kazak (3)

alala = alula (3)

tenet = tebet

sagas = sabas, samas, saras, sasas, sayas

solos = socos, sohos

sidis = siris, sisis

level = lemel

sulus = suku, susus, sutus (3)

lamas = jamas, lamar, namas, namaz, samas

elena = enema

larum = larus, sarum

assam = ossal

darts = marts, parts, warts

rated = gater, satem

hales = paler

lares = bares, cares, wares, hared, tared

demal = reman, nemas

slime = slive, stime

refer = reder, reser, reter

seles = semes, seres

spole = slone

daraf = saras

A BOOK CURIOUSLY DONE

Ever wish you had a copy of Gadsby, the E-less novel, just as a curiosity? Alphabetical Africa (New Directions paperback, 1974), by Walter Abish (a pseudonym?), is an agreeable second-best. It starts out with a chapter (A) even more restricted than Gadsby, every word beginning with A:

Ages ago, Alex, Allen and Alva arrived at Antibes, and Alva allowing all, allowing anyone, against Alex's admonition, against Allen's angry assertion . . .

In the next chapter, all words begin with A or B. By the 26th chapter, all words are usable. Then Abish works his way back up the alphabet, until in the 52nd and last chapter all words again begin with A. The writing is more telegraphic, less straightforward than that of Gadsby, even late in the alphabet, but rather more interesting. The book got generally favorable reviews, and I have seen some outright raves. I quit at K, though. (P. M. C.)