5-BY-5 LATIN WORD SQUARES

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> *To construct a Latin word square, make a word square out of words with non-repeated letters and rank the letters in each word by their alphabetic position (for example, ALICE=15423). If the ranking for horizontal words remains valid for the vertical words, then the square is Latin. The concept of Latin word squares was proposed by Dave Silverman in the August 1972 Kickshaws; in February 1973, Mary Youngquist and Murray Pearce exhibited several 4-by-4 Latin word squares, and Mary exhibited a 5-by-5 example with three invented but plausible "words".*

In the Colloquy section of the February 1990 **Word Ways**, Frank Rubin says "humans can be well-employed in following up leads suggested by partial computer solutions". The following article illustrates his point; 1 am surprised that more of this has not appeared in **Word Ways**. However, partial computer results must be deliberately developed in a form useful for human follow-up, and the computer search must be fast enough to allow feedback and multiple runs.

From my mixed list of 8779 five-letter words (principally Official Scrabble Players Dictionary, but with additions from the Wordperfect Speller and Chambers Twentieth Century Dictionary), 1 extracted 5875 words with five different letters. I then converted each word to a sequence of five integers, each integer being equal to five times the letter-value (A = 0, B = 1, etc.) plus the rank. For example, BLACK has the letter-rank 25134; B converts to 7 = 1x5 + 2, L converts to 60 = 11x5 + 5, A converts to 1 = 0x5 + 1, C converts to 13 = 2x5 + 3, and K converts to 54 = 10x5 + 4. 1 then had the computer search for word squares based on this 130-letter "alphabet". No additional testing was needed, although some was useful for program speed. A two-letter 130x130 index is very efficient, but a large computer memory is needed.

The first search yielded 34 word squares; in all of these, the horizontal and vertical words match. All words can be found in the OSPD with the exception of IDANT, 1DOSE, ALOWE and CH1TA (in Webster's Third) and HOTEI and HOTEN (in Webster's Second).

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B O U R G    B O U R G    B R A V O    C A N T Y    J A N T Y    C A N T Y
O U R I E    O U R I E    R E W O N    A L O W E    A L O W E    A L O W E
U R B A N    U R E A L    A W O L S    N O R I A    N O R I A    N O R I A
R I A N T    R I A N T    V O L T E    T W I E R    T W I E R    T W I G S
G E N T S    G E L T S    O N S E T    Y E A R S    Y E A R S    Y E A S T
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J A N T Y     D O I T S     D A T O S     J A T O S     E S C A R     B R I T S
A L O W E     O N S E T     A L E R T     A L E R T     S C O R E     R O S E T
N O R I A     I S T L E     T E R A I     T E R A I     C O S T A     I S T L E
T W I G S     T E L O I     O R A T E     O R A T E     A R T E L     T E L O I
Y E A S T     S T E I N     S T I E D     S T I E D     R E A L S     S T E I N

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

L A I T H     S A I T H     L A I T H     S A I T H     C H A T S     G H A T S
A U D I O     A U D I O     A U D I O     A U D I O     H Y D R A     H Y D R A
I D A N T     I D A N T     I D A N T     I D A N T     A D M I T     A D M I T
T I N G E     T I N G E     T I N G E     T I N C E     T R I B E     T R I B E
H O T E N     H O T E N     H O T E L     H O T E L     S A T E M     S A T E M

C H A T S     G H A T S     M A N O R     M E N S A     M E T I C     O C T A L
H Y D R A     H Y D R A     A F O R E     E Q U A L     E A R T H     C H A R Y
A D M I T     A D M I T     N O R I A     N U D G E     T R I C E     T A C O S
T R I C E     T R I C E     O R I E L     S A G E R     I T C H S     A R O S E
S A T E M     S A T E M     R E A L M     A L E R T     C H E S T     L Y S E D

O C T A L     C U B I T     Y O D L E     Y O D L E
C L A R Y     U R E D O     O D E U M     O D I U M
T A C O S     B E L O W     D E I T Y     D I R T Y
A R O S E     I D O S E     L U T E D     L U T E D
L Y S E D     T O W E D     E M Y D S     E M Y D S
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I then made a second search, forcing double Latin word squares in the top two rows and two left columns, and allowing one or two errors elsewhere. A few promising squares emerged, and 1 was able to repair one of them to a set of true double Latin squares. ARIME, MAREW and LAWER are in the OED, and INULA is in Webster's Third.

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P I C U L     P I C U L     P I C U L     P I C U L     4 2 1 5 3
I N U L A     I N U L A     I N U L A     I N U L A     2 4 5 3 1
N A R E S     M A R E S     M A T E Y     M A R E W     3 1 4 2 5
A R I M E     A R I M E     A R I M E     A R I M E     1 5 3 4 2
S M E A R     S M E A R     S M E A R     S M E A R     5 3 2 1 4
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A third search which forced double squares in the lower right corner and allowed errors in the upper left did not yield any repairable squares, but identified a few more potentially useful Webster's Third or OED words which 1 added to my list.

My final search used 8840 words of which 5936 had five different letters; these produced six more 5-by-5 squares, given below. In these, OSHAC and MUSHA are in Chambers, AR1ME and ARINE in

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B O C K S     B O C K S     A L I S H     G A M U T     S C R A N     S C R A N
O S H A C     O S H A C     L I T H E     A M U S E     C L A R O     C L A R O
C H I T A     C H I T A     I T H E R     M U S H A     R A G I S     R A G I S
K A T E L     K A T E L     S H E O L     U S H E R     A R I M E     A R I N E
S C A L D     S C A L E     H E R L S     T E A R Y     N O S E D     N O S E D
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the OED, and SCRAN, ALISH, and KATEL in Webster's Second.

Although l was not hopeful, my success with five-letter words prompted me to look as six-letter words. Restricting the search to simple squares made the process easy. As expected, the results were negative.

IS THIS QUESTION RHETORICAL?

Pop grammarians such as William Safire, wincing when President Bush confuses lay with lie, inveigh against misuses of the English language. But for Joe Citizen, reading a book on the do's and don't's of grammar is about as exciting as kissing his sister or cleaning the garage. Can grammar be made fun, or at least more palatable?

Canadian computer programmer and language aficionado Jon Steeves has answered this by inventing and marketing the game of Moot, a painless way to learn about the meanings and usages of words, not by solitary dictionary lookup, but by discussion among peers. Specifically, it consists of a thousand questions like

- *a charlatan falsely claims to a) be someone b) know something*
- *what movie title would be **Magus Ozianus** in Latin?*
- *bus was coined from what three-syllable word?*
- *is the word **ineffable** ineffable?*

One question begins "The natives want to lay down and rest.." Et tu, Steeves?

*The game can be played either as a form of solitaire in which two to five players discuss each question and jointly arrive at the most plausible answer, or as a two-team effort in which Team A jointly arrives at an answer which Team B is allowed to challenge with an answer of their own. Colloquy forms the soul of the game: it forces one to refine one's ill-formulated ideas in the face of overlooked evidence. Obviously, the game works best in a group with similar backgrounds (say, co-workers or college graduates). It should appeal to the **Word Ways** subscriber, but is hopelessly cerebral for the high-school dropout.*

Questions are divided into four groups according to level of difficulty, but I found little difference among them. The game would be more interesting if there existed strategies for maximizing one's score (number of correct answers, scaled by difficulty); one determines what level must be answered by the roll of a 12-sided die. Steeves loves wordplay ("is a pale-complexioned Mexican wan?"). Many questions distinguish between closely-related words (blase-jaded, enormity-atrocity).

The game is available for $40.95 from the author (Moot, 204-337 W Pender, Vancouver V6B 1T3 Canada).