10-BY-10 SQUARES: PROGRESS REPORT

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In the August 1988 Word Ways, I wrote about my plans to launch a computer attack on the 10-by-10 double word square. I asked for help from Word Ways readers who might help gather 10-letter words from dictionaries and other sources. I received only one reply, from George H. Ropes, who had just written an article on his own search for a 10-by-10 word square. He had the Air Force word list from Webster's Second on diskettes, and graciously supplied those diskettes to me.

This was enough to get started seriously. Merging the 41,000 or so words from the Air Force list with the 6,400 words I had typed in myself gave me nearly 45,000 words, after eliminating duplications.

I began running my program on July 11, 1988. I had a good number of adjustments to make in deciding which partial squares to record. At first, I recorded every 5,8 square -- that is, every square with 5 valid words reading in one direction, and 8 valid words reading in the other direction. However, after a few days I had over five hundred 5,8 squares and one hundred 5,9 squares. If I continued to record all of these partial squares, the computer's disk space would be overrun.

I erased all of the 5,8 squares and 5,9 squares from the computer file, and continued recording all 5,10 squares. Here are the first 5 such squares that I found:

ABSCONDERS	ACTOMYOSIN	ACTORPROOF	ARBUSCULAR	ADUSTIOSIS
BATONISTIC	BARBITURIC	BARBECUING	BEANPICKER	BERTHCARGO
ALINEATION	ANESTHESIA	ANESTHESIA	ALLSHAKING	APORETICAL
LATISEPTAL	NONTITULAR	NONTOURIST	SALTARELLA	SIMILARITY
INCREASING	DECIGRAMME	DECINORMAL	ETHICALISM	ELEGIAMBIC
ECHOPRAXIA	OCHNACEOUS	OCHNACEOUS	DIAPEDESIS	MALIGNANCE
NEWSTELLER	NEMATELMIA	NEMATELMIA	NONPLASTIC	ETALONPOST
APOTACTICI	IDONICACID	IDONICACID	ENDLICHITE	NONANALOGY
TIRETURNER	NARCOBATUS	NARCOBATUS	SALESAGENT	TRITURABLE
ENTREASURE	GREENALITE	GREENALITE	SLEDMARKER	SYNEMMENON

By the time I had searched through the word list as far as ABORTICIDE, I had 25 such 5,10 partial squares, and stopped recording them. I estimate that about 1,000 such squares would have been recorded as of this progress report, and 50,000 of the 5,8 squares.

After running for 8 days, during which only about 30 words were processed, I began to realize that the search was going to take

well over 20 years. I wanted a faster way. So I wrote a modified
version of the program that searched only for (approximately) sym-
metric squares. Of these, I recorded only those that reached level
8,8 or better. This symmetric search took just 4 days. Only 4 such
squares were found, plus some minor variations:

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ACCOMPLICE   BRACHERING   PESTICIDAL   PRECHOROID
COOPERANCY   RETRORENAL   ETHANAMIDE   RETROVERSE
COPATENTEE   ATHEROMATA   SHORTLIVED   ETHANEDIOL
OPALESCENT   CRESOTINIC   TARHEATING   CRATERLESS
METENTERON   HOROLOGIES   INTERMASON   HONEYCOLOR
PRESTATION   EROTOPATHY   CALAMITIES   OVERCOOLLY
LANCETOOTH   REMIGATION   IMITATIONS   REDLOOKING
INTERIONIC   INANITIONS   DIVISIONAL   ORIELLIPSE
SCENOOTI     NATIEHON     ADENOENA     ISOSOLNS
HYETNNHC     GLACSYNS     LEDGNSSL     DELSRYGE
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I resumed the search for a double word square on July 24, dis-
appointed that I had not found any squares beyond 8,8. I contin-
ued to make small improvements in the program over the next few
weeks. At the same time, I was adding a few words at a time from
the Webster Pocket Dictionary.

By late August, I hit a dead end. The computer no longer had
room in its memory to hold the complete word list. Over the first
weekend in September, I completely rewrote the program. I not on-
ly increased the word list capacity by another 10,000 words, but
I made the program 50 per cent faster.

This reduced the estimated running time from 22 years down to
15 years –– still not fast enough. So I changed the program to
search only half of the possible word squares. This reduced the
time to 7 years, but it removed an important check on the correct-
ness of the program. With a full search, many of the squares would
be generated twice, as mirror images. This provides verification
that the program is not skipping any valid squares. With the half-
search, this check is lost. No square could be generated more than
once.

By early November of 1988, the program had searched about 2200
words of the word list, through the word APOTHECARY. The com-
puter found 2038 squares at level 6,6, 205 squares at level 6,7,
28 squares at level 6,8, and 5 squares at level 7,7 (not counting
minor variations). Here are the five 7,7 squares:

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ACTIVELIST   AFFORESTED   AMELOBLAST   ANASTATICA   AORTARCTIA
CYANOMETER   FLORENTINE   MONOCOELIA   NONEUGENIC   OVERWEIGHT
TARTRAMATE   FORTPIERRE   ENUMERABLE   ANTANANDRO   REVILINGLY
INTRACOLIC   ORTHOCERAN   LOMBARDEER   SEALETTUCE   TRIGENERIC
VORAGINOUS   REPOPULATE   OCEANOLOGY   TUNELESSLY   ASSESSMENT
EMACIATING   ENICURIDAE   BORROWABLE   AGATESHELL   REINSTATOR
LEMONTREES   STEELINESS   LEADLAPPED   TENTSHAPED   CATENATION
ITALOIE      TIRRADE      ALBIOBP      INDUSEP      TSARETI
SETIUNE      ENRATAS      SILAGLE      CIRCLLE      IONISOC
TRECSGS      DEENEES      TAENYED      ACOEYLD      ANTCSRS
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The only 7,8 squares found were degenerate variations on the 8,8 symmetric squares presented earlier.

At this point, I decided to run the program on my word list with the words spelled in reverse, thus building squares from the bottom up instead of the top down. A rerun of the symmetric square search produced some hundreds of 8,8 examples, far more than the four I had previously located. More importantly, I quickly discovered some twenty 6,9 double word squares as well as the following 6,10 double word square:

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CASCADEFIR
MEGACERINE
PRECEDENTS
PLASTICART
ANTHOCHLOR
ORDINATIVE
PELLETIZES
DELIMITERS
TERGIVERSE
REACCESSED
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I now plan to run the program exclusively with the reverse word list.

If there are **Word Ways** readers who own or have access to an IBM or compatible PC with at least 640K of memory and who are willing to run part of the search, a parallel effort would allow the ten-square search to be completed far sooner. I also seek anyone willing to hunt for words to add to my list, now over 50,000. If you have a compatible computer and can type the words into the computer, that is best, but even if you merely list the words on paper for me to type, that would be a benefit. If you are willing to help either with word-square searching or word-listing, please write to me at 59 DeGarmo Hills Road, Wappingers Falls NY 12590.

QUERY

Richard Lederer of Concord, New Hampshire labels pairs such as **raise-raze** *or* **wreckless-reckless** *homophonic contronyms (pairs of words that 1) sound exactly alike, 2) are spelled differently, and 3) possess clearly opposite meanings). Has this category been previously identified by logologists? Can you supply additional examples?*