HETEROGRAMMATIC EIGHT-SQUARES

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Eight-squares exist in overwhelming numbers (a few million million by my guess, and 27 million million by Chris Long’s formula), so there are many ‘perfect’ examples. A 1902 effort by Charles B Stewart had a two-word place name and a word with an initial capital: decisive egomania computes impotent sauterne interned Viennese East Eden. In November 1926 (in Enigma) Mrs Burkholder came close to perfection with words from a single dictionary: Agaricus (genus) generant anaconda recanter ironwort cantonal underage (Webster2 is needed to avoid hyphen) startled. Finally, a ‘perfect’ square by Darryl Francis was reported in W88-80: rosetter overrule sequined eruptive tritical tunicate elevates redless, all in Web3, except for redless in Web2.

The major challenge is therefore to find eight-squares with some additional attributes. I had failed to find a nine-square made from heterogrammatic words by a margin of one word (Nine-Square Roundup in August 2003), so it was natural to hunt for heterogrammatic eight-squares. This turned out to be a worthwhile challenge, as I found many (18000), but none quite perfect. Given that I also found a very few diagonal nine-squares with a single diagonal, the supposition is that there is a legion of such eight-squares, but what about heterogrammatic eights with diagonal words?

Throughout the article, the squares in each section are presented in approximately descending order of quality, marks being deducted for phrases, hyphens, apostrophes, non-headwords, initial caps, foreign words etc, multiple deductions applying to a single word. All letters in the squares are normally lower-case, except where boldface indicates a capital letter. For some squares, the notes give alternative words after a semicolon.

Heterogrammatic Eight-Squares

Despite being restricted to just 15% of the 8-letter vocabulary of around 750,000, the heterogrammatic squares below are almost perfect, in that virtually all words are solid lower-case dictionary headwords (or regular derivations). They are thus comparable in quality to the best ten-squares taken from a full vocabulary. In fact, I have failed to find any previous heterogrammatic word squares in Word Ways larger than 5x5 (eg agami gamin amine miner inert in W69-226).

Here is a small selection of the better examples from the 18,000 or so squares found. BISCEOPA heads three of the best squares.

B I S C E O P A  OED aswolkeness, 1000q
I N T O M B E D  OED entomb, verb
S T U M P E R I  Discothryea stumperi vittatus, ITISa
C O M P R I S E  OED
E M P R I S O N  OED
O B E I S A N T  OED
P E R S O N A L  OED
A D I E N T L Y  OED adient, adjective
all OED bar one

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

O E D
O E D
Web2, below line
Sumidero sumidero microdentata, ITISa, or places
C_{12}H_{20}N_{2}O, eg www.echinachem.com/Category/showChemical.asp
O E D niterated, niterous
North Korea, 41° 23', 129° 19'

U P F R A M E D “domain of the upframed conceptual future”†

P Y R U V A T E
F R A D I N H O
R U D I S T A N
A V I S M E N T
M A N T E R O I
E T H A N O I C
D E O N T I C S

O E D
Arroio Fradinho, Brazil, -6° 51', -41° 44'
lower case, Web2 Rudista
O E D advisement with earlier form of advise, eg 2a 1425q
Pheidole manteroi ferox, ITISa
O E D
Chambers deontology
† in review of Reframing Business: When the Map Changes the Landscape by Richard Normann, on Amazon.com

B I S C E O P A
I N C O M B E R
S C A M P E R ' D
C O M P R I S E
E M P R I S O N
O B E I S A N T
P E R S O N A L
A R D E N T L Y

O E D aswolkeness, 1000q
O E D
scamper’d, OED scamper l 1687q
O E D
O E D
O E D
O E D
O E D
O E D
O E D

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

O E D aswolkeness, 1000q
O E D entomb, vb
Discothyrea stumperi vittatus, ITISa
O E D comprise
O E D
O E D obeisant
O E D
O E D adient, adj

all OED

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

O E D aswolkeness, 1000q
O E D
Discothyrea stumperi vittatus, ITISa
O E D
O E D
O E D obeisant
O E D
O E D adient, adj

all OED bar one

R E C U B A N T
E X O N U M I A
C O N S K I T E
U N S K A T E D
B U K A S E R O
A M I T E R O L
N I T E R O U S
T A E D O L S U

Web2
O E D
O E D
O E D; or UNSLATED Web2, below line
Uganda, 0° 23', 33° 28'
C_{12}H_{20}N_{2}O, eg www.echinachem.com/Category/showChemical.asp
O E D niterated, niterous
North Korea, 41° 23', 129° 19'
Heterogrammatic Eight-Squares with SW-NE diagonal

Of the 18,000 heterogrammatic squares, about 300 (1.7%) have a word as the SW-NE diagonal. Some of the better squares showing each of the ten different SW-NE diagonal words are given below. No squares with either of the NW or SE diagonals were found. The SW-NE diagonal is perforce palindromic, so cannot be a heterogram. All except one of the diagonals are to be found in Palindromicon II. Disregarding the merits of the diagonal word itself, the diagonals SIISSII'S, HRRRRRRRH, AAAAAAAA, and EEEEEEERE yield the best squares, in which half the words are ‘perfect’.

1. Suussuu’s: 3 found
   B E C H A R M S OED becharm
   E L H A N O U T El Hanout, Morocco, 34° 47’, -4° 21’
   C H E G O U R A Douar Chegoura, Morocco, 31°32’, -807; or Chemoura, Algeria, 33° 28’, 5° 58’
   H A G I S T E R OED
   A N O S K E L I Greece, 35° 27’, 23° 46’
   R O U T E M A N OED route 4
   M U R E L A N D OED Meg, 1538q
   S T A R I N D E OED stare 1300q (= staring)

   M A N G O L D S OED mangel, mangold
   A F E L I O U N Iرذر Afelioun, Morocco, 35° 06’, -2° 45’
   N E S O L U M A Nesoluma polymesium orcutti, ITISp
   G L O U S T E R 2 Hen. VI, iii. 1. 57, or in Athens co., SE Ohio
   O I L - S H A R K oil-shark, OED oil 6e
   L O U T A M B I Congo, -4° 04’, 13° 19’
   D U M E R B A L India, 20° 00’, 83° 27’
   S N A R K I L Y OED snarky

2. siissii’s: 8 found and given
   H A L F P E N S OED cunter I.1 1579q; or calf-pens, OED calf 7 1856q
   A N O R E X I C OED
   L O F E R I K A Sudan, 4° 11’, 32° 21’
   F R E I S T O N Lincolnshire, 52° 58’, 0° 3’; or Freyston, UK, 51° 46’, -4° 56’
   P E R S H U L T Pershult, Sweden, 56° 23’, 13° 14’
   E X I T U R A L OED exiture
   N I K O L A R E Albania, 40° 42’, 20° 27’; or NIKOLAYE†
   S C A N T L E D OED scantle

† Nikolaye-Aleksandrovskoye, Russia, 48° 24’, 135° 5’
3. Saassaas (places): 1 found
   ZODIACKS OED zodiac
   OGHMULAK Ogh Mulak, Iran, 33° 39', 48° 45'
   DHUPGARI India, 26° 36', 89° 01'
   IMPOSTER OED
   AUGSFELD Germany, 50° 01', 10° 33'
   CLATERIN OED clatter 1b 1225q
   KARELINO Russia, 58° 42', 60° 23'
   SKIRDNOY Ukraine, 49° 01', 35° 41'

4. hr-r-r-r-r-rh (EDD): 7 found
   RIESPACH France, 47° 33', 7° 17'
   INSTAURE OED reinstaure
   ESKATROL Eskatrol (Fool Button) contained Dextroamphetamine Sulfate†
   STAPRENI Latvia, 56° 44', 25° 17'
   PATRONYS OED patron, 14..q
   AURENTIO Pointe Aurentio, New Caledonia, -22° 10', 166° 15'
   CRONYISM OED
   HELISOMA Helisoma azurea speciosa, ITISa
   † (Dexedrine) 15mg and Prochlorperazine (Compazine) 7.5mg, http://www.cobo.org/knowledge/faq/obscure.html

ROMUNTCH OED Romansh
OMUNYARI Uganda, 1° 48', 33° 48'
MULCARES Mulcares Yard, Montserrat, 16° 43', -62° 9'
UNCHRISt "Unchrist, all rolled in ruin...", Gerard Manley Hopkins, The Loss of the Eurydice
NYARME-TO Ozero Nyarme-To, Russia, 72° 30', 69° 34'
TARIESUM OED tarrysome, 1513q
CRESTUMA Portugal, 41° 04', -8° 30'
HISTOMAP OED

5. tuuttuut: 2 found
   HASEMKOT Hasem Kot, Afghanistan, 33° 12', 69° 46'
   ACINOHUR Acinohur Golu, Azerbaijan, 40° 59', 46° 57'
   SIVARUYO Peru, -17° 2', -69° 37'
   ENACTORY OED
   MORTEILS OED mortal 3, 1393 Langland, Piers Plowman xviii. 290
   KHUOIBAC Khoui Bac, Vietnam, 22° 41', 106° 17'; or Khuoi Nac, Vietnam, 22° 58', 105° 36'
   OUYRлатE OED overtimely, 1440q
   TROYSCEN OED sib-lag, 1205q

6. AAAAAAAA (tutoring service): 175 found.
   BUKITCHA Bukit Cha, Malaysia, 4° 45', 100° 51'
   UNIPOLAR OED
   KILOBAUD kilobaud (very common in data telecomms)†
   IPORTAYNE OED ipotame, ipotayne
   TOBALIEN Tobalien Point, Indonesia, 1° 5', 127° 59'
   CLAYIEST OSPD, Pulliam
   HAUNESTI Romania, 44° 47', 22° 37'
   ARDENTIS OED ardent 2 (Latin)
   † in OED text as journal Kilobaud Microcomputing
BUDINSKA Budinska Skala, Slovakia, 48° 28', 19° 26'; or RUDINSKA†
UNIMOLAR OED tosyl, 1938q (why not headword?) - normally chemists say ‘molar’
DISOMATY Pulliam
IMOCAVUS Sterrhurus imocavus hebridicus, ITISa
NOMADISH “regarding my nomadish life, destiny and colonialism in Africa”‡
SLAVICHE Belarus, 54° 59', 27° 12'
KATUSHEV OED imperialist 4, 1969q
ARYSHEVO Russia, 56° 18', 86° 23'
† Rudinska Kosa, Bosnia and Herzegovina, 43° 48', 17° 53'; or TUDINSKA, Budinska Reka, Yugoslavia, 44° 21', 19° 39'
‡ Ali M’ ROIVILI (others also use this, presumably instead of nomadic).

PROVENDA OED provend (Latin)
REMINDAL OED remind
OMERFAKI Turkey, 39° 16', 29° 27'
VIRCALES Vircales Hacienda, Peru, -4° 48', -79° 33'
ENFAMISH OED
NDALithe Ndalithe Island, Fiji, -16° 48', 179° 52'
DAKESHIN Dakeshin Maheshpur, Bangladesh, 24° 59', 89° 10'
ALISHENG Afghanistan, 34° 47', 70° 05'

7. Ddddddddd (OED signature 6a 1864q “Detached Sheet: 4to; signature, Ddddddddd”): 3 found
FRISLAND UK, 56° 35', -6° 36'; or URI ISLAND uris-land OED ure 1,†
RESPALDO El Respaldo, Columbia, 7° 8', -75° 34'
ISPENDAM Turkey, 41° 04', 39° 28'
SPELDRIIN Chambers speld
LANDMICE OED 1 b land-mouse
ALDRICHES Aldrich’s, OED architect 1890q
N’DAICHET N’dai chet, Burma, 24° 59', 97° 40'
DOMNESTI Tirgu Domnesti, Romania, 46° 1', 27° 11'
† or urisland OED ure 1 1589q

8. EEEEEEEE (James Joyce, Ulysses): 86 found
PADLOCKE OED withe, 1570q
AVOUCHER OED
DOWCHERY OED Dowche, dowchery (first purchase of tracker fund?)
LCRESIA Lucre sia (forename), OED convey 2, 1567q
OCHESTAN Iran, 33° 40', 50° 24'
CHESTING OED chest
KERIANGO Angola, -10° 35', 15° 20'
ERYANGOU China, 32° 38', 110° 42'

RAMBUCH E Ecuador, -0° 14', -80° 20'
AVOUCHE D OED
MOLCHEPA Russia, 43° 59', 40° 08'
BUCKERAM OED buckram
UCHEWARI Uchewari Bhit, Pakistan, 26° 34', 69° 04'
CHERAFIT Greinat Cherafit, Mauritania, 15° 40', -6° 4'
HERPAINS OED heparin, plural in OSPD
EDAMITSU Japan, 33° 52', 130° 49'
9. MMMMMMMM (Washington Post, 22 Dec 1978, c4/1 “Mmmmmmmm” at Travolta’s hunky nearness”): 5 found.

<table>
<thead>
<tr>
<th>Place</th>
<th>Coordinates</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dorland</td>
<td></td>
<td></td>
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<tr>
<td>Isla Remo, Chile</td>
<td>-47° 59’, -73° 53’</td>
<td></td>
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<tr>
<td>Bled Smir, Algeria</td>
<td>35° 10’, 0° 2’</td>
<td></td>
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<tr>
<td>Bosnia and Herzegovina</td>
<td>44° 25’, 16° 55’</td>
<td></td>
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<tr>
<td>Sweden</td>
<td>61° 38’, 16° 04’</td>
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</tr>
<tr>
<td>Web2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Russia</td>
<td>54° 22’, 35° 6’</td>
<td></td>
</tr>
<tr>
<td>Morengai Farm, Kenya</td>
<td>0° 3’, 37° 8’</td>
<td></td>
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<tr>
<td>Porich’am, North Korea</td>
<td>40° 27’, 126° 19’</td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td>7° 6’, -70° 39’</td>
<td></td>
</tr>
<tr>
<td>Rio Lumbe, Mozambique</td>
<td>-18° 10’, 35° 44’</td>
<td></td>
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<tr>
<td>i-clumben, OED</td>
<td></td>
<td></td>
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<tr>
<td>OED chump vb</td>
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<tr>
<td>Madagascar</td>
<td>-20° 53’, 43° 54’</td>
<td></td>
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<tr>
<td>Maengsol-li, South Korea</td>
<td>34° 8’, 126° 38’</td>
<td></td>
</tr>
<tr>
<td>Laos</td>
<td>18° 33’, 103° 43’</td>
<td>or TORIKHAM, Torikham, Pakistan, 35° 54’, 71° 33’</td>
</tr>
<tr>
<td>Venezuela</td>
<td>7° 6’, -70° 39’</td>
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</tr>
<tr>
<td>Rio Lumbe, Mozambique</td>
<td>-18° 10’, 35° 44’</td>
<td></td>
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<tr>
<td>i-clumben, OED</td>
<td></td>
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<tr>
<td>Burma</td>
<td>23° 1’, 93° 47’</td>
<td></td>
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<tr>
<td>OED hum-bird, or humbird’s in 1634q</td>
<td></td>
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<tr>
<td>Madagascar</td>
<td>-20° 53’, 43° 54’</td>
<td></td>
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<tr>
<td>Maengsol-li, South Korea</td>
<td>34° 8’, 126° 38’</td>
<td></td>
</tr>
</tbody>
</table>

10. OOOOOOOO (Bluebottle, in The Goon Show): 11 found.

<table>
<thead>
<tr>
<th>Place</th>
<th>Coordinates</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montes Mulheico, Mozambique</td>
<td>-14° 23’, 38° 4’</td>
<td></td>
</tr>
<tr>
<td>Utain-gol, Mongolia</td>
<td>46° 23’, 99° 21’</td>
<td></td>
</tr>
<tr>
<td>solid in Chambers and OED variant</td>
<td></td>
<td></td>
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<tr>
<td>Chambers hideout</td>
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<td></td>
</tr>
<tr>
<td>OED inform 5a, 1400q</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>31° 15’, -9° 25’</td>
<td></td>
</tr>
<tr>
<td>OED curtain, 1340q</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethostoma olmstedi williamsi, ITISa</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Popular Top Row Words in Heterogrammatic squares

A frequent everyday top row word (0.16% of squares) is DESPATCH. More frequent are the following, with the TOMBRACH the most popular, occurring at the top of 0.43% of all squares:

G O B S M A C K O E D
H O M E S I C K O E D
Z E T L I S C H Hohen Zetlisch, Czech Republic, 49° 50', 12° 46'
M O D R I C K A Modricka Reka, Yugoslavia, 43° 31', 21° 20'
N Y A S K O C H Mys Nyaskoch, Russia, 51° 44', 87° 32'
M I S T R U C K Mistruck, Honduras, 15° 14', -83° 53'
N E B L I S C H Neblish, Poland, 53° 51', 21° 11'
H O G S B A C K hogs-back, OED hogback 2a 1973q
T O M S H A C K personal name, US Census
T O M B R A C K Tombrack, Ireland, 52° 36', -6° 32'

Popular Words anywhere in Heterogrammatic Squares

A frequent everyday word is ISLANDER, at 0.07% of all 150,000 words in the squares; KINGSLEY (Water Babies) and TUCKINGS are a little more frequent; but the most frequent, occurring up to 0.225% of the time, are listed here in ascending frequency:

I Z U T A C H O Izutacho, Japan, 35° 28', 139° 39'
O T A R U S H I Otaru-shi, Japan, 43° 11', 141° 1'
I S T A N G O L Istan gol, Pakistan, 35° 57', 71° 47'
K I N G S W A Y Kingsway, an important road and Underground station, London, WC2
O T E M A C H I Otemachi, Japan, 36° 4', 136° 13'
U C H I N D O L Uchin Dol, Bulgaria, 43° 20', 24° 36'
K I N G S E A T Kingsseat, Fife, Scotland
A C H I N D O W Ach'indow, Ethiopia, 14° 19', 38° 15'
A R E T U C H I Aretuchic, Mexico, 28° 7', -107° 36'
I M U R A C H O Imuracho, Japan, 34° 44', 137° 26'
I C H A N S U L Ichansul, Guatemala, 14° 13', -90° 25'
O C H I N G U E Rio Ochingue, Angola, -12° 4', 18° 5'

Sources: Dorland = Dorland’s Illustrated Medical Dictionary; ITIS = Integrated Taxonomic Information System of the USDA; ITISa = ITIS animal; ITISp = ITIS plant; NIMA = National Imagery and Mapping Agency (USA, default source for place names); OSPD = Official Scrabble Players Dictionary.

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