

## DESIGNER ISOMORPHS

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It is twenty years since isomorphs were given significant room in *Word Ways*; "A Pattern Word Quiz," by Mary and Harry Hazard, appears in the November 1980 issue. In view of this time lapse, readers might find it useful to be reminded of the terminology associated with isomorphs:

- *Isomorphs*: *Word Ways* uses the term **isomorph** to denote words having the same letter pattern. Thus, both the words in that panda delight, EXCESS BAMBOO, have the letter pattern 123144.
- *Pattern Words and Non-pattern Words*: A word with at least one repeated letter is called a **pattern** word, as distinct from a non-pattern word in which all the letters are different (heterogram). When considering isomorphs, it is more satisfying to use pattern words than non-pattern words.
- *Crashes*: Two words of the same length are said to **crash** if they contain the same letter(s) in the same position(s). Non-crashing isomorphs are considered superior to crashing isomorphs like AMERICAN KENTUCKY, both words of pattern 12345617 but with the crashing letter C.

### A Brief History of Isomorphs in *Word Ways*

Before embarking on *Designer Isomorphs*, it seems an appropriate time to take a brief look at the history of isomorphs in *Word Ways*. The word isomorph made its debut in *Word Ways* in the August 1969 Kickshaws, then under the auspices of David Silverman. His examples include the non-crashing pair ALFALFA ENTENTE with the letter pattern 1231231, and the crashing (letter H) pair SWEETHEART BLOODHOUND with the pattern 1233453674. (I found BATTENTLIE in the OED as a non-crashing isomorph of SWEETHEART, and POLLENLIKE in Webster's Second as a non-crashing isomorph of BLOODHOUND.)

During the 1970s, a variety of isomorph items appeared in *Word Ways*. The main contributors, in alphabetical order, were Ross Eckler (Nov 1971, Feb 1972, Aug 1973 Colloquy, Nov 1977), Murray Pearce (Aug 1971), David Shulman (Nov 1975), and David Silverman (Kickshaws of Aug 1969, May 1972, Feb 1973, Aug 1974, Nov 1974).

The interest in isomorphs during the 1970s was kept alive by a series of pattern word lists produced by Professor Jack Levine, the words taken from Webster's Second and Third Editions with derived words (plurals, past tenses, etc.) added. Although Levine produced the lists as an aid to solving simple cryptograms, substitution ciphers in which the divisions between the words are preserved, the lists also served to make the task of finding isomorphs much easier. Levine produced three pattern word lists: *A List of Pattern Words of Lengths Two Through Nine* (1971), *A List of Pattern Words of Lengths Ten Through Twelve* (1972), and *A List of Pattern Words of Lengths Thirteen to Sixteen* (1973). Only small numbers of each list were produced and they quickly became unobtainable.

Other pattern word lists, most of which have been referred to in Word Ways, include

- *Cryptodyct* by Eldridge and Thelma Goddard (1976) [based on a small dictionary, and probably out of print]
- *Pattern-Word List (Vol. 1)* by Frederick D. Lynch, Aegean Press (1977) [words up to 10 letters, no longer listed in the Aegean Press catalogue]
- *Pattern and Nonpattern Words of 2 to 6 Letters, Pattern and Nonpattern Words of 7 & 8 Letters, Pattern and Nonpattern Words of 9 & (Some) 10 Letters, Pattern and Nonpattern Words of 10 Letters (Complete), Pattern and Nonpattern Words of 11 Letters, Pattern and Nonpattern Words of 12 Letters, Pattern and Nonpattern Words of 13 to 15 Letters* by Richard V. Andree, Raja Press (1977-1983) [based on Webster's Seventh Collegiate, with derived words added; at least the first four volumes were issued in limited editions, and are probably out of print]
- *Pattern Words – Three Letters to Eight Letters in Length, Pattern Words – Nine Letters in Length* by Sheila A. Carlisle, Aegean Press (undated, but prior to 1993); *Pattern Words – Ten Letters and Eleven Letters in Length, Pattern Words – Twelve Letters and Greater in Length* by Robert W. Wallace, Aegean Press (undated, after 1993) [probably based on a collegiate dictionary; listed in the 1999 Aegean Press catalogue]

Here are some of the more significant non-crashing isomorphs that have appeared in Word Ways. In the May 1972 Kickshaws David Silverman exhibited a pair of isomorph transposals from Levine's list: POOPES OPPOSE, and in the Aug 1972 Kickshaws Mary Youngquist added two more pairs: RITTER TERRIT and OPPOSIT POOPITS. In Feb 1973 Leslie Card claimed that CHECKBOOK had no isomorph. (I found two in the OED, both variant forms of embezzles: EMBESILLS and EMBESYLLS.) What is the longest pair of non-crashing isomorphs? Using Levine's list, Ross Eckler presented DEMULSIFICATION GYNAECOMORPHOUS in the Aug 1973 Colloquy, and David Silverman added several more 15-letter examples in the Aug 1974 Kickshaws, including CINEMICROGRAPHY METHAEMOGLOBINS and COUNTER-MARCHING HEMISAPROPHYTIC. 'Flash' (a pseudonym of one of Dave Silverman's friends) listed CONCEPTUALISM EXCEPTIONABLY in the Nov 1974 Kickshaws; both words are in Webster's Collegiate. Notice how the letter string CEPT occurs in both words without crashing.

In "The Patterns of State Names" in the November 1977 Word Ways, Ross Eckler set about finding the commonest English words having letter patterns matching the various state names. He found isomorphs for 27 of the single-word states, 19 of them non-crashing. In the list below, the non-crashing ones are denoted by asterisks; I have replaced Ross's crashing isomorphs with non-crashing ones.

Alabama exegete*	Illinois effected*	Montana clearer*
Alaska emerge*	Indiana keckses	Nebraska conserve
Arizona example*	Kansas headed*	Nevada houses*
Arkansas enseurer	Kentucky diamonds	Ohio that*
California undertaken*	Louisiana metabasis	Oklahoma abstract*
Colorado paranoia	Maryland somebody*	Oregon either*
Delaware brainier	Michigan starting*	Virginia believed*
Georgia already*	Minnesota hurricane	Washington introduced*
Hawaii recess*	Missouri terrible*	Wisconsin begrudged*

## Designer Isomorphs

With the exception of isomorph transposals, POOPES OPPOSE etc. (see above), it would appear that isomorph examples of the various forms of wordplay have not been given prominence in *Word Ways*. Here, I attempt to remedy this situation. Palindromic and tautonymic isomorphs, being numerous and therefore trivial, are not included. All the examples below are non-crashing isomorphs. Most of the words can be found in the *Oxford English Dictionary, Second Edition*, either as headwords, variant forms or text words including citations. Sources for non-OED words are given at the end.

### ASSIGNING A = 1, B = 2 through Z = 26

#### 1. *Balanced Words* (average letter value 13.5)

REILLY - STUCCO - VACUUM	QUININES - PETITION
RIVERISH - TOMATOES	SPARTANS - TRIALIST
NEPHROLOGY - VOWELISING	

#### 2. *Century Words* (letters total 100)

FOOTSY - OZZIES    PLUMULE - REVIVES    PLUNGING - EDMONTON

#### 3. *Lightweights and Heavyweights* (average letter value given in brackets)

BABBAGE (2.857) - ZYZZYVA (21.571)

#### 4. *Numerical Palindromes*

EMETIC - GIGMEN (both 23.32)    PARROT - BROOMY (both 35.53)

#### 5. *Numerical Tautonyms*

HELPED - MICKIE (both 25.25)    BUMMER - WHEELS (both 36.36)

#### 6. *Both Numerical Palindromes and Numerical Tautonyms*

RACIAL - FIGLIA (both 22.22)	SMACKS - ETHISE (both 33.33)
CUTEST - PISTES (both 44.44)	UNSAYING - CRUMHORN (both 55.55)

#### 7. *Numerical Palindrome Transposals*

CATERS - REACTS (both 24.42) – no repeated letters

## ALPHOMES

#### 1. *Alphomes* (letters in alphabetical order)

BERRY - FILLS    ADEEMS - BILLOT - FLOOSY

#### 2. *Reverse Alphomes* (letters in reverse alphabetical order)

UPPIE - ZOOEA    UNHEED - YVONNE    SPOOK - TREED

#### 3. *Alphomes and Reverse Alphomes - one word of each*

BELLOOT - SPOONNE

## CONSONANTS AND VOWELS

#### 1. *Consonants (including Y) and Vowels - one word of each*

TRYSTS - IUAEIE (or OUEIOI)    SYLPHS - AIOUEA

#### 2. *Consonants (excluding Y) and Vowels - words of each*

VMFF - PWLL - IEUU - AUEE    TWTH - IOIE

#### 3. *Consonants and Vowels in Corresponding Positions*

ISOMORPH - ABIDINGS  
 PATTERN - DUNNOCK - KIBBUTZ  
 CRASHES - SWINDON

#### 4. *Consonants and Vowels Alternating*

EPIDEMIC – ITEMIZED – the vowels EIEI have been replaced by the vowels IEIE

5. *Monovowel Words with Vowels and Consonants in Corresponding Positions*

CATAMARANS - VISIBILITY

6. *Monoconsonantal Words with Consonants and Vowels in Corresponding positions*

BOBBIE - TATTOU

BAOBAB - REARER

ANNONE - EVVIVA

7. *AEIOU Words*

AUTOSITE - PERIOURA

**DOUBLE LETTERS**1. *Two Sets of Double Letters*

ABBESS - BOOTEE

CESSPOOL - DOLLBEER - GARROTTE - TUPPENNY

2. *Two Sets of Double Letters Adjacent*

ALLAAS - EFFEER - LEELLY

3. *Two Sets of Like Double Letters*

ASSESS - BOOHOO - TEEPEE

**GEOMETRICAL WORDS** (see WW Aug. and Nov. 1997)1. *Triangles* (letter ratio 1.2.3.)

MISSIS - WEDDED - HORROR - FALLAL - LYNNYN

2. *Rhombuses* (letter ratio 1.1.2.2.3.)

FETTERERS - TIFFINING

3. *Pentagons* (letter ratio 1.2.2.3.)

DEADHEAD - GINGLING - HOCHPOCH

4. *Hexagons* (letter ratio 2.2.3.)

ALFALFA - SOUSOUS - ESENSE - HATHATH - TZITZIT

5. *Trapeziums* (letter ratio 2.3.)

ESSEE - LEELL

COCCO - NANNA - SESSE

REREE - TOTOO

AZZAZ - SEESE

GEGGE - ONOON - KOKKO - MAMMA

6. *Eggtimers* (letter ratio 1.2.2.)

BOOBY - ERRED COCOA - JUJUS - PAPAL - VIVID GIGLI - ILIAL - TETHE

ALGAL - KAFKA - MIAMI - SENSE (*Miami Words* - see WW Feb. 2000)**LETTER GROUPS**1. *Letters taken from the First and Second Halves of the Alphabet - one word of each*

AMALGAM - USUROUS

CAMILLA - SYRUPPY

CHILLED - UPROOTS

CLICKED - SUNSPOT

GLACIAL - SYNTONY

GIMMICK - OUTTURN

HECKLED - UNSTONY

CHEMICAL - OUTSWORN

BALDFACED - OUTSPURNS KAMACHILE - ZOROTYPUS (which, with an average letter value of 19.44, is a contender for the heaviest 9-letter word)

2. *Odd and Even Letters of the Alphabet - one word of each*

MOSSY - PHFFT

MIMIC - PHPHT

3. *Tall Letters and Narrow Letters*

flitt - idyll (tall)

censuses - unserene (narrow)

4. *Tall Letters and Narrow Letters - one word of each*

flightily - aero-screw

5. *Curved Letters and Straight Line Letters - one word of each*

COUSCOU - MANXMAN

COCCOUS (W2) - MAMMATE

JOCOSUS - HELENIN

6. *Horizontally-Symmetrical Letters*  
BEECH - COOED - ICCHE
7. *Vertically-Symmetrical Letters*  
AXOTOMY - MUTATIO
8. *Horizontally- and Vertically-Symmetrical Letters - one word of each*  
TOMATO - DECIDE
9. *Typewriter Left Hand and Right Hand - one word of each*  
DEADER - ONIONY      REREAD - LILIUM      SERVER - UNKINK  
DESSERT - MILLION      REGRETS - KINKILY
10. *Typewriter Top Row*  
PIERROT - QUIPPER      PIPPIER - TETTERY
11. *Typewriter Top Row and Middle Row - one word of each*  
WETTER - DALLAS      TERRERE - HADDADA

**MEANINGFUL**

1. *Thematic*  
Isomorphs may exhibit a common theme. Reading across the page, we find isomorph pairs relating to mammals, birds, attire, plants (2 examples) and climate (a triple), respectively:  
GIBBON - POSSUM      LINNET - PUFFIN      PANAMA - BIKINI  
LILIUM - JOJOBA      VANILLA - TOBACCO  
NORTHERN - CLIMATIC - DRENCHED
2. *Synonyms (or near synonyms)*  
MAXIMUM - EXTREME      HUBBUB - POWWOW      DOSSED - SLEEPS  
KILLINGS - MASSACRE      ENVIRONS - LOCATION      EGGS - SEED  
SMELL - WHIFF      KICKOFF - CONCUSS (in the world of football!)
3. *Antonyms (or near antonyms)*  
LESSER - COMMON

**NUMERICAL LETTER SERIES**

1. *Square Letters (a,d,i p y)*  
DADDA - PIPPI
2. *Fibonacci Letters (a,b,c,e,h,m,u)*  
CAABA - HEEME (or MEECE)      BUCCA - HAMME  
BACACH - CUBUBE
3. *Prime Letters (b,c,e,g,k,m,q,s,w)*  
SKEEG - BEGGS      BEEBE - ESSES      ESSEW - KEEKS
4. *Roman Letters (I,V,X,L,C,D,M)*  
MIIL (or its reversal LIIM) - ILLD

**PHRASES**

1. *Two Word Phrases*  
MAFFIA PEDDLE      ROBBER SNOOPS      TENNIS VOLLEY  
FUELLED CAREERS      IDIOTIC ANAGRAM      PROPOSE TUITION  
SKIMMIA BLOSSOM      SQUEEZE CHASSIS      ESTIMATE SYMPTOMS  
SUBURBAN DETECTOR      INTRINSIC ORATORIOS      STURDIEST PERISCOPE  
TELEVISIONING SATANOLOGY
2. *Three Word Phrase*  
ENGLAND REDUCES CAPITAL

**REVERSALS**1. *Reverse Isomorphs*

Choose a pattern word and make a note of its letter pattern starting from the end of the word rather than the beginning. Thus the State of KENTUCKY has the reverse letter pattern 12345672. Now search for non-crashing words with that pattern. They include DEXTROSE and GENDARME.

Once again, here are the pattern single-word States, but this time they have been allocated isomorphs which are non-crashing when read in reverse:

ALABAMA - OLOROSO	ALASKA - STASIS	ARIZONA - CHAOTIC
ARKANSAS - none found	CALIFORNIA - LAMENTABLY	COLORADO - MAXIMUMS
CONNECTICUT - none found	DELAWARE - SPICIEST	GEORGIA - BASKETS
HAWAII - EENING	ILLINOIS - MARIANNA	INDIANA - TITANIA
KANSAS - MEMBER	KENTUCKY - PLATEFUL	LOUISIANA - IMITATORS
MARYLAND - CONDEMNS	MASSACHUSETTS - none found	MICHIGAN - BROADWAY
MINNESOTA - SIGNALLER	MISSISSIPPI - none found	MISSOURI - OTHELLOS
MONTANA - POPCORN	NEBRASKA - CATCHING	NEVADA - DEDUCT
OHIO - PULP	OKLAHOMA - INSPIRES	OREGON - ARCHER
PENNSYLVANIA - none found	TENNESSEE - none found	VIRGINIA - CEMENTED
WASHINGTON - ADULATIONS	WISCONSIN - CROCKFORD	

2. *Dual Isomorphs*

The same word may act as both isomorph and reverse isomorph. These words have the same letter patterns running backwards as well as forwards, even though they are not palindromes. They include: OLOROSO - 1213141 (see ALABAMA above) and the Shakespearean characters BOTTOM - 123324, CRESSIDA - 12344567, CAESAR - 123425

**SHIFTS**1. *Alphabetic Shifts*

Any word whose letters are shifted  $n$  places along the alphabet will always form a word which is a non-crashing isomorph of the original word.

BABE + 14 = POPS      BOMB + 6 = HUSH      ADDER + 1 = BEEFS  
 FILLS + 6 = LORRY      SNEER + 1 = TOFFS      STEEDS + 1 = TUFFET  
 PRIMERO + 3 = SULPHUR      and a triple: BEEF + 10 = LOOP + 4 = PSST

2. *Typewriter Shifts*

Words shifted one key to the left: NIDD - BUSS      TIFF - RUDD      GARRY - FLEET  
 Words shifted one key to the right: SUSA - DIDS      CUSS - VIDD      SWEET - DERRY

**SPECIAL PATTERNS**1. *Identical Trigram Heads and Tails*

INSULINS - GALENGAL

2. *Identical Tetragram Heads and Tails*

OUTSHOUTS - RESTOREST

3. *Reverse Trigram Heads and Tails*

SCIATICS - REVOLVER

4. *Agamemnon Words*

AGAMEMNON - MIMULUSES

5. *Memnon Words*

MEMNON - GIGOLO - USURER

### 6. *Split-word Transposals*

Words like BILABIAL and HORSESHOER, in which the letters of the first half of the word are repeated in a different order in the second half, can be called split-word transposals.

They constitute a special type of pair isogram. Some split-word transposals are isomorphs.

AROROA - GUNUNG - KHAHAK - SAEAES	SHOOSH - HECCHE
CNICIN - DREDER - ISAIAS - TERTRE	AENEAN - NATANT - OYNYON
SHIPPISH - TEAMMATE	PRAEPARE - TEISTIES

### MISCELLANEOUS

#### 1. *Dictionaries*

OXFORD - EUREKA - INKISH - ALBANS	COLLINS - FREEDOM - BLOOMED
WEBSTER - CLEARLY - FACTUAL	CASELL - WHOOPEE - PIGGOTT
MERRIAM - STOOGES	

#### 2. *Elements*

MERCURY - THULIUM

#### 3. *Personal Names*

DAVID - EMILE - SILAS      CLARA - IRENE      NANCY - SUSAN

### Last Words

All but the last (triple) of these isomorphs are apposite and/or make a phrase:

element iridium	thesaurus jargoning	sprayers drenched
smelled blossom	thatched property	mediaeval braveries
hemmed cotton	Mormonic tax-taker	narrated colloquy
historical fairytales	isomorphs Britisher Reaganite	

Here are two phrases made from reverse isomorphs:

Nevada cactus      Washington implicated

### Sources of Non-OED Words

Bacach, coccous, dollbeer, gunung, Hathath, ilial, jojoba, Neillia, reree (Webster's Second)

shoosh (Webster's Third)

axotomy (Stedman's Medical Dictionary)

Perioura, Zyzzyva (Nomenclator Zoologicus)

Aiouea (A Dictionary of the Flowering Plants and Ferns, by J.C. Willis, CUP 1966)

jocosus, vowelising (Chambers English Dictionary)

Arorua, Azzaz, Khahak (The Times Index-Gazetteer of the World)

Oueioi (Language on Vacation, by Dmitri Borgmann, p 156)

phph (Official Scrabble Players Dictionary)