SHIFTS PROGRESS

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A *shift* is the process which occurs when the letters of one word are all shifted the same number of steps along the alphabet (looping from Z to A) to make another word. For example OHM +1 = PIN, whilst CHEER + 7 = JOLLY. Here, I refer to these as *basic shifts*. This article examines other types of shift in which the shift values are not all the same but which abide by various rules. Each series of shift values makes a *shift pattern*.

Unreferenced words can be found in the Oxford English Dictionary, Second Edition.

Other references: *edd* English Dialect Dictionary; *OSPD* Official Scrabble Players Dictionary; *Pcon* The Palindromicon by Jeff Grant & Dan Tilque; *web2* Webster's Second Edition.

Locations, identified by country, are taken from the United States Board on Geographic Names.

PROGRESSIVE SHIFTS - 4 LETTERS

A *progressive shift* is the name I give to shifts in which the shift values increase from one letter to the next such that the difference between the succeeding shift values is constant. This difference can be called the *progressive constant* (PrC). In order to avoid a letter shifting to itself (A to A, B to B etc.), which could be considered as a shift value of 0 or 26, shift values are here restricted to 25. This avoids looping more than once round the alphabet. This restriction, however, results in a decrease in the number of possible shift patterns as the PrC increases. Thus, in the case of 4-letter words, there are 22 shift patterns for a PrC of 1 (1.2.3.4 to 22.23.24.25) but only 1 pattern for a PrC of 8 (1.9.17.25.). Below, a single example is given for each of the shift patterns which abide by PrCs of 1 to 8.

PROGRESSIVE CONSTANT = 1

Shift Pattern

1.2.3.4.	RIVA - SKYE	2.3.4.5.	PRAY - RUED	3.4.5.6.	TWIN - WANT
4.5.6.7.	OVAL - SAGS	5.6.7.8.	MILK - ROSS	6.7.8.9.	MIME - SPUN
7.8.9.10.	DATA - KICK	8.9.10.11.	KNEE - SWOP	9.10.11.12.	YEAR - HOLD
10.11.12.13.	SPAR - CAME	11.12.13.14.	LOAF - WANT	12.13.14.15.	BRAY - NEON
13.14.15.16.	FAWN - SOLD	14.15.16.17.	OWEN - CLUE	15.16.17.18.	DEAN - SURF
16.17.18.19.	PAWN - FROG	17.18.19.20.	KISS - BALM	18.19.20.21.	MAIM - ETCH
19.20.21.22.	DOSH - WIND	20.21.22.23.	STEW - MOAT	21.22.23.24.	KELP - FAIN
22.23.24.25.	SAGO - OXEN				

PROGRESSIVE CONSTANT = 2

Clun is a town in Shropshire, England.

1.3.5.7.	ARID - BUNK	2.4.6.8.	BELL - DIRT	3.5.7.9.	PONE - STUN
4.6.8.10.	CLAD - GRIN	5.7.9.11.	ABED - FINO	6.8.10.12.	FADS - LINE
7.9.11.13.	HEAL - ONLY	8.10.12.14.	HERE - PODS	9.11.13.15.	WAVE - FLIT
10.12.14.16.	TIED - DUST	11.13.15.17.	EVAN - PIPE	12.14.16.18.	PANG - BODY
13.15.17.19.	PLUS - CALL	14.16.18.20.	EMIT - SCAN	15.17.19.21.	NUBS - CLUN
16.18.20.22.	GIRO - WALK	17.19.21.23.	BUNS - SNIP	18.20.22.24.	BORG - TINE
19.21.23.25.	HALT - AVIS				

PROGRESSIVE CONSTANT = 3

1.4.7.10.	OATH - PEAR	2.5.8.11.	MILD - ONTO	3.6.9.12.	DUDS - GAME
4.7.10.13.	PAUL - THEY	5.8.11.14.	HARM - MICA	6.9.12.15.	FLAP - LUME
7.10.13.16.	BEAK - IONA	8.11.14.17.	EDAM - MOOD	9.12.15.18.	JAPE - SMEW
10.13.16.19.	IRKS - SEAL	11.14.17.20.	DINT - OWEN	12.15.18.21.	SLAY - EAST
13.16.19.22.	JOSH - WELD	14.17.20.23.	ERIN - SICK	15.18.21.24.	LOFT - AGAR
16.19.22.25.	SKIT - IDES				

PROGRESSIVE CONSTANT = 4

1.5.9.13.	STIR - TYRE	2.6.10.14.	PUDS - RANG	3.7.11.15.	FLAP - ISLE
4.8.12.16.	SWOB - WEAR	5.9.13.17.	GRAN - LANE	6.10.14.18.	ZEAL - FOOD
7.11.15.19.	HALF - OLAY	8.12.16.20.	DOME - LACY	9.13.17.21.	CHAP - LURK
10.14.18.22.	MATH - WOLD	11.15.19.23.	GLUG - RAND	12.16.20.24.	PERM - BULK
13.17.21.25.	CUTE - PLOD				

PROGRESSIVE CONSTANT = 5

1.6.11.16.	SIAN - TOLD	2.7.12.17.	MUSH - OBEY	3.8.13.18.	PONG - SWAY
4.9.14.19.	KIMS - ORAL	5.10.15.20.	ABLE - FLAY	6.11.16.21.	MESS - SPIN
7.12.17.22.	KIWI - RUNE	8.13.18.23.	THAN - BUSK	9.14.19.24.	NASH - WOLF
10.15.20.25.	FLOE - PAID				

PROGRESSIVE CONSTANT = 6

1.7.13.19.	OBAN - PING	2.8.14.20.	ASHE - CAVY	3.9.15.21.	ARCS - DARN
4.10.16.22.	WISE - ASIA	5.11.17.23.	WARS - BLIP	6.12.18.24.	WONG - CAFE
7.13.19.25.	CHAT - JUTS				

PROGRESSIVE CONSTANT = 7

1.8.15.22.	GAWP - HILL	2.9.16.23.	FLOG - HUED	3.10.17.24.	PARR - SKIP
4.11.18.25.	ALMS - EWER				

PROGRESSIVE CONSTANT = 8

1.9.17.25.	BRAT - CARS

PROGRESSIVE SHIFTS - MORE THAN 4 LETTERS

These progressive shifts have **5 letters**. In each case the *PrC* is 1.

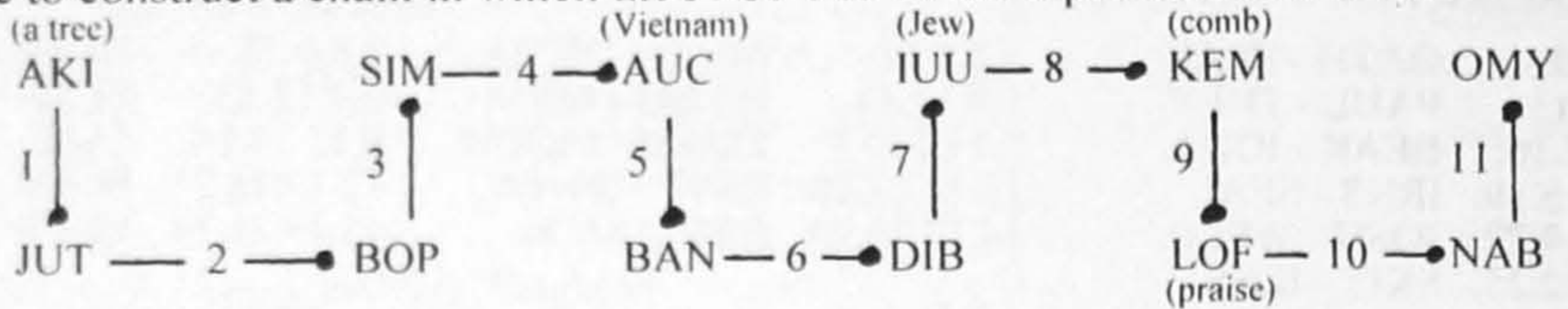|	
1.2.3.4.5.	DREAM - ETHER (see below)
4.5.6.7.8	ABILA (Spain etc.) - EGOSI (Nigeria)
6.7.8.9.10.	CHORD - IOWAN, MIAMI - SPIVS
12.13.14.15.16.	UNDER - GARTH

Seemingly, the only reference concerning what I call progressive shifts to grace the pages of Word Ways appeared in WW79050 as a short potpourri item. Roger Hannah 'challenged readers to determine the rule used to construct the following word pair set': O-P, NU-OW, EMU-FOX, RIBS-SKEW, DREAM-ETHER, and the **6-letter** SPRENG - TRUISM. In our terminology, the answer is that, in each case, the *PrC* is 1 and the initial shift is a single letter shift.

PROGRESSIVE SHIFT CHAINS

Adjacent words in these progressive shift chains are linked by the same shift pattern. In each case the *PrC* is 1:

9.10.11.	RAX (a stretch) - AKI (a tree) - JUT - SEE - BOP - KYA (an African's hut) - TIL (a plant)
2.3.4.5.	NOWT - PRAY - RUED
8.9.10.11.	STUG (a pig trough) - ACER - ILOC (Philippines) - QUYN (queen)

It is possible to construct a chain in which the *PrCs* 1 to 11 are represented *in order*.

(a tree)	(Vietnam)	(Jew)	(comb)
AKI	SIM— 4 —▲AUC	IUU — 8 —● KEM	OMY

AKI
1↓
JUT —— 2 ——● BOP

(Vietnam)
SIM— 4 —▲AUC
3↑   5↓
BAN— 6 —●DIB

(Jew)
IUU — 8 —● KEM
7↑   9↓
LOF — 10 —●NAB
(praise)

(comb)
OMY
11↑

PROGRESSIVE PROGRESSIVE SHIFTS

Progressive progressive shifts seems a suitable term to apply to those shift patterns which move forward a constant amount from one word to the next:

SUVI 4.6.8.10. WADS 6.8.10.12. CINE   PAUL 4.7.10.13. THEY 7.10.13.16. ARRO (Spain etc.)
(Croatia etc.)

REGRESSIVE SHIFTS

Perhaps this is a suitable stage at which to point out that any progressive shift becomes a regressive shift (or vv) when the two words exchange places. For example, the progressive shift WON - LEE (15.16.17.) becomes the regressive shift LEE - WON (11.10.9.). The respectively-placed numbers in the two opposing shift patterns always add up to 26 (15+11, 16+10, 17+9). In this particular case, if the letters of these 2 words are reversed we also have EEL - NOW (9.10.11.) and NOW - EEL (17.16.15.).

The regressive shift VAL - QUE (21.20.19.) is unusual in that the two words combine to make another word - VALQUE (Nicaragua).

PROGRESSIVE SHIFTS INVOLVING VARIOUS WORD GENRES

All except one (*) of the progressive shift patterns below have a *PrC* of 1.

PALINDROMES

1.2.3.	ZYX - <u>AAA</u>, DUB - <u>EWE</u>	5.6.7.	<u>MOM</u> - RUT	15.16.17.	<u>MOM</u> - BED
18.19.20.	OHM - <u>GAG</u>	21.22.23.	REP - <u>MAM</u>	22.23.24.	<u>MUM</u> - IRK

3.4.5.6.	HAZE - <u>KEEK</u>, BONY - <u>ESSE</u>	5.6.7.8.	HUTE (hoot) - <u>MAAM</u>
9.10.11.12.	<u>DEED</u> - MOPP (mop)	13.14.15.16.	HEDE (have, head, heed) - <u>USSU</u> (issue)
15.16.17.18.	WONT - <u>LEEL</u> (*edd*)	19.20.21.22.	<u>MOOM</u> (New Guinea) - FIJI

The word KUTH (couth) can be progressively shifted to make the palindromes shown. *Basic shifts* connect the palindromes:

KUTH

5.6.7.8 —— 9.10.11.12. 10.11.12.13. 16.17.18.19. 19.20.21.22 20.21.22.23.

PAAP (*edd*)	*4.4.4.4.*	TEET	*1.1.1.1*	UFFU (*Pcon*)	*6.6.6.6*	ALLA (*web2*)	*3.3.3.3*	DOOD	*1.1.1.1*	EPPE (Germany)

TAUTONYMS

A tautonym may form one word of a shift pair:

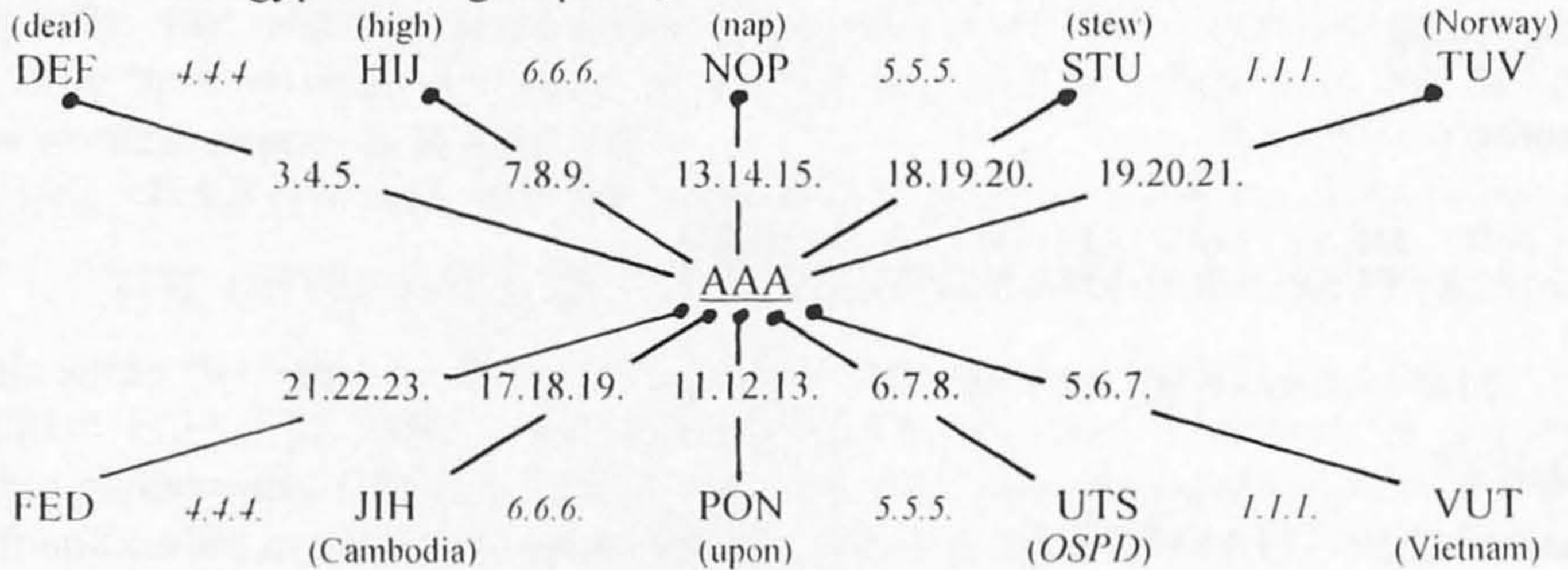| 3.4.5.6.	<u>IEIE</u> (a screw-pine) - LINK	18.19.20.21.	<u>EYEY</u> (full of eyes or holes) - WRYT (write)
19.20.21.22.	<u>SOSO</u> - LINK	12.14.16.18.	<u>GAGA</u> - SOWS (*PrC* = 2*)

MIAMI WORDS (pattern *12?12*)

Miami words can also be progressively shifted:

| 2.3.4.5.6.	<u>MIAMI</u> - OLERO (Kenya)	9.10.11.12.13.	<u>SENSE</u> - BOYER (Charles)

WORDS MADE FROM ALPHABETICALLY-CONSECUTIVE LETTERS

The top row below shows how certain 3-letter words, consisting of alphabetically-consecutive letters in order, can be linked by *basic shifts*. Their reversals, on the bottom row, are also linked by the same *basic shifts*. In between, the two sets of words behave as the target, and source, respectively, of progressive shifts using the palindromic word AAA (chief of the signet bearers in the court of the Egyptian king Aspalut). All the shifts linked to AAA have a *PrC* of 1.

	(deaf)		(high)		(nap)		(stew)		(Norway)
	DEF	4.4.4	HIJ	6.6.6.	NOP	5.5.5.	STU	1.1.1.	TUV

3.4.5.   7.8.9.   13.14.15.   18.19.20.   19.20.21.

AAA

21.22.23.   17.18.19.   11.12.13.   6.7.8.   5.6.7.

	FED	4.4.4.	JIH	6.6.6.	PON	5.5.5.	UTS	1.1.1.	VUT
			(Cambodia)		(upon)		(*OSPD*)		(Vietnam)

PIVOTAL SHIFTS

Pivotal Shifts is the name I give to letter shifts which all start at the central letter (pivot) of a word with an odd number of letters and shift, in turn, to each of the other letters of the word from left to right. Consider MOGUL. The pivot is G and hence the pivotal shifts are G to M (6), G to O (8), G to U (14), and G to L (5). In this, and most words with an odd number of letters, the length of the shifts bear no relation to each other. Occasionally, however, we come across words in which the pivotal shifts form a pattern. The two words below demonstrate pivotal types of progressive and regressive shifts respectively.

ILFOR
progressive shift

KIDGE
regressive shift
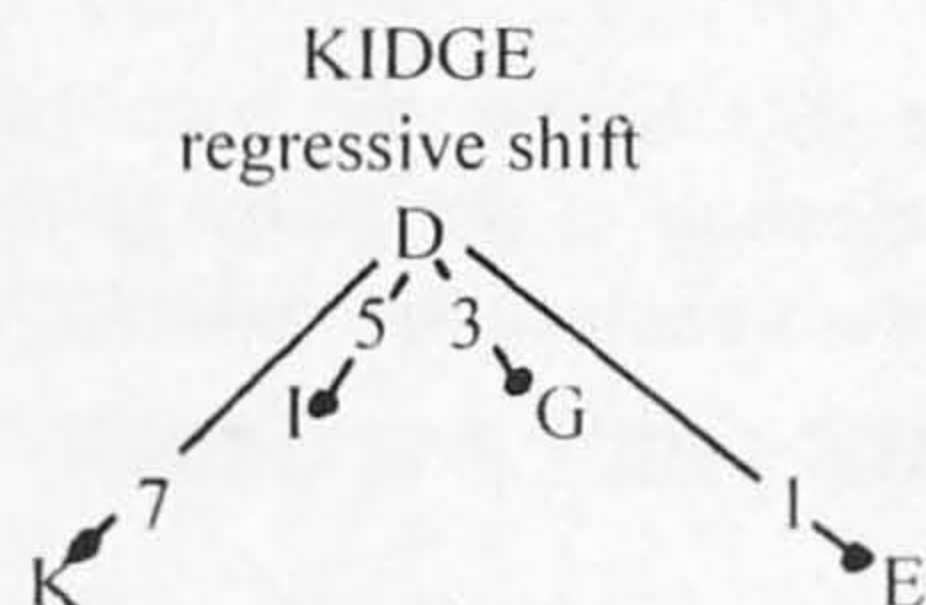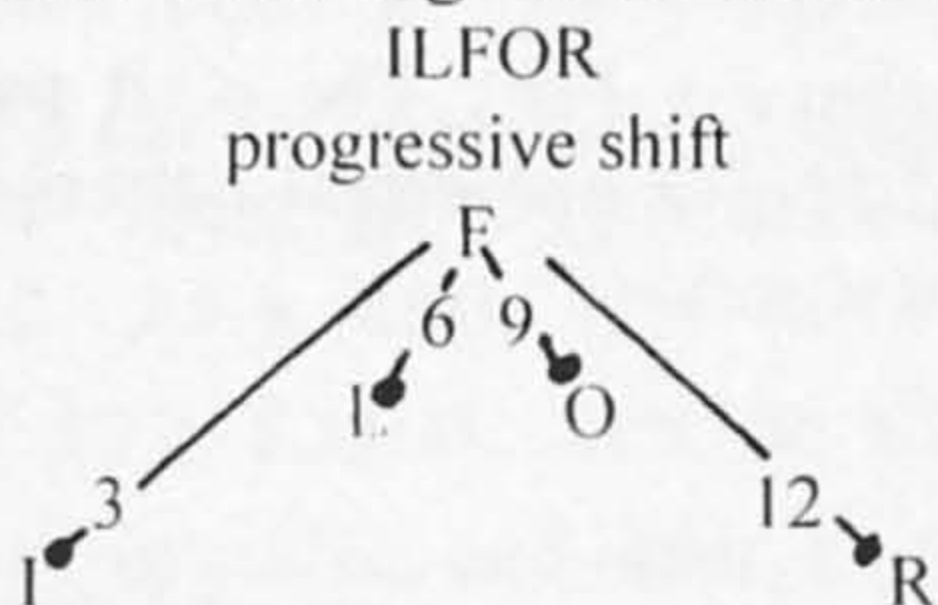
In the first word, ILFOR, the pivotal letter F is shifted to the four letters I, L, O and R in turn. The length of each shift supercedes the length of the previous shift by the same number of steps: F to I (3), F to L (6), F to O (9), F to R (12). It could be said that the word ILFOR has a *pivotal PrC* of 3. ILFOR is the name of a stream in East Timor.

In KIDGE, the pivotal letter D is similarly shifted to K, I, G and E in turn. In this case, however, the length of each shift is shorter than the length of the previous shift by the same number of steps: D to K (7), D to I (5), D to G (3), D to E (1). Thus KIDGE has a *pivotal regressive constant* of 2. KIDGE = 'kedge' - meaning brisk, lively, in good spirits.

NUMBER SERIES AS SHIFT PATTERNS

A group of adjacent numbers extracted from a particular number series can be used as a shift pattern. With one exception (*) the shift values below progress but not by a constant amount. The reader is reminded that the maximum shift value under consideration is 25. The significance of + is explained in the later section entitled *The Difference Between Successive Shift Values*.

FIBONACCI SHIFTS

Fibonacci number series: 1.1.2.3.5.8.13.21...

1.*1.2.3.   CHIP - DIKS, SHAH - TICK, STEP - TUGS
1.2.3.5.   ICON - JERS, OMIT - POLY, TEEN - UGHS
2.3.5.8.   BLOW - DOTE, NODE - PRIM, RODE - TRIM
3.5.8.13.   LOAF - OTIS, POSE - STAR, PRAT - SWIG
5.8.13.21. DENS - IMAN (Imam), FAYS - KILN, OWES - TERN

SQUARE SHIFTS

Square numbers: 1.4.9.16.25...

4 letters
1.4.9.16.   LARD - MEAT, MAIN - NERD, GAIN - HERD
4.9.16.25. AMOS - EVER, KILT - ORBS, WISE - ARID
5 letters
1.4.9.16.25.   MAMOS (sunbirds) - NEVER

PRIME SHIFTS

Prime numbers: 2.3.5.7.11.13.17.19.23...

4 letters
2.3.5.7.   PRAY - RUFF, PRIM - RUNT
3.5.7.11.   AVON - DAVY, IDLE - LISP, PONS - STUD, PORT - STYE
5.7.11.13.+   CRAN - HYLA (a toad), DOTE - IVER (ivory), JOTA - OVEN, VEAL - ALLY
7.11.13.17.+   LANG - SLAT, YARM - FLED, THUN - ASHE
11.13.17.19.+ ANIL - LAZE, HUNK - SHED, HURT - SHIM, TINY - EVER
13.17.19.23.+ ANEW - NEXT, GRUB - TINY, SNUG - FEND
5 letters
5.7.11.13.17. CHARM - HOLED

SPECIAL SHIFT PATTERNS

Again, in the lists below, the successive shift values do not have a *PrC*. The shift patterns represent a selection of the many palindromic, tautonymic and Miami numerical patterns. The words themselves exclude any palindromes, tautonyms or Miami words.

PALINDROMIC SHIFT PATTERNS

4 letters

1.2.2.1.	AMID - BOKE	1.3.3.1.	SERF - THUG	1.4.4.1.	SEAR - TIES
2.4.4.2.	NEAP - PIER	8.23.23.8.	DREW - LOBE	11.3.3.11.	SLIT - DOLE
13.1.1.13.	RUDE - EVER	14.4.4.14.	BASE - PEWS	25.5.5.25.	SPOT - RUTS

5 letters

1.2.3.2.1.	RARER - SCUGS	1.6.9.6.1.	BUILD - CARRÉ	14.9.3.9.14.	FYFES - THING
16.3.22.3.16.	DEMON - THIRD	23.7.14.7.23.	WAUGH - THINE		

6 letters

1.9.12.12.9.1. BICKER - CROWNS   14.8.8.8.8.14. BANGLE - PIVOTS   22.10.19.19.10.22. REAPER - NOTION

TAUTONYMIC SHIFT PATTERNS

4 letters

1.2.1.2.	ICED - JEFF	1.4.1.4.	LARD - MESH	1.12.1.12.	BIRD - CUSP
3.23.3.23.	PRIG - SOLD	4.11.4.11.	SWAN - WHEY	9.3.9.3.	TORY - CRAB
13.23.13.23.	HOAD - ULNA	16.13.16.13.	DEER - TRUE	21.23.21.23.	FORD - ALMA

6 letters

1.6.14.1.6.14.   KINDLE - LOBERS (lubbers)   12.13.1.12.13.1. ABUSER - MOVERS

MIAMI SHIFT PATTERNS

1.2.3.1.2.   DEVOR - EGYPT   13.7.24.13.7.   EXCEL - REARS   13.10.22.13.10. THIRD - GREEN
15.25.18.15.25.DUMPS - STEER   18.14.16.18.14.DAVID – VOLAR   19.25.14.19.25.   SPORT - LOCKS
25.1.7.25.1.   TONER - SPUDS   25.20.11.25.20.CAMPS – BUXOM
BONER 17.1.21.17.1. SPIVS 9.11.2.9.11. BAKED 25.1.24.25.1. ABIDE 14.20.18.14.20. OVARY 7.13.13.7.13. VINYL

OTHER SHIFT PATTERNS

Theoretically, any relatively short series of numbers can form a shift pattern. With 4 digits, 'years' offer themselves as shift patterns. Special years can be selected. In this particular case, both the words are apposite to the event:
1.4.9.2 SAIL - TERN (sea bird) *In foureen hundred and ninety two, Columbus sailed the ocean blue...*

THE DIFFERENCE BETWEEN SUCCESSIVE SHIFT VALUES

In certain shifts *the difference between successive shift values* is significant. Consider the 3-word chain GRUB 13.17.19.23. TINY 11.13.17.19. EVER. The differences between the successive shift values are palindromic. GRUB *4.2.4.* TINY *2.4.2.* EVER. More palindromic examples (marked +) can be found earlier in the article under *Number Series as Shift Patterns* - Prime Shifts.

The differences between the successive shift values of some *reversals* are palindromic:
PINS 3.5.21.23. (*2.16.2.*) SNIP   FLOG 1.3.23.25. (*2.20.2*) GOLF   SPAY 6.11.15.20. (*5.4.5.*) YAPS

The differences between the successive shift values may be tautonymic...
CHARM 5.7.11.13.17. (*2.4.2.4.*) HOLED

...or adhere to a Miami pattern:
COLAGE (college - web2) 1.6.7.19.24.25. (*5.1.12.5.1.*) DUSTED

MISCELLANEOUS

Here, the *SAME BIGRAM* appears in both words: 12.13.14.15.   FREE - REST, HUGO - THUD

NAMES can be progessively shifted to make other names:
PrC = 1   3.4.5. IAN - LES, KAY - NED   4.5.6.   IVY - MAE
PrC = 2   2.4.6. REG - TIM   9.11.13 ADA - JON, IDA - RON

     13.23.8.13.23.   SUSAN - FRANK has a Miami shift pattern.

Some progressive, and other, shifts make *PHRASES*:
Progressive Shifts
PrC = 1   7.8.9.10.   LORD - SWAN   14.15.16. OLD - CAT   15.16.17.18. NEAT - CURL
PrC = 2   11.13.15   PAY - ANN
PrC = 7   3.10.17.24. TEAM - WORK
Palindromic Shift
1.2.2.2.1.   ROSY'S - SQUAT
Tautonymic Shifts
1.4.1.4.   ANN'S - BROW
1.12.1.12.   FOSS - GATE   (FOSSGATE is the name of a street in the city of York, England)
Miami Shift
13.10.22.13.10. THIRD - GREEN

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    Finally, word has it that SHIFT itself has moved to TONGA - via Miami!