WORD STRINGS

TOM PULLIAM
Somerset, New Jersey

The word SARI can be converted into the word ARID by deleting the first letter and adding a letter at the end; the words RIDE, IDEA and DEAD can be successively formed in the same manner. Historically, such a sequence of words has been known as a word stair, in recognition of its appearance if each word is offset underneath its predecessor, with identical letters in a column. (If, on the other hand, the words are written directly underneath each other, and the process is stopped when the number of words equals the word length, a progressive word square is formed.) However, a much more compact notation is achieved by a single row of letters, such as SARIDEAD, which can be called a word string. (If the ends of a string can be joined, as is possible with APER: ape-per-era-rap, the word string becomes a word ring, in recognition of the fact that the letter sequence can be inscribed on the outside of a band wound on one's finger.)

Word strings (and rings) are characterized by two parameters, the word length and the degree of overlap (the step size of a word stair). If words can be reused in a string, strings of extreme length are possible; to avoid such situations, let us consider strings in which each word appears but once. Furthermore, let us restrict the step size to one, the greatest degree of overlap possible. Even so, it may surprise the reader to see how long such strings can be when composed of boldface words from Webster's New International Dictionary (Second Edition) and Webster's Third New International Dictionary:

Three-letter words: slaspadyertababeboakabicielobedhadabub
    eeleamabyaneanaearedobiduntdocaeraesataalachaetheyewaual
    bagoamekelyeonagodagespyaneferhiadoiraamibeskidelemu
    didodzoarubizerifaireikengudoerrethoeschetethahailahicepi
    ileessghinimikushajinaarvaseasahoteyrestajotoichinohocholain
    thipahulakhumaitakonipsihirionookaloophunamaywlofokirumho
    ranorootiwalowyishismanuluvativaumuloursoutapayturuniusears
    itrayattaehleveledecoredecoufawashurooluylellm (437 letters)

Four-letter words: skagurusasesaramayahodlamanochamirane
    ecushhabacanabozeemerebaleetamadenezekeralualiaiasheh
    erevelamahabedomelanailetonerichouredeasualainowerishathey
    renamalasinanerowestewanaliteritenanasirideaseringanoseesera
    restetelameloderosarabissaidemiteranisishiveraleonanemole
    noloratarakalidosedeno (296 letters)
Five-letter words: sacaracharamanasalemaneth (25 letters)

Six-letter words: relatesterol (12 letters)

The final string is by Kyle Corbin of Raleigh, North Carolina, who sent it to Games magazine (published in the Eureka column of the March/April 1979 issue); ATESTE is found under 'atestine' in Webster's Third Edition.

If all letters of the string must be different, an upper limit of 26 is automatically imposed, and in fact most strings are considerably less:

Three-letter words: gjawlopstyredhubink (19 letters)
Four-letter words: kvastonerichump (15 letters)
Five-letter words: stomanicer (10 letters)

I am indebted to Ross Eckler for supplying the five-letter string.

A. Ross Eckler: Little previous work has been done on word strings. The May 1976 issue of Games & Puzzles reported a prize contest based on Chambers Twentieth Century Dictionary in which a ring of 858 four-letter words with step size two was achieved. H. E. Dudeney, in his book 300 Best Word Puzzles (Scribner's, 1968), cites the existence of a string of three-letter words with step size one of length 173. In the August 1968 Word Ways, Dmitri Borgmann presented the five-letter word string ISHAMORANGE, which included one non-Websterian word (SHAMO, in Funk & Wagnalls) and one proper name (MORAN, in the biographical section of Webster's); this was equaled in the Games magazine word stair contest reported by Roger Hannahs in the February 1979 Word Ways, and slightly extended by my SAGRASPARELICA. I know of no previous work on word strings with all different letters other than my own, cited in Word Ways challenges in the February 1979 issue.

If the word list is restricted to the Merriam-Webster Pocket Dictionary, the word strings shrink markedly. In the February 1970 Word Ways, Dave Silverman cites WASHERAYETAGEMUD for three-letter words, and TSARIDESK for four-letter ones. For word strings with all different letters, the best examples I know are SPALEGOBINK for three-letter words, ATOMENDS for four-letter words, and ALINERT for five-letter words.