A sequence of letters forms a word stair if each set of n consecutive letters in it forms a word: for example, a 16-space word stair of three-letter words is WASHERAYETAGEMUD (was, ash, she, . . . , emu, mud) from the May 1970 Kickshaws. In its May/June 1978 issue, the magazine Games sponsored a contest based on a generalization of the word stair. It allowed words of any length and any degree of overlap to be formed out of the letter sequence: for example, a 12-space generalized word stair is WORDUPSTAIRS (word, dups, upstairs, stairs). More specifically, the contest objective was to construct a 20-space generalized word stair out of words taken from the Merriam-Webster Unabridged Dictionary, Third Edition, the winning entry being the one with the greatest total of letters in the words used.

I quickly concluded that the theoretical maximum score was 110, achieved by eleven ten-letter words or ten eleven-letter words arrayed in a word stair. However, finding such a pattern was an impossible dream; a more realistic goal was a word stair of three-letter, four-letter or five-letter words, scoring 54, 68 or 80 points, respectively. It also became clear that dropping or adding more than one letter at a time should be avoided as much as possible; in other words, the best solution ought to resemble a word stair as closely as possible.

The winner of the contest, Richard M. Silberg of Columbus, Ohio, was awarded a year's supply of snails with a score of 74; I came in second with 73, earning a Games T-shirt. Our solutions are given below, along with another 73-point solution devised by Ralph Beaman but not entered in the contest.

SAGRASPARKAROMANISEI: Sagra, Agras, grasp, raspa, aspar, spark, parka, arkar, aroma, Roman, Omani, manis, anise, Nisei (74)
CAROMANITOSCARETEMES: carom, aroma, Roman, Omani, manit, anito, nitos, tosca, Oscar, scare, caret, arete, retem, teme, emes (73)
TOSCA RetestaterseSSE: tosca, Oscar, scare, caret, aretes, retest, testa, estate, stater, taters, terse, eres, sess, esse (73)

What light does this shed on the word stair problem? Silberg's solution contains a word stair of 12 spaces (8 steps), equaling in length two less-satisfactory ones given by Dmitri Borgmann in the August 1968 issue of Word Ways. One of these uses the inferred
"Agest" ('Thou agest rapidly, my son!'), and the other uses Isham (an English town), Shamo (the Chinese name for the Gobi desert), and Moran (towns in Kansas, Michigan, Texas and Wyoming). Readers are challenged to find a longer word-stair of five-letter words in Webster's Third.

If both Webster's Third and Webster's Second are allowed as sources, the word-stair can be readily extended to 14 spaces (10 steps) by a slight modification of Silberg's solution noted by the editor.

SAGRASPARELICA: Sagra, Agras, grasp, raspa, aspar, spare, parel, Areli, relic, Elica

Areli is a proper name from the Bible, and Elica a proper name from the Douay Bible, both in Webster's Second.

TWO WORD-ORIENTED CALCULATORS

The Lexicon Corporation of Miami recently marketed the LK-3000, a hand-held calculator with an alphabetic keyboard into which one can key a phrase up to 16 letters long and obtain its translation into another language (choice of Spanish, French, Italian, German or Portuguese). Alternatively, one can key in a foreign-language phrase and learn what it says in English. Each language is programmed into a separate cartridge, which is plugged into the calculator; the calculator with one cartridge retails for $225, and additional cartridges cost $65 apiece. I suspect that it operates on a simple word-for-word translation, for users are cautioned to keep the grammar as simple as possible, and rephrase their thoughts if they have trouble with a given translation.

Texas Instruments has developed Speak and Spell, a hand-held calculator selling for $50 which is designed to teach children how to spell a set of 230 words (such as anxious, obey, language, learn). In one mode, the calculator speaks the word and the student attempts to spell it on the alphabetic keyboard; in another mode, it flashes a word on the screen and invites the student to pronounce it before giving the correct pronunciation over the speaker; in a third mode, it plays Hangman with the student, giving him seven chances to guess the letters of a mystery word (correct guesses are shown in their proper positions in the word).