A (5,4) WORD CHAIN NETWORK

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On February 27, 1994, I heard Will Shortz on National Public Radio announce the winner of a contest to form the longest possible (5,4) word chain using words from Webster's 10th Collegiate. A Tulane professor came up with the eight-step SCRAP-CRAPE-RAPES-APEST-PESTO-ESTOP-STOPE-TOPER-OPERA (which can be represented in compressed form as SCRAPESTOPERA).

Using words from the OSPD, OED and other sources, I determined by computer search a few months ago that the only cycle possible is the one mentioned by Dmitri Borgmann on page 210 of Language on Vacation: -RESTE-ESTER-STERE-TERES-EREST-. This forms the core of a 71-word (5,4) directed word network shown below in compressed form. (The core is depicted by a vertical TERES connected by a cycle of dots; trace out words counterclockwise.) The network consists of seven starters (BABAS, CECHE, TABUR, ESCAL, STARE, SCRAP, MACHO) and three enders (AREDE, PERAI, ERNES); the only way out of the cycle is via STERN-TERNE-ERNES.

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                 ┌─DE        MACHORES┐                • • •
                 │                   ├──────────── T  •
  STARE ─┤       │       ┌───────────RES┘                •  •
         │                                             •  •
         └─A─┤   ┌───────────────                      •  •
             │   └─STE─┐       ┌─LEST─┬───────── E  •
                       │ ─ASTE─│      │                •  •
   ESCAL─┘             └─────   │   ──────── R  •───NES
                           ┌─ST────┘    │             •  •
                 SCRAPE─┤─STOPERAI       E  •
                           └─RE┐                      •  •
              TABURASERE─┼──────────── S  •
       BABASHE──┐       │                              •  •
              │─THERE┘                               • • •
          CECHEA──┘
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