EULER PATH WORDS

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The 26 capital letters of the alphabet can be topologically viewed as simple networks—collections of links joined by nodes. Nodes are classified by the number of links that meet there. A well-known theorem in graph theory states that a network contains an Euler Path (a path that traverses the network, once only along each link) if and only if it has at most two nodes with an odd number of links. (This theorem was once used by Euler to prove that one could not traverse the seven bridges of Königsberg without repeating one or more of them.)

If one posits a sans-serif alphabet, the Euler Path letters (ones that can be traced out without lifting pencil from paper) are BCDGIJLMNOPQSUVWZ. Words of Euler Path letters include

DISILLUSIONING	DISCOMPOSING	INCONSPICUOUS	SNOWMOBILING
COMMISSIONING	DISCUSSIONS	LIBIDINIZING	SOLILOQUIZING
CONDOMINIUMS	DISILLUSIONS	MONOPOLIZING	SUBCOMMISSION
CUMULONIMBUS	DISINCLINING	NONCOMBINING	SUBCONSCIOUS
CUNNILINGUISM	IMMOBILIZING	NONPOISONOUS	UNCONVINCING
DISCOMMODING	INCOMMODIOUS	OSCILLOSCOPIC	UNSUSPICIOUS

One can also construct words with no Euler Path letters, the longest being THEREAFTER.

AFFRAYER	FEATHERY	HAFTARAH	REFERRER
AFTERTAX	FERRETER	HEATHERY	REHEATER
EYETEETH	FETTERER	HETAERAE	TARTRATE

A strict Euler Path word is one in which one can trace all the letters without lifting pencil from paper and connecting successive letters with horizontal lines: CULM, CULP, ISIS, IWIS, JIMP, MILS, NIMS, NISI, SIMS, SIMP, SWIM, SWIMS, VIMS. WIMP.

The editor points out that Battus, on page hq of *Opperlans!* (Querido, 2002) has created a more detailed topological classification of the sans serif capital letters, adding endpoints to the mix. Euler Path words consist of the first four groups.

1. no nodes or endpoints: DO
2. no nodes, two endpoints: CGIJLMNSUVWZ
3. one three-node, one endpoint: PQ
4. two three-nodes: B
5. one three-node, three endpoints: EFTY
6. two three-nodes, two endpoints: AR
7. one four-node, four endpoints: KX
8. two three-nodes, four endpoints: H

Battus was unable to find a Dutch word containing one letter from each of his eight groups, so coined POCHBERK. There is an English word, however: BAKESHOP. Longer words containing all groups include HUMPBACKED, PHRASEBOOK, SHIPBROKER, XENOPHOBIA, and TRISKAIDEKAPHOBIA (fear of 13).