Crashing Word Lists

Lewis Carroll invented a form of wordplay that he called "Doublets," but which is usually called "Ladders" today, in which the object is to pick two words of the same length that are antonyms or at least contrasting pairs, and to find a list of words that link these two words. Each word in the list is to differ from the previous word by only one letter. Thus each word "crashes" with the next word in all but one position.

Here are some examples:

love – hate: love hove have hate

soup – nuts: soup noup nous nots nuts

slow – fast: slow slot slit flit fait fast

small – large: small stall stale stage suage surge sarge large

chaos – order: chaos ciaos cipos sipos sipes sides sider aider arder order

The amusement value (aside from trying to pursue a lot of options at once and exercising one's vocabulary) lies in finding that although the meanings of these words are worlds apart, the spelling draws them together.

The shortest possible ladder between two words has one more rung than there are letters that differ between the two words. For example, "love" and "hate" differ in three letters (L → H, O → A, V → T), and therefore the four-rung ladder given above is the shortest possible. "Soup" and "nuts" differ in all four letters, so the five-rung ladder given above also is the shortest possible. The ultimate challenge is to find such shortest ladders for all antonyms with the same length. The other examples given above are not minimal, and the reader is challenged to improve them.

Sometimes it is not possible to find a ladder that connects one word with another; for example, there is no way to transform "good" into "evil," which I guess is a good thing.

But just before the chasm between two words becomes infinite and uncrossable, it becomes as long as possible. Many wordplay explorers have tried to find the longest possible ladder. This is quite a challenge, for three reasons. First, the requirement that the two words be antonyms or even contrasting pairs is incredibly difficult to maintain, and is usually dropped. Second, the number of parallel paths that must be searched increases dramatically as the length of the ladder increases. Third, there is always the risk that your lexicon omits a word that will shorten your ladder.

With that said, the longest ladder of which I am aware spans the chasm between "install" and "puranas" and is 64 rungs long. Here it is: instill instils instals instars enstars ensears enseals unseals unheals unheads unleads unloads unlords uncords uncorks uncocks unlocks unlucks untucks untacks unpacks unparks unbarks unbares unbared unbaged uncaged uncages encages enrages earages parages panages manages manases mantses manties masties pasties pastils pastels pasters passers possers dossers dossels dossils dessils desoils resoils recoils recools recooks recorks records rewords rewards retards petards petaras pitaras pitayas pirayas piranas puranas.

Can anyone shorten this list, or find a longer one?

Since wordplay lovers are always looking for a new challenge, they have generalized the idea of lists of words that crash only with the next word in the list to the idea of words that crash with every other word in the list. This multiplies the challenge many times. The ultimate pinnacle on this peak is a list of words that crash with each other on the list in exactly one place.

For example, consider the following list of six five-letter words: sanes swipe waist tense tweet weeps. In this list, "sanes" crashes with "swipe" in the first "s" only, with "waist" in the second "a" only, with "tense" in the third "n" only, with "tweet" in the fourth "e" only, and with "weeps" in the last "s" only. What is more, this same pattern is true of every other word in the list. "Swipe" crashes with "waist" in the third "i" only, with "tense" in the last "e" only, with "tweet" in the second "w" only, and with "weeps" in the fourth "p" only. Such lists exhibit a "fearful symmetry."

The longest known list is the following list of eight seven-letter words: sorties slickly concord ternery tritone pensile pronked closens.