Eriksson's Bulgarian Solitaire Variant

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Bulgarian Solitaire was popularized by Martin Gardner in 1983. The unusual name was given by the late Henrik Eriksson in 1981 in a Swedish recreational mathematics journal. He also introduced a variant there: Given a total of n cards distributed into piles and a positive integer k, remove k cards from each pile to create a single new pile (if a pile has k or fewer cards, take the whole pile—no negative pile sizes). Bulgarian Solitaire is the case $k = 1$. We consider this as a function on the set of integer partitions of n determining a finite dynamical system. Using generalizations of triangular numbers and a the notion of a partition's rank, we will describe and count the cycles and the Garden of Eden states (partitions with no predecessor under the operation).