

1086-VR-1093      **Colm Mulcahy\*** (colm@spelman.edu), Dept of Mathematics, Spelman College, 350 Spelman Lane, Atlanta, GA 30314. *Gilbreath Shuffle Variations*. Preliminary report.

The classic Gilbreath principle applies to a prearranged packet of cards, cycling  $a_0, a_1, \dots, a_n$ , over and over, let's say  $m$  times. If any number of cards—traditionally “about half of the packet” (roughly  $\frac{mn}{2}$ )—are dealt to a pile on the table, and the resulting two subpackets are then riffle shuffled together, it turns out that each set of  $n$  cards from the top down must consist of one each of  $a_0, a_1, \dots, a_n$ , in some order. What happens if the original packet is merely split in two, and these are riffle shuffled? Or if the original packet is split in three or more subpackets, all of these being riffle shuffled together? In a preliminary report of joint work with Ron Graham, we provide partial answers to these and related questions. (Received September 18, 2012)