Comments on Jim Steinmeyer’s
King’s Coronation principle

The (Mostly) Promiscuous Principle

Jim Steinmeyer’s “King’s Coronation” in his latest book, Further Impuzzibilities, is based on the fact that if a certain type of spelling and discarding deal is done to a packet of four face-up Kings, with colours alternating Red Black Red Black from the face, then the last card remaining is always the King of Clubs. It’s all based on the suit names and the alternating arrangement, and it works with any card values.

Here’s the deal as published by Steinmeyer: on each spell (there will be three of these) the suit of the face card (the top card when the packet is held face-up) is used to determine the number of cards transferred one by one from top to bottom. One card is moved for each letter in the suit name: 5 for Clubs, 6 for Spades or Hearts, and 8 for Diamonds. Then the resulting top card is discarded. So, if the suits are H, S, D, C from the face of the packet, the first word spelled is “hearts,” so that 6 cards are transferred from top to bottom, which puts the D on top. Set it aside and continue: next 5 five cards are transferred as “clubs” is spelled, this leads to the S being on top. Set it aside and continue: “clubs” being spelled leads to the H on top, set it aside and the C remains. Note that this time the cards were discarded in the order DSHC.

This works no matter which of the 8 possible Red Black Red Black set-ups we start with. Even more delightfully, as Steinmeyer observes, after two discards, when we are left with the H and the C (in some order), we are actually free to switch the order of these before the final spell and discard; no matter which of H or C is on top, the H will always be the next one to go, leaving the C.

Actually, much more is true. If the three discarded cards are placed in a row from left to right as they are discarded, and the final card is placed to the right of these, then the order of the four suits on display is always DSHC (CHaSeD backwards - and the opposite of chaste is promiscuous right?), no matter which starting arrangement we had.

Before exploring this further, let’s ask what happens when the cards alternate Black Red Black Red. It turns out that for the 4 possible arrangements of suits in this order, those which start with the Spade on top lead to less predictable results, and what is worse, it makes a difference if the last two cards are switched before the final spell. On the other hand, for Black Red Black Red arrangements starting with the Club, CDSH again leads to DSHC everytime, whereas CHSD always leads to HSDC.
While this seems to suggest that we stick with an initial \textbf{Red Black Red Black} set-up, there is a way out. The idea is to throw in an additional spell and transfer the beginning, at the end of which no card is discarded!

If we start with \textbf{Red Black Red Black}, then spelling Diamonds and transferring 8 cards restores the packet to its original order, and spelling Hearts and transferring 6 cards merely puts the Diamond on top, the cards still alternating \textbf{Red Black Red Black}.

Here’s the good news, for \textbf{Black Red Black Red} arrangements starting with the Club, spelling Clubs and transferring 5 cards turns the packet into on which alternates \textbf{Red Black Red Black}. Steinmeyer will take care of the rest.

Finally, for \textbf{Black Red Black Red} arrangements starting with the Club, spelling Clubs and transferring 6 cards puts the Club on top. Which almost solves all of our problems: as remarked above, half of the time we’ll end up with DSHC everytime and half the time we’ll end up with HSDC.

The conclusion is that with this additional “up-front” spell and transfer (without discarding a card) almost all (7 out of 8 in fact) alternating colour arrangements lead to a final card order of DSHC—\textit{The Mostly Promiscuous Principle}—and every one of them leads to the final card being the Club.

We’ll actually set the final Club aside in every single case, to be revealed at the end, and focus first on the values of the other three cards. These cards will generally be in the order DSH, and if not, then it’s a simple matter to present HSD as DSH! Hence, even in the one case where “things go wrong,” and we end up HSDC, all is not lost.

\textbf{Properly presented, every alternating colour set-up leads to total victory!}

Actually, there is another way to ensure victory. Have \textbf{ONE} volunteer arrange the 4 cards of different suits in any order “avoiding two cards of the same colour being together” (this forces one of the 16 out of 24 possible arrangements in which alternating colours). Have the spelling done as above, with the discarded placed cards face down in a single pile, and ask a \textbf{SECOND} volunteer to pick up that packet, and turn it over. From the face, the cards read either HSDC or DSHC. If the second volunteer now does the spelling routine as well, DSHC will result without fail.