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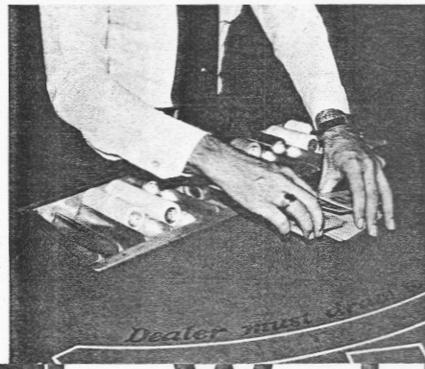
The World Championship Of Blackjack

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by Edward O. Thorp

From December 17th through the 20th, the Sahara Hotel is sponsoring what it calls the Sahara World Championship of Blackjack. The Sahara event promises to be interesting for gamblers and beneficial to the Sahara Hotel. However, I think it very unlikely that the eventual winner of this contest will also be the world's most skillful casino blackjack player.

First of all, the rules (published in the September issue of this magazine) exclude authors or instructors of blackjack systems or books. This certainly gives the less skilled players a better chance to win, but it also may prevent the world's best player from even entering. Therefore I suggest to the organizers that next year they have two divisions, one for amateurs and one open to every caliber of player.

Second, the eventual winner of the tournament probably won't even be the best player who enters. Here are some examples to show why. The examples will also show you some of the weird strategies for betting and playing hands which should be used in this contest, even though such methods would be very bad in ordinary play.

The first elimination round of the Championship has seven players at each table. Each player buys in for $500 and play continues for two hours. At the end the player with the most money is the winner. (What if there is a tie? Is there a tiebreaker? The published abstract of rules doesn't say.) He gets a black-and-white television set and qualifies for the next round. Now suppose that it is the last deal of the first round and only two players remain. One is an amateur with $500 (he has broken even) and the other is an expert

who has made $200 and now has $700. What do you think their chances are? Possibly almost equal!

The expert is to play first. According to rule 9, he also is first to decide how much to bet. Suppose the deck is slightly unfavorable (say minus 2%) and the expert bets $5. (Rule 8 says each player must bet and the minimum bet is $5 and the maximum bet $500.) Then the amateur bets $500. If the amateur wins his bet, he has $1,000 and wins the round, regardless of whether the expert won or lost his $5 bet. Even though the deck is minus 2% so the amateur expects in the long run to lose 2% of $500 in similar situations, this is a good bet for him because if he wins he gets not only $500 but the extra payoff for surviving the first elimination round. This payoff has two parts: (1) He gets a portable black-and-white television set (monetary value $120?), and (2) he gets to advance to the next round. This, too, has a monetary value (a wild guess: $800). Therefore, in addition to an expectation of minus 2% of $500, or minus $10 on his original bet, the amateur has about a 50% chance to win the equivalent of, say, $920. This adds about $460 to his expected return for a net positive expectation on this bet of $440.

What if the expert bets $500 instead of $5? The amateur bets $5. If the expert loses this one hand, the amateur wins the elimination round. The chance of this happening is about 50%. So once again the amateur, even though he is $200 behind, has about an even chance to win the elimination round from the expert just by making a clever last bet.

Is there a more favorable bet for the expert? No! If he bets from $5 to $250, the amateur can bet $500 with roughly an even chance to win the round. If the expert bets between $250 and $500, the amateur can bet $5, again with roughly an even chance to win the round. (I am neglecting the effects of pushes and of payoffs not equal to the original bet, such as from doubling down, pair splitting, and blackjack. This reduces the amateur's winning chances somewhat but they still almost equal the expert's.)

What if the expert bets and plays second instead of first? Then the amateur needs to bet more than $194 to have a significant chance. For, if he bets $194 and the expert bets $5, the amateur only wins the round if he wins more than the amount of his bet. Suppose the amateur bets $500. If the expert bets $5, he wins only if the amateur loses or pushes. So his chance to win the round is a little more than half. But if the expert bets $500, then he wins the round unless (a) the amateur wins his bet and the expert doesn't, or (b) the amateur pushes and the expert loses.

What, then, is the chance of the expert winning the round? Suppose the chance of a push is 8%, the chance of a win is 45%, and the chance of a loss is 47%. These are not the exact numbers, but they are close enough to illustrate the idea. Such a deck gives about a zero expectation because some winning hands pay more than the original bet. If the results for the amateur and the expert on this last deal are independent of each other (an incorrect assumption, fixed below), then we can "multiply probabilities" and we find the chance of (a) is .45 × (.08+.47) = 0.2475 and

the chance of (b) is .08 × .47 = 0.0376, which makes the amateur's chance of winning 0.2851 or about 29%.

In the actual game, the results of the various player bets are not independent. For instance, with a neutral deck, on those deals where (say) the first player loses, each of the other players will, on average, lose substantially. How much? Find out by experiment. Deal a hundred times to, say, seven players and see how much the other players lose when (1) the first player loses, (2) the first player pushes and (3) the first player wins. You'll find the worse the first player does, the worse the others do. Therefore if the amateur wins, as in (a) above, it's more likely than usual that the expert also wins. The 0.2475 number should be smaller, perhaps 0.16. If the amateur pushes, the chance of the expert losing probably isn't affected as much so the 0.0376 figure probably doesn't change much. Thus we get a corrected figure of 0.1976, or about 20%.

The expert is better off when he bets last, which shows the advantage of position. However, the amateur still has a good chance to come from behind on the last hand and win. Notice too that for any other big bet by the amateur, say between $200 and $500, the expert can limit the amateur's chances to the same (roughly) 20% figure by simply betting the same amount the amateur does.

The chances of the best blackjack player winning the tournament are pretty slim

Things are even worse than this for the best player at any table of seven in the first elimination round, because even if he's top money player going into the last deal, he now has not one but six players all trying to beat him. Suppose for instance that Player 1 has $300, Player 2 has $350, Player 3 has $400, Player 4 has $450, Player 5 has $500, Player 6 has $550, and Player 7 has $700. Suppose also that Player 7 really is the best casino blackjack player at the table, and that he's in the last seat. The first player bets $300 (his only chance to win). Each player in turn bets as close to $500 as he can in order to have a maximum chance to win.

The chance is about 45% that Player 7 wins his bet and consequently wins the elimination round. If Player 7 doesn't win his bet, but one or more other players does, then the one of these who had the most money before the deal will win the elimination. If, instead, no one wins his bet, but some players push, the player who pushes and had the most money before the deal will win. If all players lose on this deal, then again, Player 7 wins. The total chance that Player 7 wins is about 50%. The situation is about the same if the player with the most money doesn't bet last. Again, everyone bets $500, etc.

You may say that having the best player win with a 50% chance still allows skill to play an important

part. But his chances are much less than 50%. If the other players are of nearly equal skill, the best player only has a little more than a 1/7 chance of having the most money in a two-hour session. Even if the other players only know the basic strategy and play even, the chance that the world's best player will have the most money near the end under the contest conditions is not that overwhelming. And the player with the most money before the last deal does have an edge on winning the round.

Like the betting strategies we discussed for the final deal, there are similar strategies for the next to last deal, the third to last deal, and so on. These strategies further reduce the chance the leading money winner going into these deals will finally win the round.

Imagine there are three deals left, that six players have $400 each and one player, both luckier and more skillful, has $1,000. The six poor players all bet $400 each. The leader bets $5. Three of the six poor players are eliminated and the other three now have $800 each going into the next to last deal. They each bet $500. What does the leader do? If he bets small, someone else will likely be the leader on the last deal. That also happens if he bets big and loses. If he bets big and wins, one or more of the other players will probably also win and be only $200 away on the last round. The final result is that, even with his enormous lead three deals before the end, the chance he

eventually wins is probably less than half!

My conclusion from this sort of analysis is that although the best player at a table has more than a 1/7 chance to win, if the skill level of the players is close, then his chance isn't much more than 1/7. Even at a table with a great skill difference — say, six basic-strategy players who have read this column and know how to bet on the last few deals versus the world's best player — I'd guess the world's best has only about a 1/4 to 1/5 chance to win the first round. Then he has to survive several further rounds where the competition is better and his chances are still less.

Suppose there are $7 \times 7 \times 7 = 343$ players, hence three elimination rounds. The world's best might have a 1/4 chance to survive the first round, a 1/5 chance to survive the second round, and a 1/6 chance to survive the third round thereby winning the tournament. This gives him a $1/4 \times 1/5 \times 1/6$ chance, or one chance in 120 to win versus the average chance of one in 343!

We have seen that the best player won't be in the contest, and that the best player in the contest probably won't win it. Further, the betting strategy at the end is much different, and wilder, than for good casino play. (It's also true that the best way to play hands, especially near the end, may be different as well.) So the contest is not a good test of casino blackjack skill. But it should be wild, exciting, and fun for the players and spectators. It will be interesting to see what happens.

Next month's column begins a series on roulette systems, some of which can win! **9**

you telling us, him and me, that you got a tip on this colt by Native Dancer from this self-same Big Joey who touts a lot around here?"

To which his partner adds, "Isn't that smart. And to think he gave us, him and me, a couple of other beetles in the self-same race, both of which are up the track." (Or words to that effect, although if you are around mob guys they will sting your ears off the way they say it.) So whilst Joey is making friends amongst the winners, he is fast becoming Public Enemy Number One on the gangsters' hit parade, you know what I mean?

It does not take Big Joey long to run out of winners, and pretty soon the word gets around that Big Joey, formerly a big mob guy, has now sunk so low as to become nothing but an ordinary race track tout. It is not an honorable profession, as any decent, self-respecting mobster does not like to lose his money on a scam like touting on the races. Sure, he will send it in big on any hunch, dream, old wives' tale, tip or inside dope, but do not, I repeat, do not ever get caught giving out tips on more than one horse at a time in a self-same race. Also, do not ever give a mob guy a steady diet of losers or even that will earn you a trip to the bottom of a pig farm in Jersey.

So nobody sees hide nor hair of Big Joey around for the longest time and I get it from the grapevine that maybe Big Joey has touted his last tout. **9**