

Hurrah for Our Pirate King!

THIS ISSUE'S PUZZLE

This puzzle runs in November, so to make it topical, it involves elections. And to make it tropical, it involves pirates. What could be better than a puzzle involving pirate elections?

So, the seven pirate kings from the seven seas gathered for their convention (held every seven years) to discuss major important pirate issues of the day. They drank grog, they sang some Gilbert & Sullivan, and then settled in to elect the king of the pirate kings.

In the first round of the election, every pirate voted for himself to be the king of the pirate kings. This was not unexpected. Captain Ahab suggested that they hold a second vote, where they each voted for their second choice. This also resulted in a seven-way tie. Captain Bluebeard suggested they each vote for their third choice, which also resulted in a seven-way tie. Captain Cook suggested they each vote for their fourth choice, which also resulted in a seven-way tie. Then Captain Drake had an idea: that they each vote for their fifth choice, which also resulted in a seven-way tie. Captain Edwards suggested they each vote for their sixth choice, which also resulted in a seven-way tie. Captain Fear had the bright idea that they each vote for their seventh choice, but it was pointed out that they had already voted six times and everyone already knew who everyone's seventh choice was and that it was also a seven-way tie.

Things looked pretty bleak. But then Captain Gary spoke up, and said "There are seven of us, so no two-way vote can end in a tie. Why don't we first vote between Captains Ahab and Bluebeard, then pit that winner against Captain Cook, and so forth, until we've all had a go at it?"

Captain Drake grumbled that such an arrangement gave an unfair advantage to the later rounds but these were pirates and not mathematicians so they proceeded according to Captain Gary's plan.

Captain Drake was quite correct, and



Captain Gary (who was a mathematician as well as a pirate) knew it. So, two questions for you:

1. If Captain Gary can choose the order of the voting, can he always rig the election so that he is certain to win?
2. If the pirates just go alphabetically, what is the probability of Captain Gary winning?

You may take as given that every pirate votes for his top preference in each round, and doesn't change his preference from round to round.

PREVIOUS ISSUE'S PUZZLE

Take the Money and Run

Once upon a time, there were four thieves who successfully trekked across a desert, rowed across a river, traversed a forest, tunneled under the wall, and made off with 18 sacks of the Sultan's jewels and gold. The names of these thieves were Antone, Bruno, Cristoph, and Dan. Because Antone had organized the raid, they all agreed his share should be the largest, so he got eight sacks. Bruno was the second-in-command, so he got five sacks. Cristoph got three and Dan got the last two. Everyone agreed to this division, and swore an oath to abide by it.

They seemed to be set for life, because even two sacks of gold and jewels will go pretty far in these inflationary times. They made it back through the tunnel and crossed the forest without any difficulty but ran into some trouble at the river's edge.

You see, as is common for these types of stories, the boat was only large enough to carry across two people at a time. Since the thieves were traveling with heavy sacks of gold and jewels, they were fur-

ther restricted because they couldn't fit two people and even a single sack of gold and jewels into the boat at one time. They could either carry up to two people, or one person plus some of the Sultan's treasure.

Although they had all agreed to the division of treasure and all trusted each other enough to undertake this huge expedition, they also had a fair understanding of human psychology. They knew that if, at any point, any members of the gang were on the homeward side of the river with more than their share of the treasure, they would likely succumb to the temptation to abandon the rest of the gang and run off. None of them wanted to place his companions in such a predicament.

The gang needed a way to get all of themselves and all the treasure across the river, so that each trip took one thief, two thieves, or one thief plus some amount of treasure. Further, at no point could any subset of the gang of thieves be on the homeward side of the river in possession of more than their agreed-upon share of the treasure. (Having some thieves on the homeward side of the river with less than their share of the treasure is fine.) Finally, since they are in a bit of a hurry, the thieves need to minimize the total number of trips across the river. What's the minimum number of trips required, and who and/or what is on the boat for each trip?

Solution

If you ever start to feel like nobody's paying attention to you, I can recommend no quicker way to erase the feeling than to publish a mistake in your puzzle. My original thought was that every thief wanted his share of the treasure safe from pilfering by any other thief at all times. That is, at no point should there have been more treasure among thieves than the share those thieves were due. This, however, makes the puzzle very difficult because at no point can anyone be alone on land or in the boat with more than his share, nor can any group be left alone with more

than their collective portion. I wanted to loosen the condition and allow them to be left on the far side of the river with more than their share but I expressed that poorly. The resulting puzzle was, in fact, trivial. As stated, the thieves could cross the river by ferrying one another across (in any order), then have someone bring over the treasure in the last load (some treasure including all treasure). A large percentage of the solvers asked what they had missed as there seemed to be no trick to the puzzle. They were correct—there was no trick.

I hope that clears up what the puzzle should have been. Please give it another try as a bonus puzzle for this issue. I'll include the solution next time. My apologies

for the confusion (but I'm glad you were paying attention).

SOLVER LIST

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Solutions may be e-mailed to cont.puzzles@gmail.com or mailed to Puzzles, 65 W. 35th Place, Eugene, Ore. 97405.

In order to make the solver list, please make sure that your answers and solutions are received by **Nov. 30, 2008**. Depending on the response volume, solver lists may contain only the names of people who solved puzzles on the first attempt.

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