

LAST ISSUE'S BRAIN TEASER:

PROBLEM:

The SML Express pulled out of the new Bedford station late one night, and began its winding journey up the East coast toward Washington and New York under heavy darkness. Owing to the late hour, there were only a handful of passengers aboard the small train. At the stroke of midnight, the lights illuminating the interiors of the two cars were suddenly extinguished. When they came back on a few moments later, the passengers were alarmed to see one of their number lying on the ground motionless.

The conductor phoned the local police department at the next station, and though it was very late, the dispatcher assured the worried conductor that they were sending their very best detective, K.C. Jones, who had an usual methodology when it came to solving crimes. Knowing witnesses to be often be mistaken and contradictory, Jones made a habit of asking his witnesses to state to him only one fact they remembered clearly and with absolute certainty from the moment the crime took place.

K.C. Jones wasted no time upon arriving and, after taking a quick overview of the scene, asked each of the ten remaining passengers in turn to state one absolute fact from the moment right before lights went out in the two train cars. His interview notes are as follows:

Ms. Saunders: I was dining with Mr. Johnson.

Mr. Gill: There were the same number of men and women in my car.

Mr. Johnson: Mr. Keefer was not in the dining car.

Ms. Lyme: Mr. Quimby had just entered my car.

Mr. Fralin: Ms. Witcher and Ms. Pitt were talking to one another in hushed tones.

Mr. Rucker: Mr. Gill was not in the passenger car.

Mr. Quimby: There were fewer women in my car than the other.

Ms. Pitt: Ms. Lyme was not in the same car as me.

Mr. Keefer: Ms. Pitt was in the passenger car.

 $\mbox{Ms.}$ Witcher: Mr. Fralin was avoiding Mr. Rucker and hiding behind a newspaper in the opposite car.

The bewildered conductor watched as Jones completed his interviews, scribbled a few more lines in his notes, and turned to announce he had solved the case.

"But surely you can't have figured out the identity of a murderer simply from a list of seating arrangements?" the conductor protested. "You haven't even been told in which car the victim was seated!"

"To the contrary, my good man," the detective answered placidly. "It is the curse of a criminal that he must answer any question regarding the crime he has committed with a lie. The innocent tell only truths, but the lone murderer has been betrayed by his testimony."

Whom did Detective K.C. Jones arrest?

SOLUTION:

Jones began by assuming everyone was telling the truth about each other's location and came up with the following arrangement: Saunders, Johnson, Lyme, Quimby, Gill, Rucker (4 men, 2 women) in the dining car and Keefer, Pitt, Witcher, Fralin (2 men, 2 women) in the passenger car. (Rucker and Fralin are interchangeable in this scenario, but as both are men, the precise position of each is irrelevant to this point.) This contradicted both Gill 's statement that there were an equal number of men and women in his (the dining) car and Mr. Quimby 's claim that fewer women were in one car than the other.

Thus, the detective concluded that both Gill and Quimby were telling the truth, and someone was lying about the occupancy. Jones reasoned that only one possible configuration could make both men's testimonies true: Gill, 2 other men, and 3 women in one car and Quimby, 2 other men, and 1 woman in the other.

Because Gill and Quimby had to have been in opposite cars, Jones worked back up his witness list to find the lie that had placed Quimby in the wrong car. He first examined Lyme's statement that she and Quimby shared the same car. If this alone was the lie, it would leave Saunders, Johnson, Lyme, Gill, Rucker (3 men, 2 women) in the dining car and put Keefer, Pitt, Quimby, Witcher, Fralin (3 men, 2 women) in the passenger car, meaning Gill's and Quimby's statements still would be inaccurate.

Ms. Lyme must be telling the truth then, and Jones instead turned to Pitt's claim, which had placed Lyme (and Quimby by extension) in the other car. If Pitt was lying, it would mean only Saunders, Johnson, Gill, Rucker (3 men, 1 woman) were in the dining car and Keefer, Pitt, Lyme, Quimby, Witcher, Fralin (3 men, 3 women) were in the passenger car. Again, neither Gill's or Quimby 's statements are met.

K.C. Jones, now certain Mr. Gill, Mr. Quimby, Ms. Lyme, and Ms. Pitt were all telling the truth, backtracked to Mr. Keefer next, who had established Pitt 's position. Assuming Keefer a liar, Jones was able to place Saunders, Johnson, Pitt, Gill, Witcher, Rucker (3 men, 3 women) in the dining car and Keefer, Lyme, Quimby, Fralin (3 men, 1 woman) in the passenger car.

A prudent man, Jones double checked his work by running each remaining statement against his reasoning and stiffened his resolve upon finding Keefer to be the only possible person whose lone lie could make every other witness statement truthful.

Mr. Keefer was arrested and led away to the relief (albeit, slight puzzlement) of the conductor and his passengers.

Gremmie's Mailbox

As Assistant Editor of Discover Smith Mountain Lake, "Gremmie" loves to get mail. Here she is, busy at work, looking over the entries in our puzzle competition.

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