

## Four logical deduction problems from famous motion pictures

Stumped while trying to come up with a suitable gift for the Gathering, I procrastinated by switching back and forth among some movies on television. Imagine my delight when it dawned on me that, seen in the right light, some famous scenes from these films contain quite remarkable logic puzzles. I reproduce those scenes here for your solving pleasure. True, the scenes may be slightly different from how some cinema lovers will remember them: I blame the lapses on my own faulty memory.

If you're stumped while trying to figure any of these out and would like a hint, or if you would like to check your answer, please feel free to contact me at [jkalef@philosophy.rutgers.edu](mailto:jkalef@philosophy.rutgers.edu).

### Puzzle 1

Sam Spade, private investigator and master of logical deduction, has his hands full dealing with a gang of four criminals (Kasper Gutman, Brigid O'Shaughnessy, Joel Cairo, and Wilmer Cook). He knows that one of them always tells the truth, one of them always lies, and the other two alternate between true and false statements (that is, if they make a true statement, the next statement they make is false, and vice versa). One of them has the gun that killed Spade's partner, Miles Archer. Spade needs the gun to give to Police Detective Tom Polhaus, who will be arriving soon. When he asks these four characters about the gun, the following conversation ensues.

Spade: All right, Cairo, cough up the gun if you've got it.

Cairo: Excuse me, sir, but Miss O'Shaughnessy has it.

O'Shaughnessy: No, Sam, it's Cairo who has it.

Cairo (trying to contain his anger): Mr. Spade, Miss O'Shaughnessy tells nothing but lies.

O'Shaughnessy (getting angry in turn): Why, I've never told a lie in all my life!

Spade (turning to Gutman): I take it you can help resolve this lovers' quarrel? If I'm pretending to trust you now, that is.

Gutman (laughing): By gad, sir, I'm a man who always speaks truthfully.

Spade (to Cook): And how about you? You've been awfully quiet. Can you vouch for Gutman's truthfulness?

Cook: He always tells the truth. Ain't you been listening?

Spade: Oh, yeah, he assures me he's honest. But if I'm not sure about someone's honesty, I shouldn't take his word for it, and I shouldn't trust his guns on the subject, either, should I?

Cook: [speaks two words, the first a short guttural verb, the second 'you.î]

Spade: People lose teeth talking like that.

Gutman (smiling at the situation): You'll find that Wilmer here has the gun, sir.

Cook: [stands up, staring wildly and open-mouthed at Gutman, not saying a word].

Spade: All right, fellows. No need to start breaking up the furniture over this. It's pretty clear now who has the gun and who's been lying about it.

Who has the gun that shot Miles Archer?

## Puzzle 2

Imagine visiting the Rocky Mountains, at a grand, luxurious hotel whose employees are all, to say the least, unusual. Half the employees are sane, and have been all their lives: these employees believe everything that is true and disbelieve everything that is false. The other half are insane, and have been insane all their lives: they believe everything that is false and disbelieve everything that is true. Moreover, half the employees are chronic liars: every statement they make is false, or so they believe. The other half are absolutely honest: every statement they make is true, or so they believe. It's not possible to tell, from looking at a hotel employee, whether he or she is sane and honest (and hence always truthful), sane and dishonest (and hence always untruthful), insane and honest (and hence always untruthful), or insane and dishonest (and hence, inadvertently, always truthful). You also happen to know that exactly one employee is the caretaker.

You enter the grand ballroom and see people dressed up for a roaring twenties costume evening. As you watch, you notice a very proper-looking English employee inadvertently spilling a tray of drinks onto a quite scruffy-looking American employee. As the employee who spilled the drinks apologizes and tries to lift the stain out of the scruffy employee's clothing, the following conversation ensues between them:

Torrance: "Look, Mr. Grady: you believe that I believe that you believe that I'm the caretaker."

Grady: "Sir?"

Torrance: (smirking) "Mr. Grady, you're the caretaker of this hotel."

Grady: "I'm sorry to differ with you, sir; but you're the caretaker here. You've always been the caretaker."

Torrance: (smiling after a confused pause) "Mr. Grady, I'm not insane."

Grady: "I hope you don't mind my saying so, sir, but I am fully sane. I should know, Mr. Torrance. I've always been sane."

What can be deduced about these two employees? And which of them, if

either, is in fact the caretaker?

### Puzzle 3

In the late 1980s, Detective Kimball, a private investigator, was hired to look into the disappearance of Paul Allen, a vice president of the Wall Street firm Pierce and Pierce. Before meeting with the other vice presidents, Kimball learned that they had all earned their MBAs at either Yale (in which case they belong to the elite Walrus club) or Harvard (in which case they belong to the secretive Boden club). He also learned that members of the Walrus club take a lifelong oath to always make true statements if their business cards have a lettering type that contains an R in its name, and to always make false statements otherwise. Each Boden club member, by contrast, swears to only make true statements if his business card's lettering type doesn't contain an R in its name, and to always make a false statement otherwise. The only confounding factor is that a few members of either club earn VIP status, in which case they have to do the opposite of what they promised in their oaths. All such VIP members are able to make Friday night reservations at Dorsia, a fashionable Manhattan restaurant. It is impossible for anyone who is not a VIP member to make such a reservation.

Detective Kimball's conversation with the other vice presidents goes as follows:

Detective Kimball: Thank you all for taking the time to meet with me. Let's start with you, Mr. Bateman. Where were you on the evening of Friday, October 16th, the night Paul Allen disappeared?

Patrick Bateman: Let's see. I was returning some videotapes that night.

Timothy Bryce (smirking): What are you going to tell us next, Bateman? That Phil Collins' "Sussudio" is a new peak of professionalism?

Patrick Bateman: Bryce, it is a new peak of professionalism. It's a great, great song, and a personal favorite.

David van Patten: Paul Allen made a reservation at Dorsia that night. He was the only one of us who could get one.

Detective Kimball (turning to Carruthers): I forget now, Mr.

Carruthers. Did you tell me in our pre-interview that Mr. van Patten was also able to get such a reservation?

Luis Carruthers: I'm not the sort of person who could have said that.

Patrick Bateman: Here's Paul Allen's business card. Note its tasteful thickness. And that lettering.

Detective Kimball (turning to van Patten): Like the lettering on your card, Mr. van Patten?

Marcus Halberstram: No, van Patten's card has Romanian type, or something else with an R in it.

Detective Kimball: Do you and Mr. van Patten know each other well, Mr. Halberstram?

David van Patten: Not really. I went to Harvard. Halberstram is part of that Yale thing.

Marcus Halberstram: Actually, van Patten did his MBA at Yale.

Craig McDermott: No he didn't, Marcus, you nitwit. He went to Harvard.

Detective Kimball: And how do you know that, Mr. McDermott?

Craig McDermott: Because I was there with him. We were in the same year.

Detective Kimball: Okay, let's cut to the chase. What's going on with Paul Allen? Where is he?

Patrick Bateman: I had to kill him last week because of his business card. It even had a watermark.

Luis Carruthers: Patrick, don't even joke about such a thing.

Craig McDermott: Actually, he's in London. A friend of mine just had lunch with him there yesterday.

At this point, Detective Kimball logically deduced what had happened to Paul Allen and was able to close his case. What did he deduce?

#### Puzzle 4

(Don) Vito Corleone, the head of an underworld family, has to keep his wits about him. There has been an attempt on his life by Philip Tattaglia, the head of a rival family, presumably over a dispute about whether Corleone should use his political influence to help support drug dealing. He has just recovered and learned that his eldest son, Santino, has been killed in an ambush. To end the escalating violence, he calls a truce and meets with the heads of all five families (the other three families are Stracci, Cuneo, and Barzini).

Corleone no longer knows which family heads are involved in which criminal enterprises. But he does know that the heads of families that are involved in drugs but not gambling only make false statements, as do the heads of families that are involved in gambling but not drugs. Heads of families that are not involved in drugs or gambling only make true statements, as do heads of families that are involved in both drugs and gambling.

Corleone welcomes everyone to the meeting. Then, he listens as the heads of the families speak as follows:

Victor Stracci: The Tattaglia family, the Barzini family, and the Cuneo family are all in the drug business. They need your support, Don Corleone.

Philip Tattaglia: None of us are involved in gambling, though. Of the five families, only yours is involved in that, Don Corleone.

Emilio Barzini: Don Corleone, what can I say? I was never behind the attack against you.

Carmine Cuneo: I had nothing to do with the attack against you, Don

Corleone.

And don't worry

about Stracci. Stracci had nothing to do with that attack.

Victor Stracci: That's right, Don Corleone. We Straccis earn money from drugs. We earn money from

gambling. But I

never acted against you, directly or indirectly.

Philip Tattaglia: I alone acted against you, Don Corleone. Nobody here directed me to do it.

After some further discussion, Don Corleone makes his peace with Tattaglia and embraces him, ending the meeting. But unlike the heads of the other families, Don Corleone is a great master of deductive reasoning. On the way home from the meeting, in a private conversation with his adopted son, he speaks disparagingly of Tattaglia, saying "He never could've outfoxed Santino. But I didn't know until this day that it was \_\_\_\_\_ all along who directed the attack against me."

Fill in the blank: Who was the mastermind behind the attack on Don Corleone, and how did Don Corleone know?