

Gods, Demons, and Mortals

Prepared by Mark on March 3, 2025

Based on Raymond Smullyan's *To Mock a Mockingbird*.

Section 1: Warm-Up

Problem 1: The Flower Garden

In a certain garden, each flower was either red, yellow, or blue, and all three colors were represented. A statistician once visited the garden and made the observation that whatever three flowers you picked, at least one of them was bound to be red.

A second statistician visited the garden and made the observation that whatever three flowers you picked, at least one was bound to be yellow.

Two logic students heard about this and got into an argument.

The first student said: “It therefore follows that whatever three flowers you pick, at least one is bound to be blue, doesn’t it?” The second student said: “Of course not!” Which student was right, and why?

Problem 2: What Question

There is a question I could ask you that has a definite correct answer—either yes or no—but it is logically impossible for you to give the correct answer. You might know what the correct answer is, but you cannot give it. Anybody other than you might possibly be able to give the correct answer, but you cannot! Can you figure out what question I could have in mind?

Section 2: Gods, Demons, and Mortals

Setup:

One night, Inspector Craig had a curious dream. He had been browsing that day in a library specializing in rare books on mythology, another of his many interests. His head was filled with gods and demons, and so his dream was perhaps not so surprising.

Time sometimes passes in unusual ways in the course of a dream. Craig dreamed that he spent nine days in a region in which dwelled gods, demons, and mortals.

The gods, of course, always told the truth, and the demons always lied. As to the mortals, half were knights and half were knaves. As usual, the knights told the truth and the knaves lied.

Problem 3: The First Day

Craig dreamed that on the first day he met a dweller of the region who looked as if he might be a god, though Craig could not be sure. The dweller evidently guessed Craig's thoughts, smiled, and made a statement to reassure him. From this statement, Craig knew that he was in the presence of a god.

Can you supply such a statement?

Problem 4: The Second Day

In this episode of the dream, Craig met a terrifying being who had every appearance of being a demon. "What sort of being are you?" asked Craig, in some alarm.

The being answered, and Craig then realized that he was confronting not a demon, but a knave. What could the being have answered?

Problem 5: The Third Day

In this episode, Craig met a totally nondescript-looking being who from appearances could have been anything at all. The being then made a statement from which Craig could deduce that he was either a god or a demon, but Craig could not tell which. Can you supply such a statement?

Problem 6: The Fourth Day

Craig next met a being who made the following two statements:

- A god once claimed that I am a demon.
- No knight has ever claimed that I am a knave.

What sort of being was he?

Problem 7: The Fifth Day

A being made the following two statements to Craig:

- I never claim to be a knave.
- I sometimes claim that I am a demon.

What sort of being are we now dealing with?

Problem 8: The Sixth Day

In this episode, Craig came across two beings, each of whom made a statement.

Craig could then infer that at least one of them must be a god, but he could not tell which one.

From neither statement alone could Craig have deduced this.

What statements could the beings have made?

Problem 9: The Seventh Day

On the next day, Craig again met two beings each of whom made a statement. Craig could then infer that one of them was a knave and the other a demon, though he could not tell which was which. Again, from neither statement alone could Craig have inferred this. Can you supply two such statements?

Problem 10: Introducing Thor

On the eighth day, Craig met a being who had every appearance of being the god Thor. The being made a statement, and Craig then knew he must be Thor. What statement could Thor have made?

Problem 11: A Perplexity Resolved

Craig and Thor became fast friends. In fact, on the evening of the ninth day, Thor gave a magnificent banquet in Craig's honor. "I propose a toast to our illustrious guest!" said Thor, as he raised his glass of nectar.

After a round of cheers, Craig was asked to speak. "I am very perplexed!" said Craig as he rose. "I wonder if this may not all be a dream!" "Why do you think you may be dreaming?" asked Thor. "Because," said Craig, "two incidents have occurred today that seem totally inexplicable. This morning I met someone who made a statement which no knight, knave, god, or demon could possibly make. Then this afternoon I met someone else who also made a statement which no dweller of this region could possibly make. That is why I suspect that I may be dreaming. "

"Oh!" said Thor. "Be reassured; you are not dreaming. The two incidents have a perfectly rational explanation. You see, we have had two visitors here from another realm. Both of them are mortal. One is Cyrus, who always tells the truth, although he is not called a knight since he is not from this region. The other is Alexander, who sometimes tells the truth and sometimes lies. It must have been those two whom you met today. What statements did they make?"

Craig then told the company what each had said. "That explains it perfectly!" said Thor. "Moreover, it follows from their having said what they did that Cyrus was the one you met in the morning. And interestingly enough, if you hadn't met Alexander in the afternoon, you could never have known whether the one you met in the morning was Cyrus or Alexander."

Craig thought the matter over and realized that Thor was right.

What statements could these two outsiders have made which fulfill all of the above conditions?

Problem 12: A Philosophical Puzzle

The next morning, Craig was wide awake and recalling his dream. He wondered whether he had been logically inconsistent in his sleep. “The trouble is this,” thought Craig: “In my dream I believed that Thor was a god and that gods always tell the truth. Yet Thor told me that I wasn’t dreaming. Now how could Thor, who tells the truth, say that I wasn’t dreaming when in fact I was? Wasn’t this an inconsistency on my part?”

Would you say that Craig’s dream was logically inconsistent?