CH. 5: THE WISE MONKEY

Read cautiously of rare events.

The teacher had a new mission for the student. "Many monkeys live in the valley below," she said. "And it is said that in every 10,000 monkeys, there is a single one that possesses all knowledge."

"All knowledge?" the student said. "What, does it wear robes and talk?"

The teacher ignored her. "You ask it questions, and listen to its replies," the teacher said. "The Wise Monkey will coo for 'yes,' and grunt for 'no.'"

"And how am I supposed to find it?" the student said.

"Go to the valley," the teacher said. "Ask questions of the monkeys. If you find a Wise Monkey, it will answer correctly."

"And what if I find an ordinary monkey?"

"What do you think?" the teacher scoffed. "It will answer randomly."

The student set out for the valley. She moved from monkey to monkey, asking them questions until they got one wrong. A few monkeys showed promise, getting six, seven, or even

(in a few cases) eight questions right. But they all erred sooner or later. As sundown neared, the student began to despair.

"Is purple my favorite color?" she said, approaching yet another monkey.

The monkey grunted. No.

"Right," the student said. "Is green my favorite color?"

The monkey cooed. Yes.

As the right answers mounted, the student could scarcely believe it. Ten questions later, the monkey was 10 for 10.

"I found one!" the student announced when she'd brought the monkey back with her.

The teacher studied her monkey carefully. "How do you know?"

"I asked it ten questions," the student reported. "It got them all right."

"Couldn't that be a coincidence?"

"I *guess*," the student said. "But it seems awfully unlikely. Ten is a lot of questions."

"But tell me," the teacher said, "how many monkeys did you speak with today?"

"Hundreds," the student said. "Maybe a thousand."

"I see." The teacher nodded. "Let's say a thousand. Now, of those, how many got the first question right?"

"Well, by dumb luck, half of them," the student said. "So 500."

"Good. And how many got the second question right, too – again by dumb luck?"

"Half of those. So 250."

"And the third question?"

"Half again. 125."

"And the fourth?"

"63, more or less."

"And the fifth?"

"32." The student got a sudden sinking feeling.

"And the sixth? Seventh? Eighth? Ninth?"

The student tried to keep up. "16. Then 8. Then 4. Then 2."

"And tell me, my student," the teacher said, "Of a thousand ordinary monkeys, how many would get all 10 questions right, purely by chance?"

The student slouched. "One would."

The teacher then turned to the monkey. "Tell me, little one, is the sky blue by day?"

The monkey grunted. No.

"Really, now," the teacher said. "Is the sky yellow by day?"

The monkey cooed, and the student groaned.

CH. 5: DISCUSSION

This might remind you of the old adage that a thousand monkeys, given infinite time and a steady supply of typewriters, would reproduce the entire works of Shakespeare—minus the dubious "infinite time" part. Here, a thousand monkeys, given ten yes-or-no questions each, will produce one monkey who looks like a genius.

The moral amounts to this: Coincidences happen.

Think of sports—the octopus that accurately picked World Cup winners, or the pattern that the stock market dips when an AFC team wins the Super Bowl, or the countless fans who insist that their private rituals and practices steer their teams' fortunes. You can chalk it all up to coincidence. If you try enough sea creatures, one is bound to predict the games correctly. If you look at enough meaningless indicators, one is bound to match the stock market's fate, by sheer luck. And if you do enough random things each time your team plays, one of them is bound to correlate with the days your team wins.

But there are more pernicious examples. Consider money managers who claim they're excellent at picking stocks. Gather together a thousand of these experts, and watch their performance for ten years. Track whether they perform above or below the market average. Even if their success is totally random, you'll probably have someone who beats the market average for ten years running. Investors will flock to this wizard's fund, but he might not be the Wise Monkey he seems to be.

CH. 5: QUESTIONS

1. Let's say 1 in every 10,000 monkeys really *is* wise.
   a. If you give a ten-question quiz to 10,000 monkeys, how many would you expect to get 100% on the quiz? (Include wise ones *and* lucky ones.)
   b. Suppose we've got a monkey that aced the 10-question quiz. What's the probably that it's a wise one?
   c. How many yes-or-no questions would a monkey need to get right before you'd be confident that it's a wise monkey, and not just a lucky imposter?

2. What if, instead of asking yes-or-no questions, the student asked the monkeys multiple-choice questions? (Assume the monkeys can make enough noises to answer these.) Out of 1000 (not-wise) monkeys, how many would get 100% on…
   a. A five-question quiz with three answer choices per question (A, B, and C)?
   b. A five-question quiz with four answer choices per question (A, B, C, and D)?
   c. A five-question quiz with five answer choices per question (A, B, C, D, and E)?
   d. Would a multiple-choice quiz have made it easier for the student to locate a wise monkey? Why or why not?

3. Here's a classic scam: Send out a letter to 32,000 people, promising to name a stock each week, and to state whether it will rise or drop in value. Give free tips for the first five weeks, and then charge $1000 for the sixth week's tips. If you play your cards right, you could make up to $1,000,000 that sixth week (minus the cost of postage). How does this scam work?

4. Why do humans often assign so much meaning to coincidences? Is this a bad impulse, a neutral one, or somehow beneficial?