

## Smullyan's Revenge: The Smullyaning II<sup>1</sup>

Somewhere in the ocean, there is a strange island known as the Island of Questioners. The inhabitants never make statements; they only ask questions.

- Each inhabitant is one of two types, A and B.
  - Those of type A ask only questions whose correct answer is yes; those of type B ask only questions whose correct answer is no.
1. Suppose you meet a native of this island, who asks you: "Am I of type B?" What would you conclude?
  2. Suppose, instead, they had asked you whether they were of type A. What would you have concluded?
  3. I once visited this island and met a couple named Ethan and Violet Russell. I heard Ethan ask someone, "Are Violet and I both of type B?" What type is Violet?
  4. Another time I met two brothers whose first names were Arthur and Robert. Arthur once asked Robert, "Is at least one of us of type B?" What types are Arthur and Robert?
  5. Next I met a couple whose last name was Gordon. Mr. Gordon asked his wife, "Darling, are we of different types?" What can be deduced about each?
  6. Then I met a native whose last name was Zorn. He asked me, "Am I the type who could ask whether I am of type B?" Can anything be deduced about Zorn, or is this story impossible?
  7. Going from the sublime to the ridiculous, I came across a native who asked, "Am I the type who could ask the question I am now asking?" Can anything be deduced about them?
  8. I next came across a couple whose last name was Klink. Mrs. Klink asked her husband, "Are you the type who could ask me whether I am of type A?" What can be deduced about Mr. and Mrs. Klink?
  9. Then I met a couple named John and Betty Black. Betty asked John, "Are you the type who could ask whether at least one of us is of type B?" What are John and Betty?
  10. The next incident was really a logical tangle! I met three sisters named Alice, Betty, and Cynthia. Alice asked Betty, "Are you the type who could ask Cynthia whether she is the type who could ask you whether you two are of different types?"

As I walked away, I tried to puzzle this out and finally realized that it was possible to deduce the type of only one of the three girls. Which one, and which type is she?

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<sup>1</sup> These problems have been adapted from Smullyan's *The Lady and the Tiger*, which possesses more interesting logic puzzles like these than I could conceivably borrow.