Polkinghorne Questions

Chapter 3

1. What is a hidden variable interpretation?

2. What is the difference between a probability and a probability amplitude? Is there a relationship between the two?

3. Can you think of two numbers with the following property: if you first square each number then add the results, you get a positive number, but if you first add the two numbers then square the result, you get zero? This relates to the Schumacher (video) example of two paths cancelling.

4. In a hidden variable theory, physical laws can still be deterministic. What is going to happen just depends on a variable that, for one reason or another is hidden from us. If we knew the variable, we would know the outcome. We don't know the variable, so we don't know the outcome. This is just ignorance, and we can continue to think of probabilities as representing ignorance. Is there an alternative way to think about probability?

5. What do you think of the statement "science is simply about correlating phenomena and it should not aspire to understand them"?

6. What is the measurement problem?

7. What is the correspondence principle?

8. Why do you suppose the many worlds interpretation is attractive to quantum cosmologists?