

"a phenomenon which is impossible [...] to explain in any classical way, and which has in it the heart of quantum mechanics. In reality, it contains the only mystery [of quantum mechanics]."

• Richard Feynman

David Deutsch posits that this phenomenon is evidence of a multiverse

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the interference the particle encounters is the path that it took in a different universe.







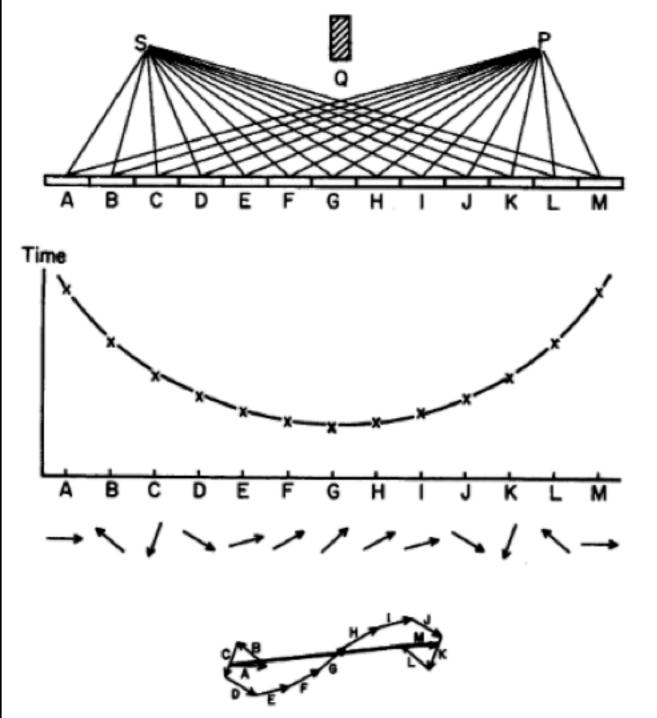


FIGURE 24. Each path the light could go (in this simplified situation) is shown at the top, with a point on the graph below it showing the time it takes a photon to go from the source to that point on the mirror, and then to the photomultiplier. Below the graph is the direction of each arrow, and at the bottom is the result of adding all the arrows. It is evident that the major contribution to the final arrow's length is made by arrows E through I, whose directions are nearly the same because the timing of their paths is nearly the same. This also happens to be where the total time is least. It is therefore approximately right to say that light goes where the time is least.

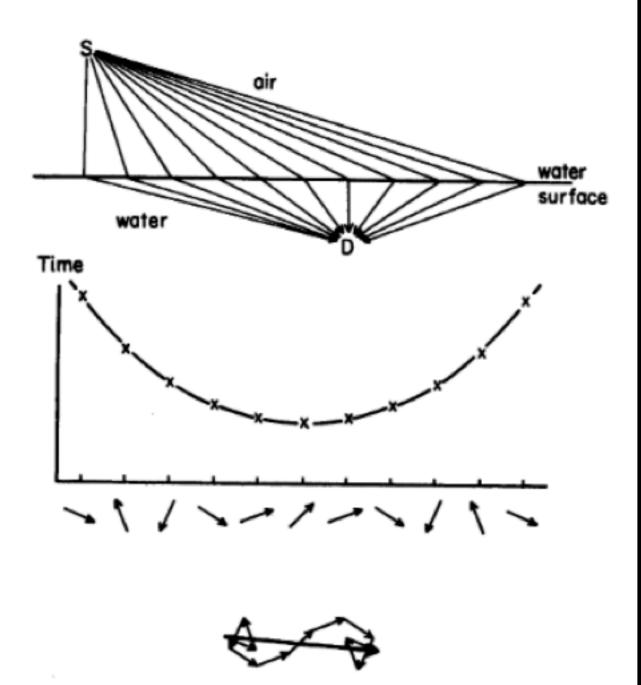


FIGURE 29. Quantum theory says that light can go from a source in air to a detector in water in many ways. If the problem is simplified as in the case of the mirror, a graph showing the timing of each path can be drawn, with the direction of each arrow below it. Once again, the major contribution toward the length of the final arrow comes from those paths whose arrows point in nearly the same direction because their timing is nearly the same; once again, this is where the time is least.







