Suppose we set up the two-path experiment as shown above, with the incoming particles prepared in such a way that they are certain to go up through a magnet with orientation 90°. When we put particle detectors in Paths A and B, we find that any incoming particle activates one or the other of them. Hence we conclude:

1. **Every incoming particle follows either Path A or Path B.**

   Further, if we block off Path B—so that any particle that makes it through the second magnet must have followed Path A—we find that 50% of the particles entering the second magnet go up, and 50% go down. (We also find, if we rotate the second magnet so that it has orientation 0°, that every particle entering it goes up, as expected.) Hence we conclude:

2. **Every particle that follows Path A has a 50% chance of going up through the second magnet.**

   Finally, if we block off Path A—so that any particle that makes it through the second magnet must have followed Path B—we again find that 50% of the particles entering the second magnet go up, and 50% go down. (We also find, if we rotate the second magnet so that it has orientation 0°, that every particle entering it goes down, as expected.) Hence we conclude:

3. **Every particle that follows Path B has a 50% chance of going up through the second magnet.**

   From 1, 2, and 3, it follows that

4. **Every incoming particle has a 50% chance of going up through the second magnet.**

   But if we leave Paths A and B undisturbed—i.e., don’t block them off, and don’t put detectors in them—we observe what is depicted above: every incoming particle in fact goes up through the second magnet. Hence 4 is false, and even though it seems that we have excellent experimental confirmation for 1, 2, and 3, at least one of them must be given up.