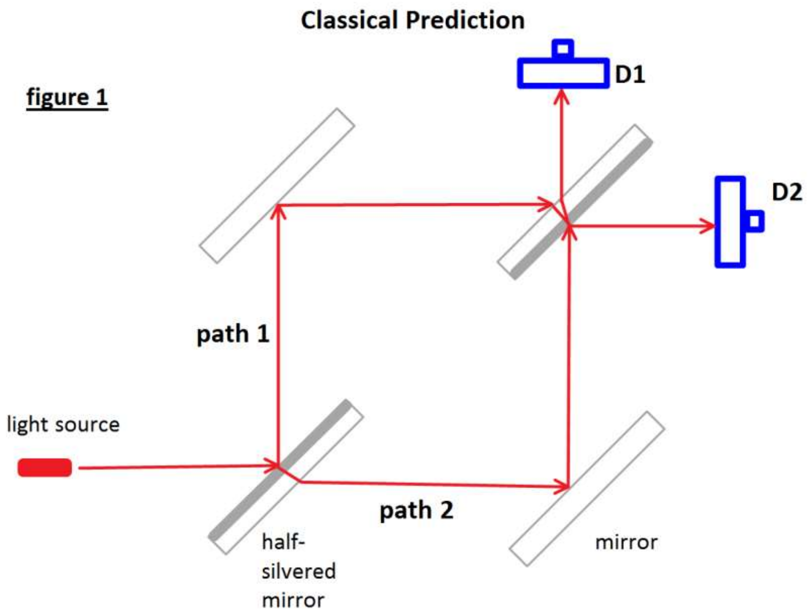
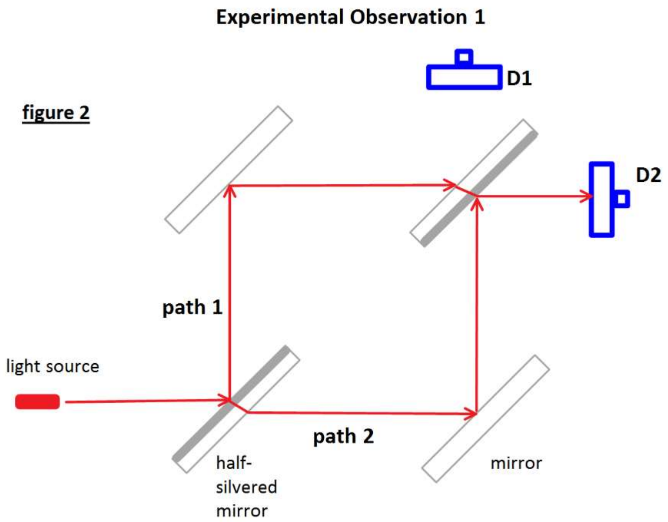
QGD Interpretations of Quantum Entanglement Experiments

Preonics provides simple and realistic explanations of observations of so-called quantum entanglement experiments. Not only are QGD predictions consistent with such experimental observations but, unlike quantum mechanics, it precisely explains the mechanisms responsible for observed outcomes without violating the principle of locality.

In the setup shown in figure 1, which is called a Mach-Zehnder Interferometer, photons from a light source are first split into two beams by the half-silvered mirror at the bottom left which will follow two distinct paths. Classical optics predicts that the photons on path 2 will be reflected by the mirror on the bottom right to the half-silvered mirror on the top right which will split the beam into two smaller beams each containing 25% of the photons from the source, directing one towards D1 and the second towards D2.



Similarly, the beam on path 1 will be split by the half-silvered mirror at the top right into two beams containing each 25% of the photons, one directed to D1 and the other to D2. So, each of the detectors will receive 25% of the photons that follow path 1 and 25% of the source photons through path 2 for a total of 50% of the photons.

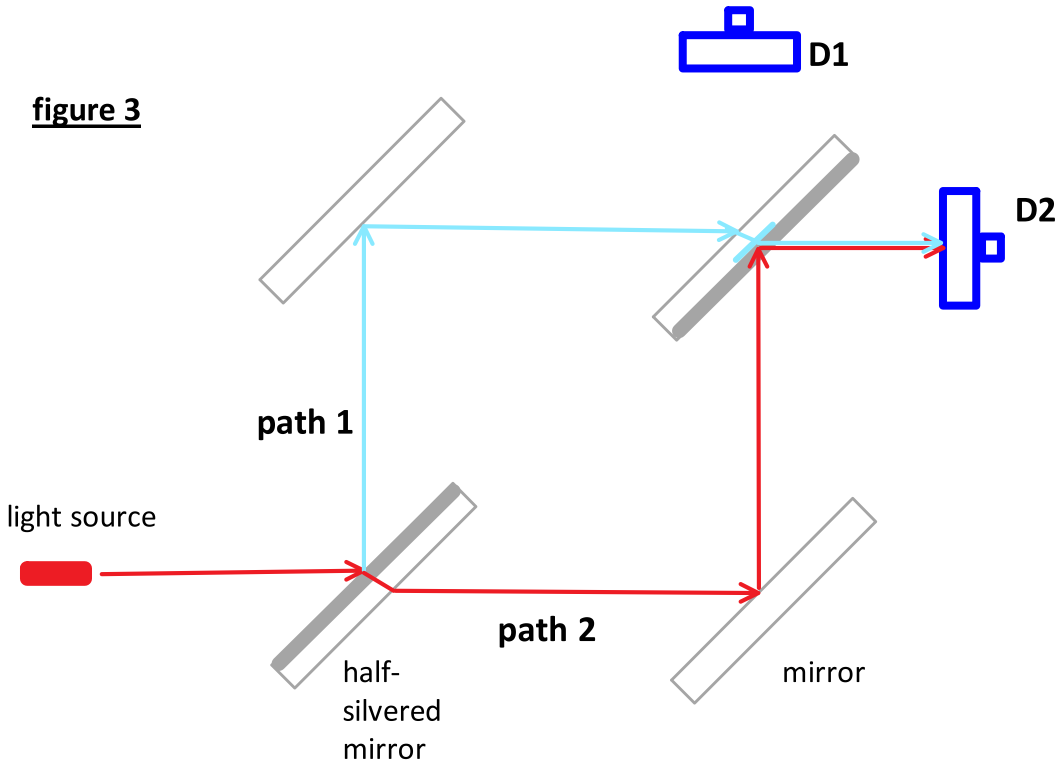


However, observations show the classical prediction to be incorrect and finds that 100% of the photons from the source reach D2 and none reach D1 (figure 2).

Quantum mechanics, in a way that is similar to double-slit experiments, explains that all photons travels through both paths and interfere constructively at D1 and destructively at D2.

As discussed earlier, the momentum of any particle or structure a can only change by discrete amount following the relation $\left\|\Delta\vec{P}_a\right\| = xm_a g^-$ where x is an positive integer, m_a is the mass of the particle or structure (the number $preons^{(+)}$ of its composed from) and g^- is the fundamental unit of n-gravity (the repulsive force acting between $preons^{(-)}$, the discrete units of space). For e_0^-, the permitted change in momentum is $\left\|\Delta\vec{P}_{e_0^-}\right\| = xm_{e_0^-} g^-$, so only a photon γ with momentum $\left\|\vec{P}_\gamma\right\| = \left\|\Delta\vec{P}_{e_0^-}\right\|$.

figure 3



What we observed in our setup is photons from the source that follow path 1 (color coded blue) are transitorily absorbed by the electrons of the glass of the top right mirror. The energy states of the electrons changes from e_0^- to e_1^- (blue rectangle of the top right half-silvered mirror in figure 3). Since $m_{e_1^-} = m_{e_0^-} + m_\gamma$, the permitted change in momentum of e_1^- is $\left\|\Delta\vec{P}_{e_1^-}\right\| = x\left(m_{e_0^-} + m_\gamma\right)g^-$. Since $\left\|\vec{P}_\gamma\right\| < \left\|\Delta\vec{P}_{e_1^-}\right\|$, the momenta of the photons along from path 2 are smaller than the permitted change in momentum for e_1^-, they will be reflected towards D2 by the mechanism of reflection we described earlier. The e_1^- electrons form essentially form a reflective surface for all photons for which $\left\|\vec{P}_{\gamma}\right\| < \left\|\Delta\vec{P}_{e_1^-}\right\|$. Therefore, none of the photons ever reached D1 because 100% of them were directed at D2.

figure 3a

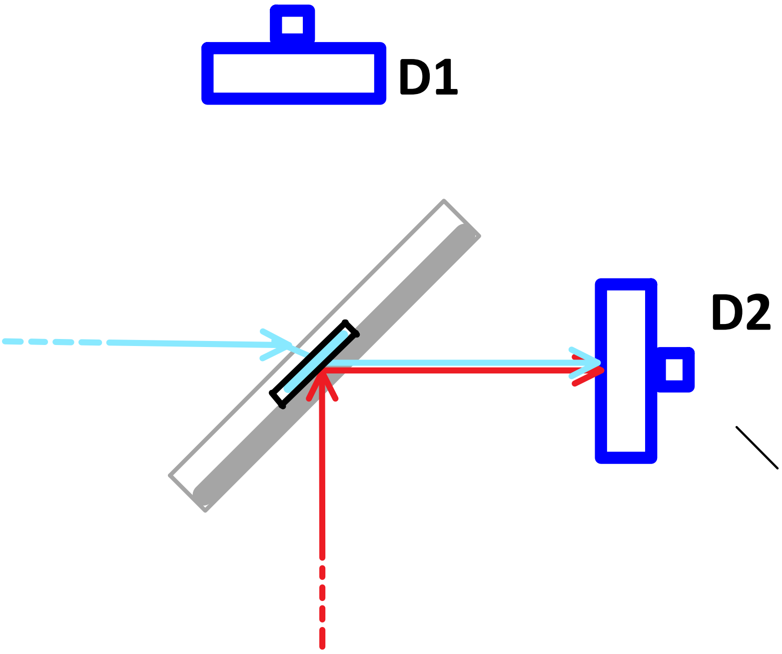
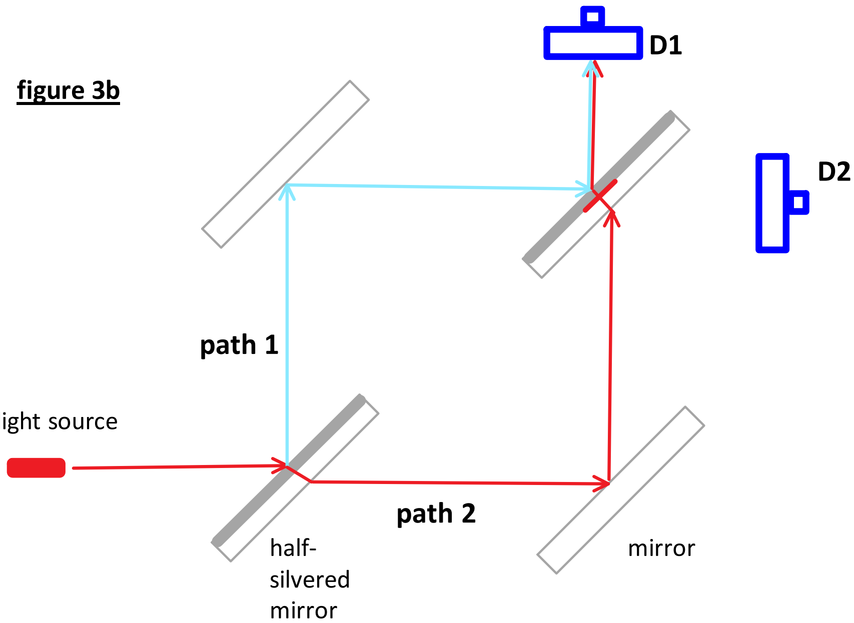


Figure 3b below shows QGD the same experiment with the silvered side of the top right half-silvered mirror facing D1.

figure 3b



Now consider the setup shown in figure 4. Observations show that in this setup 50% of the photons reach D3, 25% of the photons that will reach each of D1 and D2 detectors.

Experimental Observation 2

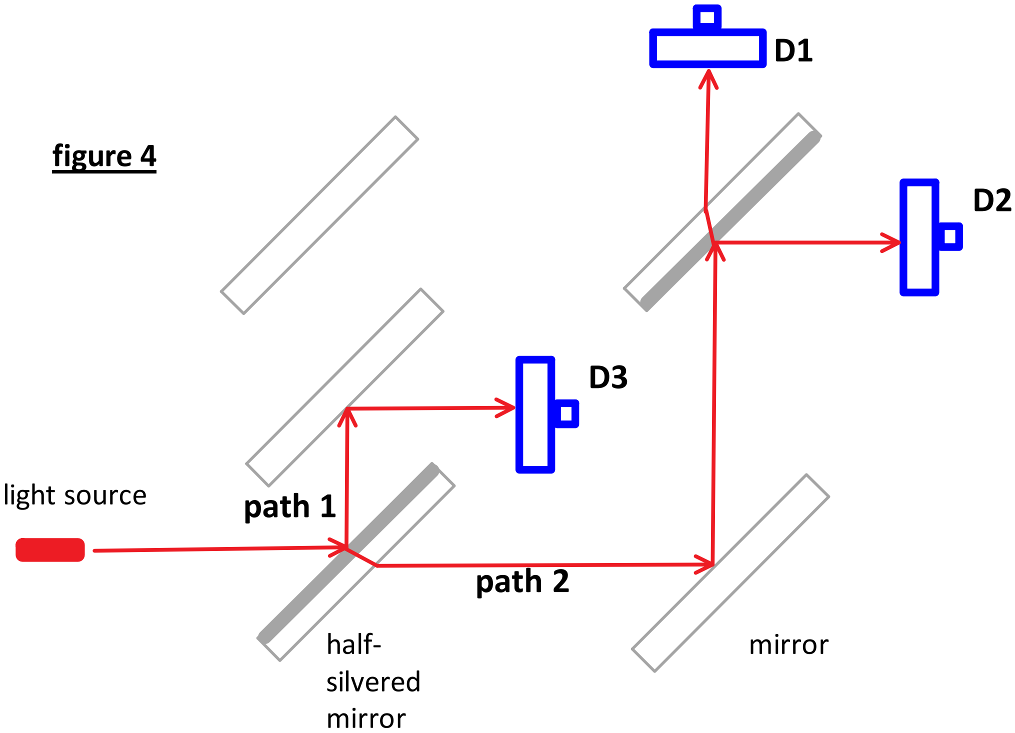


figure 4

According to quantum mechanics, the photons moving along path 2 that reach D1 can only do so if the photons moving along path 1 are deflected towards D3. This raises the question: How can the photons that reach D1 know that the photons of path 1 were deflected towards D3?

The quantum mechanical explanation is that the photons from path 1 and path 2 are entangled, so a measurement (detection) of photons by D3 influences photons at D1 and D2, and does so instantly and independently of the distance that separates the detectors. This, of course, violates the principle of locality, and *as interpreted by quantum mechanics*, is considered evidence of quantum entanglement.

QGD explanation is simply that photons from path 1 are not reaching the mirror on the top right as it does in the earlier setup, hence electrons of the glass side of the half-silvered mirror are not excited from e_0^- to e_1^- as shown in figure 3 and 3a, so photons from path 2 are free to reach D1.

The examples discussed in this section are additional examples of experiments for which the outcomes support quantum entanglement, yet they can be explained classically.