

Unpredictability Implies an Abstract Reality

Niels Bohr once stated that “Everything we call real is made of things that cannot be regarded as real”. Bohr was referring to his very own, “Copenhagen Interpretation”, which postulates that the wave function isn’t physical but is instead, an abstract mathematical object describing the probability of finding a particle in a particular place. It has been argued that recent quantum mechanical experiments point to a world, which is completely unpredictable. This essay will argue that if such experiments are accurate, this automatically suggests that reality is abstract, in the way delineated by the Copenhagen Interpretation.

The Argument:

Quantum theory states that there is randomness in regards to predicting events on the microscopic level. Initially this randomness was believed to have arisen as a result of a lack of knowledge about the system being investigated. However, today it is often argued, from experiments examining Bell’s Inequality, that the quantum world is pure probability, meaning that the probabilities in quantum mechanics are not an illusion due to a lack of knowledge but are real. Hence the behavior of particles are entirely unpredictable, because the laws of quantum physics state that their behavior is, in and of itself, entirely probabilistic.

Predictability is the ability to know with certainty an event in the future. This potential, to have certainty of a future event is something that can always be achieved with material objects, as material objects always follow the pattern of cause and effect. Cause and effect can be defined as a relationship between events and things, where one event is the result of the influence of the previous. Through our observation of the natural world it is clear that physical objects exclusively follow the pattern of cause and effect. Although philosophical objections could be made to this idea, in practice we observe that this principle is true, as there are no examples in our everyday reality of a physical object behaving in a manner that would contradict this. For example if one were to throw a rock at their neighbours’ window, they would still have to pay for the damages and any statement that the rock did not cause the window to break simply wouldn’t cut it as a suitable defense. Therefore, everyone in practice accepts that physical objects operate exclusively according to the principle of causality, because from what we can tell by our everyday (and scientific) observations there are no instances of them contradicting this principle.

Cause and effect is what allows for predictability in the universe, and when there is cause and effect this strongly suggests that the object is of a physical nature, due to the fact that physical objects operate exclusively according to this principle. Hence if it is true that there is genuine unpredictability or randomness in Quantum Mechanics then this by extension implies that reality is abstract, because unpredictability implies a lack of cause and effect, which in turn

suggests that this pattern has emerged from an object that is abstract. This is because the only way to account for unpredictability, or pure randomness, in the universe, is to introduce something that is non-physical, as material objects always abide by the principle of causality, and this principle always gives rise to predictability.

Therefore, if it could be substantiated that there is pure randomness, and thus genuine unpredictability, this automatically implies that reality is abstract (most likely in the way outlined in the Copenhagen Interpretation), as physical objects cannot give rise to absolute unpredictability by virtue of always following the principle of cause and effect.