

# Quantum Absurdities, Part One

Hi everyone! Welcome to the second episode of the Metaphysics of Physics video podcast. Today we are going over quantum absurdities and showing how quantum physics is in fact highly absurd.

While this is not an exhaustive list, it covers many of the essential absurdities.

What is the purpose of this? Yes, the mathematics of quantum theory is incredibly useful and impressive. But we want to show that the physical interpretations of quantum mechanics make no sense.

This is part one of a two-part series.

## Particle Wave Duality

Quantum physics asserts that particles can be described as both a wave and a particle.

Albert Einstein had this to say about particle-wave duality:

“It seems as though we must use sometimes the one theory and sometimes the other, while at times we may use either. We are faced with a new kind of difficulty. We have two contradictory pictures of reality; separately neither of them fully explains the phenomena of light, but together they do.” - *Albert Einstein*

Until the early twentieth century, light was widely considered to be a wave, as demonstrated by [Thomas Young](#).

But then Einstein showed that light seemed to have particle behavior! And Planck showed that light seemed to come in discrete packets.

So, was light a particle or a wave? Which was it? Later physicists alleged to show that light sometimes shows particle behavior and sometimes wave behavior.

This led them to conclude that light is somehow both a particle and a wave at the same time. And that it, somehow, sometimes behaves as a wave and sometimes behaves as a particle.

Does this make any sense? Well, of course not.

A wave is an abstract description. It describes the motion of something. It describes various relationships.

Take a sound wave. It is an abstract description of the movement of air that can be mathematically represented as a wave.

Or take a water wave. When we say "wave" in this context, we are describing water arranged in a certain pattern.

*The pattern of rise and fall with peaks and troughs.*

The concept of a water wave describes the relationship of positions between water molecules that makes this pattern.

In common speech, it is often said that a "water wave" or the like refers to the water molecules. This is the noun form of "wave" that describes something arranged like this (something that is waving).

We are using wave in its verb form, as a description of motion or behavior, or a description of some kind of relationship.

A wave is a behavior that a physical entity does. Water may move in a wave motion. Air molecules move in a wave pattern and we experience this as sound.

A wave is the behavior of physical entities. It is not a form of physical entity.

Saying that light is a wave is saying "Light is the movement or behavior of something". It does not tell us what it is that is waving.

*It is like if I held up a ball and asked what it is and you said "That is a bounce".*

You have told me something that the ball does but not what the ball actually is. Bouncing is what the ball does, it is not what the ball *is*.

Physics is the science of explaining the nature of the fundamental physical constituents of the universe. You want to explain what those things are and how they interact.

Saying "light is a wave, an abstract description of behavior" does not further that in any way and evades the question of *what is doing the waving*.

We do not even have to get into the issue that something cannot be a wave and a particle at the same time. Because a wave is a description of behavior while a particle is a description of what something is, its form.

The idea of particle-wave duality reifies an abstraction and attempts to reduce physical entities to an abstraction.

It also evades the Law of Identity that says that things are what they are. Something is either a particle or not. It is not a particle, a form of matter and also a wave, an abstraction.

Contradictions do not exist. If you think you see a contradiction in reality then check your premises, because one or more of them are wrong.

## **Indeterminacy**

It is said that until they are observed, particles do not have a definite state. Instead, they exist in a state of "superposition".

That is, they exist in multiple different, mutually exclusive states all at once. And then when an observation takes place, they take on definite values for their properties.

A property is merely an aspect of something's existence. But any property of any particle can only exist in one state at a time. That particle's property can only take one value at a time.

That is just another way of saying *something is what it is* and that *it has a nature* and *its properties are determined by its nature*. Its properties are simply an aspect of its nature and cannot be any different than what they are.

This implies that properties must have single, definite values, as determined by the nature of the entities in question.

Saying that particles exist in a superposition of states is equivalent to saying that those properties have no values and do not exist.

It is denying that a particle is what it is and instead treats it as some kind of Platonic combination of possibilities.

This reifies the idea that a particle can have different possible states and pretends that these possible states are all somehow real, independent of the particle and its nature.

## **Primacy of Consciousness**

A central tenant of quantum physics is that observation somehow causes particles to take on definite states. As though particles magically defy having definite natures but somehow know when they are being looked at and then decide to stop being subject to magic.

Note, that we are not talking about the fact that observation often requires physically interacting with the system.

It is true that if you use light to observe something, the light will interact with the system and potentially cause the system to be in a different state.

This is not a practical issue of trying to observe a system without interfering with it.

Quantum mechanics asserts that the very fact something has been observed somehow causes the indeterminacy in a system to vanish and for the state of the system to take on definite values.

It is not the means by which something is observed which is the issue, but the fact that observation has happened. As though the fact that observation itself somehow magically makes the system behave.

This is simple primacy of consciousness. This view opposes the view that reality is what it is, independent of the consciousness. It does not agree that things are what they are and that consciousness merely observes things.

It asserts that reality does not exist independent of consciousness but that it is somehow created by consciousness or that reality is whatever man wants it to be.

Man can choose things in reality by taking actions in accordance with reality. However, the primacy of consciousness view does not amount to "If you want something, go out and make it so by taking the appropriate actions".

It amounts to "Reality is created by our minds and is what we say it is".

## Anti-Realism

Realism, as used in physics, is the idea that physical reality exists independently of the human mind. More specifically, as used in quantum mechanics, it is the (allegedly unreasonable) "assumption" that particles have well-defined properties that exist independently of measurement.

That is, particles have certain properties regardless of whether we measure those properties.

For instance, an electron will always have a certain "spin" direction, even if nobody bothers to check what it is.

Perhaps an example from the macroscopic world would help to make this more clear. Suppose that we consider a ball. It has various properties, even if nobody is currently observing the ball. It has a radius, it has hardness, it has velocity, it has various chemical properties.

These properties exist even if we stop looking at the ball.

This might seem rather obvious and so it should. What we call the "properties" of the ball are simply various aspects of the ball's nature. The "properties" of the ball simply describe the ball and its nature and/or what it will do under given conditions.

It should be obvious that these properties will exist regardless of measurement. A ball will always have a certain radius or a certain temperature, regardless of whether we are measuring those properties or observing the ball.

*The act of observation does not create these properties.*

We do not create these properties simply by measuring them. Just as we do not create the ball's radius when we take a measuring tape to it and measure it.

We do not create its temperature when we measure its temperature. Measuring a property does not create that property.

"Property" refers to some attribute of something and those attributes are simply aspects of something. Such aspects exist whether or not they are being observed.

Now, can we apply this to the quantum world? Of course, we can. We should not expect that just because subatomic particles are very tiny, that they are somehow not subject to basic metaphysical principles.

These entities also have attributes that exist independently of the human mind.

In denying realism, quantum mechanics openly embraces primacy of consciousness by pretending that consciousness itself magically determines the nature of particles, that is, that consciousness magically creates reality!

This is, of course, nonsense. Things are what they are and have a specific nature, including properties, independent of consciousness. Consciousnesses does not create reality, it observes it.

But the founders of quantum mechanics all believed that consciousness creates reality, not the other way around.