

ON SUPERPOSITION

by Marialaura Ghidini

Superposition, I thought. Before Christ ascended, He was in what quantum theory calls superposition - neither here nor there, up nor down. He was Schrödinger's cat.

John Updike, *Toward the end of time*, 1997

Why Superposition? What is a Superposition?

The name in itself is fairly self-explanatory. Superposition concerns the idea of position, or better still, the definition of a position.

In an ordinary situation, the position of an object is defined by its distance from other objects.

Here is an ordinary scenario. I am typing on a laptop, which is in front of me on the top of a desk - at 73 centimetres from the floor -, which in turn leans against a wall - at 50 centimetres from the laptop - that connects to another wall with a window on the street - at 1.50 meters from the desk -. The laptop faces me writing at the desk - at 2.80 metres from the room door -.

I stare at the laptop and, after observing and determining its distance from other objects, conclude that, by virtue of it being solidly in place and stable, I can talk about its existence.

At sub-atomic level, things are slightly different.

At this level of reality, any idea of positioning asks for a dissimilar mindset. In this context, existence is far off from being in relation to the definition of fixed and commonsensical positions.

According to quantum theory, Superposition is a principle which holds that bits of matter can be in all possible states at once; and therefore in all possible positions: here, there and everywhere at the same time.

In effect, an electron or proton is said to be in superposition because it exists as a potential reality until it is measured; it can be in two or more places at once, and as a consequence has no definite location.

Thus the difference between the everyday experience and the submicroscopic level of existence lies in the possibility of reading the position of elements - be they objects, electrons, people or laptops.

John Updike in his novel *Toward the end of time*, discusses the workings of being in a Superposition. Besides Updike's entropic take on the meaning of life, the novel introduces a linkage between quantum theory and the everyday.

In *The Dollhouse* chapter of the book, from which the quote on the index page has been taken¹, the writer jumps from a quotidian scenario to a biblical one, and then back again to the mundane, through referring to quantum mechanics.

One day Ben Turnbull, the main character in the book, goes to church with Deirdre, his mistress, and during the sermon he begins to wonder about the positions of the observer and observed - the viewer and the object - in relation to the concept of existence. Ben does so by commenting on the biblical story of Mary Magdalene and Jesus². And what John Updike is getting

¹ John Updike, *Toward the end of time*, Fawcett Crest, New York, 1997; pp. 116

² Please note that at literary level, one might talk about the historical Jesus and the dogmatic Christ. Jesus was a man, whose story and life is documented in tone of the books of the *Bible*, the *New Testament*; while the dogmatic figure of Christ pertains, and is recognised by, the religious groups belonging to Christianity.

at here is that while seeing is believing for some; for others it is only by way of a much personal way of observation - touching in the instance of Mary Magdalene - that the existence of something can be proved.

This brings in another element; the act of producing evidence of the state of the observed object seems to be a sine qua non for determining the object position. And an obvious consequent requisite is that there has to be an explicit correlation between the subject and the object during the act of observation.

But let's dwell on Updike for a bit longer.

For the writer, the question is that "before Christ ascended", Christ was in an in-between state; nor on the Earth or with his Father, nor dead or alive. He was in a Superposition. And on that account, his state bears similarities with that of Schrödinger's cat, which is said to exist in superposition because, once in the steel box of the physicist theoretical experiment, it is both dead and alive at once³.

It follows that Superposition is beyond any idea of position and very much concerns the way the act of framing of that which is observed takes place.

But here is a third scenario.

In the framework of contemporary culture, there seems to be a tendency toward *everywhere-ness*, which I would define as the neither here, nor there, up nor down.

Electronic, before, and media culture, later on, has proposed a shift in the common conception of position, in that it has generated a materialisation of the realm of possibilities theorised by quantum theory. The possibility of objects' movements from a context to another has intensified, and created, networks within which the objects are translated and redistributed, often under different guise. What has been brought forth is a scenario characterised by simultaneity and fields of relations, which take place anywhere and anyhow.

And the act of determining a position may seem to be superfluous, or unnecessary even.

Yet again, in the day-to-day experience the position of objects is one at a time.

In effect, the state of *everywhere-ness* cannot be checked by the bare eye because it exists as long as one does not try to determine it - once the position of the object is considered, thus measured, the object becomes limited to a single possible state.

Both the eye and the ear, by framing, control the surroundings and the way they operate suggests the necessity of being tied to a position, or measuring the distance and the proximity between the observer and the observed.

Everywhere-ness exists as long as it is not looked at.

³ See the video for a demonstration of Erwin Schrödinger experiment, <http://www.youtube.com/watch?v=7SjFJImg2Z8>

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