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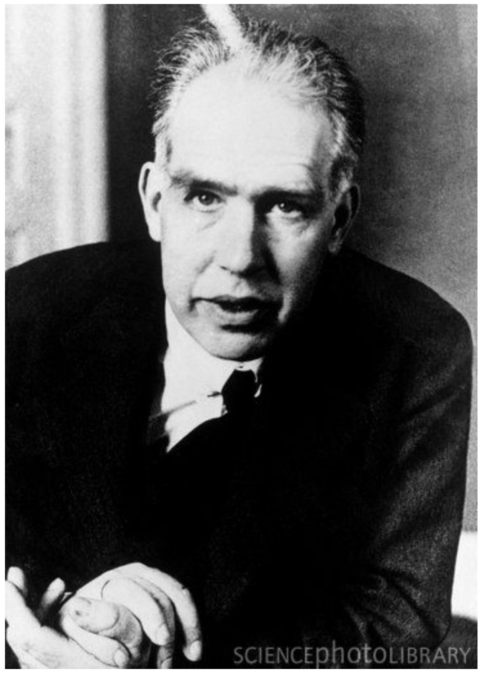
ON QUANTUM NON-LOCALITY



by Miles Mathis

And they, so perfect is their misery,
Not once perceive their foul disfigurement
But boast themselves more comely than before.
—*Milton*

I have already disproved quantum non-locality in my papers on superposition, where I explain the old experiments with real and diagrammable qualities and quantities. But here I will show in more detail how and why quantum non-locality was always nothing more than a terrible mistake.

To do this, let us start by analyzing the first paragraphs at the Wikipedia page on quantum non-locality. This is paragraph two on that page:

Experiments have generally favoured quantum mechanics as a description of nature, over local hidden variable theories.[1][2] Any physical theory that supersedes or replaces quantum theory must make similar experimental predictions and must therefore also be nonlocal in this sense; quantum nonlocality is a property of the universe that is independent of our description of nature.

That's all either propaganda or an outright lie, depending on how you want to look at it. To prove that, let me start by reminding you that I have explained the experiments with real, mechanically assigned variables. Not "hidden" variables, but rigorously assigned variables, with real motions. My solutions to these problems are not mathematical only. They are both physical and visualizable, and I have provided the diagrams to prove that. So in hindsight, we can see that the experiments never favored the old rule-breaking that has stood as quantum mechanics for 90 years. The old experiments just provided us with outcomes. Those outcomes couldn't possibly favor non-local or non-real solutions. Those outcomes only demanded logical explanations. Since the old guys couldn't provide those logical explanations, they provided illogical explanations instead, but then sold these illogical explanations under the cover of novelty and new science. They convinced several generations of physicists that these illogical explanations were the only possible explanations. Beyond that, they prevented physicists after them from trying to find logical explanations. They did that with authoritative pronouncements like the Copenhagen Interpretation, and by trying to shame anyone that disagreed with them. The leader of this suppression of science, Niels Bohr, took on Einstein first, trying to silence him with debating tricks and false conclusions. Although any sensible person who follows those debates can tell Einstein destroyed Bohr and his minions, we are told the opposite. Since Bohr's followers outnumbered Einstein's followers, they simply declared victory in the press in as many places as they could, and they have been declaring victory ever since. We see it at Wikipedia to this day, where the authors claim that everyone agrees Bohr won the debates. That simply isn't true, and many top physicists sided with Einstein, including Planck and Schrodinger and many others. Many physicists still don't believe in non-locality, to their everlasting credit.

You can see the levels of propaganda by reading closely the quote above. They tell us that any new theory that replaces quantum theory must be non-local. But that is just talking in circles. It is like saying that any theory of religion that replaces theism must include the idea of God. It doesn't make any sense. They admit in the first sentence that quantum mechanics is defined by non-locality and similar ideas, so if your new theory had to include non-locality, it would just be quantum mechanics all over again. Basically, they are trying to use writing tricks to convince you that you have no choice: non-locality is a requirement, so don't bother questioning quantum mechanics. Even if you came up with a new theory, they say, it would still include non-locality and would therefore be a form of quantum mechanics. So why bother coming up with a new theory? They are protecting themselves, you see.

To make that even more explicit, they tell you non-locality is a property of the universe independent of our description of nature. What does that mean? It means they are trying to put non-locality beyond the reach of any human theory. They are trying to make you think they have proved non-locality to such an extent that it may no longer be questioned. It isn't a theory, it is actually a property of the universe. You have to laugh. These guys who are so opposed to religion and *a priori* assumptions nonetheless have no compunction in trying to position their own theories beyond reach. "Any idea you have needs to be constantly open to new evidence and experiment, but any idea *we* have is a property of the universe, which may no longer be questioned. Our ideas determine all future physics, and are inescapable."

The theories themselves are not only full of these sorts of contradictions, but the salesmanship is, too. Any intelligent person should read the first few sentences of a page like this at Wikipedia and know he is being snowed, because this isn't science. The moment you see a physicist trying to convince you that his theory is unquestionable, is the moment you should know you aren't talking to a real physicist. This is the main reason Bohr lost the debates with Einstein: his main argument was that quantum mechanics was finished, that it couldn't be questioned, and that what they knew in the late 1920's must determine all future work. That argument isn't even worth debating. Any real scientists should know it is false, since it contradicts all the foundations and definitions of science. Bohr is defining dogma, not science.

Since all of quantum mechanics is based on this sort of dishonest salesmanship, physicists should have known non-locality was a blatant error even before I proved it. Physicists shouldn't have required my proof or my diagrams or my straightforward explanation of the old experiments. They should have know all along that non-locality was just a fudge dressed as a revolution. The fact that a majority of physicists have been snowed so easily by such transparent propaganda is a very bad sign for science, since it indicates the majority of physicists aren't capable of logic or of spotting bald contradictions. In a strictly rational universe, any physicist who signed on to the idea of non-locality should have immediately had his union card revoked.

But let us return to the old problems, to see once again how this mistake was made. As I showed in my superposition papers, the primary error was treating the initial variables as mathematical abstractions rather than as real motions. If we look at the math used at the time or the math used now to represent the problem (either of superposition or of non-locality), we find the probabilities treated as mathematical entities only. In other words, a spin is treated just like a linear motion, and a velocity is treated just like a position. Instead of real parameters that require real assignments, each possible variable is treated only as a function or probability. An equation is then built to contain these probabilities, and they are then juggled in various ways. Bohr juggles them one way, Einstein another, and Schrodinger another, but none of these scientists bothers to assign the variables to real motions, and to follow these motions through the machines, as I have. This is the reason neither Einstein nor Schrodinger was ever able to win the argument in a completely convincing manner. Because their maths always remained at the level of probabilities, with the variables unassigned to real motions, the equations remained fuzzy, allowing Bohr's side to continue to hedge at each juncture in the argument.

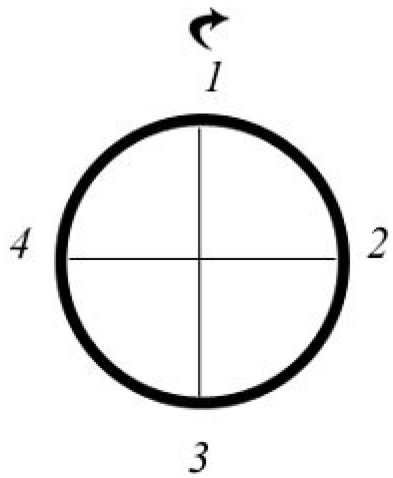
For example, an equation used by both sides to start the discussion is something like this:

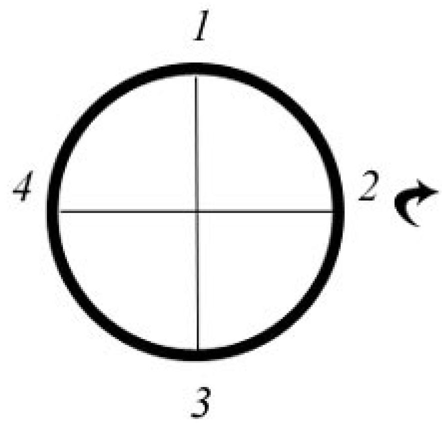
$$|\Psi,t\backslash = 1/\sqrt{2}|1,V\backslash|2,V\backslash + 1/\sqrt{2}|1,H\backslash|2,H\backslash$$

That describes the wavefunction as a composition of vertical V and horizontal H polarization probabilities. But I have shown that equation doesn't represent the actual wavefunction, which means neither side can hope to find a solution from it. The equation itself *prevents* a real solution, which is why it benefits Bohr's side of the argument. This means that Einstein's first mistake was in accepting Bohr's formulations. The first equation was wrong, so even with the right theories and intentions, Einstein couldn't hope to do anything with it.

That equations simply doesn't contain all the degrees of freedom that the real particles enjoy, so it can't explain the experimental outcomes. Specifically, representing vertical and horizontal polarization isn't enough to specify any real wavefunction, since it neglects to assign that polarization to a real spin on a real particle. If we give real particles real spins, then that wavefunction equation expands to include at least one more variation, and that variation allows us to explain the outcomes in a logical manner.

Although I don't find these equations useful, I can rewrite this equation to show the new variation. This second variation could physically be one of several. I have shown that spin stacking will give us a second variation, for instance. But the simplest field variation to show you is just the reversed spin, as we find on antiphotons. To diagram this, I will use my diagrams from my second superposition paper.





Those two diagrams represent the vertical and horizontal polarization they were talking about, so that gets us started. However, even in the simplest case, those two configurations are not the only two. We can reverse either diagram, having the 3 on top. Physically, that just represents a reversed spin. The vertically polarized particle can be spinning either to the east or west, and the same applies to the horizontal spin. Since quantum mechanics demands symmetry, the old guys should have known that. They now try to explain everything by symmetry, as we saw recently with Eric Weinstein, so it is shocking to see them ignoring symmetry in this early problem. They are trying to apply what we would now call incomplete gauges or partial matrices to these particles, so we should not be surprised to see the equations failing to represent the wavefunction. They have actually only represented half of the simplest wavefunction.

So the very first correction we must make to the equation above is including the variances we just found:

|Ψ,t\ = 1/√2|1,EV\|2,EV\ + 1/√2|1,NH\|2,NH\ + 1/√2|1,WV\|2,WV\ + 1/√2|1,SH\|2,SH\

I have simply added north, south, east and west identifiers to the equation, to represent the degrees of freedom. Of course we also have to correct the first number in each probability, since we no longer have only two states. We have four states, so we can get rid of the square root.

|Ψ,t\ = 1/2|1,EV\|2,EV\ + 1/2|1,NH\|2,NH\ + 1/2|1,WV\|2,WV\ + 1/2|1,SH\|2,SH\

Other corrections are also necessary, but the reader can already see what I am doing here.

[Addendum, 2013: A few readers told me that they had assumed the 1, 2 in the probabilities were already doing what I am talking about. They had thought 1V and 2V had meant vertical spinning east and west, for example. I had assumed the 1 and 2 were signifying linear motion of the quanta relative to the charge field, since although this is a wave equation, we need to signify linear motion as well. This is the wavefunction of a particle existing in a charge field after all, not a particle existing in a charge vacuum. So at the very least we need to signify whether the particle is mainly moving east or west (say). Why? Well, because the spins will work differently depending on the linear motion of the particle, of course. If we track spins, a particle moving west isn't equivalent to a particle moving east. Direction counts. What this means is that the wavefunction is a parameter short no matter how you look at it. If you look at it like I did at first, it is short the opposing spins. If you look at it like these readers were looking at it, the wavefunction is short the linear motion in the charge field. Either way, we have had only half a wavefunction for almost a century.]

The reason this solves the old problems and explains the outcomes in a real manner is that if we follow these more complex wavefunctions through the experiments, we don't encounter any paradoxes. We can explain any experimental set-up without any mystery, as you saw from my two superposition papers, where I did just that. If we can do that, then non-locality is disproved.

Not only that, but all of quantum mechanics is basically overturned. Just consult Wikipedia, which tells us in the sidebar of the EPR page that the fundamental concepts of quantum mechanics are "Complementarity · Decoherence · Nonlocality · Quantum state · Superposition · Tunnelling · Uncertainty · Wave function." I have shown that giving quanta real spins destroys most of these concepts, including nonlocality, superposition, complementarity, and the current expression for the wavefunction. I have also shown in other papers that quantum tunneling and decoherence arise from this mistake, or similar mistakes in early math. So, in a sense, quantum mechanics is already dead. I have replaced it with real mechanics, and this mechanics is no different than macro-mechanics. In my theory, no old rules are ever broken, so although I do make major corrections to Newton, and although I accept the major tenets of Relativity, you could call my movement a return to classicism. In fact, I am far more rigorous than those who are now called classicists, including Newton himself. Strictly, I am not returning to any time or any previous -ism. I am cleaning up physics, and doing that pretty much indiscriminately. Although I generally have more respect for physicists before Bohr, since they were more rigorous, I have found big mistakes everywhere I have looked, some of them not really defensible even by the standards of the time. Newton, Laplace, Lagrange, Maxwell, and all the other big guys fudged equations and then attempted to camouflage these fudges. That said, the fudging only became pandemic and fatal after Bohr. Bohr was quite simply the worst thing that ever happened to physics, and I am still mystified by Einstein's respect for him. I can only explain it by Einstein's desire to fit in, and perhaps by Bohr's personal charm. Even after he became famous, Einstein was treated like an outsider, and I think it galled him. He couldn't agree with Bohr, but I think he was gratified to be included in the debate, and didn't wish to appear too aggressive. I could wish that either Einstein or Schrodinger had thought to look more closely at the wavefunction, and had found a way to win the debate 90 years ago. But if they had, I suppose I wouldn't have the joy of doing it myself.