I) I just read an interview of the pianist Keith Jarrett on the web page of the Wall Street Journal on 01/29/2009. Keith Jarrett says:

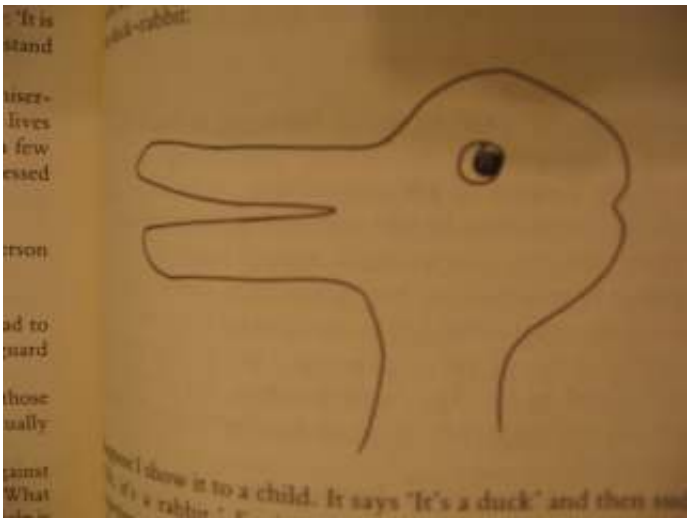
"I once had a conversation with Vladimir Ashkenazy. We were on a cruise with the English Chamber Orchestra and I gave him a tape with some of my improvisations. When he had listened to it, he said, 'How do you play all the right notes?' I said, 'No, you see they just become the right notes by virtue of their environment.' Then he said, 'I'd love to be able to improvise" but I know I'd need so much time to get into the right headspace to do that.' Of course, he didn't use the word 'headspace.' But he knew he'd have to shut everything down. From where they are you can't get to the improvisation and have it be you, because you've been trained outside of yourself.

"If you're improvising and you finish a concert and you're changed forever, that's different from finishing any kind of classical concert, no matter how good. The reason you can't be physically, cellularly changed is it did not come through you. The music was already there."

http://online.wsj.com/article/SB123319724806127435.html

To me the message in the quote above is that the music was there and the role of the pianist was to emulate the right environment in order for the music to be expressed. Wishful thinking? For too long a long time I was puzzled by the question I formulated as: "what would it be to experience the world as a quantum particle?" Had I sought more rapidly an answer to this question I would have understood it did not make much sense. If music may appear to be existing in its right notes and be able to be expressed if the proper environment is set up, then similarly describing or "feeling" a quantum particle behavior outside of a properly defined environment should be possible. Physicists define an observable (usually associated to an experimental project) as morphism between a Boolean lattice and the lattice of properties of the entity under scrutiny. If the entity is "classical" the lattice of propositions is Boolean too and there is no ambiguity in the answers obtained each time one ask a question while if the entity is quantum, the lattice has a different nature, and the answers obtained to the questions asked generally do not have a clear cut, unique answers; they oscillate between several possibilities. In both cases however physicists are bound to the Boolean lattice(s) from which they read the values of their measurements. Like the musician who "can't be physically, cellularly changed" but need this reality to get to the music, there is no way for the physicist to get to the description of the behavior of a quantum particle without being attached to the scale of a measuring apparatus and therefore his knowledge is constrained by this link. This appears to put an end to my question of what it would be like "to be" a quantum particle.

II) For a long time as well I have noticed that when I am faced with a decision to take, I live for a long stretch of time with the possible alternate answers in my head before being compelled by the timeline of the decision to choose one branch of it. This could participate to answering partially the question raised in (I) above, since it appears to be possible to model such kind of process using a generalization of quantum mechanics. This may also give us a hint as to the reason why classical and quantum mechanics are seemingly the two unique modalities addressing question in the physical world: because they already function as such in our brain. This would give credence to the long lasting work that started recently in Brussels under the leadership of Diederick Aerts, and which seeks to apply a generalized quantum formalism to Cognition. Moreover a very recent work by Aerts and D'Hooghe explicitly address the question of one classical logical versus one quantum conceptual thought existing simultaneously with applications to economics, decision theory, and concept theory. It looks much more comfortable however to work in the realm of physics since the possibilities of errors or simply the potentialities to force a model on some data appears to be much larger in the domain of the "social" sciences than in physics. If someone is able to take some experimental data in the field of cognition and shows that it fits a generalized quantum model how does he makes sure that self reference to his own work or the conceptualization of the experiment generating the data, like the order in which the questions were asked, …do not force the system into a quantum description from the start, since the latter preexist in his own conceptual apparatus and may be at work unconsciously. For a specific example I would take the "DuckRabbit" one, Wittgenstein made famous (Wittgenstein, Philosophical Investigations):



In a funny way when we look at this picture we see either a rabbit or a duck. It appears that we have ingrained in us a basis composed of duck and rabbit. It would take a long exercising to get to see the duckrabbit for itself. At will we are able to witness the collapse of the image to either a duck or a rabbit. But contrary to a Stern-Gerlach experiment (with a cache) in which once the spin has been prepared (collapsed) into one of the eigenstates |+> or |-> it is there until another measurement restore the ambiguity, in

concept we can measure the duck to become a rabbit or vice versa fairly at will. This example illustrates well I believe the difficulty of transplanting a quantum formalism, even generalized, to the domain of cognition. One may find similarities but they may be accidental.

When describing experiments in cognition, at the expression level we seek to follow a classical logical thinking, so that one can say: "oh yes he is right, I believe this is true, …" While I am currently writing, I focus on the meaning I want to express and I have the distinct feeling that all along I intend to use a classical logic to make my points more or less clear. But am I right? It is very difficult to trace in the work being done whether there are any processes that would as well show some amount of a generalized quantum behavior and in the event a positive answer would be given to this question, how could it be dealt with and included in the validity of the reasoning process? Moreover this manner of proceeding is induced in stage since the moment I think about the way I am thinking there is an extra stage that automatically appears to set itself up and in principle must be explored. This is not like an experiment in physics (not its interpretation) which ends when the measurements are made and the numbers collected. In cognition at first sight it appears that one has to accept a "last" layer assumed to be classical so as not to generate any ambiguity in the wording and the description of the experiment and which then plays the role the measuring apparatus does in physics.

I understand at this point that the remarks formulated above need to find a much better formulation.

Benoit Boulat, 01/2009