We are here obviously faced with events whose regular and lawful unfolding is guided by a ‘mechanism’ entirely different from the ‘probability mechanism’ of physics. We must be prepared to find a new type of physical law.

Erwin Schrödinger, *What Is Life?* February 1943, p. 28

**Physics of Life: Flipping a Quantum Coin**

To understand the physics of life, first we have to understand Quantum Mechanics\(^{(1)}\).

If Schrödinger’s cat paradox is difficult, look at the light cone from Wikipedia above and consider flipping a quantum coin. Saul Youssef writes in quant-ph/9509004v1:

The situation before the observation could be described by the distribution \((1/2,1/2)\) and after observing heads our description would be adjusted to \((1,0)\). The problem is, what would you say to a student who then asks: “Yes, but what causes \((1/2,1/2)\) to evolve into \((1,0)\)? How does it happen?”

To understand ‘how it happens’, try to trace back your observation ‘heads’ \((1,0)\) from the instant B ‘here and now’. Before ‘heads’ \((1,0)\) happened at B, it *should* have been a quantum coin \((1/2,1/2)\) in you past light cone A, according to the axiom of causality (Wikipedia), \(A \rightarrow B \rightarrow C\) (Piotr Chrusciel).

**Q:** Can you trace back the quantum coin \((1/2,1/2)\) in your past light cone A?
1. If your answer is ‘yes’, please explain (i) the dynamics of converting the quantum coin state $\left(\frac{1}{2}, \frac{1}{2}\right)$ at A into definite state ‘heads’ $(1,0)$ at B, and (ii) the history of the other coin state ‘tails’ $(0,1)$, which was also in your past A, but now is waiting patiently (where?) for the next (in any) flipping of the quantum coin, to get 50/50 chance to be observed.

2. If your answer is ‘no’, please explain why.

3. If your answer is ‘the question does not have an answer’, please explain why.

My answer to the quiz is (3), ‘the question does not have an answer’: the quantum coin $(1/2,1/2)$ is not a fact, and therefore it does not live anywhere on the light cone.

But where is it? What kind of ‘time’ is implied in Schrödinger equation?

As Alfredo Macias and Hernando Quevedo explain in gr-qc/0610057v1, "time in quantum mechanics is a Newtonian time, i.e., an absolute time. In fact, the two main methods of quantization, namely, canonical quantization method due to Dirac and Feynman’s path integral method are based on classical constraints which become operators annihilating the physical states, and on the sum over all possible classical trajectories, respectively. Therefore, both quantization methods rely on the Newton global and absolute time. The absolute character of time in quantum mechanics results is crucial for its interpretation, i.e., matrix elements are evaluated at fixed time, and the internal product is unitary, i.e., conserved in time, and it implies conservation of the total probability. Therefore, time is part of the classical background, which is needed for the interpretation of measurements."

Fine, but again, is the quantum coin $(1/2,1/2)$ located anywhere on the light cone? Read Erwin Schrödinger from 1935:

In general, a variable has no definite value before I measure it; then measuring it does not mean ascertaining the value that it has.

Therefore, the quantum coin $(1/2,1/2)$ cannot have definite values, neither before we measure it nor after we measured it.

But again, is the quantum coin $(1/2,1/2)$ anywhere on the light cone? If not, where is it?

Plato suggested the answer twenty-four centuries ago. In modern parlance, the inevitable non-definiteness of the uncolored Kochen-Specker sphere (Helena Granström) is noumenal ‘monad without windows’ (Leibniz). It defies any mathematical logic. Read p. 44 in ‘Platonic Theory of Spacetime’ from 4 November 2018, available at my website below. Both the quantum coin and the Schrödinger cat exist ‘out there’ as Platonic reality, known as Res potentia. The Moon (David Mermin) also exists ‘out there’, but as physical reality of ‘facts’ (Res extensa) placed only in the past light cone A. The Platonic Res potentia originates “between” null intervals, i.e., “between” photon’s emission and absorption (Kevin Brown). It communicates (p. 44) with matter and fields in the past light cone A only at the event B ‘here and now’ — once-at-a-time (Slide 7), as recorded with a clock. This is not some fake “quantum computing”. This is the physics of life (Erwin Schrödinger). RDFM.

Needless to say, the physics of life cannot be understood without gravity. Many people are brainwashed with the current textbooks in General Relativity, and will claim that gravity is classical phenomenon, because it always has definite values, both before we measure it and
after we measured it. But what makes up ‘gravity’ to become geometric, and not physical, “field”? What is the origin of gravity? Let’s try to find out what this phenomenon is not.

The origin of gravity is not some quantum phenomenon, like the quantum dice above, but the origin of gravity is not some force field either: read the first paragraph in p. 45 and follow the links. Surely the physical contributions to gravity, placed in the right-hand side of Einstein field equations, have always definite values, like the ‘heads’ (1,0) and ‘tails’ (0,1) above, but the left-hand side contains an entirely different, neither quantum nor classical, animal. Many people consider “intuitively clear” to interpret this brand new object as ‘pure geometry’, like the grin of the Cheshire cat without the cat (p. 15), but here’s a catch: “There is no spring or sink everywhere (emphasis mine – D.C.) in spacetime for matter (particles’ plus electromagnetic field’s) energy-momentum” (Zhaoyan Wu), which could be reserved exclusively for gravity, so that gravity could employ such “spring or sink” to interact with matter and fields, say, with a plastic bottle (p. 21) or with “a bead on a stick” (Richard Feynman). We face the same puzzle in the physics of the human brain: if the mind were able to interact with brain’s tissue, then the mind will be a bona fide physical field.

The only available solution is provided with the Platonic theory of spacetime, p. 44. Namely, the quantum-gravitational Res potentia does not live anywhere on the light cone, but only “around” (pardon my French) the event B ‘here and now’ (read above). Physically, we can observe only its physicalized “jackets”, cast only in the past light cone A, once-at-a-time. We may detect these gravitational “jackets” iff their detector is endowed with self-action, like the human brain. Forget about the fake “GW astronomy”. Welcome aboard and RDFM.

If you are not interested in Mathematics and theoretical physics, and are only curious about the basic principle in the physics of life, check out p. 4 and the continuum on p. 39 in the “manual”. The quantum-gravitational, atemporal, and pre-geometric Res potentia springs “within” every geometric point/event, that is, “between” photon’s emission and absorption (Kevin Brown). Its duration, recorded with a physical clock, is zero – read the Greek story on p. 31 therein. In the so-called Arrow of Space, ‘time’ comes from both ‘change in space’ (coordinate “time”) and ‘change of space’. The latter is completely nullified, being “within” every geometric point/event. Hence we enjoy perfect spacetime continuum in the light cone, whereas the Platonic Res potentia is shifted to the potential future. It is accessible only to the living and quantum-gravitational matter. Yes, we can evoke the appearance of its physicalized “jackets” at macroscopic length scale, producing unlimited and ecologically clean energy (p. 45). Yes we can. Don’t ever say that you knew nothing about it.

Finally, I wish to explain why I wrote this online paper. Many years ago, in November 1989, I completed my manuscript on the physics of life, entitled: ‘How to Bind Mind to Matter?’. It was dated 15 January 1990, to mark eighteen years of my study and research, started in January 1972, at age 19. I am already old and probably won’t be around to witness the devastating climate catastrophe, but many younger people, including my loved ones, will. It feels like being forced, along with my children and grandchildren, to sit in a rubber boat, surrounded by a bunch of crazy idiots, who enjoy rafting a rough mountain river toward a gigantic waterfall just a few kilometers ahead (p. 38). All I can do is to tell these people to stop immediately the boat, before it is too late. Now, thirty years ago, I was talking about the physics of life and quantum gravity, but nobody showed any interest, maybe because these issues looked purely academic. But now the situation is totally different (p. 45). There is no viable alternative to the proposal for clean unlimited energy from March 1994 (p. 9). All you need is spacetime and a brain, like the one above your neck.
What will you do, my dear reader? Pretend that you’ve heard nothing and know nothing, and enjoy rafting the river?

D. Chakalov
chakalov.net
8 November 2018
Last update: 11 November 2018, 09:55 GMT

_________________________

¹ Download the latest version from my website at this http URL.