The Elephant in the Water

An exciting new hypothesis about the role of water in living organisms

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We are all absolutely convinced that water is crucial to life. But when it comes to the question of "Why?", the majority of the scientific community will claim that water is only a **solvent** in which biochemical processes occur. However, a small but steadily growing group of scientists does not agree with this worldview and believes that water is also an **actor**, deeply engaged in creating and steering the vast amount of biochemical processes taking place in every living cell.

To better understand why water could also be seen as an actor, we must take a look at recent scientific developments related to (a) quantum computing and (b) material sciences:

A/ Quantum computing

Quantum computing is a rapidly emerging technology that harnesses the laws of quantum mechanics to solve problems too complex for classical computers. Where a classical processor uses bits to perform its operations, a quantum computer uses qubits to run multidimensional quantum algorithms. For qubits to perform their calculations, they must be brought in quantum coherent states of "superposition" and "entanglement". To realise this "quantum coherence", quantum computers must be electronically shielded and cooled down to almost absolute zero temperatures (-273°C).

B/ Material sciences

In 2010, the Nobel Prize for Physics went to Andre Geim and Kostya Novoselov "*for ground-breaking experiments regarding the two-dimensional material graphene*". Graphene is a material composed of carbon atoms grouping that are hexagonally positioned. This arrangement results in carbon monolayers of an atom thick. Because of this structure, graphene is e.g. approximately 200 times stronger than steel. Recently, scientists proposed that because of the way these carbon atoms -including their electrons- are ordered within hexagonal crystalline sheets, graphene could be used to build next-generation quantum computers which should also function at room temperatures.

Why does this matter, and what does this have to do with water?

In Nature, we see many processes which can only be explained the way quantum computers are working. An interesting example is the extremely efficient energy transport during the process of photosynthesis. During this transport, the excited energy of an incoming photon is always following the shortest path to the reaction centre of a cell. To solve such "travelling salesman routes", enormous "classical computing" power is required. Here scientists are proposing that the noisy, warm and wet interior of a living cell could be the "quantum environment" which drives this quantum dynamics and maintains "quantum coherence" in the process of photosynthesis, rather than destroy it.

This leads us to the main question *"if water could be the quantum computer"*?

To answer this question, we must take a more in-depth look at recent discoveries related to the structure of water. Researchers lately taught us that water close to hydrophilic surfaces begins to organise itself into hexagonal crystalline sheets, dividing itself into two layers, one of which begins to transform into an entirely new form of structured or "coherent" water, different to any bulk water with which we are familiar. Further experiments showed e.g. that water inside carbon nanotubes -whose inner dimensions are not much bigger than a few water molecules- froze solid and looked like crystals, this even at high temperatures that would normally set it boiling.

The "Elephant in the Water" hypothesis states that once water becomes coherent, it forms graphene-like hexagonal crystalline sheets. Because of this structure, the ordered water molecules are now able to receive, process and transmit information based upon exactly the same principles which drive quantum computing. This hypothesis is further based upon the fact that many biological processes are too complex to explain in any other way, while we also see more and more evidence that quantum computing -unshielded and at room temperature- is at work in Nature.