

Glue, Memory, and Quantum Biology

Lecture dedicated to the memory of Ray Paton

Koichiro Matsuno

Department of Bioengineering
Nagaoka University of Technology
Nagaoka 940-2188, Japan

Abstract: The notion of glue or gluing one molecule to another coined first by Ray Paton has been instrumental in forming the core structure of the burgeoning quantum biology. Cohesive interactions met in biology are more than what physics has revealed so far under the name of attractive interactions. The gluing function underlying cohesive interactions ubiquitous in the biological realm is prior to precipitation of glues as material substrates. Deciphering what the activity of gluing is all about can be made as consulting the transitive activity embodied in various transitive verbs. Focusing on transitive verbs is more than just a mere linguistic metaphor, and provides a concrete material means for approaching various biological activities in quantum mechanical terms. The gluing is intrinsically local in its exercise, and the associated spatio-temporal horizon remains finite. The action referred to in the form of a transitive verb on the spot is in the present progressive tense, which can subsequently be transferred into the past progressive tense. The gluing first occurs in naturally accommodating the transference of multiple agencies acting in the present progressive to the single agency surviving in the past progressive tense. Part of those events registered in the past progressive tense can be frozen in the present perfect tense, whose material manifestation is in the occurrence of a quantum after Max Planck. An energy quantum experiencing other quanta of a similar nature provides an opportunity of transforming itself further as resuscitating what has once been registered in the present perfect tense again in the present progressive tense. Memory of biological origin as a key testimony of quantum biology can gradually develop and precipitate as repeating the cycle from the present progressive to the present perfect tense and back exclusively on material grounds.
