

# When does "big" state function reduction as universal death and re-incarnation with reversed arrow of time take place?

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## Abstract

In ZEO based view about quantum measurement theory as theory of consciousness one has two kinds of state function reductions (SFRs). The ordinary "big" SFRs (BSFRs) and "small" SFRs (SSFRs). BSFR changes the arrow of geometric time and is identified as death of self identified as a sequence of SSFRs, which do not change arrow of time but increase the size of self by keeping passive boundary in place and states at it unaffected but increasing the size of CD by shifting the upper boundary towards future. Both boundaries increase in size. The 3-surfaces at the active boundary form a kind of log file about events in the life of self and - contrary to expectations - the memories are stored to geometric future.

In this article the question under what conditions BSFR takes place is considered using biological death as a starting point. It is found that metabolic conditions dictate its occurrence. The condition that the decay of biomolecules and larger structures in biological death corresponds to their generation for time-reversed re-incarnate gives testable predictions.

## 1 Introduction

In ZEO based view about quantum measurement theory as theory of consciousness one has two kinds of state function reductions (SFRs) [L1, L3]. The ordinary "big" SFRs (BSFRs) and "small" SFRs (SSFRs) [L5]. BSFR changes the arrow of geometric time and is identified as death of self identified as a sequence of SSFRs, which do not change arrow of time but increase the size of self by keeping passive boundary in place and states at it unaffected but increasing the size of CD by shifting the upper boundary towards future. Both boundaries increase in size. The 3-surfaces at the active boundary form a kind of log file about events in the life of self and - contrary to expectations - the memories are stored to geometric future.

Under what conditions does "big" state function reduction (BSFR) changing the arrow of time take place? I have proposed several ad hoc guesses about this. One example is following. If the  $h_{eff} = n \times h_0$  assignable to the CD or its active boundary does not change in SSFRs, the entanglement can become such that the diagonalized density matrices does not have eigenvalues in the extension of rationals considered and one can argue that BSFR is forced to occur. The proposal for how the sequence of SSFR could in special case correspond to a sequence of iterations for a polynomial of degree  $n$  [L4] is however in conflict with the constancy of  $n$ .

The hypothesis is that BSFR corresponds to the death of self followed by re-incarnation with opposite arrow of geometric time in universal sense. This suggests that one should look what one can learn from what happens in the death and birth of biological organism, which should now take in opposite arrow of time. It is found that metabolic conditions dictate its occurrence. The condition that the decay of biomolecules and larger structures in biological death corresponds to their generation for time-reversed re-incarnate gives testable predictions.

## 2 Under what conditions does BSFR take place and what happens in it?

In the following the question under what conditions BSFR takes place and what happens it is discussed by taking biological death as a guideline.

1. Death certainly occurs if there is no metabolic energy feed to the system. Metabolic energy feed is guaranteed by nutrition using basic molecules as metabolites. Since the increase of  $h_{eff}$  quite generally requires energy if other parameters are kept constant and since the reduction of  $h_{eff}$  can take spontaneously, the metabolic energy is needed to keep the distribution of values of  $h_{eff}$  stationary or even increase it - at least during the growth of organism and perhaps also during the mature age when it would go to increase of  $h_{eff}$  at MB.

If the size of CD for at least MB correlates with the maximum value of  $h_{eff}$  or its average, the size of CD cannot grow and can be even reduced if the metabolic energy feed is too low. The starving organism withers and its mental abilities are reduced. This could correspond to the reduction of maximum/average value of  $h_{eff}$  and also size of CD.

One can argue that if the organism loses metabolic energy feed or is not able to utilize the metabolic energy death and therefore also BSFR must take place.

2. In ZEO self-organization reduces to the second law in reversed direction of geometric time at the level of MB inducing effective change of arrow of time at the level of biological body [L2]. The necessary energy feed correspond to dissipation of energy in opposite time direction. In biological matter energy feed means its extraction from the metabolites fed to the system. One could say that system sends negative energy to the systems able to receive it. A more precise statement is that time reversed sub-system dissipates and metabolites receive the energy but in reversed time direction.

In living matter sub-systems with non-standard arrow of time are necessary since their dissipation is needed to extract metabolic energy. The highest level dissipates in standard time direction and there must be a transfer of energy between different levels. This hierarchy of levels with opposite arrows of geometric time would be realized at the level of MB.

These observations suggest that one should consider the reincarnation with opposite arrow of time with wisdom coming from the death of biological systems.

1. We know what happens in death and birth in biological systems. What happens in biological death should have analogy at general level. In particular, in death the decay of the system to components should occur. Also the opposite of this process with reversed arrow of time should take place and lead at molecular level to the replication of DNA and RNA and build-up of basic biomolecules and at the cell level to cell replications and development of organs. How these processes could correspond to each other?
2. The perceived time corresponds to the hyperplane  $t = T/2$  of CD, where  $T$  is the distance between the tips of CD and therefore to maximal size of temporal slice of CD. The part of CD above it shifts towards future in SSFRs. In BSFR part of the boundary of space-time surfaces at the active boundary of CD becomes unchanging permanent part of re-incarnate - kind of log file about the previous life. One can say that the law of Karma is realized.

If CD decreases in size in BSFR the former active boundary keeps its position but its size as distance between its tips is scaled down:  $T \rightarrow T_1 \leq T$ . The re-incarnate would start from childhood at  $T - T_1/2$  and would get partially rid of the permanent part of self-hood so that new permanent part would be between  $T/2$  and  $T - T_1/2$ . Reincarnate would start almost from scratch, so to say. The part between  $T - T_1/2$  and  $T$  would be preserved as analog of what was called BIOS in personal computers.

3. At the moment of birth CD possibly would thus decrease in size and the former passive boundary between  $t = T/2$  hyperplane and lower tip of new CD at  $T - T_1$  would become active and the seat of sensory experience. Where the analog of biological decay is located?

The region of CD above  $T/2$  and  $T - T_1/2$  is the only possible candidate. This region is also the place, where the events related to birth in opposite time direction should take place.

The decay of previous organism should correspond to the development and birth of re-incarnated organism. The decay of organism dissipates energy in standard time direction: this energy could be used by the re-incarnate as metabolic energy.

This vision might be tested. The replication of DNA and RNA and build-up of various bio-molecules should be time-reversals for their decays. The same applies to the replication of cells and generation of organs. Replication of DNA is self-organization process in which second DNA strand serves as a template for a new one. The decay of DNA should therefore involve two DNA strands such that the second DNA strand serves as a template for the time reversed replications. The double strand structure indeed makes possible for the other strand to decay first. One could even ask whether the opposite inherent chiralities of DNA strands correspond to opposite arrows of time. Maybe this could be seen as a kind of explanation for the double strand structure of DNA.

In biology pairs of various structures often occur and maybe they could correspond in some sense to time reversals of each other. Also cell replication should use another cell as replicate and same would happen in the cell decay.

4. Eastern philosophies talk about the possibility of liberation from Karma's cycle. Can one imagine something like this? The above picture would suggest that in this kind of process the reduction of the size of CD does not occur at all and therefore there would be no decay process equivalent to the growth of time reversed organism. This would serve as an empirical signature for the liberation if possible at all. CD would continue to increase in size or perhaps keep its size. It would seem that a new kind of non-biological source of metabolic energy is needed.
5. Mental images should correspond to sub-selves and therefore sub-CDs of CD. The idea that the re-incarnations of mental images correspond to re-incarnations with a reversed arrow of time is very attractive. After images is the basic example. Only the after images with standard arrow of time would be experienced by us. Are the after images sensory memories of subjective past involving communication with re-incarnated visual mental image?

The original, rather natural, proposal was that the after image is in the geometric past but according to the new view it would be shifting with the active boundary of CD towards geometric future at the active boundary of CD as a kind of log file. To remember it as sensory mental image requires communication with it along active boundary involving both future and past directed signals.

One can imagine also more mundane explanation for after images in terms of propagation of dark photon signals along closed magnetic loops giving rise to periodically occurring mental images.

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