DMT, pineal gland, and the new view about sensory perception

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Abstract

What distinguishes TGD from neuroscience is that sensory receptors are assumed to serve as carriers of sensory percepts. Zero energy ontology (ZEO) providing new view about time and memory allows to solve the basic objections related to phantom limb phenomenon: pain in phantom limb would be sensory memory.

The assumption that sensory percepts are artworks rather than passive records of sensory input requires virtual sensory input from brain to sensory organs and build-up of the final percept by pattern recognition - an iterative procedure involving very many forth-and back signals. Nerve pulse transmission is quite too slow process to allow this and signals propagating with maximal signal velocity are suggestive.

Nerve pulses and neurotransmitters would not represent real communication but give rise to temporary intra-brain communication lines along which communications as dark photon signals would take place with maximal signal velocity using dark photons (characterized by $h_{eff}/h = n$) transforming to biophotons in an energy conserving manner. Neurotransmitters and also other information molecules (hormones, messengers) attached to receptors would serve as bridges fusing permanent but disjoint communication lines along axons to a connected temporary communication line for dark photons to propagate. Nerve pulses would also generate generalized Josephson radiation allowing communications between biological body (BB) and magnetic body (MB) using EEG. Meridian system would be permanently connected system of communication lines.

This picture leads to a concrete proposal about the roles of DMT and pineal gland concerning imagination and dreams and hallucinations.

Contents

1 Introduction

The recent discussions with artist Sini Kunnas [L2] about perception as creation of an artwork inspired additional insights about how sensory perception, imagination as almost sensory perception, dreams and hallucinations as virtual percepts, and their motor analogs relate to each other.

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The assumption that sensory percepts are artworks rather than passive records of sensory input requires virtual sensory input from brain to sensory organs and build-up of the final percept by pattern recognition - an iterative procedure involving very many forth-and back signals. Nerve pulse transmission is quite too slow process to allow this and signals propagating with maximal signal velocity are suggestive.

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2 Zero energy ontology (ZEO)

Zero energy ontology distinguishes TGD from standard model, and this distinction plays a key role in TGD based view about consciousness and sensory perception.

1. In ZEO quantum states are pairs of positive and negative energy states. Positive energy states are analogous to the usual quantum states assignable to time=constant section of space-time. Time=constant section is replaced with a pair of 3-surfaces located at the opposite boundaries of causal diamond (CD) defined as the intersection of future and past directed light-cones of M^4 with each point replaced with CP_2. CDs form a hierarchy with CDs within CDs. In consciousness theory CD is identifed as the perceptive field of self and sub-CDs correspond to subselves defining mental images of self.

   Space-time surfaces are preferred extremals of certain action serving as analogs to Bohr orbits having 3-surfaces at the opposite boundaries of CD as their "ends". Quantum states are quantum superpositions of preferred extremals. Holography is realized in the sense that 3-D data (3-surfaces) at the boundaries of CD fixes the space-time surface. In fact, preferred extremal property implies what I call strong form of holography (SH): 2-D data at string world sheets and partonic 2-surfaces is enough to fix the preferred extremals.

2. ZEO forces a modification of the standard quantum measurement theory. One must allow moduli space for CDs corresponding to a varying temporal distance between the tips of CDs. Lorentz transformations leaving the second tip of CD invariant generate new CDs. Besides this the position of the tip of CD can vary: one has full Poincare group transforming CDs to each other.

   During unitary time evolution the passive boundary of CD and members of state pairs at it are unaffected: they represent prepared state. The sequence of unitary time evolutions of this kind gives rise to a generalization of Zeno effect or what is called weak measurement.

   Active boundary becomes delocalized in moduli space of CDs with fixed passive boundary and also the states at it are affected in given unitary evolution. "Small" state function reduction localizes the active boundary in the moduli space. The distance between the tips of CD increases during sequence of "small" reductions.

   The observables measured in "small" state function reduction must commute with the observables, whose eigenstates the states at the passive boundary are. It sooner or later happens that all possible observables are measured and "big" reduction occurs and changes the roles of the boundaries of CD.

3. From the point of view of consciousness theory "big" reduction means death of the self assignable to a given choice of passive boundary and re-incarnation of self with opposite arrow of geometric time: active and passive boundaries of CD change their roles.

The state function reduction sequence defining experienced time is mapped to a clock time defined by the increasing temporal distance between the tips of CD maps defined by sequences of unitary evolutions followed by "small" reductions. Only correlation would be in question. The identification of these times would lead to the well-known problems both in the philosophy of free will and in quantum measurement theory.

4. Since zero energy states are 4-D in well-defined sense, one can say that also the geometric past changes in state function reductions - this gives a connection with Libet's findings about active aspects of consciousness [J1]. Signals can propagate in both time directions, which allows to fuse sensory percepts and memories to single 4-D perception: CD and sub-CDs represent the 4-D perceptive field.

   Sensory input would be localized in good approximation near the active boundary of CD whereas the other aspects of 4-D percept would be interpreted as memories - mental images (subselves) located in geometric past. Symbolic representation of memories (only cognitive mental images) would allow to distinguish sensory "Now" from past. Sensory memories are in principle possible and can be indeed induced by electric stimulation of temporal lobes. Some people with cognitive defects might be more or less permanently in a state of consciousness in which sensory input is 4-D (memory feats of autists). Memories could be also seen as communications with geometric past inside CD. Motor actions could be seen as sensory perceptions in non-standard direction of time.

3 A new view about the role of nerve pulses in sensory perception

Sensory perception would in TGD generate sensory mental images at sensory organs: this would solve a basic problem of neuroscience due to the similarity of neural tissue in various sensory areas. The new view about time and memory implied by ZEO solves the problem cause by the phantom limb. The pain in phantom limb is sensory memory of pain. The stimulation of temporal lobes indeed generates sensory memories, and people with cognitive inpairment are known for memory feats such as being able to draw some building seen in past with every detail or to learn music pieces with single listening. These feats can be understood if memories correspond to "seeing" in time direction with beam of dark photons travelling to past reflected back. ZEO allows this.

Also Libet's findings about active aspects of consciousness [J1] involving subject person deciding to raise his index finger and reporting it to experimetner can be understood in ZEO without giving up the notion of free will. In the quantum jump also the geometric past would be affected and this would explain why neural activity begins fraction of second before the conscious decision the subject person decides to raise his index finger.

Since perception involves a lot of processing this would require forth-and back signaling between brain and sensory organs. There would be virtual sensory input from brain or via brain. Sensory percept would be an artwork, standardized mental image, resulting as pattern recognition assigning to sensory input standardized mental image nearest to the input.

1. Nerve pulses would not mediate information inside brain. They would only build short connections between existing flux tube connections parallel to axons. Same happens in old fashioned telephone network by relays: it would be energy consuming to keep the connections on all the time.

   The velocity of nerve pulse conduction is quite too slow to realize the iteration leading to a standardized sensory mental image. If the signal velocity is light velocity, duration of order 1 ms for nervepulse also for 10 cm neural pathway about 10^6 forback travels between sensory cortex and retina.

   Communications would occur by dark photons signals with $h_{eff}/h = n$ and with maximal signal velocity allowing for an iteration leading to standardized percepts as near as possible to the sensory input and representing only the essential features. Dark photons could transform in energy conserving manner to biophotons with energies in visible and UV range (at least) and thus above thermal energy and therefore having effects not masked by thermal radiation. Brain is known to emit biophotons and they are also associated with axons [K4, K3].

2. All information molecules (neural transmitters, hormones, messengers) would be connection builders so that the view of neuroscience would be badly wrong here. I have discussed this idea earlier but in slightly different form: the proposal was that information molecules are attached to the end of a flux tube getting longer as the molecule travels to its target. This is possible but un-necessary since it is enough to build just the bridge between existing connections.

   Remark: The view of neuroscience might be very different if information technologies would have been known century ago. Same applies to homeopathy and water memory [K2], which still remains curse words in mainstream science, although a lot about the mechanisms involved is known.

   The standard view about learning as strengthening of synaptic connections would translate to a gradual build-up of permanent flux tube connections so that communications with dark photon signals would be possible all the time. This would lead to fusion of sender and receiver to single quantum entangled system.

   If the meridians of acupuncture network correspond to this kind of permanent network, they would not require nerve pulses, transmitters, nor information molecules.

3. Nerve pulse patterns would however generate Josephson radiation at EEG frequencies propagating from brain to its MB from axonal membranes serving as Josephson junctions. EEG would code the nerve pulse patterns as frequency modulated Josephson radiation [K1].

This picture leads also to a more precise vision about how anesthetes act on human brain. The popular article "Scientists Just Changed Our Understanding of How Anaesthesia Messes With The Brain" (see `http://tinyurl.com/y8vxuorf`) tells about the [J2] finding that anesthetes weaken the communications between neurons (see `http://tinyurl.com/y976p94b`). It is found that an anesthete known as propofol restrics the movement of protein syntaxin 1a appearing as neurotransmitter at synapses and neurons.

The TGD inspired explanation for the loss of consciousness would be following. Nerve pulse activity is needed to generate neurotransmitters attaching to the receptors of post-synaptic neuron and in this manner forming connections between pre- and post-synaptic neurons giving rise to networks of active neurons. The transmitter would be like a relay in old-fashioned telephone network. Propofol would prevent the formation of the bridges and therefore of the networks of active neurons serving as correlates for mental images. No mental images, no higher level consciousness. At deeper level flux tube networks would accompany the networks of active neurons as already explained.

The earlier TGD inspired proposal was that anesthetes induce a hyperpolarization reducing the nerve pulse activity. How anesthetes could induce hyperpolarization [L1] (see `http://tinyurl.com/yatfreqe`): the model involves microtubules in an essential manner. Hyperpolarization would have same effect as the restriction of the movement of syntaxin 1a. This mechanism might be at work during sleep and also some anesthetes (but not propofol) could use it.

4 The role of DMT and pineal gland

Concerning sensory perception, dreams, hallucinations (psychedelic experiences), and imagination the roles of DMT and pineal gland are extremely interesting and suggests a unified view about these aspects of consciousness.

1. Pineal gland is third eye in quite concrete sense for some amphibians and reptiles. This suggest that it still has some function: biology does not invest metabolic energy without return. Could pineal gland serve as the eye of imagination?

   Dark photons would arrive from brain or via brain to pineal gland and give rise to imagined sensory experiences (almost seeing, almost hearing, ... thoughts as internal speech, etc...). All these signals would be realized in terms of dark photons in different wave length ranges for various sensory qualia and the entire energy range of biophotons could be involved: visible light involves one octave in good approximation. At this level perception would be basically "seeing".

2. DMT (N-N dimethyltryptamine, see http://tinyurl.com/osfg9r3) is the only psychedelic manufactured by brain itself: in pineal gland (see http://tinyurl.com/86joshm) in the case of rodents and therefore also in the case of higher mammals.

   Remark: In "DMT" "N-N" refers to two nitrogen atoms; "Dimethyl" refers to two CH_3 groups replacing H; ttryptamine is the only amino-acid having two aromatic rings.

   Endogenous DMT could have same role as psychedelics and could induce dreams. The state between wake-up and sleep is somewhat analogous to REM sleep and characterized by hallucination like sensory percepts. This cold be due to DMT. During wake-up state dreams would be intefere with genuine sensory percepts and would be replaced by imaginations. It would seem that the virtual sensory percepts associated with the build-up of sensory percept and via pineal gland must be independent.

3. The binding of DMT to receptors in pineal gland would give rise to small bridges connecting disjoint dark photon carrying flux tubes to connected flux tubes going down to sensory organs, where the dark photon signals would give rise to dreams and hallucinations. What would be needed is that dark photons induce sensory stimulus at sensory organ.

   Remark: Interestingly, the inverted structure of the lense in eye is optimal for receiving virtual visual input.

4. Also motor actions would be prepared by iterative process analogous to the build-up of sensory percept but in reverse direction of time as Libet's findings [J1] about active aspects of consciousness (volition) suggest. Motor action would be sensory perception in opposite direction of time: this makes sense in ZEO one makes distinction between experienced and geometric time. Imagined motor actions would be mediated by similar mechanism involving DMT and pineal gland.

A further fascinating possibility is that the flux tube connections extend even to outer space, to the brains of members of advanced civilization in distant galaxies. Could the experiences about encounters with ETs or god-like creatures reported by the uses of psychdeles could be real?

1. This is in principle possible since in TGD Maxwellian fields are topologically quantized. Magnetic field decomposes into flux tubes represented as flux sheets in many-sheeted space-time. One can say that any system has field identity, field body.

2. Dark photons can travel along the flux tubes of MB to arbitrary distances without weakening of the signal as in Maxwellian world.

3. ZEO allows also signals in non-standard time direction so that it is possible to send signal which is time-reflected back as signal in opposite time direction: this can happen almost instantaneusly so that finite light-velocity ceases to be a restriction to communications.

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