

## **TGD Inspired View About Remote Mental Interactions and Consciousness-Related Anomalies: Part II**

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### Abstract

In the second part of an article devoted to the updated vision about parapsychological phenomena and remote mental interactions, I will discuss some applications of the basic vision provided by TGD. First the notion of conscious hologram is discussed from the point of view of remote mental interactions. The notion of magnetic body is in decisive role as it is also in the understanding of quantum biology in TGD framework.

TGD inspired model for OBEs relying on the notion of magnetic body is summarized. The idea is that OBEs could correspond to sensory experiences assignable to magnetic body rather than real body. Also the connections with the work of other researchers, such as Shnoll, Persinger, and Tiller are discussed briefly. The challenge of testing the vision is also considered.

**Keywords:** Consciousness; Quantum biology; Remote mental interactions; Quantum Entanglement; Hologram;

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## 1 Conscious hologram and remote mental interactions

The notion of conscious hologram allows also a unified description of remote mental interactions.

### 1.1 Big vision

The notion of conscious hologram, which is based on the generalization of the notion of Feynman diagram, provides a general view about remote mental interactions.

1. Brain can be seen as a part of a gigantic dynamical and fractal brain consisting in fact of the entire universe. The same mechanisms that at the brain level work also work at larger length and time scales. Brains/bodies serve as 'neurons' for the magnetospheric selves receiving information from several brains/bodies. In particular the fusion of the mental images defined by similar structures can give rise to stereo-consciousness, and the notion of species consciousness and even multi-organ consciousness associated with various kinds of organs makes sense.
2. The notions of super-genome and hyper-genome provide a concrete view about how transpersonal levels of self-hierarchy are realized. Super genes are magnetic flux sheets containing sequences of genes like text lines at the page of book. Hyper genes are flux sheets containing sequences of super-genes belonging to different organisms as genetic text lines. This picture conforms nicely with and generalizes Sheldrake's species memory and 'alike likes alike' rule. It also suggest a concrete realization of remote biological mental interaction based on activation of gene expression and nerve pulse activity.

The simplest guess is that the flux sheets associated with super-genome and hyper-genome have field strengths equal to .2 Gauss, which is  $2/5$  of the nominal value of the magnetic field of Earth (this from the observation that field strength of this magnitude explains the effects of ELF radiation on vertebrate brain). The correlation of the quality of remote cognition performance with sidereal time [J12]

leads to the hypothesis that also the flux quanta of galactic magnetic field couple somehow to living matter.

3. Besides time mirror mechanism charge entanglement realized in terms of  $W$  MEs is a basic mechanism of remote mental interaction. The simplest model for the generation of nerve pulse is based on quantum jump leading to a state in which Bose-Einstein condensate of  $\text{Ca}^{++}$  and/or  $\text{Mg}^{++}$  becomes exotically ionized and generates charge flow through cell membrane. Quite generally, charge entanglement would be part of the ordinary bio-control realized in terms of  $\text{Ca}^{++}$  waves. Charged entanglement provides also a mechanism for the sharing of mental images between magnetic body and biological body. There is no reason why this mechanism could not work also at the level of other remote mental interactions than those that we are too familiar with to realize that remote mental interactions are in question. The typical time 13-15 seconds associated with the remote realization of intentions by Qigong masters [J7] could correspond to a typical duration of  $W$  entanglement.

The models for bio-photons [I2] and Gariaev's findings [I3] suggest a tentative model for how remote mental interactions proceed. Charged entanglement via  $W$  MEs makes possible sharing of mental images. After a reduction of entanglement the generation of positive and negative energy MEs occurs and involves time mirror mechanism making possible remote metabolism and communications of declarative memories. In the case of ordinary bio-control magnetic body utilizes the metabolic energy resources of biological body.

4. Association mechanism works also for remote mental interactions. The mechanism relies on MEs and magnetic flux tubes with neuronal firing and metabolic activities being side products of this mechanism.
5. One of the strange findings about remote mental interactions is that remote viewer can receive information about an object for which she knows only coordinates, which as such are meaningless numbers to her. It is also commonly reported that erroneous readings or interpretations of the target tend to propagate to other viewers. These findings suggest that magnetospheric (earthly or galactic magnetosphere could be in question) dynamical multi-brained selves act as kind of relay stations mediating the remote contact between remote viewer and object. If some brain knows the meaning of the coordinates of the target, this is enough to connect remote viewer to the correct target.

Empirical support for the notion of multi-brained collective levels of consciousness comes from the experiments of Mark Germaine [J8]. An operator and a subject person were involved. The stimulation of the subject person consisted of a sequence of identical sounds containing now and then an odd-ball stimulus (now silence). The odd-ball stimulus generated an event related potential (ERP) visible in EEG and reflecting the conscious reaction. The operator was in a second room and by simple toss of coin decided whether to observe the stimuli in the computer monitor or not. The stimuli appeared in the computer monitor one second before they were heard by the subject person.

What was found that when the operator saw the odd ball stimulus from the computer monitor, the ERP was weaker on the average. An 11 Hz periodicity was the major component in the difference profiles.

The simplest explanation is that the brains of both the operator and of the subject person belong to a larger multi-brained self and that the evoked response represented partially the reaction of this self. When this multi-brained self had already seen the stimulus through the operator's eyes, it was not so surprised to hear this stimulus again through the ears of the subject person, and ERP was weaker.

The appearance of the 11 Hz periodicity suggests that this frequency is an important correlate for the entanglement of the subject person's mental images with those of some multi-brained magnetospheric self. The cyclotron frequencies of most bosonic ions in Earth's magnetic field are in alpha band so that the finding is consistent with the vision about a fractal hierarchy of generalized EEGs associated with the dark matter hierarchy (see chapter *Dark Matter Hierarchy and Hierarchy of EEGs* of [K8]). The notion of hyper-genome provides a detailed model for how transpersonal levels of self hierarchy control the behavior of groups of individuals. The hypothesis could be tested by looking whether the gene expressions of individuals having close personal relationship but not in a direct personal contact correlate.

## 1.2 Sketch for what could happen in a typical remote viewing experiment

Consider a situation in which a system consists of remote viewer A, person B knowing the position of target T and the coordinates XYZ for it. B gives the coordinates XYZ for person C in turn giving them to the remote viewer A. The following simplified sketch assumes that communication channels are permanent and that the intentions involved with the process are realized as p-adic space-time sheets in the brain of A, and very probably involve p-adic MEs as representations of the intentions.

1. Remote viewer A, person B who has target-XYZ association as two mental images in his brain, and target T have permanent bridges to a magnetospheric multi-brained self M. Therefore M knows the target-XYZ association via the brain of B.
2. Remote viewer A acts as a "client" of the multi-brained self M using the remote sensory services provided by M. A-M contact is more or less permanent: this is what it means to have the ability to remote view. Minimum requirement is the existence of magnetic flux quanta connecting A to M. The sharing of mental images requires generation of entanglement, say charge entanglement by  $W$  MEs. This would correspond the most primitive passive mode of remote viewing.  $W$  mode allows to share also mental images of primitive living systems like plants, and even those assignable to system regarded usually as in-animate. The reduction of charge entanglement makes possible remote mental interaction since resulting charge non-equilibrium generates currents: generation of nerve pulse and  $Ca^{++}$  waves would represent basic example of this kind.
3. One can imagine also active mode of remote viewing and this could be involved with telepathy: in this case M would not be involved. This mode involves in-

tentional action (p-adic MEs are transformed to their real variants) and classical communications with the geometric past/future using neutral negative/positive energy MEs could realize declarative memories/"declarative" precognition as well as motor action based on classical communications using symbolic representations. The model for bio-photons suggests that  $Z^0$  and em MEs are generated after the reduction of charge entanglement. The ability to predict reasonable well the personal future could rely on "declarative pre-cognition". The evolution from bicameral mind to modern consciousness (see chapter *Semitrance, Language, and Development of Civilization* of [K3]) could have proceeded from a mere sharing of mental images by  $W$  MEs to complex classical symbolic communications involving also neutral MEs.

4. Since  $M$  cannot be assumed to have anything comparable to a nervous system, A-M communications should rely on sharing of mental images. That is, the intention of  $A$  (p-adic space-time sheet in brain of  $A$  perhaps) to remote view and the questions of  $A$  about the target would be shared by  $M$ . T-M communications could involve classical communication with light velocity generating magnetospheric sensory representation about the target by self-organization. The 13-17 second delay of remote mental interactions [J7] could correspond to the typical duration of charge entanglement. Target could be also "non-living": it is quite possible that magnetospheric selves form sensory representations also about "non-living" matter. The finding that meteor sounds have frequency spectrum in the 40 Hz band of thalamocortical resonance frequencies, rather than in the predicted 20-20.000 Hz band, supports the view that magnetospheric sensory representations at 40 Hz resonance band are associated also with the non-living matter (see chapter *Magnetic Sensory Canvas Hypothesis* of [K8], see also [F1]). Also the vision about dark matter hierarchy conforms with the idea about Earth's magnetosphere as a living organism.
5. Remote viewing by the sharing of mental images means that there are no sensory receptors associated with the passive mode of remote viewing: no such receptors have been identified [J6]. Various physiological correlates (say EEG patterns) of remote viewing should be reactions to the shared mental image rather than direct correlates of it. If primary sensory qualia are at the level of sensory organs, remote viewing differs from hallucinations in that there is no feedback to the retinas from cortex responsible for "qualiafication": this could provide be a clear-cut test. At least in the case of living targets the laws that govern the ordinary sensory perception should hold true for the remote viewing. For instance, the known correlation of the AC performance with the spatial and temporal entropy gradients of the target should hold true for living targets. Even in the case of a non-living target similar correlation holds true if the sensory perception of magnetospheric selves obeys same laws as that of ours: there is some evidence for the correlation of the entropy of non-living target with the AC performance [J6].

### 1.3 About the physiological correlates of anomalous cognition

In the article "Physiological correlates of Psi cognition" of Charles Tart [J13] some apparently contradictory findings about physiological correlates of anomalous cognition

are described besides the experimental findings of Tart. Changes in EEG, galvanic skin response, finger pulse, and basal skin resistance are examples of possible candidates for the physiological correlates of remote mental interactions.

The findings are following.

1. The first class of experiments involves two persons: subject and agent. The agent is subjected to various kinds of stimuli inducing emotional response: sudden sounds, painful stimuli as in the experiments of Targ, etc.. Subject person is typically in a sound proof room and tries to remotely cognize when subject person experiences these stimuli. Various candidates for the physiological correlates are measured. The physiological correlates typically express a heightened arousal. For instance, in the experiments of Tart [J13] galvanic skin response occurred more frequently, and EEG became more complex with more beta waves and fewer alpha, theta, and delta waves.
2. In the second kind of experimental arrangement remote viewing or telepathy is involved but the second person, if present at all, is not subject to any stimuli inducing emotional reaction. Now the physiological correlates tend to be characteristic for a relaxed state of mind. The increase of the basal skin resistance is one such correlate.

At first these findings might seem to be contradictory. The paradox disappears if sharing of mental images is in question and if the mental images induce same emotional response in the subject person as in the agent.

The remotely perceived (possibly sub-conscious) stimulus or remote anticipation of the stimulus induces in the subject person an emotional reaction having as a correlate the reduction of skin resistance. In the experiments of Tart [J13] both the real electrical stimulus experienced by the agent and the electrical stimulus guide by the operator to an electrical resistance instead of the agent, generates the arousal in the subject. This requires that both the operator, agent, and subject belong to the same multi-brained self so that the reaction of the subject can be interpreted as a kind of conditioned reaction of the multi-brained self expressed via the body of the subject.

#### **1.4 Local sidereal time, geomagnetic fluctuations, and remote mental interactions**

The article of J. Spottiswoode [J12] discusses two strange findings about remote mental interactions.

1. There is a statistical tendency of the anomalous cognition (AC) performance to concentrate in a 2 hour period around 13.30 of the local sidereal time (ST), which is the time measured using as a reference distant stars and thus running at a slightly different rate than the solar time: the lag is  $\Delta T = 24/365$  hours  $\sim 3.7$  minutes during 24 hours.
2. The anticorrelation between the level of geomagnetic fluctuations and AC performance has also a maximum during 2-hour period around  $\sim 13.30$  ST.

The fact that AC performance is associated with the same sidereal hour suggests the identification of the galactic magnetosphere as a conscious involved with remote cognition. For interstellar and galactic magnetic fields cyclotron time scales correspond to the time scales of human consciousness so that also these magnetic flux quanta could receive sensory input from biosphere and control it.

#### 1.4.1 Support for the role of magnetospheric consciousness

The so called ap index measures the intensity of the fluctuations of the Earth's magnetic field. If the magnetosphere is a conscious entity, ap index can be interpreted as a measure for the level of arousal of the magnetospheric mind. The negative correlation between ap and AC performance tells that AC is most probable, when the magnetosphere is in a "calm state of mind". This is natural since only in this kind of situation the noise masks minimally the signals from the galactic magnetosphere.

The local magnetic noise produced by the modern high tech environment is much stronger than the geomagnetic noise but this does not matter. If artificial magnetic fields correspond to  $k_d = 0$  level of the dark matter hierarchy, they have no effect on higher levels of dark matter hierarchy.

#### 1.4.2 Is there an ELF signal from the special direction masked usually by the geo-magnetic noise?

The obvious question is why the anticorrelation between anomalous cognition effect size and ap index is highest at 13.30 ST? What this finding means that a particular portion of the sky defined by a definite longitude is above the head of a successful anomalous cognizer independently of the time of year. Thus there should be something special in a direction at this longitude.

The simplest explanation for these findings goes as follows.

1. Suppose that there is a higher level conscious entity at the direction 13.30 ST at the galactic magnetic body such that various cyclotron frequencies involved with the communications with this entity correspond to a typical time scale of the anomalous cognition. This conscious entity could have size of galaxy or it could correspond to a flux tube of galactic magnetic body using the cognizer and target as sensory receptors and motor instruments just as our magnetic body might use neurons of our brain or our body parts.
2. Anomalous cognition could involve positive and negative energy signals to this magnetic body and back so that essentially instantaneous AC events would be possible.
3. The information transfer between two kinds of flux tubes is made possible by the topological condensation of the flux tubes of  $B_E$  or its dark variant at those of the galactic magnetic field or its dark variant and would be maximal when both are nearly vertical. Also geomagnetic noise would be transferred via worm-hole contacts to the flux tubes of the galactic magnetic field and perturb these communications. Both AC and its anticorrelation with geomagnetic noise would be maximal when the flux tubes of of magnetic fields in question are approximately parallel. Since the flux tubes of  $B_E$  are approximately vertical, this the



case when the galactic center is directly above the head. This would explain the special value of sidereal time. One can say that the magnetic flux tubes of the interstellar magnetic field define kind of cosmic umbilical cord which might serve as a correlate for the tunnel experience associated with NDEs.

4. If signals to geometric past and back are involved the time and length scales would be measured using  $10^5$  years as unit. The signals themselves would be coded using frequencies characterizing time scales of neural consciousness as kinds of ripples to the very slowly oscillating background signal just as perturbations due to nerve pulses interfere with EEG rhythms. Since remote psychokinesis and anomalous cognition should rely on the same mechanism, the first guess for the time scale involved with these signals is as the time lag of 13 to 17 seconds involved with the remote realization of intentions by Qigong masters [J7] : the interpretation as a typical duration of charge entanglement was already proposed. It would not be surprising if the time scale of entanglement would determine also the scale of cyclotron frequencies. This would mean the importance of the frequencies in the range .06 to .08 Hz for anomalous cognition.

The following scenario suggests a possible manner to understand the time scale of remote PK.

1. If protonic cyclotron transitions generate the low frequency MEs in the range  $f_1 = .06$  Hz to  $f_2 = .1$  Hz, the strength of magnetic field must be in the range 13 to 17 nT (nanotesla). The magnetic flux tubes of an interstellar magnetic field in a direction with a longitude defined by 13.30 ST should be in question.
2. The ends of the magnetic flux quanta attached to structures within the inner magnetosphere co-rotate with Earth. The resulting twisting presumably tends to induce additional noise to the interstellar magnetic field or Earth's magnetic field or both.
3. The strengths of the typical disturbances of Earth's magnetic field are in the range 50-200 nT [J12]. The average strength for a given frequency component for the fluctuating part of the Earth's magnetic field increases at low frequencies. At the alpha band the strength of the Fourier component of fluctuations is about  $\sqrt{B^2(f)} \simeq 1 \text{ pT}/\sqrt{\text{Hz}}$  at alpha frequencies. Interestingly, the magnetic perturbation produced by brain at alpha band has a peak, which is slightly above the fluctuations of the Earth's magnetic field. This is perhaps not an accident in light of the expected role of the alpha band in remote mental interactions. The strength for the Fourier component  $B^2(f)$  for the fluctuations of  $B^2(t)$  [J3] is roughly  $\sqrt{B^2(f)} \simeq .1 \text{ nT}/\sqrt{\text{Hz}}$  at  $f_2 = .01$  Hz, and about  $\sqrt{B^2(f)} \simeq 10 \text{ nT}/\sqrt{\text{Hz}}$  at frequency  $f_1 = .06$  Hz.

What puts bells ringing is that the noise level 50-200 nT is by a factor 4 to 15 higher than the required interstellar static magnetic field at the lower limit corresponding to the 17 second period. These findings suggests that magnetic fluctuations tend to mask the positive effect of the interstellar magnetic field on AC. Only when the strength of the fluctuations of the Earth's magnetic field at the cyclotron frequency of the interstellar magnetic field reduces sufficiently

below the strength of the interstellar magnetic field, the masking effect is small enough.

### 1.4.3 What is the origin of the interstellar magnetic field?

The idea about the magnetic umbilical cord connecting distant astrophysical objects to a single quantum coherent whole is sensible in the many-sheeted space-time. The TGD based model for the galaxy formation assumes that the ordinary matter results from the decay of cosmic strings, which are objects carrying extremely strong magnetic fields (magnetic flux tubes and these objects belong to the same solution family of field equations). These cosmic strings form a complex network. For instance, this model explains gamma ray bursters (see chapter *TGD and Cosmology* of [K5]).

The huge energy production of gamma ray bursters is consistent with their huge distance only if one assumes that the energy is liberated in jets. In TGD framework the gamma ray bursts can be identified as jets resulting in the decay of split cosmic strings giving rise to the ordinary matter. The bursts are indeed known to originate in the regions, where new stars are born. This picture supports the idea about the existence of a fractal magnetic flux tube network connecting different astrophysical objects, and left as a remnant from cosmic strings, when their magnetic energy transformed to the ordinary matter and gave rise to the birth of stars. This network could give rise to galactic nervous systems in turn combining to the central nervous system of the Universe.

Surprisingly, this picture might be consistent with the constraints on the direction and magnitude of the interstellar magnetic field.

1. According to the online lecture of S. Oliver [E4] , the measured values of the interstellar magnetic fields depend somewhat on the method with which they are measured (this might be a signal of the many-sheetedness). The interstellar magnetic fields vary in the range  $B_u = 1$  mGauss–  $B_l = .1$   $\mu$ Gauss [E8] , which means that both electronic and protonic cyclotron time scales for all interstellar magnetic fields correspond to time scales relevant for human consciousness. The minimal values of  $k_d$  are  $k_d = 53$  for  $B_u$  and  $k_d = 66$  for  $B_l$  from thermal stability: .1 second time scale of alpha band is mapped to 50 s for  $B_u$  and to  $\sim 3$  days for  $B_l$ .
2. The synchrotron radiation associated with the diffuse emission from the whole sky but concentrated towards galactic plane corresponds to a field strength  $\sim .6$  nT. Zeeman splitting for hydrogen 21 cm line from condensing clouds gives fields in 1-2 nT range. In the plane of the galaxy the field is roughly parallel to spiral arms and its strength is 1-1 nT and too weak to correspond to the proposed magnetic umbilical cord. Also the direction of the spiral arm is different from the direction of the required magnetic umbilical cord.
3. The second guess is that the magnetic umbilical cord is orthogonal to the galactic plane. The direction of the galactic North Pole has the right ascension (identifiable as the sidereal time at the meridian of the rotating observer) RA=12.49  $\delta = 27.4$  degrees: RA is not too far from 13.30 so that this guess might make sense. Taking into account that the rotation axis of is tilted by 23.5 degrees towards Sun this

would mean that the direction of the magnetic umbilical cord is with accuracy of 3 degrees in the plane defined by the orbit of Earth around Sun. Interestingly, the magnetic field associated with the solar wind varies in the range .2 – 80 nT and average value is 6 nT.

According to [E8] , galactic center carries a dipole like field with a strength of order 100 nT, not too far from 10-30 nT. Also this field has filament like structures (flux tubes), which might extend to long distances [E8]. The flux tubes of this field should intersect the galactic plane orthogonally. If the strength of the magnetic field inside the flux tubes stays constant rather than varying like dipole field strength, these flux tubes could give rise to the magnetic umbilical cords connecting us directly to the center of the galaxy. Galactic center, perhaps the immense black-hole region there, could be an monstrous brain having galaxy sized central nervous system! That the model for magnetospheric consciousness would generalize to the scale of entire galaxy would conform with the fractality of consciousness.

4. According to [E8] , supernova remnants are accompanied by radial filament like structures carrying magnetic field in 1-10 nT and it seems that supernova wind might carry this field around galaxy: very natural if flux tubes carry the field. According to [E4] , for individual sources such as supernova remnants like Cas A Minor, the field strength is 10-30 nT. This corresponds to the interval 5.6 to 17 seconds. That the field strength is of the same order of magnitude as the dipole field at the galactic center conforms with the idea about magnetic nervous system of galaxy connecting the center of the galaxy to the stars. This magnetic field would be easy to observe in case of supernovae because super nova explosion has packed magnetic flux tubes to a very dense bundle.

#### 1.4.4 Connections with other effects?

There might be fascinating connections with other strange findings.

1. In Comorosan effect [I1] (see chapter *Wormhole Magnetic Fields* of [K6]) the irradiation of a bio-matter with a laser irradiation lasting for a multiple of 5 seconds has anomalous effect on a catalyst action. 5 seconds corresponds to to  $n = 3$  cyclotron transition for proton in a magnetic field of 10 nT. Comorosan effect occurs also in a non-living matter and suggests that the magnetic umbilical cord serves as a kind of cosmic clock.
2. The strength of the Earth's magnetic field in far-away in the plasma sheet is about 10 nT. Could this cosmic magnetic umbilical cord be connected with the plasma sheet and be in a synchrony with what happens there? Plasma sheet is known to be highly self-organizing structure containing in the velocity distributions of charged particles features like "wings" and "eyes" [F2]. In (see chapter *Magnetospheric Sensory Representations* of [K3]) I have proposed that plasma sheet defines the "self model" of magnetospheric brain and is thus in a role analogous to the insula in the human brain. It would be rather natural for the cosmic

umbilical cord to couple with that part of the magnetospheric brain which corresponds to the highest level in the self hierarchy associated with the magnetic Mother Gaia.

3. Lungs contain magnetic particles giving rise to magnetic field of about 10 nT. The theory of magnetospheric sensory representations inspires the speculation that the moment of physical death is decided by magnetospheric self sending to lungs stopping signal at proton's cyclotron frequency associated with 10 nT magnetic field.

### 1.5 Could magnetic flux tubes make possible effective holograms?

What are conscious holograms? Are they genuine holograms or are they holograms only in the sense that the scattering of light beams from them is very much like scattering on ordinary holograms - that is like scattering from the original object. Could one imagine mechanism making possible scattering from the original object effectively represented by the hologram like structure?

To proceed notice that there is rather general belief that just some objects possessed by the patient is enough for healer- in some sense this object are holograms of the patient. Usually this belief is of course regarded as primitive *pars pro toto* magic. This belief might however have some justification in terms of negentropic entanglement expected to be fundamental aspect of remote mental interactions. In principle negentropic quantum entanglement can take place via arbitrary number of relay stations and magnetic flux tubes connecting the entangled objects would be the quantum correlate for it. Negentropic entanglement would serve as a correlate for attention, experience of understanding, etc., and it would correlate closely with metabolism: generation of ATP and associated high energy phosphate bond would generate negentropically entangled electron Cooper pair or add electron to negentropically entangled existing many-electron system and its decay to ADP would liberate metabolic energy quantum and destroy the negentropic entanglement.

Negentropic entanglement could actually mean that objects of the external world - say living beings - can act like parts of our biological body. There is a wide variety of psychological experiments which show how illusory is our view about what our body is. Quantum entanglement of object with its target having magnetic flux tubes as geometric correlates making object a relay station. The object - call it *O* - would only serve as a relay station connected to say person, call it *P*, possesses the object. The light scattering from the *O* could actually transform to dark photons and travel along flux tubes to *P*, where it is scattered back- say from DNA- and returns back along flux tubes and leaves *O*. Effectively this is like scattering from a hologram of *P* represented by object *O*. The flux tube connection would make various objects in our vicinity effective holograms. This is something that one actually expects since attention- both visual and auditory - has flux tubes connecting perceiver to the target of attention as correlates.

One can consider two options since the radiation to object could transform to positive or negative energy photons. In the first case scattering could be seen as ordinary scattering from *P*. Negative energy photons would however represent signals

traveling to the geometric past (analogs of phase conjugate laser beams) and scatter back from  $P$  as positive energy photons traveling to  $O$ . TGD based models of memory as communications with the geometric past and intentional action as a process in which negative energy signal to geometric past initiates neural activities (Libet's findings about active aspects of consciousness) involve similar mechanism. Also the remote metabolism based on sending of negative energy signals to a energy storage (analogous to population inverted laser) relies on the same mechanism.

Peter Gariaev's experiments irradiating DNA with red laser beam generate broad of radio waves, which in TGD Universe could correspond to photons with same energy but with large Planck constant. These photons have biological effects on organisms of the same species and even on closely related species. TGD based proposal is that the scattered laser beam defines a collection of frequencies serving as addresses for parts of DNA activating gene expression.

If this represents a basic mechanism of genetic expression, one can quite well imagine that an organism- call it A - whose DNA is somehow damaged, could utilize the healthy DNA of another organism - call it B - by sending to it the counterpart of laser beam which scatters and generates the superposition of dark photon beams serving as an address activating the DNA of A. A would effectively use the DNA of B and B would effectively become part of A:s biological body. This mechanism could explain why the mere presence of healthy organisms of the species can induce the healing of organism which is not healthy. It could be the basic mechanism of healing: patient could remotely use the healthy DNA of the healer to generate signals activating her own genes.

Some further comments and questions are in order.

1. The relay station mechanism could universal in biology. The transformation of ordinary photons to dark photons at flux tubes defining the magnetic body of DNA is assumed in the model explaining the photos taken by Peter Gariaev and his group about DNA sample showing the presence of what looks like macroscopic flux tube structures (see chapter *Model for the Findings about Hologram Generating Properties of DNA* of [K2]).
2. The mechanism could also explain phantom DNA as real DNA connected by flux tubes to the chamber that contained the original DNA. The laser beam arriving to the empty chamber would travel along flux tubes to the place, where the removed DNA is, scatter and return back. This would create the scattering pattern assigned with the phantom DNA.
3. One can even ask whether the basic mechanism of homeopathy relies on relay station mechanism. Homeopathically treated water would be a collection of flux tube connections to the molecules, which were present in the first stage of the preparation process of the homeopathic remedy. Since the dark photons travel with light velocity, the times for travel of photons would be so small that the scattering of incoming light via the relay station mechanism would almost instantaneous so that the original molecules would be effectively present.
4. For instance, the de-differentiation of cells which looks to my rather mysterious phenomenon, means rejuvenation. Could one imagine that the genetic programs are replaced with those in geometric past and similar mechanism is at work.

Could the rejuvenation mechanism involve scattering of the counterpart of phase conjugate laser light from non-differentiated healthy cells of the geometric past? If so, one should try to achieve the same effect directly at the level of cells. One could try to induce de-differentiation of the cells of the owner of the object serving as a relay station in the same manner. Healing of say cancer cells by de-differentiating them to omnipotent state. In the experiments involving Becker's DC current just this happened. In this microscopic situation might be can demonstrate the effect really convincingly.

## 2 TGD inspired model for Out of Body Experiences (OBEs)

The knowledge about OBEs like NDEs (and often part of NDEs) relies mostly on reports about subjective experiences and the experimental testing of theoretical models is difficult if possible at all. OBEs can be generated nowadays by electrical stimulation of brain and this gives hopes about laboratory testing. On the other hand, TGD based view about life and consciousness introduces the notions of magnetic body and dark matter and about dark matter only its existence is known. Therefore the theory is unavoidably very speculative and OBEs might pose the badly needed constraints on imagination. The following contains a brief summary about what OBEs are describe very briefly a model for them with possible answers to some basic questions about OBEs. A more detailed treatment of OBEs in TGD framework can be found in the chapter TGD based model of OBEs of "TGD Inspired Theory of Consciousness" [K9].

### 2.1 OBEs, autoscopy, heautoscopy, and other strange experiences

#### 2.1.1 Phenomenological characterization

The phenomenological characterization of OBEs [J5] has been discussed in [J9]. A precise definition of OBE is to have sensation of being outside the body. Autoscopy experience involves a also a sensation of seeing a mirror double of the body or part of it or at least experiencing its presence. There is a form of AS in which some internal organs are perceived. In one form form of AS only the presence of double is experienced. AS experiences are often accompanied by physical difficulties such as migraine episodes and epilepsy.

Heautoscopy refers to an experience of meeting one's alter ego, doppelganger. The main differences to AS is that in AS the double is mirror image and that alter ego is experienced to have also duplicated features of psychological self.

OBEs are classified to parasomatic and asomatic experiences according to whether the person experiences of having body or not. In aparasomatic experience a detachment from both the physical and parasomatic body is experienced. Blackmore suggest that OBE starts when sensory input from the body ceases while person remains conscious [J5]. This brings in mind the notion of subtle body of spiritual practices identified as the body experienced during lucid dreaming [J19]. The notions of guardian angle and ba-ka double of ancient Egypt, could relate to the double body too.

There is also a classification of OBEs to asensory, naturalistic and supernaturalistic ones. Asensory experience lacks sensory percepts about environment, naturalistic one involves perception of familiar surroundings, and supernaturalistic other-worldly realms like heaven or visits to other planets and contacts with aliens.

One can distinguish between natural and enforced OBEs. Natural OBEs are triggered by exhaustion, illness, traumatic events, NDEs, meditation, etc.. Enforced experiences can result from intoxication, anesthesia, hypnosis, etc..

### 2.1.2 OBEs induced by electric stimulation

Relatively recently OBEs and AS experiences have been produced by an electric stimulation of the angular gyrus [J10]. Angular gyrus is located in the parietal lobe, near the superior edge of the temporal lobe, and is involved in processes related to verbal communication and cognition and also with the transformation of written language to internal monologue. The experience developed to a full fledged OBE as the intensity of electric stimulation was increased. The electric stimulation induced responses in vestibular and sensory-motor systems, two of three systems which govern body balance.

According to experimenters, OBE and AS frequently involves what they call pathological sensations of position, movement and perceived completeness of one's own body. These include vestibular sensations such as floating, flying, elevation and rotation, visual body-part illusions (illusory shortening, transformation or movement of an extremity) and the experiences of seeing one's body only partially during OBE or AS. Authors believe that these experiments yield neurological evidence about the common neurological mechanism behind OBEs and AS experiences. The interpretation of experiments has been criticized in [J9, J2].

1. Only single subject person was studied. She suffered from temporal lobe epilepsy and the epileptic region was at distance of about 2 cm from angular gyrus. Hence one can ask whether genuine OBEs were in question and whether the results generalize to healthy persons.
2. The OBE was not typical. For instance, body was seen only partially and the conscious attempt of the subject person to examine it more closely led to its disappearance. The environment was not perceived.
3. The claimed localization of the spot inducing OBEs to angular gyrus might be an illusion. Some researchers have represented results in which the OBE is induced in a different manner. Interestingly, the experience is associated with the generation of 4 Hz theta wave, which corresponds to the dominating EEG band during sleep.
4. The reductionistic conclusion that OBEs can be reduced to neuropathology and are thus "only" hallucinations is not justified. What has been shown is that electric stimulation of angular gyrus helps to induce the OBE and this leaves a lot of room for theorizing.

### 2.1.3 Explanations of OBEs and related experiences

The explanations for OBEs can be divided to two classes.

1. Something is assumed to leave the body.  
This something could be something physical or non-physical ("astral"). In some cases people who have had OBE share reported of having perceived objects that were actually there and having experienced events and dialogue that truly happened. Charles Tart has documented the case of Miss Z [J13, J14] who in controlled experiments was able to deliver the randomly selected five digit number which was in a position which could be seen only from the position out of her body. Telepathy would be an alternative explanation for this.
2. Nothing leaves the body.  
Parapsychological explanations involve remote sensing and hallucinations. Psychological explanations regard OBEs as basically hallucinations. The observation that electrical stimulation generates both AS and OBE could be seen as a support for this interpretation. Of course, one can ask what hallucinations really are. Furthermore, the reports about seeing internal organs during AS experience [J4] are not easily explainable as hallucinations.

TGD based model does not fit into either category. The model involves the notion of magnetic body serving as the third person receiving visual stimulus from the body and reflecting it back to the brain where its is processed. In this model the conflict between hallucinatory character of AS and OBEs and a real perception of body from outside is only apparent. The basic mechanism allows to develop also a more detailed model for dreams, hallucinations, third person aspect of wake-up consciousness, and directed attention.

## 2.2 TGD inspired model for OBEs

A general TGD based model for the remote mental interactions follows from a model for the living matter by assuming that also other biological bodies than the personal can serve as targets for the control action of the magnetic body or communicate sensory information to the magnetic body. Ordinary intentional action would represent a particular case of remote mental interaction in this framework. Metabolism as the provider for the energy generating negentropic entanglement favors biological systems as targets but it is of course an open question whether also object composed of "dead" matter could have negentropic entanglement with magnetic bodies.

Consider now OBEs in this general framework.

1. During OBEs the mental images constructed by brain about biological body could be absent due to the absence of the metabolic energy feed to the appropriate parts of brain taking care of the construction of cognitive mental images about biological body and communications of them to the magnetic body. The simplest representation would be in terms of bit sequences with bit 1/0 represented in terms of population inverted state/ground state of many-sheeted laser. Negative energy signals to the geometric past would be used to read these signals by inducing partial reduction of the population in inverted states. In absence of metabolic energy feed 1:s would gradually transform to 0:s. It is however essential that time-like negentropic entanglement is involved besides classical communications. This would make it possible to share the mental images.



2. In absence of the sensory input from biological body serving as reality constraint, magnetic body would not anymore provide strict cognitive representations of biological body and virtual world experiences would result. Since only magnetic body would contribute to the bodily experience, the low rate of dissipation due to large value of  $\hbar$  could explain the pleasant experience about the absence of the sensory noise.
3. This general picture could also explain why OBEs seem to correlate with neural disorders such as epilepsy and disorders relating to perturbed body image. During this kind of disorders the feedback provided by the sensory and cognitive input would be lacking from the brain regions suffering the neural disorder and magnetic body would be solely responsible for the body image. The lacking strict correspondence between the conformations of magnetic body and biological body would mean that the experience is hallucination from the point of view of biological body. At the imbedding space level the "conformations" of the magnetic body could be rather abstract and represented in terms of positions and other moduli of sub-*CDs* (*CD* denotes causal diamond, which is a central notion in zero energy otology).

This model would apply also to experiences not usually regarded as OBEs: such as moving train illusion, the unpleasant GUT sensation near the cliff, and maybe also dreams and hallucinations. The essential idea would be that the motion of biological body with respect to the magnetic body is replaced with the motion of the magnetic body with respect to the biological body. Some parts of brain responsible for the information of the virtual sensory data from the magnetic body could be awake and sense virtual sensory data to primary sensory organs as dark photon beams and thus generate virtual sensory percepts. This process would be always involved with the processing of sensory data but during dreams and hallucinations genuine sensory input would be altogether absent.

To get some perspective it is good to answer some basic questions about OBEs.

### 2.2.1 Where the information processing giving meaning to what is seen is carried out?

Seeing is much more than just receiving the photons on retina, since a lot of information processing is needed to give meaning to what is seen. This essentially involves a decomposition of visual input to recognized objects having relations to each other and to the past of perceiver. This applies also to the visual percepts during OBEs. The most natural candidate for the system processing the visual stimulus and giving it meaning is the brain of the subject person.

Sharing of mental images allows to consider an alternative interpretation based on telepathy. The sensory organs in other bodies receive the visual stimulus and other brains do the information processing. For instance, "unconscious" victim of accident could share the fused mental images of people around the place of accident.

### 2.2.2 Are OBEs "only" hallucinations?

In TGD framework the first possibility is that the sensory stimulus is always artificial and comes from brain to eyes and other sensory organs by back projection. OBE would

be a dream like cognitive representation, simulation rather than a real percept. REM is expected to always accompany OBEs in this case.

There is an objection against this idea. If person is unconscious or has NDE, it is questionable whether she is able to construct such high level cognitive representation as the representation of the state of her own body as seen by outsider is, and even transform it to a sensory representation. One can also ask what hallucinations really are. In TGD framework hallucinations must be generated by an artificial sensory stimulus so that hallucinations and genuine OBEs might involve the same basic mechanism.

### 2.2.3 Does OBE originate from an actual sensory stimulus?

The well-known fact that body parts indeed contain holograms about other body parts [I4] (see the discussion in (see chapter *Homeopathy in Many-Sheeted Space-Time* of [K1]) and the TGD view about the relationship between dark and living matter (see chapter *Dark Forces and Living Matter* of [K4]) allows to consider seriously the possibility that OBE originates from an actual sensory stimulus.

The dark photon laser beams emanating from the body would be received by a magnetic body containing dark matter at some level in the hierarchy of magnetic bodies and would be reflected back to the receiving sensory organs along MEs possibly parallel to magnetic flux tubes rather than space-time sheets along which ordinary visual input arrives.

It is quite possible that several magnetic bodies in the hierarchy are involved. The magnetic bodies involved need not always correspond to a personal magnetic body and could receive input from several biological bodies and remote vision and telepathy might involve signals from brain reflected to a second brain via multi-brainy magnetic body. Magnetic bodies could be associated also with "dead" matter.

### 2.2.4 Why does electrical stimulation induce OBEs?

Electrical stimulation of angular gyrus induces OBEs just as the stimulation of neurons of temporal lobe induces long term sensory memories. In neurological "brain only" approach the interpretation would be that the responses in the vestibular and somatosensory system induce the AS and OBE as hallucinations. In TGD framework the response in vestibular and somatosensory system would be interpreted as a response to an actual experience of being in a detached position and orientation, and brain would process genuine sensory data about being in detached position.

One might think that the temporal ordering between the experiences and these responses would allow to decide what causes what. In TGD framework negative energy signals propagating backwards in the geometric time are however a basic element of brain functioning and this criterion need not be apply.

One imagine two mechanism generating OBEs electrically.

1. The mechanism inducing visual OBE and related experiences could simply turn off the ordinary sensory input so that only the dark photon beams from the magnetic body and reflected back from biological body would contribute to the visual stimulus. The virtual sensory input from the magnetic body ending down to the level of primary sensory organs could in the form of dark photons could be processed to form standardized sensory mental images by some parts of brain

in wake-up state and returned to the magnetic body. This would occur automatically during dreams and NDE experiences.

2. The virtual sensory input from the magnetic body could also involve also amplification. Time mirror mechanism could be responsible for this amplification (see chapter *Time, Spacetime and Consciousness* of [K1]). During epilepsy strong electric fields generated by brain during epilepsy induce starvation of neurons and the electrical stimulation of angular gyrus could have the same effect. Starving neurons would generate a beam of phase conjugate (negative energy) dark photons received by magnetic body in order to get metabolic energy. The magnetic body would be in a state analogous to a population inverted (possibly many-sheeted) laser defining a hologram like representation of the body. The receipt of negative energy photons would induce a cascade like induced return to the ground state and amplify the dark photon beam arriving from magnetic body so that it would not be masked by the ordinary visual input anymore and would give rise to a percept.

### 3 Connection to the work of researchers in forefront

#### 3.1 Simon Shnoll

Shnoll and collaborators [E1, E6, E5, E2, E7, E3] have discovered strange repeating patterns of random fluctuations of physical observables such as the number  $n$  of nuclear decays in a given time interval. Periodically occurring peaks for the distribution of the number  $N(n)$  of measurements producing  $n$  events in a series of measurements as a function of  $n$  is observed instead of a single peak. The positions of the peaks are not random and the patterns depend on position and time varying periodically in time scales possibly assignable to Earth-Sun and Earth-Moon gravitational interaction.

These observations suggest a modification of the expected probability distributions but it is very difficult to imagine any physical mechanism in the standard physics framework. Rather, a universal deformation of predicted probability distributions would be in question requiring something analogous to the transition from classical physics to quantum physics (see chapter *A Possible Explanation of Shnoll Effect* of [K4]).

The hint about the nature of the modification comes from the TGD inspired quantum measurement theory proposing a description of the notion of finite measurement resolution in terms of inclusions of so called hyper-finite factors of type II<sub>1</sub> (HFFs) and closely related quantum groups. Also p-adic physics -another key element of TGD- is expected to be involved. A modification of a given probability distribution  $P(n|\lambda_i)$  for a positive integer valued variable  $n$  characterized by rational-valued parameters  $\lambda_i$  is obtained by replacing  $n$  and the integers characterizing  $\lambda_i$  with so called quantum integers depending on the quantum phase  $q_m = \exp(i2\pi/m)$ . Quantum integer  $n_q$  must be defined as the product of quantum counterparts  $p_q$  of the primes  $p$  appearing in the prime decomposition of  $n$ . One has  $p_q = \sin(2\pi p/m)/\sin(2\pi/m)$  for  $p \neq P$  and  $p_q = P$  for  $p = P$ .  $m$  must satisfy  $m \geq 3$ ,  $m \neq p$ , and  $m \neq 2p$ .

The quantum counterparts of positive integers can be negative. Therefore quantum

distribution is defined first as p-adic valued distribution and then mapped by so called canonical identification  $I$  to a real distribution by the map taking p-adic  $-1$  to  $P$  and powers  $P^n$  to  $P^{-n}$  and other quantum primes to themselves and requiring that the mean value of  $n$  is for distribution and its quantum variant. The map  $I$  satisfies  $I(\sum P_n) = \sum I(P_n)$ . The resulting distribution has peaks located periodically with periods coming as powers of  $P$ . Also periodicities with peaks corresponding to  $n = n^+n^-$ ,  $n_q^+ > 0$  with fixed  $n_q^- < 0$ , are predicted. These predictions are universal and easily testable. The prime  $P$  and integer  $m$  characterizing the quantum variant of distribution can be identified from data. The shapes of the distributions obtained are qualitatively consistent with the findings of Shnoll but detailed tests are required to see whether the number theoretic predictions are correct.

The periodic dependence of the distributions would be most naturally assignable to the gravitational interaction of Earth with Sun and Moon and therefore to the periodic variation of Earth-Sun and Earth-Moon distances. The TGD inspired proposal is that the p-adic prime  $P$  and integer  $m$  characterizing the quantum distribution are determined by a process analogous to a state function reduction and their most probably values depend on the deviation of the distance  $R$  through the formulas  $\Delta p/p \simeq k_p \Delta R/R$  and  $\Delta m/m \simeq k_m \Delta R/R$ . The p-adic primes assignable to elementary particles are very large unlike the primes which could characterize the empirical distributions. The hierarchy of Planck constants allows the gravitational Planck constant assignable to the space-time sheets mediating gravitational interactions to have gigantic values and this allows p-adicity with small values of the p-adic prime  $P$  (see chapter *A Possible Explanation of Shnoll Effect* of [K4]).

What makes Shnoll effect so interesting is that it involves interaction of very long length scales with microscopic scales - even nuclear physics length scale as in the experiments of Shnoll. Similar situation prevails machine-mind interaction involving intention to affect sequences of random numbers generated by microscopic systems via quantum transitions. The proposed model suggests a mathematical description of the statistical distributions modified by the intentional action but leaves the interaction mechanism open. A possible mechanism could be a realization intentions as actions via a mapping taking p-adic space-time sheets representing them in long length scales to real space-time sheets in short length scales. In the recent case the field patterns would represent space-time sheets carrying classical fields inducing the desired effect at microscopic level on particles that have topological sum contacts to these sheets. Classically gauge forces would be in question and at quantum level modifications of various reactions rates caused by these fields.

This map would be carried out by the quantum counterpart of canonical identification or its variant (see chapter *TGD as a Generalized Number Theory: p-Adicization Program* of [K9]). The map would be characterized by resolution defined by power  $p^N$  of prime  $p$ . For powers of  $p^n$ ,  $n > N$ , the map would be continuous from p-adics to reals and for  $n < N$  it would be discontinuous and would correspond to the identification of reals and p-adic numbers via common rationals. I have discussed this kind of option based on ordinary canonical identification - actually one of the first ideas related to p-adic physics - in qarithmetics,galois. The main objection was that this map is not general coordinate invariant. This could however make sense since cognition breaks General Coordinate Invariance via a selection of a preferred coordinate system and bringing in the number theoretic anatomy of coordinate variables. I have also

proposed (see chapter *Miscellaneous Topics* of [K7]) that the generation of cognitive representations and realization of intentional actions using canonical identification and its inverse could define the analog of T-duality of string theories, which also maps long and short scales to each other. that the generation of cognitive representations and realization of intentional actions using canonical identification and its inverse could define the analog of T-duality of string theories, which also maps long and short scales to each other.

A more concrete model for the intentional action is obtained if one requires consistency with the model based on time mirror mechanism as a key element of intentional action. Canonical identification maps p-adic space-time sheet representing the intention and having the size of  $CD$  assignable to intentional agent and characterized by a typical macroscopic time scale (actually astrophysical since already electron corresponds to Earth sized  $CD$  with time scale of .1 seconds) to a much smaller space-time sheet representing a flux tube connection and possible accompanying massless extremal connecting the biological body of the operator and and target. The classical fields carried by these space-time sheets would induce the microscopic effect realizing the intention.

### 3.2 Michael Persinger

Anyone - atheist or believer - wanting to learn about Persinger's work and the basic insights of neuro-theology should listen the extremely inspiring talk *God and the Brain - The Persinger 'God Helmet', The Brain, and visions of God* by Todd Murphy [J1]. Persinger's work (for references to the articles by Persinger and collaborators see the *Wikipedia article about God helmet*) suggests that the temporal pattern of the modulation of magnetic field strength (FM would be in question for slow variations) is important. We do not however know the "code". Also the strength of the magnetic field can be important. Note that the effects of very weak ELF em fields on vertebrate brain take place in amplitude windows (see chapter *Dark Matter Hierarchy and Hierarchy of EEGs* of [K8]).

The modulation of magnetic field would probably induce FM of cyclotron frequencies. The model for hearing suggests this kind of modulation as a manner to represents the frequencies of the sound wave. Also phase information is very important: time reversed speech sounds very different as normal speech but has the same power spectrum. Modulations would be slow in the time scales defined by the audible frequency range..1 seconds would represent lower limit for the variation rate of modulation. Audible frequencies above 20 Hz.

The article *TGD Based View about Classical Fields in Relation to Consciousness Theory and Quantum Biology* contains a section considering a model for the findings of Persinger and collaborators using "God helmet". The spiritual experiences induced by "God helmet" could be interpreted as subjective experiences generated when the personal magnetic body receives an additional layer. For instance, manic-depressive bipolar cycle might be understood as a cycle in which euphoric period means the emergence of a new layer appears to the magnetic body and depressive period means its disappearance. I have also commented other findings of Persinger. God helmet might provide a technical tool to test the notion of magnetic body.

### 3.3 William Tiller

William Tiller in Stanford University has carried out impressive experimental work with what he calls intention imprinted electronic devices (IIED), and his results challenge that standard assumption that the intentions of experimenter do not affect the experimental apparatus [J15, J16, J17].

#### 3.3.1 Experimental arrangement

The goal was to try to imprint a specific intention into a simple, low tech electronic device so as to influence the companion, specific, well-designed, target experiment. The intentional imprinting was attempted in a meditative state. The intentionally imprinted device, IIED, was sent to a laboratory located at distance of about 1500 miles where colleagues had set up the experiment. The device was placed about 6 inches from a continuously running and computer-monitored target experiment and switched on (total electrical power rate was less than 1 microwatt). Over a time period of about 1-4 months the recorded results from the target experiment changed in the directions of the specific intention and the change eventually reached the selected magnitude of the specific intention. Also an identical, but not intention imprinted device was used and the results were compared in order to achieve more objective measurements about the effects of human consciousness on electric devices.

The targets used were purified water, some bio-molecules, and larvae of flies. These targets were either unshielded or shielded from radiation. For the latter purpose they were closed inside a grounded Faraday cage (FC), which screened rather effectively the radiation coming at microwave frequencies whereas for ultra low frequency (ULF) fields the screening is virtually absent (skin depth behaves as  $1/\sqrt{\pi\sigma f}$  at low frequencies and  $f = 2\pi\sigma$  (in units  $\hbar = c = 1$ ) defines kind of critical frequency above which screening occurs effectively). The targets could be affected by control device (CD) or by identical IIED generating microwave radiation. Radiation was generated either at single frequency (7.3 MHz) or at three frequencies (5.0, 8.0 and 9.3 MHz) [J18].

In the case of purified water the spatial distributions of physical parameters like pH, temperature, and conductivity were measured as a function time. In the case of bio-molecules the possible effect on thermodynamical activity, which measures the thermodynamical energy of single molecule, was measured. In the case of fly larvae the effect on the larval development time was studied. The results from various arrangements were compared with control targets (no FC, no CD, no IIED).

I have discussed a TGD based model for Tiller's findings the chapter *Biosystems as conscious holograms*.

and the intentional imprinting involves magnetic fields and possibly also corresponding cyclotron frequencies. If one accepts the canonical identification as a map taking intention represented by p-adic space-time sheet to action represented by real space-time sheet in much shorter scale then the space-time sheets create would be microscopic space-time sheets carrying magnetic fields giving rise to the cyclotron frequencies.

The basic experimental results were two-fold. First of all intended effects were achieved. Secondly, the "conditioning" of the laboratory resulted as an unexpected effect and continued even after the removal of the target and IIED.

### 3.3.2 Direct effects of the intentional action

1. IIED imprinted by intention to increase/decrease the pH of water gradually induced a shift in the pH of purified water to the intended value, increased the in vitro thermodynamic activity of bio-molecules, and a reduction of larval development time.
2. For bio-molecules and larvae four simultaneous side-by-side treatments were tested: i) an unshielded sample, ii) a shielded sample, iii) a shielded sample with an "on" control device, iv) a shielded sample with an "on" IIED. Just the shielding of em radiation affected the thermodynamic activity of the bio-molecules, and just adding less than about 1 microwatt of microwave radiation via control device reduced the thermodynamical activity and lengthened the developmental time. Thus the microwave radiation acted as a stressor having entropic effect. When the control device was replaced with IIED, the degradation caused by microwave radiation was overcome.

### 3.3.3 "Conditioning" of the laboratory

Quite unexpected phenomena arose from a repeated conduct of IIED in a given laboratory space. By simply continuing to use IIED in the laboratory space, it became "conditioned in some very fundamental way". Three signatures heralded the onset of the "conditioning" process.

1. Oscillations of air and water temperature, and of pH and electrical conductivity of water with large amplitudes with the periods of oscillations in 10-100 minute range developed. The amplitudes of pH- and temperature oscillations was  $\sim \Delta pH = .1$  pH-unit and  $\Delta T \sim 1 - 3$  K units respectively. Even more remarkably, the oscillations were sustained in the locale even after the removal of the IIED suggesting kind of phantom effect analogous to phantom DNA effect. Oscillation amplitude had peaks at the harmonics of fundamental frequency  $f_l = 1/T_l$ ,  $T_l = 36.6$  minutes with three lowest harmonics being very clearly visible [J17]. Also  $T_l = 51.2$  minutes appears as fundamental period in some experiments. The ratio of these periods is 1.4 and rather near to  $\sqrt{2} = 1.41$ , which might relate to p-adic length scale hypothesis.
2. When an pH-increasing IIED with intention to increase pH by one unit was turned on in an almost unconditioned space located several hundred feet away from a strongly conditioned space, a well-defined pattern of pH-oscillations in an unconditioned space emerged. This pattern was accompanied by a highly correlated pattern of oscillations in strongly conditioned space. This kind of highly correlated oscillations were not observed in several unconditioned spaces - also located several hundred feet away.
3. The targets were subject to the action of a vertically aligned magnetic field in the range of  $10^{-2} - 5 \times 10^{-2}$  Tesla, such that the direction of the field could be reversed. In an unconditioned space the change of the direction of the magnetic field did not affect the pH. In the strongly conditioned space the effect on pH was different for the opposite directions of the applied field and the difference in

pH values was about 6 units. One can say, that the target had become sensitive to the effects of external magnetic fields.

### 3.3.4 TGD based model for intentional imprinting

The model obtained by combining the model for Shnoll effect based on the canonical identification as a map taking intentions to actions with time mirror mechanism would suggest that intentional imprinting generates flux tubes between the target and magnetic body (MB) of operator and also those between target and biological body (BB) of the operator. These flux tubes would correspond to the images of p-adic space-time sheets representing the intention and having astrophysical size scale (or the order of the size of  $CD$  associated with operator). These flux tubes would connect BB and MB also to the nearby environment of IIED. The fact that nearby environment remains intentionally imprinted when target and IIED are moved away could explain why the effect remains as oscillations even when IIED is removed and why synchronous oscillations take place.

Negative energy signals would tend to generate negentropic effects eliminating the entropic effects if microwave radiation. This could explain why IIED reduces the entropic effects caused by microwave radiation. Cyclotron frequencies define natural candidates for the time scales involved. The magnetic fields in question would be of order 10-100 pT. The mechanism of compensation of the effects of cyclotron photons remains open. The simplest possibility is that microwave photons generated by IIED correspond to large  $\hbar$  phase conjugate photons with energies in the range of energies of microwave photons. The effects of negative energy large  $\hbar$  photons, which have suffered phase transition to ordinary positive energy microwave photons could induce the negentropic effects.

## 4 Tests for the view about remote mental interactions

The assumption that the notion of magnetic body and hierarchy of Planck constants defines key element in remote mental interactions reduces the tests at the level of physics to tests for these notions.

### 4.1 Direct metabolic correlates for remote mental interactions

The proposal is that ATP is the molecule of consciousness in the sense that its presence as relay in flux tube connection carrying negative entanglement entropy. ATP would be also the molecule of attention if negentropic flux tubes connecting perceiver and attended system serve as correlates of attention. There is complete symmetry between the two systems which conforms with the "Eastern" vision that there is no distinction between observer and observed during observation. The distinction emerges only after the observation is over and sensory percept has become a memory.

Also remote mental interactions should have ATP as a correlate of intentional action at the end of the operator and the rate of metabolism might be used as a correlate



for the remote mental interaction such as psychokinesis or intentional imprinting or human-machine interactions.

## 4.2 How to choose senders and receivers?

In the above discussion only the new physics phenomena suggested to be essential for both biology, neuroscience, and remote mental interactions are considered, and many experiments could be carried out without operator and target as they are used in remote mental interaction experiments. One might however hope that the model could give some idea about optimal planning of experiments related to remote mental interactions.

In these experiments an important aspect of testing is optimal choice of targets and the persons acting as sender.

1. Quite generally, the optimal target system for demonstrating these effects would be a critical system very sensitive to small perturbations. Any critical system would work, and one might even consider that the critical systems used to detect elementary particles might be used. Overcooled vapor or liquid or overheated liquid is one possibility. One could take register what happens in the system using same methods as in particle physics. Organic compounds might be by definition be this kind of systems.
2. One could also try to identify optimal 'senders'. Persons with strong will power or with firm belief on the effect, or persons with lower level of inhibition (children, actors, artists,...) could be considered as optimal 'senders'. One could find whether some drugs which remove inhibition, could enhance telepathic and psycho-kinetic abilities. The "blessed are the meek since they quantum entangle" prediction could be also tested. Indeed, one of the most dramatic experiments supporting psychokinesis was done using chicken which imprinted to a robot [J11]. The robot, whose behavior was programmed earlier by random number generator, tended to stay near the chicken, as if chicken had induced a quantum jumps changing the geometric past in macro-temporal time scales.

## 4.3 Short FAQ related to the testing of the model

I decided to add a short FAQ section in response to questions by Lian Sidorov, adding a few of my own in order to clarify specific aspects of the theory. The questions are listed under these main topics:

1. Electromagnetic/ biophoton emissions at the target.
2. Ion/electron discharge signatures of entanglement.
3. Generation of ATP/increase in metabolic rate/unusual metabolic profiles as in Bigu serve as correlates of remote mental interactions.
4. Time lag a general characteristic of remote mental interactions (as per ISLIS papers on tohate effects).
5. Directionality and target specificity of remote mental interactions.

### 4.3.1 Questions related to the notion of many-sheeted space-time

**Q:** The differences between Maxwellian electrodynamics and TGD seem to be essential for the model of remote mental interactions. What are these differences?

**A:** The dynamics of all classical fields reduces to that of 4-D space-time surfaces. This is an extremely restrictive condition. Not all possible radiation fields are possible as in Maxwell theory since linear superposition fails. One can have only superposition of planewaves propagating in same direction (MEs). This give pulses preserving their shape and propagating only in one direction: pulses propagating in opposite directions are impossible inside given ME. Same applies to magnetic and electric fields.

General linear superposition for Maxwell theory (summation of fields) is geometrized: it is replaced with a set theoretic union. One just adds various kinds of space-time sheets to the soup and lets them interact by forming wormhole contacts which in turn have interpretation as quanta of the fields involved! If two sheets have projections in same region of Minkowski space they develop wormhole contacts identifiable as photons and also other gauge bosons. The repertoire of fields associated with various space-time sheets is extremely limited: the fields are like self organization patterns representing "features" as neuroscientist would say. Quantum theorists would talk about Bohr orbitology generalized from electron orbits to patterns of classical fields.

If one adds small space-time sheet to this soup, it develops wormhole contacts to all the flux sheets representing electromagnetic fields of various sources, and through this wormhole contacts experiences the sum of forces associated with these fields. Linear superposition of fields is replaced with superposition of effects. This is operationalism taken to extreme!

**Q:** How do massless extremals (*MEs*) and magnetic flux tubes differ from each other?

**A:** Many-sheeted spacetime predicts modifications of classical Maxwell's electrodynamics. The attempt to represent constant magnetic field (or radiation field, say plane wave of em field) as space-time surface fails. One can represent only part of it. Spacetime containing magnetic field splits into flux tubes or more general flux quanta - topological field quanta, space-time quanta, many manners to say it. Same happens in the case of radiation field.

Flux tubes thus emerge in imbeddings of magnetic fields which can be static and represent cylindrical 3-surfaces locally. Flux tubes make themselves manifest in superconductivity. Quite recently magnetic strings carrying dark matter and connecting galaxy clusters were discovered so that the notion is gaining experimental support in astrophysics and cosmology.

The basic biological function of flux tubes is to bind living matter to a kind of Indra's net. They bring non-locality in biology. Dark matter at the magnetic flux tubes is behind virtually all basic mechanisms in TGD inspired quantum biology: basic mechanism of catalysis as a phase transition changing Planck constant and reducing or increasing flux tube length: the reconnection for magnetic flux tubes to modify the topology of the net; collections of cyclotron frequencies as passwords; generation of negentropic entanglement by excitation of cyclotron states at flux tubes; shared use of DNA; realization of bio-holograms;....

*MEs*/topological light rays emerge in imbeddings of radiation fields and are not static. I would compare them to laser beams. *MEs* are ideal for communications and

control since pulse shape is preserved. They can accompany magnetic flux tubes and be parallel to them (wormhole contacts). Alfven wave associated with magnetic field would be the Maxwellian counterpart.

**Q:** You talk about ions dropping from one spacetime sheet to another. What determines the direction of the flow?

**A:** This relates to one of the key predictions of p-adic physics as physics of cognition and intentionality. p-Adic physics makes itself visible via constraints on real physics. Space-time sheets would be arranged with respect to p-adic length scale, I call it  $L(k) \propto 2^{k/2}$  or  $L_p$ ,  $p \simeq 2^k$  prime. Dropping would be transfer from smaller to bigger and liberate zero point kinetic energy. Kicking to smaller one is its opposite. Transfer is a more neutral expression. p-Adic physics actually predicts a hierarchy of metabolic energy quanta and ATP corresponds only one particular metabolic energy quantum.

One cannot assign the long range negentropic entanglement ( $NE$ ) characterizing operator-target pair with ATP alone. Rather, ATP can serve as a source of metabolic energy (high energy phosphate bond) and possibly also of  $NE$  transformed to long range  $NE$  in  $ATP \rightarrow ADP$ . The liberated metabolic energy quantum would generate  $NE$  in long length scale, say that assignable to magnetic flux tube or a path formed by several magnetic flux tubes.

#### 4.3.2 Questions related to Negentropic entanglement ( $NE$ )

**Q:** What makes  $NE$  negentropic?

**A:** The mathematical definition of  $NE$  makes certainly sense when entanglement probabilities defined as eigenvalues of density matrix characterizing subsystem entangled with environment are rational. The reason is that the p-adic norms of probabilities are well-define in this case. It is possible to extend the definition to probabilities in finite-dimensional algebraic extensions of rationals.

**Q:** Entanglement is expected to be stable under Negentropy Maximization Principe (NMP). What does this mean?

**A:** In its standard physics form NMP states that in state function reduction the reduction of entnglement entropy is maximal. This implies that entangled system pair goes to an unentangled state which is one of the orthogonal eigenstates of the density matrix.

If one accepts number theoretic variant of Shannon entropy, which is maximal for a unique value of  $p$ , it is possible to have negative number theoretic entanglement entropy that is positive negentropy. The interpretation is as information associated with entanglement as a rule  $A \leftrightarrow B$  representing its instances  $a \leftrightarrow b$  as quantum superposition rather than as information about either of the entangled systems. NMP as a basic variational principle telling what can occur in state function reduction favors the generation of this kind of entanglement, and one expects that a situation in which negentropy is maximal is achieved: stability means purely mathematically more or less the same as stability of thermodynamical equilibrium in thermodynamics.

**Q:** Can one identify  $NE$  physically? Can one identify mechanisms creating it?

**A:** Delocalized single particle excitation of cyclotron Bose-Einstein condensate at magnetic flux tube could generate  $NE$ . Also many-particle states of electrons can be considered but in this case there are additional restrictions. Energy would be fed either to longitudinal motion generating the analog of DC current of Becker or to transversal

cyclotron motion.

There are actually two options involved depending on whether also totally unexcited state appears in the superposition or not. If state function reduction to a state possessing negentropic entanglement takes place, the state could contain only single particle excitations and entanglement would be certainly negentropic since the weights of various single particle excitations would be same. Non-local electronic excitations have been indeed observed in the recent experiments in photosynthesis for electrons. This identification is attractive because it combines ELF wisdom leading to dark matter as large  $\hbar$  phases, what we know about photosynthesis, and the DC currents of Becker.

For the minimal option ATP would serve as an energy storage only. High energy phosphate bond could however carry also  $NE$  transformed to  $NE$  at usually much longer flux tube length scale when ATP is used. ATP would liberate photons, which excite the negentropically entangled cyclotron states at flux tubes. There would be an analogy with Orch OR. The period of long scale  $NE$  - say that associated with attention) would follow  $ATP \rightarrow ADP$ .

**Q:** Only biomolecules can serve as metabolic energy source: could this be due to the fact that they and presumably also ATP carry negentropic entanglement?

**A:** An attractive guess is that biomolecules used as nutrition indeed carry  $NE$  so that fight for survival would be fight for  $NE$ .

#### 4.3.3 Questions related to $NE$ and remote mental interactions

**Q:** If I have a cell culture (call it  $C$ ) seeking to entangle with something (call it that  $S$ ) that offers it food or positive emotional content, then where would you expect an ion discharge - at  $C$  or  $S$ ? What about the energy release/ATP formation? The way I read your papers it seems the "signatures" of entanglement would be found at  $C$ , but can you confirm that?

**A:** It seems that there are two options. 1)  $NE$  is generated between  $S$  and  $C$  (love) or 2)  $S$  only provides metabolic energy to generate the entanglement in  $C$  (just food).

1. For option 1 (love)  $NE$  should be between  $S$  and  $C$  or at least at the flux tube or sequence of them connecting them and overlapping with them. Therefore  $\hbar$  must be so large that the otherwise "small" space-time sheet (say flux tube) is scaled up to so large size that the condition is satisfied. Delocalized single particle excitation of this structure would entangle  $S$  and  $C$ .
2. Option 2 (food): ATP in  $S$  would be used to generate dark photons with travel along flux tubes to  $S$  and generate  $NE$  there - say by kicking electrons to smaller space-time sheets to build metabolic energy or by directly exciting cyclotron states. Also entangled Cooper pairs - of say electrons - could be transferred from  $S$  to  $C$ . This is in principle possible and would predict electron/ion currents between healer and healee. This brings in mind the healing currents of Becker.

**Q:** Also, what is the difference (in terms of these predictions) between a scenario where  $C$  initiates the entanglement for its own benefit and where  $S$  initiates it (the latter being analogous with healing)?

**A:** The metabolic energy needed for healing would come from healer or "third party". If  $C$  generates the local entanglement it could provide the ATP. Also when  $C$  sends negative energy to  $S$  to get negentropic entanglement or activate ATP, this is seen as enhanced metabolic rates at  $S$ . The open questions concern the identification of possible "third party". Maybe we should see entire magnetic Mother Gaia as single organism.

**Q:** Are these energy/ion signatures supposed to be of similar sign when information is injected into  $C$  (as in healing intention by  $S$ ) *vs.* extracted (as in  $S$  remote viewing target  $C$ )? Or can one expect opposite effects with these opposite informational transactions?

**A:** I can only answer with a series of counter questions.

What is the difference between healing and remote viewing? Could it be that healer sends positive metabolic energy or healee sends negative energy? Presumably both options are possible.

What happens in remote viewing? Viewer receives information,  $NE$ . Does this mean that she receives energy from the target or some third party or uses her own ATP to generate it? In any case, flux tubes and  $NE$  between  $S$  and  $C$  would be involved and metabolic energy generating excitations of cyclotron condensates too. Remote viewer has the metabolic machinery generating the currency so that she might pay the bill in the case of non-living targets.

**Q:** What if someone else (say  $P$ ) "entangles"  $S$  and  $C$  by making them both part of an experiment?

**A:** It is not quite clear what this statement could mean. Could one say  $P$  allows/makes it easier for  $S$  and  $C$  to entangle? Making an arrangement which together with NMP allows  $NE$  to develop between  $S$  and  $C$ ?

**Q:** Above questions relate to transfer of metabolic energy. Could one imagine pure control action, like turning on a switch and requiring very little metabolic energy?

**A:** Certainly. The natural expectation is that the metabolic energy is used to turning on switches rather than doing the hard work. Psychokinesis with inanimate targets is of course an exception.

#### 4.3.4 Electromagnetic aspects of remote mental interactions

**Q:** We know that unusual electromagnetic discharges have been observed at PK targets; so if I say that electron/ionic flow at the target is predicted as a signature of entanglement in TGD (both for PK and RV) - is that correct? It seems that what happens at the operator end may be less predictable, depending on whether the operator himself uses own energy or absorbs energy from somewhere else to conduct this process (and also operator tends to be human, which makes it too complex for unambiguous interpretation of measurements); but the target can be something very simple, hence very easy to measure under different scenarios.

**A:** Living targets and operators are ideal in the sense that they give the best hopes for non-trivial effects. They are however very complex, and one should be able to direct the attention to the essential aspects. In principle metabolic rates could provide a manner to test the model. Say in the case of PK, where the operators have reported exhaustion. The model for the generation of  $NE$  as that for a cyclotron BE condensate at flux tube is very general and makes sense also for non-living targets.

Whether electron or ion flow to target is a necessary counterpart of  $NE$  is an open question. Suppose that the generation of  $NE$  is based on non-local single particle excitations of cyclotron BE condensate at magnetic flux tube by incoming dark photon.

1. One can have both longitudinal excitations generating flow of large  $\hbar$  charged particles (bosonic ions or Cooper pairs of fermionic ions or electrons) and transversal genuine cyclotron excitations which do not generate longitudinal current.
2. Second alternative is many-particle state of electrons rather than superconducting state. In this case excitations would be most naturally transversal cyclotron excitations since for them excitation energy does not depend on the initial state. For longitudinal excitations the excitation energy is not constant unless all electrons are in ground state in longitudinal degrees of freedom: current would be generated in this case.

**Q:** Could there be any correlation between biophoton frequency or polarization at the target and the biophotons emitted by the healer - is it likely that these two properties would be preserved as the photons travel along flux tubes?

**A:** It is.

1. The simplest identification of biophotons would be as decay products of dark photons with much larger  $\hbar$  and having frequency even in ELF range (from  $E = hf$  and large value of  $h = 2\pi\hbar$ ).  $f$  would be of same order of magnitude as the inverse time scale  $T$ :  $f = c/T$  and the longer the time scale of remote mental interaction, the larger the value of  $\hbar$ ). Biophotons can transform to ordinary photons (visible, UV, or infrared) or decay to a bundle of ordinary low frequency photons. Large  $\hbar$  implies coherence and therefore correlation between polarizations and frequencies in the scale of  $NE$ .
2. The password mechanism based on resonant absorption of dark photons with several frequencies would require that cyclotron energy spectrum is same. The length of flux tube should be such that it corresponds to the dark photon energy. Metabolic energy quantum is preferred and corresponds to .5 eV: the value of  $\hbar$  determines the flux tube length and this can vary from cell size scale up to Earth size scale corresponding to different layers of magnetic body. The strength of the magnetic field at flux tube defines the scale of cyclotron frequencies. Both might allow variation in some range.
3. Approximate standardization of flux tube lengths would be natural: one could however think of magnetic immune system based on fine tuning by varying flux tube lengths to distinguish between individuals. This would eliminate the danger of becoming "possessed".
4. Maybe healer can control the flux tube length and magnetic field strengths of her own magnetic body. The radiation emitted when cyclotron BE condensate returns to ground state could thus have controllable frequency scale and healer could tune to the frequencies of healee. Frequency modulation would be an obvious mechanism of tuning.

**Q:** Are there particular ions you expect to be seen at the target with these ion flows? If we knew which ions to look for it might be easier to test for them.

**A:** Biologically important ions are the most natural candidates.  $Ca^{++}$  ion is boson and  $Ca^{++}$  waves are very important in neuroscience and Blackmann found their cyclotron frequencies to be important in ELF excitations of vertebrate brain.  $Ca^{++}$  waves also appear in extremely wide time scale range so that the assignment with the hierarchy of Planck constants might make sense.  $Mg^{++}$  is also boson. If one allows Cooper pairs of fermionic ions also other biologically important ions become important.

#### 4.3.5 Temporal aspects of remote mental interactions

**Q:** Could one make any temporal predictions about the lag time between intent application and effect?

**A:** For MEs signal propagates with light velocity and its shape is unchanged. This determines fundamental distinctions from Maxwell's electrodynamics. The time is determined by the length of ME:  $L = cT$ . This means that for longer time scales the size scales of layers of magnetic body involved are necessarily astrophysical. For  $T = .1$  seconds the scale is of order of circumference of Earth. It is not easy to get accustomed to the possibility that we might be much more than what we see. Libet's experiments about passive aspects of consciousness suggest that sensory data is fraction of second old: the explanation would be that it propagates from cell membranes to the layer of magnetic body corresponding to time scale of order .1 seconds, which is the basic time scale of sensory perception.

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