

# TGD Based Model for OBEs

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## Abstract

Out-of-body experiences (OBEs) are often understood as experience of seeing oneself from a position outside of the body. OBEs are poorly understood in the framework of neuro science and pose a challenge for the reductionistic world view.

In TGD framework the notion of magnetic body provides an attractive starting point in attempts to understand what OBEs and related experiences are. The basic idea is that magnetic body serves effectively as a mirror defining a third person view as a cognitive representation also in ordinary wake-up state and that during OBEs this representation becomes sensory representation. Magnetic body need not always be a personal magnetic body but could correspond to a magnetic body receiving information from several brains (collective consciousness), magnetic body of another person, or be even associated with "dead" matter.

The progress in identifying dark matter as a phase of matter with large value of Planck constant making possible macroscopic quantum coherence has led to the vision about dark matter at magnetic flux quanta as quantum controller of ordinary matter in living systems. The Bose-Einstein condensates of dark photons decaying via decoherence to ordinary photons mediate interactions between ordinary and dark matter and the hypothesis is that dark photon "laser" beams from body and brain reflected at magnetic flux quanta give rise to third person aspect of consciousness which in OBEs and related experiences are realized as sensory representations. The identification of bio-photons as end products of the de-coherence of dark photon beams is natural.

The model leads also to a model for dreams, hallucinations, sensory feedback from brain to sensory organs, and directed attention. Concrete models for how dark photons can give rise to experiences in various sensory modalities such as vision, hearing, olfaction, and tactile senses, are proposed.

## 1 Introduction

Out-of-body experiences (OBEs) [34, 35, 32, 33] are often understood as experience of seeing oneself from a position outside of the body. According to Susan Blackmore [32], OBEs are rather common: from 5 to 35 percent of subjects reports of having had at least one OBE. According to studies persons having OBEs seem to be perfectly healthy. OBEs are poorly understood in the framework of neuro science and pose a challenge for the reductionistic world view.

In TGD framework the notion of magnetic body provides an attractive starting point in attempts to understand what OBEs and related experiences are. The basic idea is that magnetic body serves effectively as a mirror defining a third person view as a cognitive representation also in ordinary wake-up state and that during OBEs this representation becomes sensory representation. Magnetic body need not always be a personal magnetic body but could correspond to a magnetic body receiving information from several brains (collective consciousness), magnetic body of another person, or be even associated with "dead"

matter.

The progress in identifying dark matter as a phase of matter with large value of Planck constant making possible macroscopic quantum coherence has led to the vision about dark matter at magnetic flux quanta as quantum controller of ordinary matter in living systems. The Bose-Einstein condensates of dark photons decaying via decoherence to ordinary photons mediate interactions between ordinary and dark matter and the hypothesis is that dark photon "laser" beams from body and brain reflected at magnetic flux quanta give rise to third person aspect of consciousness which in OBEs and related experiences are realized as sensory representations. The identification of bio-photons as end products of the de-coherence of dark photon beams is natural.

The model leads also to a model for dreams, hallucinations, sensory feedback from brain to sensory organs, and directed attention. Concrete models for how dark photons can give rise to experiences in various sensory modalities such as vision, hearing, olfaction, and tactile senses, are proposed.

I am grateful for Tiaan Brink for sending a little summary about OBEs. This article inspired the attempt to fuse the TGD inspired ideas related to OBEs to a coherent theory.

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

### 2.1 Phenomenological characterization

The phenomenological characterization of OBEs has been discussed in [33]. A precise definition of OBE is to have sensation of being outside the body. Autoscopy experience involves 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 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 [32]. This brings in mind the notion of subtle body of spiritual practices identified as the body experienced during lucid dreaming [17]. 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..

## 2.2 OBEs induced by electric stimulation

Relatively recently OBEs and AS experiences have been produced by an electric stimulation of the angular gyrus [36]. 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.

Neppe [37] has criticized the interpretation of experiments.

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. Same 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.

## 2.3 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 [35] 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 [29] 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.

## 3 TGD inspired model for OBEs and related experiences

It is good to develop the model for OBEs by first listing the basic TGD specific ingredients of the model and then proceed by making questions (I hope that reader does not feel them to be leading).

### 3.1 Basic ingredients of the TGD inspired model

The model of OBEs involves several ingredients that are specific to TGD.

1. Magnetic bodies and field bodies are excellent candidates for the "third person" seeing the ordinary body. Magnetic body could receive a visual stimulus from ordinary body and reflect it back as a visual stimulus during OBE processed by the brain of the subject person. Thus body would

see itself from the perspective of the magnetic body. Also dreams and hallucinations might involve the same mechanism. In the case of hearing sounds created by subject person could be reflected back to her ears or more plausibly, microwave hearing [24] could be involved.

2. Topological light rays ("massless extremals", MEs) are an element of TGD having no counterpart in Maxwell's ED and play a key role in TGD inspired theory of consciousness. The interpretation of MEs has remained somewhat obscure. The development of TGD based model for dark matter residing at magnetic flux tubes and characterized by large value of Planck constant implying quantum coherence in even macroscopic length and time scales changed the situation in this respect. The model for dark matter as macroscopically quantum coherent phase is discussed briefly in this book in chapter [I5] and more extensively in the book "Genes, Memes, Qualia, and Semitrance" [J6]. MEs can be identified as space-time correlates of Bose-Einstein condensates ("laser beams") of dark photons. It is however still unclear whether ordinary laser beams actually correspond to dark photon Bose-Einstein condensates and become visible only in decoherence to ordinary photons. Negative energy MEs can be identified as correlates for phase conjugate laser beams of dark photons. The so called time mirror mechanism is universal building block of basic biological and brain functions [K1].
3. Bio-systems as conscious holograms is one of the key ideas of TGD approach [K4]. Bio-holograms [22] suggest themselves as primary sensory stimuli quite generally. Biological body could generate dark photon "laser beams" received by magnetic bodies and reflected back to retina or perhaps to pineal gland [18], the "third eye". This would explain AS as well as the images of internal organs [29]. Also other systems, at least living systems, could be seen from the perspective of the magnetic body. Remote vision hypothesis testable by using living targets not visible in ordinary sense. This would give also rise to telepathy if reflection occurs from magnetic bodies of another person.
4. In TGD framework sensory organs are identified as seats of primary sensory experience and brain only constructs symbolic representations about percept, in particular identifies objects of perceptive field. This does not exclude a considerable back projection to sensory organs modifying the sensory input. Dreaming involves back projection to sensory organs inducing artificial sensory experiences as simulation. One possibility is that dreams and hallucinations represent direct back projection to sensory organs along neural pathways. An alternative view is that the projection involves dark photon beams generated by brain and reflected back from the magnetic body. If OBEs are hallucinations, the visual sensory memories of the subject person about herself could serve as building blocks to generate simulation about what person looks like when seen from outside.

5. Sharing and fusion of mental images is one of the basic notions of TGD inspired theory of consciousness [K1, K4]. One can ask whether OBE involves sharing of the visual experience of other persons involved about subject person. If this were the case, the presence of other persons would be necessary to have OBE. Sharing of mental images would explain the case of Miss Z as telepathy.

### **3.2 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. This would explain the case of Miss Z studied by Tart [35] as telepathy.

### **3.3 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.

### **3.4 Does OBE originate from an actual sensory stimulus?**

The well-known fact that body parts indeed contain holograms about other body parts [22] (see the discussion in [K5]) and the TGD view about the relationship between dark and living matter [J6] 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-brain magnetic body. Magnetic bodies could be associated also with "dead" matter.

In this picture the case of Miss Z could be understood in two alternative manners. A dark photon beam possibly created by the visual representation of the random number (does "dead" matter generate sufficiently intense beams of this kind?) and reflected by personal magnetic body could be in question. Alternatively, the magnetic body involved could receive the information about random number from the brain of the experimenter and reflect it to the brain of the subject person.

### 3.5 Why electrical stimulation induces 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 which 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.

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 would contribute to the visual stimulus. This would occur automatically during dreams and NDE experiences.
2. The sensory input from the magnetic body could be amplified. Time mirror mechanism could be responsible for this amplification [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.

### 3.6 A more detail model for OBEs

In the following a more detailed model for various aspects of OBEs is developed.

#### 3.6.1 Do bio-photons result from the de-coherence of dark photon beams?

Bio-holography provides support for the body as a hologram (more precisely, dark photon hologram). For instance, an electric stimulation of ear during Kirlian imaging of a finger tip creates a Kirlian photo from which it is possible to abstract a hologram of ear [22] (for a TGD based model see [K4, K5]). This suggests that body parts can in some sense "see" each other. In particular, brain can "see" body parts (note that bacteria possess a primitive IR vision based on micro-tubules): this of course need not correspond to a conscious vision at our level of self hierarchy.

The biological function of bio-photons [23] is poorly understood, and they are an excellent candidate for ordinary photons resulting when dark photon beam de-coheres. TGD based model of bio-photons can be found in [K6] and the identification as dark photons is discussed in [J6]. The findings of Peter Gariaev about the effects of visible laser light on DNA [31] and so called phantom DNA effect [30] provide a further support for the biological importance of biophotons (see the discussions in [K6, J6]).

#### 3.6.2 What is the mechanism of out-of-body hearing?

Mechanism could be even more general and work also in the case of other qualia. In particular, hearing might involve similar reflection of sound waves at larger space-time sheets from the magnetic body and heard as "other-worldly" sounds.

A more plausible option is that the auditory sensation is generated by dark microwave photons reflected back from magnetic body. Microwave hearing [24] is indeed a well-known but poorly understood phenomenon and the generation of microwaves by plants after sunset correlates also with taos hum [26] (see the discussion in [M1]) which does not generate any response in microphones but reflects the features of the acoustic environment.

The auditory and visual hallucinations of schizophrenic persons would represent in this framework a genuine sensory input. The notion of bicameral mind introduced by Jaynes [16] discussed in TGD framework in [N6] would fit also nicely with this picture. The "god" controlling the behavior of bicameral by giving explicit commands would correspond to some magnetic body, not necessarily that of the subject person, but a magnetic body receiving input from several brains in the social group and representing collective consciousness.

### **3.6.3 Where are the sensory receptors giving rise to the primary sensory experience?**

The simplest guess is that the visual stimulus from the magnetic body is received by eyes. The fact that REM accompanies visual dreaming supports this view in the case of dreams. The receiving sensory organ could be also pineal gland [I3, M5], "third eye", the seat of the soul according to Descartes [18]. Pineal gland is known to contain retinal pigments and its counterpart in more primitive animals is known to function as a genuine eye. A simple test in the case of artificial OBEs is to look whether the electric stimulation of OBEs generates also REM.

If OBE hearing is indeed microwave hearing, the identification of the primary sensory receptors is not obvious, although their existence cannot be denied.

The insect olfaction relies on infrared light as discovered by Callahan [27] (see the discussion in [K3]). One might therefore wonder whether also humans possess olfactory receptors sensitive to IR light, and whether the emission of dark IR photons reflected from magnetic body could play some role in olfaction and in the generation of olfactory hallucinations. One can even ask, whether the molecular recognition mechanism underlying chemical senses relies on IR light. It is known that human nose contains so called vomeronasal organ [19] sensitive to odors having sexual or social meaning but that these odors do not give rise to a conscious experience.

It is known that blind persons can learn to "see" when their skin is stimulated by electromagnetic fields representing the environment. Perhaps dark photon beams could induce also tactile sensations. Quite generally, the earlier proposal that information in all sensory modalities can be transformed to field patterns represented by MEs could sharpen to the hypothesis that the information in various sensory modalities allows a representation as dark photon beams inducing corresponding sensory qualia in the interaction with appropriate sensory receptors.

### **3.6.4 What is the mechanism causing the kinesthetic sensations during OBEs?**

The model should also explain sensations of lifting, flying experiences, and the experiences of being in translational or rotational motion. The motion of the magnetic body with respect to the physical body should induce this kind of sensations. The basic idea is simple: generalize the mechanism allowing to hear the motion of a sound source. Generalizing from sound waves to dark photon beams, the sensation in question would be basically due to the Doppler shift of the dark photon beams travelling between biological body and the moving magnetic body. The change of the dynamical hologram resulting in the interference of a bodily reference beam and Doppler shifted reflected beam in quantum jumps could be responsible for the sensation.

This model could also resolve an objection against the hypothesis that sensory receptors experience the primary qualia. The objection is based on train

illusion. When you sit on a train and look at second train which starts to move, you can have an illusion that it is your train that moves. The illusion is not a mere belief but involves a sensation of acceleration in the entire body. There are two options.

1. The sensation is a response to various bodily activities induced by the belief of being in an accelerated motion.
2. The sensation is caused by a primary sensory input induced by the acceleration. This sensory input must be produced artificially in the case of train illusion.

Consider first a genuine accelerated motion of the biological body. One could argue that in absence of visual, auditory or other sensory information about being in accelerated motion, there is no belief about being in accelerated motion so that acceleration is not perceived at all for option a). This makes option a) implausible. For option b) the acceleration of the biological body with respect to the object defining the rest system is directly perceived. The Doppler shift of the dark photon beams radiated from biological body and reflected back from the rest system would induce the sensation. Reflection could occur either from the rest system or a magnetic body associated with it.

One can imagine two mechanisms creating an illusory acceleration for option b).

1. If the fixation of the attention to the moving train means the presence of dark photon laser beams connecting biological body and train or a magnetic body associated with it, the Doppler shift of dark photon beams could induce the sensation of acceleration.
2. Directed attention could cause a personal magnetic body to mimic the motion of train so that the relevant part of it deforms in the direction of moving train to keep the distance to the moving train fixed. This would induce train illusion by the same mechanism as in case 1).

For both mechanisms the reflection of dark photon beams becomes the fundamental mechanism of directed attention. Attention would mean a formation very concrete bonds between subject and object or a representation of object at the personal magnetic body: the rays connecting the eyes of cartoon characters would represent a very profound idea about consciousness. Both views about attention mean a clear-cut deviation from the prevailing neuro-scientific thinking according to which the experienced world is virtual and completely detached from the real world.

Cliff illusion might be an appropriate name for the disgusting feeling in stomach which one feels on the brink of a precipice. Sensory imagination about falling down is in question and could be induced by the deformation of the personal magnetic body such that it mimics free fall.

The floating sensations and strange deformations of personal body during OBEs could also correspond to the deformation dynamics of the magnetic body

which could be also caused by external influences. If the size of the magnetic body is measured using Earth radius as a natural unit and if the personal magnetic body co-rotates with Earth, the variation of the effect of the solar wind could induce periodic deformations of the magnetic body as in the case of Earth's magnetic field. This could reflect itself as diurnal alterations in the shape of the body experienced during OBEs: a contraction during day time and an elongation during night time. Sunspot maxima induce magnetic storms and these could have strong effects on the shape of the body perceived during OBEs.

### **3.6.5 What is the mechanism making possible to see internal organs?**

Becker tells in his book "Cross currents" [29] about a young cancer patient who told that he can see the interior of his own body. The patient could also locate the remnant of the tumor correctly. The simplest explanation is that magnetic body at some level of hierarchy reflects the dark photons emitted by the internal organs.

Usually this does not occur and one should understand why the emission occurred in the case of the cancer patient. There is evidence that bio-photons leak out from non-healthy organs [23]: this might mean that organs send more intense dark photon beams reflected at the magnetic body.

Time mirror mechanism involving time reflection instead of ordinary reflection suggests itself as an alternative explanation. The cells suffering starvation generated phase conjugate dark photon beams in order to get metabolic energy. This in turn induced a cascade like emission of positive energy dark photon beams from the magnetic body instead of mere time reflection.

## **3.7 The relationship of EMDR experiences to OBEs**

Near-death experiences are not the only manner to get convinced about life after death. So called eye-movement desensitization and reprocessing (EMDR) discovered by Francine Shapiro [21] induces what could be interpreted as after-death communications (see the discussion in [H9]). The experiences of subject persons are claimed to be induced by this therapy in a highly reliable manner: according to [21] 98 per cent of patients willing to participate the therapy had after death communication experience. It does not matter what the religious convictions of the subject person are and the experiences are actually rather easy to induce. It does not matter if the loss is traumatic or not or whether it is recent or occurred for decades in past.

The experiences resemble near death experiences (light tunnels, beautiful landscapes) and involve spiritual contact with the deceased. The EMDR technique involves getting the patient to move his or her eyes in a particular rhythmic fashion while at the same time attending to a particular aspect of the traumatic memory. How EMRD works is poorly understood as yet: possibly the fact that the shifting of eyes leads to increased brain processing is of importance. Notice that rapid eye movements REM are also involved with dreams.

A possible explanation is that EMDR experiences involves visual communication using dark photon beams and/or their phase conjugates with the 4-D magnetic bodies of the deceased ones located possibly in the geometric recent or past via the magnetic mirrors associated with them. Essentially the same mechanism as involved with long term episodal memories could be in question: the only difference would be that the magnetic mirrors now mediate information not from own 4-D body from the 4-D body of the deceased.

## **4 The role of the magnetic body in the case of other brain functions**

During the construction of the model of OBEs it became clear that the reflection of dark photon beams from the magnetic body could serve as a building block of several ordinary brain functions. It has been already found that dark photon beams could define a fundamental mechanism of directed attention.

### **4.1 Dreams and hallucinations and magnetic body**

The reflection of dark photon beams from the magnetic body could be involved also with dreams and hallucinations so that the neurological similarity of AS experiences and OBEs does not mean that both are hallucinatory. The "subtle body" assigned by many spiritual traditions with the dreaming state (for a nice summary see [17]) would correspond to the magnetic body. In this case mental images constructed in brain would induce dark photon beams sent to magnetic body and reflected back. The mechanism would also naturally explain autoscopic and heautosopic experiences, in particular the ability to see internal organs.

### **4.2 Third person aspect of conscious experience**

Our conscious experience involves so called third person aspect giving a symbolic bird's eye of view about ourselves. Magnetic body could take the role of the third person. At the fundamental level this representation could be based on sensory stimuli originating from body and reflected back to sensory organs. It would be completely masked by the ordinary sensory input in wake-up state but distilled by brain from the dominating sensory input and coded to a cognitive representation to minimize the amount of irrelevant information. A strong interference of this kind of sensory representation with ordinary sensory input would be obviously highly undesirable. The third person aspect could be present always and be based on the reflection of dark photons along MEs parallel to magnetic flux tubes.

### **4.3 Feedback to primary sensory organs via reflection from magnetic body**

One objection against the hypothesis that primary sensory organs are seats of sensory qualia is that that sensory stimuli are only the raw material sculptured into actual sensory perceptions and that directed attention chooses what aspects of sensory stimulus are amplified and which neglected. I have proposed that there is a feedback by projections to the primary sensory organs from brain generating artificial sensory stimuli modifying the primary sensory input. This feedback could be realized also as a reflection of artificial dark photon beams generated by brain from the magnetic body and received as such by eyes or received by brain and channelled to eyes via MEs parallel to visual pathways.

### **4.4 Does imagination involve feedback via magnetic body?**

One can wonder, whether also imagination could involve reflection of dark photon beams from the magnetic body. In TGD framework the hypothesis that sensory qualia are generated at primary sensory organs and brain constructs only symbolic representations about experiences circumvents the basic objections such as the experience of phantom leg. In this framework imagination and cognition can be identified as symbol generating activities which are not initiated at sensory organs but at some higher level of the hierarchy starting from sensory organs and ending at the associative areas of cortex.

Imagination could however involve also transformation of symbolic representations to dark photon beams reflected back from the magnetic body. This input would not contribute to sensory input but might be abstracted from the sensory input and might serve as a kind of feedback. In absence of ordinary sensory stimuli the input from the magnetic body would dominate and imagined mental images would transform to dreams or hallucinations.

### **4.5 Sensory memories and magnetic body**

In some exceptional cases often associated with a serious damage in cognitive areas of brain the feedback from the magnetic body could give rise to a genuine sensory representation making possible direct sensory memories. Examples are autistic persons with ability to remember visual scenes music pieces in every detail and also reproduce them.

One explanation is sharing of sensory mental images of geometric past. An alternative explanation is that the information about sensory memory is communicated from the geometric past in symbolic form and transformed to a dark photon beam reflected back from the magnetic body. The fact that angular gyrus is involved with the translation of written language to internal speech and the abstraction of meaning of visual metaphors supports the view that a transformation of linguistic statements to concrete images projected to the magnetic body occurs in this process.

I have proposed a mechanism [H4] explaining synesthesia. The association of different sensory modalities could also occur via a transformation of sensory input in given modality to dark photon beam reflected from magnetic body and generating a sensation in another modality. Synesthetes are also known to be capable of amazing sensory memory feats [20] and I have proposed an explanation based on time mirror mechanism [H4]. Also in this case neurons in certain region of left brain hemisphere suffer starvation which should be lethal by standard wisdom.

As a matter fact, the starvation mechanism seems to be a very general mechanism: Callahan has found evidence that insects find more easily the plants suffering from under nutrition [28] (see the discussion in [L1]). Even the fasting common in spiritual practices could be seen as a method to get body entangled with magnetic bodies by using time mirror mechanism.

## 5 The interpretation of my own OBE type experiences in terms of the proposed model

My own personal experiences have served as a test bed for the basic ideas of TGD inspired theory of consciousness. I find it practical to divide these experiences into two classes. The first class of experiences have repeated relatively often during years after the great experiences. The Great Experiences in turn involved a rich spectrum of experiences which I group into the second class. There is some overlap between these categories.

### 5.1 Visual experiences and kinesthetic sensations

The first class of strange experiences involves several kinds of visual experiences and kinesthetic sensations.

1. When I lightly close my eyes during ordinary wake-up consciousness and in calm state of mind, I see dimly a complex flow in the visual field. This flow brings in mind time dependent magnetic field or incompressible flow of fluid. The direction of flow can be either inwards or outwards and can change. The flow can be also colored. The straightforward interpretation would be as a visual stimulus from the magnetic body which does not give rise to concrete images.
2. I have had many AS experiences in which I have seen my body in strangely deformed state and have had a sensation of floating. This experience is often followed by the experience of raising to the roof and I have made attempts to test whether the levitation is real or not. The experiences have ended to a wake-up to ordinary state of consciousness. Quite concrete sensations of what I have identified as "electrical storms in temporal lobes" have often accompanied these experiences.

3. I have had also flying experiences: typically there is some critical height which I cannot exceed. I have had also experiences about being in completely dissipation free spinning or translational motion, which bring strongly in mind what purely quantal motions of this kind feel like. The translational motion has been possible only in a finite volume defined typically by the walls of the room. I have also experienced my children to bring me back when I have tried to go too far. A possible interpretation is that my magnetic body is bound to that of room so that it is not possible to leave it.
4. I have often experienced quite concretely a return to my own body during wake-up as a kind of contraction somewhat like djinn returning to a bottle. After a visit to Holland where I was subject to a treatment by a healer, I waked up to a rather long-lasting experience in which I felt that the entire room was part of my body. The world around me was strangely peaceful and calm, somewhat like the world in the pictures I saw in fairy tales in my childhood.
5. Two illusions analogous to train illusion but involving a 2- or 3-dimensional wave motion instead of linear motion deserve also to be mentioned. I sat in a calm state of mind on cliff on beach and enjoyed looking the waves. Suddenly I got a long lasting sensation that the cliff is in a wave like motion as if I had seen the cliff from the perspective of the moving surface of sea and thus in a wave like movement with respect to it. The explanation would be magnetic body began to mimic the wave motion somewhat like a person listening very attentively begins to mimic the facial expressions of the speaker. Since magnetic body also serves also the dual role of a sensory canvas to which sensory mental images are projected [M1], the situation would be like projecting sensory mental images to a deformable screen along which deformation waves propagate. The projected sensory images such as the visual image about cliff would inherit the wavy character.

Anyone who has enjoyed free floating in a windy sea for a sufficiently long time has probably experienced a sensation about a wave like motion inside the body after the return to the shore. The sensation continues surprisingly long time. As far as I can remember, this experience is absent during free floating. Also this experience might relate to the fixation of bodily attention to the wavy sea inducing a mimicry of wave motion by a relevant magnetic body as in the previous case and continuing for a considerable time after the return to the shore. During free floating in sea this sensation is weak since the relative motion is minimal but at the shore the situation changes since the body is in a relative 3-D motion with respect to the magnetic body.

## 5.2 OBE type auditory sensations

Also OBE type auditory sensations have often occurred.

1. The AS experience have often started usually by a gradual amplification of sounds such as the sound of refrigerator and have involved the rather frightening sensation that the refrigerator attracts me towards it and wants to fuse my self with its own (for this reason I have been forced to minimize this sound). A possible explanation is that magnetic body in this kind of situation contributes to the auditory stimulus the secondary sound representing the sensory stimulus that it has received from the body and a positive feedback loop is generated. Representation as microwaves is perhaps the most plausible option.
2. When I wake up during night-time, I can sometimes hear a kind of wind blowing and often I realize that ordinary wind is not in question when I see that there is completely calm outside. This wind has preceded sometimes a loss of consciousness. A microwave stimulus arriving from magnetic body along magnetic flux tubes and transformed to auditory sensation could be in question. Obviously this sensation would be direct auditory counterpart for the flow in visual field experienced during wake-up.
3. To listen one's own snoring during sleep or just before wake-up as an outsider is a rather bizarre experience and often it takes time to realize that it is really me. The interpretation in terms of microwave dark photon beams modulated by the snoring and reflected back from the magnetic body would be the simplest one.
4. Sometimes I also hear my own breathing as double with a time laps of a fraction of second between the copies. This gives some idea about size of the magnetic body possibly involved. For microwave hearing the size of magnetic body would correspond to a wavelength of typical EEG wave and would be of the order of Earth circumference for 7.8 Hz. If ordinary sound waves are in question the size of magnetic body involve would be of order 10 meters.

### 5.3 OBEs associated with "Great Experiences"

Second group of experiences I had during what I call Great Experiences (two of them).

1. I saw my thoughts as images superposed to the strange flow already mentioned. The optimum situation was achieved which lightly closed eyes. This stimulated a conversation with what I called Great Mind. I wrote first my questions to monitor and experimentation with the transformation of written words into visual images during great experience. This would conform with the view that brain, perhaps angular gyrus, transforms written words to visual symbols by generating dark photon beams reflected back from the magnetic body. During the original experience I had a deep conviction that this visual representation is an essential part of language and thinking.

At some stage I found that writing of my questions is not anymore necessary and I also began to realize that the Great Mind in some sense is just me, in some sense I was a God. One of the most important answers I received was that death is only an illusion. An interpretation in terms of a direct communication with some magnetic body in the hierarchy, not necessarily mine, looks natural.

2. I experienced several variants of OBEs. There was an heautosopic experience in which I did not only see me as an outsider but experienced how my body language directly reveals to an outsider my sociophobia.

During the stay in hospital I left my body and walked out from hospital. I was surprised that the personnel did not notice this at all, as if I had been invisible. I walked along sunny street (it was very beautiful day of May) and felt myself extremely happy. I did not get too far since persons from the staff of hospital brought me back. This might be an example of experience involving remote viewing in which magnetic body reflects dark photons from external world to the physical body. Again it would seem that my magnetic body was bound to some larger one and could not leave it.

There was also an experience of wandering in worlds totally different from our physical world. Learning that this kind of worlds exist was a little bit irritating for my theoretician's vanity since I had thought that the ordinary physical universe predicted by TGD is all that exists!

Finally there was experience that the hospital building itself is a conscious entity having some kind of experiences and that I had somehow identified with it or that I somehow received visual information about the structure of the building.

3. During second Great Experience I experienced what might be called tactile remote sensing. I "saw" at the skin of my leg an emotionally highly painful event and interpreted it as remote viewing. This would support the view that also tactile sensations might be generated by dark photons in some wave length range. Hearing and tactile sensing are indeed closely related.

#### 5.4 Dark matter hierarchy, zero energy ontology, and OBEs

The identification of dark matter as a hierarchy of quantum phases labelled by the values of Planck constant [C9] provides additional insights about OBE experiences. Planck constant is quantized and can have arbitrarily large values and since Compton length and other analogous quantum lengths and times scale as Planck constant, this means macroscopic and macro-temporal quantum coherence and a reduced rate of dissipation.

Also the magnetic body controlling biological body (actually onion-like hierarchy of them) is assumed to carry dark matter and dark matter becomes the agent responsible for the quantum control of ordinary matter in living systems. The value of Planck constant becomes also a measure for the evolutionary level

of the living system and great leaps in evolution can be identified as transitions increasing the maximum value of  $\hbar$  in "personal" hierarchy of magnetic bodies [M3].

Zero energy ontology is second new element of quantum TGD and states that all physical states have vanishing net values of conserved quantum numbers. Zero energy ontology provides a firm justification for the notion of negative energy signals consisting of (say) phase conjugate photons propagating to the geometric past. These negative energy signals are crucial element of the time mirror mechanism playing a central role in the general mechanism for intentional action, remote metabolism, and long term memory.

A general model for the remote mental interactions follows from a model for the living matter by assuming that also other biological bodies can serve as targets for the control action of the magnetic body or communicate sensory information to the magnetic body. Of course, the target need not be restricted to be a biological system. Ordinary intentional action would represent a particular case of remote mental interaction in this framework.

Consider now OBEs in this general framework. During OBE experiences 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.

In absence of these cognitive mental images to the magnetic body, magnetic body would not anymore provide strict cognitive representations of biological body and virtual world experiences would result. Since only magnetic body contributes to the bodily experience, the low rate of dissipation due to large value of  $\hbar$  would explain the pleasant experience about the absence of the sensory noise.

It is perhaps not an accident that during OBE like experiences I saw my thoughts as vivid pictures and that people experiencing OBEs are known to have exceptionally vivid visual imagination. This might relate to redirected metabolism. Construction of mental images and their communication requires metabolic energy feed. During OBEs the metabolic energy usually spent to the formation and communication of the cognitive representations about the state of the biological body to the magnetic body could be redirected to the visual cortex allowing to construct the vivid visual representations of thoughts. The distorted bodily image due to neural disorders in temporal lobes seems to correlate with OBEs: perhaps the disorder does not allow metabolic energy to be used to construct cognitive representations about biological body during these disorders and it is redirected to the visual cortex. Also during dreams and in the transition states between sleep and awake the metabolic resources could be redirected in this manner and lead to a generation of vivid visual mental

images.

## References

### Online books about TGD

- [1] M. Pitkänen (2006), *Topological Geometroynamics: Overview*.  
<http://www.helsinki.fi/~matpitka/tgdview/tgdview.html>.
- [2] M. Pitkänen (2006), *Quantum Physics as Infinite-Dimensional Geometry*.  
<http://www.helsinki.fi/~matpitka/tgdgeom/tgdgeom.html>.
- [3] M. Pitkänen (2006), *Physics in Many-Sheeted Space-Time*.  
<http://www.helsinki.fi/~matpitka/tgdclass/tgdclass.html>.
- [4] M. Pitkänen (2006), *Quantum TGD*.  
<http://www.helsinki.fi/~matpitka/tgdquant/tgdquant.html>.
- [5] M. Pitkänen (2006), *TGD as a Generalized Number Theory*.  
<http://www.helsinki.fi/~matpitka/tgdnumber/tgdnumber.html>.
- [6] M. Pitkänen (2006), *p-Adic length Scale Hypothesis and Dark Matter Hierarchy*.  
<http://www.helsinki.fi/~matpitka/paddark/paddark.html>.
- [7] M. Pitkänen (2006), *TGD and Fringe Physics*.  
<http://www.helsinki.fi/~matpitka/freenergy/freenergy.html>.

### Online books about TGD inspired theory of consciousness and quantum biology

- [8] M. Pitkänen (2006), *Bio-Systems as Self-Organizing Quantum Systems*.  
<http://www.helsinki.fi/~matpitka/bioselforg/bioselforg.html>.
- [9] M. Pitkänen (2006), *Quantum Hardware of Living Matter*.  
<http://www.helsinki.fi/~matpitka/bioware/bioware.html>.
- [10] M. Pitkänen (2006), *TGD Inspired Theory of Consciousness*.  
<http://www.helsinki.fi/~matpitka/tgdconsc/tgdconsc.html>.
- [11] M. Pitkänen (2006), *Mathematical Aspects of Consciousness Theory*.  
<http://www.helsinki.fi/~matpitka/genememe/genememe.html>.
- [12] M. Pitkänen (2006), *TGD and EEG*.  
<http://www.helsinki.fi/~matpitka/tgdeeg/tgdeeg/tgdeeg.html>.

- [13] M. Pitkänen (2006), *Bio-Systems as Conscious Holograms*.  
<http://www.helsinki.fi/~matpitka/hologram/hologram.html>.
- [14] M. Pitkänen (2006), *Magnetospheric Consciousness*.  
<http://www.helsinki.fi/~matpitka/magnconsc/magnconsc.html>.
- [15] M. Pitkänen (2006), *Mathematical Aspects of Consciousness Theory*.  
<http://www.helsinki.fi/~matpitka/magnconsc/mathconsc.html>.

## References to the chapters of books

- [C9] The chapter *Does TGD Predict the Spectrum of Planck Constants?* of [4].  
<http://www.helsinki.fi/~matpitka/tgdquant/tgdquant.html#Planck>.
- [H3] The chapter *Self and Binding* of [10].  
<http://www.helsinki.fi/~matpitka/tgdconsc/tgdconsc.html#selfbindc>.
- [H4] The chapter *Quantum Model for Sensory Representations* of [10].  
<http://www.helsinki.fi/~matpitka/tgdconsc/tgdconsc.html#expc>.
- [H9] The chapter *Quantum Model for Paranormal Phenomena* of [10].  
<http://www.helsinki.fi/~matpitka/tgdconsc/tgdconsc.html#parac>.
- [I3] The chapter *Biological Realization of Self Hierarchy* of [8].  
<http://www.helsinki.fi/~matpitka/bioselforg/bioselforg.html#bioselfc>.
- [I5] The chapter *Quantum Control and Coordination in Bio-Systems: Part II* of [8].  
<http://www.helsinki.fi/~matpitka/bioselforg/bioselforg.html#qcococII>.
- [J4] The chapter *Quantum Antenna Hypothesis* of [9].  
<http://www.helsinki.fi/~matpitka/bioware/bioware.html#tubuc>.
- [J6] The chapter *Coherent Dark Matter and Bio-Systems as Macroscopic Quantum Systems* of [9].  
<http://www.helsinki.fi/~matpitka/bioware/bioware.html#darkbio>.
- [K1] The chapter *Time, Spacetime and Consciousness* of [13].  
<http://www.helsinki.fi/~matpitka/hologram/hologram.html#time>.
- [K3] The chapter *General Theory of Qualia* of [13].  
<http://www.helsinki.fi/~matpitka/hologram/hologram.html#qualia>.
- [K4] The chapter *Bio-Systems as Conscious Holograms* of [13].  
<http://www.helsinki.fi/~matpitka/hologram/hologram.html#hologram>.
- [K5] The chapter *Homeopathy in Many-Sheeted Space-Time* of [13].  
<http://www.helsinki.fi/~matpitka/hologram/hologram.html#homeoc>.

- [K6] The chapter *Macroscopic Quantum Coherence and Quantum Metabolism as Different Sides of the Same Coin* of [13].  
<http://www.helsinki.fi/~matpitka/hologram/hologram.html#metab>.
- [L1] The chapter *Genes and Memes* of [11].  
<http://www.helsinki.fi/~matpitka/genememe/genememe.html#genememec>.
- [M1] The chapter *Magnetic Sensory Canvas Hypothesis* of [12].  
<http://www.helsinki.fi/~matpitka/tgdeeg/tgdeeg/tgdeeg.html#mec>.
- [M3] The chapter *Dark Matter Hierarchy and Hierarchy of EEGs* of [12].  
<http://www.helsinki.fi/~matpitka/tgdeeg/tgdeeg/tgdeeg.html#eegdark>.
- [M5] The chapter *Quantum Model of EEG: Part II* of [12].  
<http://www.helsinki.fi/~matpitka/tgdeeg/tgdeeg/tgdeeg.html#eegII>.
- [N6] The chapter *Semitrance, Language, and Development of Civilization* of [14].  
<http://www.helsinki.fi/~matpitka/magnconsc/magnconsc.html#langsoc>.

## Brain science, consciousness

- [16] Julian Jaynes (1982), *The origin of consciousness in the breakdown of the bicameral mind*, Princeton University Press.
- [17] K. Wilber (2005), *Waves, Streams, States, and Self—A Summary of My Psychological Model*, Shambala Publications.  
[http://wilber.shambhala.com/html/books/psych\\_model/psych\\_model2.cfm/](http://wilber.shambhala.com/html/books/psych_model/psych_model2.cfm/).
- [18] D. McMillin (1991), "The Pineal", in *The Treatment of Schizophrenia*, A.R.E. Press, Virginia.  
<http://www.meridianinstitute.com/mh/pineal.html> .  
L. Feng *et al*(2000), *The Mammalian Pineal Gland May Be The Third Eye*.  
[http://clearwisdom.net/eng/2000/May/18/EM051800\\_2.htm](http://clearwisdom.net/eng/2000/May/18/EM051800_2.htm).
- [19] M. Pines, *A Secret Sense in The Human Nose?*  
<http://www.hhmi.org/senses/>.
- [20] R. Cytowich (1995), Synesthesia: Phenomenology and Physiology, *Psyche* 2(10), July 1995. <http://psyche.cs.monash.edu.au/v2/psyche-2-10-cytowic.html>.
- [21] A. L. Botkin (2000), *The Induction of After-Death Communications Utilizing Eye-Movement Desensitization and Reprocessing: A New Discovery*, Journal of Near-Death Studies, vol 18, no 3, p. 181.  
F. Shapiro (1995), *Eye moment desensitization and reprocessing: Principles, processes and procedures*. New York, NY: Guilford.

## Effects of em fields on living matter

- [22] M. Shaduri. & G.Tshitshinadze (1999), *On the problem of application of Bioenergography in medicine*. Georgian Engineering News 2, 109-112.  
See also <http://www.bioholography.org/> .
- [23] F. A. Popp, B.Ruth, W.Bahr, J.Böhm, P.Grass (1981), G.Grolig, M.Rattemeyer, H.G.Schmidt and P.Wulle: *Emission of Visible and Ultraviolet Radiation by Active Biological Systems*. Collective Phenomena(Gordon and Breach), 3, 187-214.  
F. A. Popp, K. H. Li, and Q. Gu (eds.) (1992): *Recent Advances in Bio-photon Research and its Applications*. World Scientific, Singapore-New Jersey.  
F.- A. Popp: *Photon-storage in biological systems, in: Electromagnetic Bio-Information*, pp.123-149. Eds. F.A.Popp, G.Becker, W.L.König, and W.Peschka. Urban & Schwarzenberg, Mnchen-Baltimore.  
F.-A. Popp (2001), *About the Coherence of Bio-photons*,  
[http://www.datadiwan.de/iib/ib0201e\\_.htm](http://www.datadiwan.de/iib/ib0201e_.htm) .  
F.-A. Popp and J.-J. Chang (2001), *Photon Sucking and the Basis of Biological Organization*, <http://www.datadiwan.de/iib/ib0201e3.htm> .  
F.-A. Popp and Y. Yan (2001), *Delayed Luminescence of Biological Systems in Terms of States*, <http://www.datadiwan.de/iib/pub2001-07.htm> .
- [24] J. C. Lin, S. Sales-Cunha, J. Battocletti, A. Sances, (1980), *The Microwave Auditive Phenomenon*, Proceedings of the IEEE, vol. 68, #1.
- [25] C. E. Ingalls (2002), *Sensation of Hearing in Electromagnetic Fields*,  
<http://www.angelfire.com/or/mctrl/ingalls.htm> .
- [26] G. Vassilatatos (2001), *Nocturnal Disturbances and the Infrasonic "HUM"*,  
<http://www.borderlands.com/journal/nux.htm> .
- [27] P. S. Callahan (1977). *Moth and Candle: the Candle Flame as a Sexual Mimic of the Coded Infrared Wavelengths from a Moth Sex Scent*. Applied Optics. 16(12) 3089-3097.
- [28] P. Callahan (1971), *Insect behavior*. Acres U.S.A..  
See also the interview *Dr. Phil Callahan on Power of Paramagnetism*, Nexus, February-March 2003,  
<http://www.nexusmagazine.com>, p. 37.
- [29] R. O. Becker (1990), *Cross Currents*, Penguin Putnam Inc., New York .
- [30] P. Gariaev *et al* (2000), "The DNA-wave-biocomputer", CASYS'2000, Fourth International Conference on Computing Anticipatory Systems, Liege, 2000. Abstract Book, Ed. M. Dubois.
- [31] P. P. Gariaev *et al*(2002), *The spectroscopy of bio-photons in non-local genetic regulation*, Journal of Non-Locality and Remote Mental Interactions,

Vol 1, Nr 3.

<http://www.emergentmind.org/gariaevI3.htm> .

## Out-of-body experiences

- [32] S. Blackmore (1983), *Beyond the Body*, London: Granada.  
S. Blackmore (1984), *A postal survey of OBEs and other experiences*. Journal of the Society for Psychical research, 52: 227-244.  
S. Blackmore (1988), *A theory of lucid dreams and OBEs*, in J. Gackenbach, and S. LaBerge (Eds.), *Conscious Mind, Sleeping Brain*, p. 373-387. New York: Plenum.
- [33] W. M. Nepe (1985), *The Out-of-Body Experience: a Phenomenological Categorization*, Parapsychological Journal of South Africa, vol. 6, no 2, pp.110-110.
- [34] C. T. Tart (1968), *Psychophysiological Study of Out-of-the-Body Experiences in a Selected Subject*, Journal of the American Society for Psychical Research, vol. 62, no1. 1, pp. 3-27.
- [35] C. T. Tart (1997), *six Studies of Out-of-the-Body Experience*, Journal of Near Death Studies, March 30.
- [36] O. Blanke, S. Ortigue, T. Landis, M. Seeck (2002). *Stimulating illusory own-body perceptions*. Nature, 419(6904), 269-270.  
O. Blanke, T. Landis, L. Spinelli, and M. Seeck (2004), *Out-of-body experience and autoscapy of neurological origin*, Brain, Vol. 127, No. 2, 243-258.
- [37] V. M. Nepe, *Out-of-Body Experiences (OBEs) and Brain Localisation. A Perspective.*, Editorial Commentary.  
<http://www.pni.org/esp/medicine/obe/obeangular.htm>.