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Near-death experiences: scientific analysis

A great introduction to the physics theory of human disembodiment and supercivilization theory

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General introduction

Throughout history many thinkers have reflected over the issue of how the body and the mind are interrelated. Many of these thinkers have considered this puzzle the key issue in the world that is not possible to ever solve. Nevertheless this has been attempted and the provided solutions are divided into two large categories.

For example, one of these categories concerns the duality of the body and mind, i.e. dualism. The French philosopher René Descartes thought that the world of physical bodies and a person's consciousness are completely different. For example, physical bodies always encompass some extent in a room - they take up space, they have dimensions. They have a certain location in a room and they can be divided into parts. But he is of the opinion that a thought does not have spatial extent and it is not composed of parts. A thought does not have a certain location in a room. Therefore, the world of physical bodies and a person's consciousness are different from each other. The physical world is composed of physical bodies. Therefore Descartes is of the opinion that there are two worlds: the spiritual world and the world of physical bodies.

However, a different approach to the problem of unity of body and mind comes from current researchers (psychologists) who find that consciousness develops in a highly differentiated nervous system that in turn is formed in a certain development stage of wildlife. This position is called "*physical monism*". According to this theory, no specific spiritual world exists, only known and yet undiscovered physical, chemical and biological phenomena. Researchers of the modern world consider any psychological manifestations the result of neural processes in the brain. Consciousness is a brain state and nothing more. There are different categories of these states of consciousness. The development of consciousness in the nervous system and its essence is addressed by both psychology and neurology. Physical monism completely denies the existence of a spiritual world, thereby reflecting the views of modern scientific world view. A lot of psychologists are convinced of the unity of the body and spirit. This conviction is confirmed by various brain studies that are done by various current methods. (Allik 2002, 19-20)

In analytical spiritual philosophy the body and mind problem is largely divided into two. These are monistic and dualistic theories. The monistic theories acknowledge only one side of the body and mind relationship, whereas the dualistic theories support both views. Also, monism may be very radical or less so. The monistic theories include the following sub-theories:

1. Subjective idealism (the whole known world is spiritual, as we only have perceptions), Berkeley.
2. Theories of two aspects (body and mind are two different forms of the same thing), Spinoza.
3. Bundle theories (body and mind are made up of different bundles, but ultimately made of the same things), Hume, Mach.
4. Extreme materialism (behaviourism and physicalism) (thoughts and feelings can be explained scientifically, therefore they do not actually exist), Watson, Carnap.
5. Identity theory (the brain allows for mental vocabulary), Smart, Armstrong.
6. Functionalism (various brain states may express only one behaviour), Putnam.

7. Dennett's materialism (a person rather decides that they see blue, not that the quality of blue is expressed).

The dualistic theories include the following sub-theories:

1. Interactionism (body and mind are two different things that affect each other), Descartes.
2. Occasionalism (consistent mental and physical phenomena which God coordinates), Malebranche.
3. Parallelism (non-causal relationship between body and mind that is "*synchronized*" from the beginning), Leibniz.
4. Epiphenomenalism (mental processes are caused by physical processes), Huxley.
5. The field of subjectivity (mental characteristics and aspects cannot be reduced to material descriptions), Nagel, Searle.

Current psychological science is convinced that consciousness and psyche do not exist without the brain. The material base of human psyche is the neurological function of the brain. It can be said that the psyche is a function of the brain. Mental activity is caused by physiological functions in the human brain. These views are generally accepted within the scientific world.

> Modern science cannot draw a clear line between the physiological and the psychological sides. This has caused the equation of the physiological and the psychological sides and also their artificial separation. There is no doubt that psyche and consciousness actually exist. This can be confirmed by everyone who for example wake up in the morning and try to remember what they had experienced in their dreams. Nevertheless, psychological images are ideal. The reality of an ideal does not need to exist as a material substance or tangible object, instead it is important to understand the functioning of the ideal reality. The nature of psyche is preventative and active in adjusting to reality. This is reflected in behaviours in which people react according to future situations or conditions that are not objectively present in the current environment. This is how the ability of psyche to reflect reality legitimately and also adjust according to information from reality and the resources the organism currently possesses, is expressed. Scientific psychology tells us that ideas do not exist separately from matter, which basically means that the surrounding reality is mediated by neurophysiological processes. At the same time we usually perceive the end results of physiological processes, not the processes themselves. End results of physiological processes manifest in consciousness as psychological images or psychological processes, states and features. Their authenticity can be verified by practical activities and also by determining the changes in the objective world. Psyche is derived from first person perspective, i.e. immediate introspection. The existence of an abstract or theoretical reality due to neurological functions is reflected by different reactions, actions and consciously stated descriptions of a person. Psyche is also derived from it. For example, a mental image helps a person describe the nature on a tropical island while objectively being in a polar region.
>
> In that regard it is important to note that the terms psyche and consciousness are not synonymous. The concept of psyche is much wider than consciousness and includes conscious psyche as one of its components. For example, a large amount of psychological

> phenomena function and occur pre-consciously or outside of consciousness. Only a small amount of psychological processes and content of the information stored in psyche manifests as a conscious experience. However, the concept of consciousness is itself not unambiguous which means that there are many approaches and emphases to its scientific definition. Scientific psychology classifies psychological phenomena into three large groups: psychological processes, psychological states and psychological characteristics.
>
> Source: Textbook "*The Basics of Psychology*" by T. Bachmann and R. Maruste.

But there exist such phenomena in medicine which overturn the views that consciousness (psyche) cannot exist without a brain. Such phenomena, called near-death experiences, will be further examined in the following text.

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1 A great introduction to the physics theory of human disembodiment and supercivilization theory

1.1 Introduction

Modern psychological science is convinced that consciousness and psyche do not exist without the brain. The material basis of the human psyche is the nervous activity in the human brain. It can be said that the psyche is a function of the brain. Mental activity results from physiological activity in the human brain. Such understandings are generally accepted throughout the scientific world.

> It should be noted here that the terms ‘psyche’ and ‘consciousness’ are not synonymous. The concept of psyche is much broader than the concept of consciousness, including the conscious psyche as one of its parts. However, the concept of consciousness itself is not unambiguous, which means that there are many different approaches and emphases in its scientific definition. Scientific psychology classifies mental phenomena into three broad groups: mental processes, mental states, and mental properties.
>
> Consciousness and psyche are not the same. Psyche is a broader concept than consciousness. It can be argued that consciousness, memories and also attention are parts of the psyche. Psyche is the broadest term to define human behavior and its causes. Psyche is studied by psychology, but consciousness is studied by the science of consciousness, which is a part of psychology. Consciousness and attention were once thought to be one and the same, but they too are actually separate parts of the psyche, albeit closely related.

In higher vertebrate life forms, the nervous system is very highly differentiated, such as in birds and mammals. The signs of such life forms indicate that their behavior is conscious. However, their characteristic behaviors are absent at all or present only partially (which can also be vague) in such life forms whose nervous system is not so highly differentiated. From this, science concludes that consciousness is related to complex neuron structures. This implies that consciousness does not exist outside of neuronal structures. Science accepts that consciousness exists only in cooperation between cortical and subcortical structures, not in either structure alone.

However, there are phenomena in medicine that refute the notion that consciousness (psyche) cannot exist without a brain. Such phenomena, called near-death experiences, or NDEs for short, are studied by the out-of-body physics theory.

Most accounts of near-death experiences clearly show a combination of near-death and out-of-body experiences. Neuroscience has tried to explain these two aspects separately, rather than linked together. But in the case of Pam Reynolds, for example, these phenomena still occurred

together, not separately. A person's out-of-body experiences and near-death experiences cannot be taken quite one for one. A person's out-of-body experience involves only leaving the body and nothing else. At the same time, however, the near-death experience includes many other aspects besides leaving the body, such as seeing the "souls" of the dead, a tunnel of light, beautiful landscapes, and a feeling of bliss. A near-death experience includes an out-of-body experience, but it is a much broader and more diverse phenomenon than just an ordinary out-of-body experience. In that sense, they are two phenomena of somewhat different depth and reach.

The physics theory of the human exiting the body describes and studies the real possibility of the human disembodied state, which is the first part of the super-civilization theory, or ÜTT. The second part describes and examines the impact of a person's disembodied state on society and civilization as a whole. The physics theory of the human disembodiment is based on the physics theory of time travel, but the supercivilization theory is based on the physics theory of human disembodiment.

The research methods of the disembodiment theory are typical of theoretical science, as there is no possibility of direct observations or experiments, which are otherwise the basis of any scientific field. Theoretical science is based on argumentation. Therefore, this field is similar to theoretical physics. Strictly speaking, the physics theory of human disembodiment is a scientific field at the intersection of neuroscience, psychology, and theoretical physics. Thus, it is a frontier science that is difficult to verify experimentally. For example, string theory is a branch of physics that studies and describes the material world in 11-dimensional spacetime. It belongs to the field of theoretical physics and is thus a scientific field of study, even though experiments and observations cannot be made directly in string theory. The physics theory of human disembodiment studies and describes the real possibility of a human disembodied state that does not contradict existing experimentally proven physical theories. In order to understand the exit from the body, a whole series of new theoretical understandings of physics are created, based on which it is possible to conduct experiments to prove them in the future.

This work presents the most basic discoveries, understandings and positions of the physics theory of human disembodiment and the resulting super-civilization theory, which have been arrived at during a long and thorough investigation. However, it must be emphasized that this work is still in an overview or introductory format, as the theoretical concepts described are actually much more voluminous, complex and nuanced than it appears at first glance. Despite this, the current work provides a good and comprehensive overview of the basic content of the physics theory of human disembodiment and the nature of the supercivilization theory. In the beginning, a great deal of emphasis is placed on refuting brain-centered theories, but it smoothly transitions to an alternative out-of-body explanation, which describes the possibility of a person's disembodied state as an electromagnetic field in the outer dimension of spacetime.

In the context of near-death experience cases, two different terms can be used that are similar to each other but different in content: artificial intelligence and out-of-body intelligence. The term artificial intelligence is used in the field of computers, programming and robots, where consciousness is created artificially with computer programs. Robots and androids can have this kind of artificial intelligence. Artificial intelligence can also exist simply in a computer where a person can interact with it. But extracorporeal intelligence is not artificial intelligence. The term extracorporeal intelligence is used when a person exists in an out-of-body state. It has nothing to do with robots or any other mechatronic creatures.

Surmalähedasi kogemusi võib lühidalt tähistada akronüümiga: SLK. Ülitsivilisatsiooniteooria lühendiks on enamasti ÜTT. Kuid erinevatesse keeltesse tõlgituna võivad sellised akronüümid

erineda võrreldes eelnevalt väljatoodud lühenditega. Näiteks eesti keeles on surmalähedaste kogemuste lühendiks SLK, kuid inglise keeles on see enamasti NDE. Ülitsivilisatsiooniteooria korral on see vastavalt ÜTT ja TSC (theory of supercivilization) või SCT (supercivilization theory).

1.2 The most famous near-death experience in history

Robert Spetzler was a brain surgeon who performed a very complex operation. His patient was 35-year-old Pam Reynolds, who could not be anesthetized by the usual method. Instead of anesthesia, he cooled her body temperature to only 16 degrees Celsius. However, this causes the patient's heart to stop. His brain was deprived of oxygen during the operation. The woman fell into clinical death. The surgeon succeeded perfectly in the operation and then warmed the patient's body to normal body temperature over time. The whole operation had gone very well, although it was a very complicated and long operation.

However, when Pam Reynolds later regained consciousness, the surgeon had an extremely unexpected experience. The patient had indicated that he had somehow been awake throughout the operation and had been able to observe the actions of the doctors and surgeon. The woman described the medical procedures performed on her body very precisely and in detail. For example, during surgery, a surgical saw was used to cut open the patient's skull. The woman was very good at imitating the whistling sound of that same saw. The woman described that after this procedure she exited her body as if through her head. From that moment on, she was floating under the ceiling, from where she could watch the actions of the nurses and the surgeon from a distance. Dr. Spetzler was surprised by the patient's narrow blood vessels, which is why the woman herself had heard him express surprise. The woman was able to describe in detail all the medical instruments that were used during the 7-hour operation. All of the descriptions she had given the surgeon show that she was awake and able to observe everything that was being done during the operation, even though the patient's brain activity had ceased at that time and her eyes were closed.

Pam Reynolds was operated on in 1991 at a hospital in Phoenix, Arizona, USA. This woman's case is one of the best-documented near-death experiences in medical history. Today, it is safe to say that the general scientific consensus among NDE researchers is that Pam Reynolds' recorded NDE poses a serious problem for a materialistic worldview. The attempt of the renowned anesthesiologist Woerlee to explain it materialistically cannot be objectively the only correct way of interpretation, as he cannot fully take into account all aspects of the phenomenon.

Near-death experiences, or NDE phenomena, occur during the clinical death of a person, in which the person's heart has temporarily stopped. The heart is necessary to pump blood to the brain, through which the brain receives oxygen. It is the main source of energy for the brain. In human activity, the general activity of the brain never ceases. Only brain wave frequencies can change during different brain states (for example, narcosis, sleep, deep sleep, etc.), but never stop. In clinical death, the general activity of the brain has ceased, as the brain usually no longer receives blood. In this case, activity (i.e. neuron charging) occurs only in very local brain regions. If the entire activity of the brain has ceased (even local brain regions), then it is brain

death (that is, the biological death of a person). It is possible to revive a person from clinical death, but not from biological death.

1.3 The most difficult aspect of the near-death experience to explain

A person's near-death experiences are very strong psychic experiences that contain mystical elements. Experiences of this nature occur when a person has entered a pre-death state. Such a condition puts a person under a lot of physical stress and emotional tension. Most near-death experiences occur when a person goes into acute cardiac arrest. An acute cardiac arrest is a very sudden but short-lived cardiac arrest. In case of cardiac arrest, a person falls into clinical death, as a result of which the patient's brain is left without oxygen for a few minutes. About 10% of patients (so not all of them) who have been in clinical death and come back to life speak of near-death experiences. Their descriptions are very similar to that of the Pam Reynolds case: they have been able to see their surroundings clearly and their attention was particularly sharp.

For a long time, scientists were skeptical of near-death experiences and even considered these descriptions to be pure fantasy. However, with recent research, scientists believe that these incredible experiences may be caused by chemical neurotransmitters, or mediators, that transmit nerve impulses from one neuron to another in the brain. Mediators are released at the synapses of neurons. Near-death experiences include mystical tunnels, colorful landscapes, and out-of-body experiences. All of them can be caused by chemical processes in the human brain immediately before deaths.

Until now, near-death experiences could be thought of as the last functions of a dying brain, or simply as hallucinations produced by the dying brain of a person. However, in order to finally agree with such an understanding, the research must also take into account such aspects in which a person sees his own resuscitation attempts from the sidelines. Such aspects force us to challenge current assumptions about why near-death experiences still occur. These aspects are the most difficult to explain in this phenomenon, and therefore near-death experiences cannot be considered illusions of the dying brain. Considering these aspects, one can only come to the conclusion that consciousness is indeed able to separate from the nervous tissue during the clinical (and therefore also biological) death of a person.

The most difficult element for researchers and medical practitioners to explain in NDEs is out-of-body experiences. There is currently no scientific explanation (except for the physics theory of human disembodiment) as to how people who report out-of-body experiences are able to give such detailed accounts of what medical personnel said or did during their resuscitation. Even more surprising are the amazingly accurate accounts of out-of-body experiences in which people are able to describe what happened somewhere else while their physical body lay in a hospital operating room. In the descriptions of near-death experiences, there is very often an aspect in which a person, being dead, sees his own resuscitation procedures from the sidelines, which he later tells to the doctors, and they, in turn, confirm his stories.

One had to actually leave the body to describe such things. Its scientific conclusions are quite clear, but the counter-criticism is whether these "resuscitation stories" are to be believed at all.

Since such an aspect is included in near-death experiences, in which a person witnesses his own resuscitation procedures when he is dead, and doctors can confirm the received adequate information after resuscitation, it must be taken into account in research, because otherwise it would not be worth believing the general stories of near-death experiences, which is practically impossible.

The recurring nature of near-death experience cases is that the patient witnesses his own resuscitation attempts from the sidelines when he is at the moment of clinical death. This aspect of the cases is repeated over time and therefore it is also possible to check it objectively. This means that the phenomenon itself repeats itself in time, not the person himself does not repeat it in time. In this sense, the falsifiability aspect of science is partially fulfilled: the nature of the phenomenon is repeatable over time, but not by the person himself. For example, somewhere around the world, people are revived from clinical death almost every day, and the testimonies from these people contain this aspect. This means that if a person has fallen into clinical death after a serious illness or serious accident, after his recovery (i.e. after he has been revived), it is possible to obtain testimonies of his experiences that occurred at the time of his clinical death. This can also be confirmed by persons present at the resuscitation attempts. Most of these cases contain this aspect.

However, some authoritative scientists explain near-death experiences as an increase in carbon dioxide levels in the blood. This means that a strong connection has been found between the perception of near-death experiences and elevated levels of carbon dioxide and, to a lesser extent, potassium in the blood. Many researchers have also considered it possible that the patient may have regained consciousness for a short period of time or that he may have felt something semi-consciously. It has also been considered possible that nurses or doctors could have told the patient something later. Some researchers believe that patient descriptions can be so general that they fit any situation. But this still does not explain the fact that when a person is clinically dead, they can simultaneously see and hear what is happening in the resuscitation room. It follows from this that carbon dioxide can indeed change the chemical balance of the human brain, but it obviously does not explain out-of-body experiences, in which a person sees, while dead, how the medics are currently trying to revive him. If a person learns something about the activity that took place at the time when he was clinically dead, it actually proves the real existence of this phenomenon, which many skeptical scientists of the world try to simply ignore.

1.4 NDE as a bright and lively experience

For example, Steven Laureys, a doctor at the University of Liege in Belgium, has studied near-death experiences. For example, he has interviewed 21 patients who had been clinically dead. Patients described near-death experiences as very strongly perceived experiences that were extremely emotional and during which the senses functioned very intensely and vividly. Therefore, near-death experiences are much more intense compared to normal memories. At this point, it should be noted that the interviewed patients did not have any special sensitivity or greater empathy than other people, including that ordinary memories were not special or different from those of other people.

Patsiendid kirjeldavad surmalähedasi kogemusi väga tugevalt tajutud elamustena, mis olid

äärmiselt emotsionaalsed ja mille ajal toimisid meeled väga intensiivselt ning erksalt. See tähendab, et surmalähedased kogemused on palju intensiivsemad võrreldes tavamälestustega. Võrreldes tavaliste mälestustega on surmalähedased kogemused palju selgemad ja eredamad. Surma kogetakse palju intensiivsemalt võrreldes maise elu kogetavusega. Surmalähedase kogemuse korral töötavad meeled väga intensiivselt. Kõige uuemad teaduslikud uurimused näitavad, et inimese ajus suureneb vahetult enne surma plahvatuslikult virgatsainete hulk. Seetõttu usuvad paljud skeptilised teadlased, et selline asjaolu võibki seletada, et miks surma kogetakse palju intensiivsemalt võrreldes maise elu kogetavusega. Näiteks aju nägemiskeskuse ja otsmikusagara keemiline aktiivsus suureneb vahetult enne surma mitmekordseks. Ajus plahvatab vahetult enne surma keemiline tulevärk, mis võibki põhjustada väga intensiivseid surmaeelseid kogemusi. Näiteks rottide aju otsmikusagaras suureneb surma piiril noradrenaliini hulk 30kordseks võrreldes normaalse tasemega. Otsmikusagaras vallanduv noradrenaliin reguleerib teadvust, tähelepanu ja keskendumisvõimet. Teadlased usuvad, et suure mediaatoraine sisalduse tõttu tekib patsiendil surmasuus olles väga terav, selge ja tähelepanelik taju oma ümbruse jälgimiseks. Kuid sellisel üsna skeptilisel ja pealiskaudsel arvamusel on olemas kolm peamist vasturääkivust, mida me järgmises peatükis pikemalt analüüsime.

Near-death experiences (NDEs) are remembered very well by those who have experienced them. For example, people can remember the details of this experience even decades later, and its effect on a person's psyche and personality is long-lasting and large-scale. Why this is so cannot be explained exactly yet. But psychologically, it can be hypothesized that since the phenomena of NDEs are so incredible and meaningful to the mind and personality of any person, that is why it is remembered in detail for a long time. This is psychologically understandable. For example, if a person were to meet a UFO that landed on the earth and an alien that floated out of it while picking mushrooms in the forest, such an event would probably remain in the person's memory for the rest of their life. This means that the more extraordinary, meaningful and incredible an event or experience is subjectively for a person, the better and longer the related details are remembered, although memories can change over time.

However, memory psychologists emphasize that memory is very susceptible to external influences (for example, information from other people or seen on social media). Memories of events that happened are not really permanently the same in people's memory. This means that memories are constantly changing.

If a person's memories change over time, then "false memories" can occur. False memories are memories of events and experiences that did not actually occur. It is significant here that false memories are not known to occur with NDEs. This means that people's memories of NDEs mostly remain true, rather than change over time. One reason for this conclusion is that a very large number of people's retrospective descriptions of NDEs match each other very closely. It can be fairly confidently stated that NDEs usually occur according to a very specific "script", so it can be concluded that people's memories of NDEs do not change very much over time, which is again an interesting phenomenon with NDEs. In the same way, social and cultural influences have not played a big role in changing the content of NDEs and how they are remembered. This means that people's descriptions of NDEs are the same 80 years ago compared to cases today. Cultural space changes over time, but the content and deeper meaning of NDEs subjectively do not change over time. It could be said that NDEs influence people's cultural space (fiction, theaters, films, cinemas, etc.), not the other way around.

Laureys concluded that a near-death experience is indeed experienced by the patient, but nevertheless it is not a real event. This means that it is an extremely realistic hallucination. He

thought that, compared to a normal hallucination, it is not possible to distinguish a near-death experience from the real thing, even after being fully conscious. Such a conclusion by Laureys is not correct, although it seems very plausible on the surface. The reason is that there are major differences between brain-generated hallucinations and near-death experiences that must be considered. Laureys makes such arguments that are primarily consistent with his own personal views, ignoring the differences between NDEs and hallucinations.

In visual hallucinations, people see objects and phenomena that do not actually exist in reality. Auditory hallucinations consist of hearing sounds that do not actually exist. This is analogous to visual hallucinations. In case of delusion, a person is absolutely convinced that he is, for example, God or Picasso. Schizophrenics also suffer from a loss of thought connections. They have difficulty connecting their thoughts - they jump from one topic to another without connection when communicating with other people.

Schizophrenia (and alcohol abuse, depression and bipolar disorder) can be accompanied by psychosis. It is a mental disorder characterized by a disturbed sense of reality, or objective reality. Reality perception disorders are based on disturbances in perception and thinking, which manifest as hallucinations and delusions. In this case, a person sees, hears or perceives something that is not really there, but he shapes his behavior according to what he sees. If he is threatened in his imagination, he perceives it as a real threat. In case of delusions, a person may have beliefs that are not true (for example, in the apartment next door, someone is plotting to kill him, even though this does not happen in reality). In this case, he lives in real perceived fear. Since a psychotic person shapes his behavior based on unrealistic stimuli, he is therefore limited in his ability to act when he is in such a state.

Schizophrenics are greatly tormented by what they see or hear or what they cannot tell others. Such circumstances make the manifestation of the disease even more difficult, and many of them fall into deep depression or depression. Some people cannot take care of themselves and that is why they are put in nursing homes. But people who have had near-death experiences, in contrast, have improved attitudes and social engagement. In this state, many people have seen beings of light, but no one has identified themselves with, for example, God or Alexander the Great. Schizophrenic visions are associated and appear repeatedly, while in contrast to these phenomena, near-death experiences are always associated and occur very few times during a person's lifetime (i.e. only immediately before death).

Some medical scientists consider out-of-body experiences (which are also one of the characteristics of near-death experiences) to be "autoscopic hallucinations". Such experiences are not very well known, but throughout history there have been reports of these phenomena. During such a hallucination, a person sees a projection of himself in front of him, which is comparable to the presence of another person. Medicine knows that people with epilepsy or migraine headaches suffer from it quite often. Much has been said about such hallucinations, but it must be kept in mind that there is still a big difference between out-of-body experiences and autoscopic hallucinations. In case of out-of-body experiences, the person's center of perception is located outside the person's physical body, but in case of autoscopic hallucinations, the person perceives his own projection from his physical body. This is a very important difference to consider. The self-projection that a person sees is usually three-dimensional and not transparent - just like a real person. But in out-of-body experiences, transparent bodies are seen. In case of out-of-body experiences, people have been able to move around without their physical body and give very accurate descriptions of it, but in case of autoscopic hallucinations, people cannot survive such experiences, because they perceive the hallucinations from their physical body.

1.5 Mediators are raging in the brain

Are near-death experiences chemical greetings from another world? Some of the main characteristics of near-death experiences are a bright light at the end of a dark tunnel, greetings from dead relatives, and overflowing feelings of happiness. Near-death experiences present themselves as the so-called experience of going to another world, which scientists have been very skeptical about until recently.

Is there life after death? Many neurologists study the experiences of people who have returned from clinical death. Neurologists are sure that mystical experiences at the threshold of another world can be explained by brain chemistry.

For example, the most recent scientific research in this field shows that the amount of neurotransmitters in the human brain increases exponentially just before death. Therefore, many skeptical scientists believe that such a fact can explain incredible and breathtaking experiences just before death. For example, the vision center of the brain processes and analyzes nerve impulses from the eyes, i.e. visual information. The frontal lobe of the brain processes, analyzes and controls a person's consciousness and thoughts. The chemical activity of the brain's vision center and frontal lobe increases several times immediately before death. Figuratively speaking, chemical fireworks explode in the brain just before death, which can cause near-death experiences.

Terms used in neuroscience, such as mediators, regulators, neurotransmitters, and messenger substances, can generally be considered synonymous terms. Mediators are chemical compounds that are released from nerve endings due to an action potential and change the function of other cells by binding to receptors. In simpler terms, a mediator or neurotransmitter is a chemical substance with which a neuron exchanges information with other cells. The neurotransmitter can be secreted, for example, at the synapse or from various nerve endings and is taken up by the presynaptic neuron and activated and/or inhibited by the receptors of the postsynaptic neuron. More specifically, the transport of the neurotransmitter packed in vesicles in the presynaptic part of one nerve cell takes place through the synaptic cleft to the postsynaptic part, where it binds to ion channels that open under the influence of a ligand in the membrane of another cell.

Neurologist Jimo Borjigin conducted experiments with rats in 2015, during which he studied the sharpening of senses when death approaches. A near-death experience-like state was induced in rats by suffocation with carbon dioxide. Since rats cannot talk about their near-death experiences afterwards like human patients, researchers from the University of Michigan in the US decided to measure changes in the biological regulatory substances in the rats' brains by inserting fine electrodes into the brain. The experiments showed that the amount of noradrenaline increases in the brain of rats at the point of death: the amount of this mediator in the frontal lobe increased 30 times compared to the normal level. Noradrenaline released in the frontal lobe regulates consciousness, attention and concentration. Scientists believe that due to the high content of the mediator substance, the patient develops a very sharp, clear and attentive perception to observe his surroundings when he is facing death.

In addition to noradrenaline, the amount of dopamine also increases: as much as seven times

compared to the normal level. Dopamine is associated with the "reward center" of the brain: this mediator is released during, for example, eating, sex, or any other pleasurable activity. An increase in the neurotransmitter dopamine just before death may explain the very strong positive feelings in near-death experiences: for example, a sense of harmony and a sense of togetherness and happiness.

Drastic increases in noradrenaline and dopamine levels in the brain just before death compared to normal levels are what scientists believe lead to the phenomena we understand as near-death experiences. But there are three main contradictions in such a rather skeptical and superficial opinion:

Firstly, noradrenaline and dopamine are both mediators, the increase in the amounts of which in the synapses of neurons is also related to the number of nerve impulses in the brain. This means that an increase in the amount of mediator substances "goes along" with an increase in brain activity. Brain activity is very high when there is a large amount of mediator substances in the brain. It is known that human consciousness does not occur in case of very weak neural activity (for example, in case of narcosis or coma) and also not in case of too strong neural activity (for example, in case of an epileptic attack or electric shock). Thus, consciousness occurs at the average level of activity of the central nervous system (for example, the desynchronized EEG of wakefulness). For example, if there are slow waves of high amplitude (about 0.1-1 Hz) in the brain, then the person is in an unconscious state. This is the case, for example, during general anesthesia and unconscious deep sleep. Very strong or very weak gamma-frequency phase synchrony in the human brain also puts the brain in an unconscious state. However, just before death, a very large number of different mediator substances are released in the brain, which is why brain activity is also very high (for example, brain frequencies are very high). Therefore, human consciousness cannot occur at a time when the brain releases a lot of mediators. As a result, a person cannot have near-death experiences either, as a person's consciousness must be present for this. A near-death experience is known to be a conscious experience that requires the presence of consciousness.

Second, noradrenaline released in the human brain regulates consciousness, attention and concentration. Scientists believe that due to the high content of the mediator substance, the patient develops a very sharp, clear and attentive perception to observe his surroundings when he is facing death. An increase in the neurotransmitter dopamine just before death may explain the very strong positive feelings in near-death experiences: for example, a sense of harmony and a sense of togetherness and happiness. But near-death experiences don't just see beings of light, beautiful and clear landscapes, and feelings of happiness. People have also seen grotesque monsters, hellish demons and spooky places and experienced eerie feelings. These types of near-death experiences are experienced with negative feelings and are much more vague, foggy and unclear compared to positive experiences. This can no longer be explained by an increase in noradrenaline and dopamine in the brain. If these mediator substances are definitely triggered in the brain all the time immediately before death (i.e. not selective by person or time), then near-death experiences are not always blissful and clear. There are also very creepy and horrifying experiences. Such a contradiction is one of the biggest and most important for those who want to explain near-death experiences with the release of mediator substances

immediately before death. From this contradiction, it follows that near-death experiences cannot really be explained by the release of mediator substances immediately before death.

Thirdly, the near-death experience is extremely memorable, vivid, deeply affecting the human psyche and very well perceived. For example, people who have experienced this about 30 years ago say it was like yesterday. The resulting “spiritual lesson” affects a person for the rest of his life. Near-death experiences have also been widely associated with the effects of narcotic substances. On the face of it, there are indeed many similarities between the effects of NDEs and narcotic substances: for example, the chemical processes in the brain during NDEs and the use of recreational drugs are similar. But NDEs are obviously more meaningful and instructive than the experiences that come from recreational substances. In case of NDEs, one gets the impression that the wonderful perceptual experiences rather result from some kind of "background system of knowledge" that the person has entered outside of his body. Unlike NDEs, narcotic substances are accompanied by euphoria, which has no deeper philosophical meaning, so it does not affect the rest of a person's life. Narcotic substances create dependence, through which it affects the rest of a person's life. But it is the philosophical and educational experience of NDEs that affects the rest of a person's life, not the resulting addiction, which has not really been observed with NDEs.

The philosophical and instructive subjective experience of NDE for a person consists precisely in those details that are not associated with the effects of narcotic substances at all. For example, in a disembodied state, a person meets a being of light who shows him a retrospective of earthly life as an extraordinary three-dimensional panorama. Through this, a person learns from mistakes made during his life or feels joy from positive successes. The feeling of euphoria described in many NDEs does not simply occur with some kind of automatic feeling when leaving the body, but it only "occurs" when meeting an otherworldly light being or when reaching the light at the end of a dark tunnel. Indescribable happiness and joy often emanate from beings of light, and do not arise out of nowhere. But in case of using recreational drugs, all those characteristics are absent, in which extraordinary perceptual experiences arise out of seemingly nothing. For example, the feeling of euphoria occurs in a person as a result of the release of certain neurotransmitters in the brain, and not from meeting beings of light. Beings of light, dead relatives and acquaintances, and light tunnels are not seen during the use of pleasure substances, including a flashback to earthly life, which is one of the most characteristic aspects of NDEs.

Vivid visual hallucinations are caused by hallucinogenic substances. They also alter a person's perception, although they suppress the activity of the central nervous system. The former comprise mescaline, LSD, and marijuana. The active ingredient in marijuana is tetrahydrocannabinol, which is chemically similar to LSD and even to the mediator anandamide produced by the human body. Marijuana is obtained from dried leaves and flowers of Indian hemp. The effects of cannabis vary greatly, depending largely on the person. A long-term user usually experiences the following during a state of euphoria:

> Objects seem particularly clear, images appear three-dimensional, food tastes better because new flavors are experienced, sexual pleasure is stronger, heightened well-being is felt, and time seems to stand still.

> However, marijuana can also intensify unpleasant experiences, deepen fear and depression. Paranoid thoughts may arise: “I’m going to die” or “I’m going crazy.” Users of LSD, or lysergide, may experience visions that can last 6 to 14 hours. The content of the visions is usually unpredictable. For most people, hallucinations begin with seeing various geometric shapes, then complex shapes and finally dream-like scenes. Perception can be so disturbed that familiar objects are no longer recognized. A person's sensory impressions become mixed, in which case the person thinks they are seeing sounds and hearing objects. LSD can also cause panic, psychosis and a sense of horror. Panic occurs especially in those people who try to somehow fight what they are supposedly seeing.

After NDEs, people tend to place more value on life and show more attention and love to their fellow-men, while their interest in personal status and material values decreases. Also, most people who have experienced NDEs report that afterwards they live with higher spiritual goals and in some cases seek a deeper understanding of the essence of life. And importantly, these reports of self-analysis are mostly confirmed by those who have observed the behavior of people who have experienced NDEs from the sidelines.

International studies have shown that the impact of NDE on a person's future life is not similar to the consequences of any other psychic experience that scientists want to identify. For example, the effect of a dream, hallucination, psychotrauma or narcotics on the rest of a person's life is not nearly the same as that of a near-death experience. For example, after using narcotic substances or perceiving strong hallucinations, people do not tend to give more value to life and do not show more attention and love to their fellow-men, nor does their interest in personal position and material values decrease. This aspect distinguishes NDE phenomena from many other psychic phenomena into which scientists want to classify NDE. This means that simple brain chemistry cannot explain such a profound effect that NDE leaves on a person. This is also one of the arguments why NDE must still be a real phenomenon and not an illusion created by the brain.

In a certain sense, the effect of NDE on a person can be classified as psychotrauma, but in a positive way. For example, if stress is classified as positive and negative in psychology, in case of NDE, a person experiences positive psychotrauma. "Trauma" comes from the word "to traumatize", which has a negative undertone, but the effect of NDE on the rest of a person's life is primarily positive. It's just that the magnitude of the effect is comparable to extreme psychotrauma, hence positive psychotrauma. This means that NDE causes lifelong psychotrauma to a person.

1.5.1 Narcotic substances

The human nervous system is very strongly stimulated by various narcotics. For example, cocaine. A cocaine user feels much stronger, more alert, more successful and more euphoric than in a normal state. However, when a person uses crack, its effects appear within seconds. A drug like crack actually reaches the brain in about 10 seconds. The user experiences a very strong and very powerful wave of pleasure and excitement for about 10 minutes. The effect and impact of crack appear faster than that of cocaine, although they are more or less the same narcotics. Ecstasy is also a stimulant. This substance makes the senses alert and does not let you fall asleep. In this sense, it is like amphetamine. Ecstasy does not trigger distortions of reality or hallucinations, as is the case with LSD, for example. Ecstasy users have significantly reduced self-control and boundaries. They often develop sincere and warm feelings for their fellow human beings. That is why ecstasy is used at many youth dance parties and raves.

> Ecstasy use increases the release of serotonin and dopamine in the synapses of neurons. If a lot of ecstasy is used, some of the nerve endings of serotonin neurons are damaged. This causes a person to become more impulsive and also increases the risk of developing depression.

Heroin also triggers an incredibly strong wave of happiness in a person's brain. The user feels sleepy and warm. The person is overcome by great peace and freedom from worries and problems. When a person uses heroin for the first time, they may feel sick. Heroin is usually injected. The effect of heroin is also similar to the effect of a sedative, as it is a depressant. For example, the functions of the nervous system and also reflex activities slow down. This includes a person's breathing and heart rate. The user can even become constipated. Many heroin users often say:

> "When you use heroin, you don't need anyone else. With heroin, you feel like a perfect and omnipotent person. You don't feel lonely, but you feel extremely independent and on your own. At first, you start to feel a buzz in your back, neck and brain. There is an incredible feeling of satisfaction and happiness. It is an absolutely perfect experience." "The crazy feelings start like an explosion. Everything is buzzing. The brain becomes extremely large. Everything you feel becomes extremely colorful and powerful. Thoughts in the brain are flying - you can think about anything and anywhere. The pleasure center of the brain is extremely affected. That is why there is an extreme wave of pleasure. The body is overwhelmed by an extremely unimaginable excitement. The effect on your physiology and mind is absolute.”

Such assessments are actually quite common for the effects of any narcotic substance on humans – not just heroin use.

Similar feelings that occur with narcotics also occur, for example, when a person falls in love. The feeling of falling in love develops in about fifth of a second. The feeling of falling in love is

similar to cocaine rush. When the right person appears in the field of view, within just a few milliseconds, the human brain is flooded with chemicals that create euphoria. This proves that love occurs at first sight. During the first feeling of love, dopamine, oxytocin, adrenaline and vasopressin stimulate many different areas of the brain. These are chemicals that make a person feel good. The feeling of falling in love and the cocaine rush are extremely similar, because the same chemicals are also released when cocaine is consumed. “They confirm the scientific basis of the process of falling in love, but at the same time they also raise the question of whether it is the heart that falls in love or the brain,” says Professor Styephanie Ortigue. “I would say that the brain is more likely to play a role, although the heart also plays a role, because the concept of love is formed by processes that go from the bottom up to the top down, from the brain to the heart and vice versa.” But there are also different types of love that affect different areas of the brain. For example, unconditional love between a mother and child is triggered by brain areas that are both common and different. For example, the midbrain. But at the same time, the brain area that processes information related to reward, as well as higher cognitive functions, triggers passionate love. Associative cognitive brain areas process, for example, a person’s posture.

Several physical components cause people to fall in love, but when they appear at the right time, in the right place and in the right order. Aroma is the first of these. This preference is either learned or comes with culture. For example, something pleasant is preferred to a bad smell – for example, perfume is preferred to the smell of sweat. The second component is pheromones. Such bioactive substances are secreted by the body. It is pheromones that are related to sex, danger, aggression and fear signals in the brain. Pheromones cause changes in libido. They highlight sexuality. However, pheromones do not allow you to choose a particular partner for mating. Choices are made more based on vision, smell, hearing and touch. For example, partners are distinguished from each other by aroma, not so much by pheromones. People are able to recognize their partner's unwashed T-shirt by smell. Studies show this. The third component is hormones that the human brain produces. For example, dopamine triggers a high feeling of arousal in the brain because it stimulates the pleasure center in the brain. However, the bonding necessary to produce offspring is created by hormones such as vasopressin and oxytocin.

1.6 Signals from the brain force the heart to stop

In 2015, researchers from the University of Michigan in the USA studied the brains and hearts of rats, particularly how they react to a lack of oxygen. The results were quite startling. For example, the brain's response to lack of oxygen was that the brain starts to release large amounts of different neurotransmitters, such as dopamine and noradrenaline. The amazing thing is that this reaction is always the same. Since the experiment with dying rats showed an increase in the intensity of the animals' brain activity immediately before their death, the researchers conclude that something similar must be happening in the human brain, which can cause near-death experiences.

Dopamine and noradrenaline are just such stimulants that create a pleasant feeling in a person, in large quantities, even an extremely good feeling of well-being. Scientists think that this can

cause near-death experiences in people's consciousness: attention becomes much sharper, a feeling of happiness fills the whole body and beautiful images are created. But in addition to stimulants, the brain also releases other mediators. They cause the heart to stop working if the lack of oxygen has lasted for about a few minutes. This means that the brain of the dying person tries to stop the activity of the heart.

Jimo Borjigin, professor of neurology at the University of Michigan, studied the functioning of the organs of rats shortly before death. He made an important discovery: just before death, the brain tells the heart to stop working. He discovered that the dying brain releases large amounts of biological regulatory substances, or mediators. They send out chemical signals that cause the heart to stop. If these signals are blocked, the heart can continue to work for a long time. This means that by preventing the brain's sabotaging behavior, doctors would gain valuable minutes to resuscitate a patient before the heart and then other vital organs stop working.

Neuroscientists cannot explain why a very large number of strong biological regulatory substances are secreted in the brain immediately before death.

1.6.1 Suppressing death

Before performing the experiment, the rats were anesthetized and electrodes recording the electrical activity of the cerebral cortex (EEG) were operated on their brains. An electrode that monitors and analyzes bioelectrical activity (ECG) was also operated near the heart muscle. Via the vagus nerve, the brain communicates with the heart, but in this experiment, it has been cut in half of the rats to prevent communication. The rats then inhaled carbon dioxide (CO_2) to induce acute oxygen deprivation. Acute oxygen deficiency, or acute hypoxia, is a very acute and short-term oxygen deficiency of the whole organism, individual organs or tissues in pro- and eukaryotic organisms.

This caused a state of crisis in the rats' brains and hearts, which the researchers carefully observed and analyzed. Rats with transected vagus nerves died eight minutes later than rats with intact vagus nerves:

> One minute after the lack of oxygen, attention becomes sharper. This is caused by a 30-fold increase in the amount of noradrenaline in the frontal lobe of the brain. The frontal lobe of the brain contains dopamine, the amount of which becomes seven times higher than normal. Therefore, it is believed that positive feelings (for example, a sense of togetherness) are suddenly strengthened. In the frontal lobe of the brain, gamma-aminobutyric acid (GAVH), which has a calming effect, is also present, the amount of which increases about 20 times compared to the normal level. Therefore, the brain rhythm slows down.
>
> In the second minute after the brain is deprived of oxygen, serotonin is released, which can cause hallucinations. Serotonin is a neurotransmitter that occurs in the cerebrum and transmits signals. Its amount increases 20 times compared to the normal level. However, serotonin and GAVH are the neurotransmitters whose effects make the heart stop.

> Noradrenaline, dopamine, GAVH, and serotonin are "regulatory substances" that can be about 40-400 times higher than normal levels about four minutes after the brain is deprived of oxygen. This is the maximum level at which brain activity ceases, along with the heart's work. It means that death has arrived. In rats with intact vagus nerves, the heart stopped working after about five minutes, but in rats with severed vagus nerves, the heart stopped only after 13 minutes.

Experiments with rats and monkeys have recorded what happens in the brain before death. These experiments have convincingly shown that activity in the alpha or beta frequencies decreases before death, but activity in the gamma frequency band increases. Since the experiment with dying rats showed an increase in the intensity of the animals' brain activity immediately before their death, the researchers conclude that something similar must be happening in the human brain, which can cause near-death experiences. Ajmal Zemmar and Raul Vicente from the University of Tartu and their team have discovered that when a person has a heart attack, the activity of some brain regions decreases immediately before it (just as it was seen in animal experiments). However, the EEG device has detected increased activity at the gamma frequency. The gamma-frequency activity of the brain is considerably lower a few minutes before a heart attack in a person. All this could only be assumed based on animal experiments. This means that the data collected from humans have matched the data collected in animal experiments.

Inimese ajus suureneb vahetult enne surma plahvatuslikult virgatsainete hulk. Näiteks aju nägemiskeskuse ja otsmikusagara keemiline aktiivsus suureneb vahetult enne surma mitmekordseks. Ka aju reaktsiooni korral hapnikuvaegusele hakkab aju vallandama suures koguses erinevaid virgatsaineid, näiteks dopamiini ja noradrenaliini. Kuid peale virgatsainete vallandab aju ka veel mediaatoreid. Need põhjustavad südametöö lakkamist, kui hapnikupuudus on kestnud umbes mõni minut. See tähendab, et surija aju püüab lakata südametöö tegevust. Surev aju vallandab suures koguses bioloogilisi regulaatoraineid ehk mediaatoreid, mis saadavad välja keemilisi signaale. Need sunnivad südame seiskuma. Erinevate virgatsainete kontsentratsiooni plahvatuslik tõus vahetult enne surma on meditsiiniline fakt, kuid selle põhjust ei osata selgitada. Neuroteadlased ei oska selgitada, et miks näiteks ajus eritub vahetult enne surma väga suur hulk tugevaid bioloogilisi regulaatoraineid. Kuna käesolev töö, mis on suureks sissejuhatuseks inimese kehast väljumise füüsikateooriasse, ei seosta seda inimese surmalähedaste kogemuste ilmingutega, siis ei ole teada ka seda, et kas neid mediaatorite või virgatsainete tõusu tajub inimene mingite muude kogemustega, mis pole otseselt seotud SLK-dega. Tekib küsimus, et kas seda saab üldse seostada mingite läbi elamistega, mis esineksid vahetult enne surma? Tundub, et vastus sellele on eitav, kuna SLK-d need olla ei saa, mistõttu pole enam ka põhjust mingite muude kogemuste ilminguteks, mis esineksid SLK-de asemel.

1.7 Tunnels and light

Pam Reynolds was in clinical death when she allegedly saw a dark tunnel with a bright light at the end. It seemed to him that something was pulling him into the tunnel, then he moved towards that light.

If near-death experiences are really illusions created by the supposedly dying brain, why don't we see something else like sunbathing or swimming on the beach, spending time with friends, driving a car, traveling somewhere nice, or fulfilling our work duties as we do in a normal dream. Why, instead of them, during near-death experiences, some unknown tunnels, beings of light, a great feeling of bliss, weightlessness, looking back on life and many other things associated with near-death experiences that most people have never experienced in their entire lives are seen?

Scientists think they have found an earthly explanation for this: lack of oxygen creates the sensation of light. They are convinced they can explain two of the most commonly reported near-death experiences. For example, if a person's heart has stopped, then as a result, the supply of oxygen to the body has ended. There are light-sensitive cells on the retina of the eyes, which become unable to work when there is a lack of oxygen. These cells initially stop working at the edge of the retina, but over time it spreads towards the center. This can cause tunnel vision in the patient. When the heart starts working again, oxygen returns to the vision cells, which causes the cells to start working again. Such sudden activation can be perceived by the brain as strong flashes of light.

Scientists are convinced that lack of oxygen causes tunnel vision:

> The visual cells in the retina of the human eye are very sensitive to lack of oxygen. For example, a lack of oxygen or its lack causes light-sensitive cells to malfunction. At first, the outer edge of the retina can be affected, but the effect spreads inward. Light-sensitive cells located at the periphery of the retina of the eye can be the first to suffer from a lack of oxygen. But this lack of oxygen spreads inwards. In the center of the eye are individual vision cells, which are the last to be supplied with oxygen. This can give a person the illusion of being in a tunnel.

Scientists think that the return of oxygen triggers the bright light:

> Oxygen is considered a very active gas whose reaction with other substances is quite energetic. After a period of lack of oxygen in the brain and eyes, oxygen returns again, so it can irritate the cells. In this case, the light-sensitive cells become active again and begin to transmit signals that the visual center of the brain can interpret as strong flashes of light. This means that if the light-sensitive cells suddenly receive a lot of oxygen, it can cause a false signal to be transmitted to the brain's visual center from the light flash.

Many people with near-death experiences have described dark tunnels and a bright light at the end. Scientists think that there is a completely normal "chemical explanation" for this. Scientists

believe that tunnel vision and the bright light at the end of the tunnels are caused by a lack of oxygen occurring and then ceasing in the human vision cells. The visual cells in the retina of the eye would suddenly receive a lot of oxygen, causing a short-term oxygen overdose. The vision cells then transmit the signal via the optic nerve to the brain's visual center, which interprets it as a flash of light. On the face of it, this is an extremely plausible theory that would quite simply and logically explain dark tunnel vision with bright light in near-death experiences.

There are light-sensitive cells in the human eyes, and if they are deprived of oxygen, it causes so-called tunnel vision. When the lack of oxygen ends, i.e. when oxygen returns, the visual cells react to it like a strong flash of light. But near-death experiences aren't always dark tunnels or bright lights. People have also seen hellish demons, deep darkness and spooky places. Near-death experiences of this nature are experienced with negative feelings in which there are no tunnels or bright lights in sight. It can no longer be explained by the lack of oxygen in the eyes and the return of oxygen to the eyes. If oxygen deficiency occurs and ceases in the visual cells definitely immediately before death (i.e. is not selective by person or time), then near-death experiences do not always include dark tunnels or bright lights. There are also very creepy and horrifying experiences in which no tunnels or bright light can be seen. Such a contradiction is of great importance to those who want to explain near-death experiences in terms of human neurophysiological peculiarities that may occur immediately before death. Unfortunately, it follows from this contradiction that near-death experiences cannot really be explained by neurophysiological features that occur immediately before death.

The physics theory of human disembodiment tries to prove that the tunnels visible in NDEs, with a bright light at the end, may actually be tunnels in spacetime, or wormholes, described in theoretical physics. With the help of tunnels, it is possible to cover very large distances in space or travel in time in a very short time. In general relativity, a wormhole is a speculative structure that connects different points in spacetime and is based on Albert Einstein's special solution to the equations of the gravitational field, or the curvature of spacetime. A wormhole can be visualized as a tunnel with two ends at different points in spacetime (i.e. different places or different points in time or both).

Albert Einsteini üldrelatiivsusteoorias kirjeldatakse ussiurgete olemasolu võimalikkusest, kuid seda ainult aegruumi kõveruse kaudu. Ussiurgete füüsikalist olemust kirjeldatakse ajas rändamise füüsikateoorias samuti aegruumi kõveruse kaudu, kuid see on seotud peale selle ka veel tavaruumi K ja hyperruumi K’ füüsikalise süsteemiga, mida relatiivsusteooria ei kirjelda.

Üldrelatiivsusteoorias tuletatakse aegruumi tunneli meetriline võrrand:

$$ds^2 = -e^{2\varphi_{\pm}(r)}dt^2 + \left(1 - \frac{b_{\pm}(r)}{r}\right)^{-1} dr^2 + r^2(d\theta^2 + sin^2\theta d\varphi^2)$$

mis kirjeldab staatilist ussiauku. Sellest saab inimene minna läbi. Kujufunktsioon b(r)

$$\frac{dl}{dr} = y = \pm\frac{1}{\sqrt{1 - \frac{b}{r}}} = \pm\left(1 - \frac{b}{r}\right)^{-\frac{1}{2}}$$

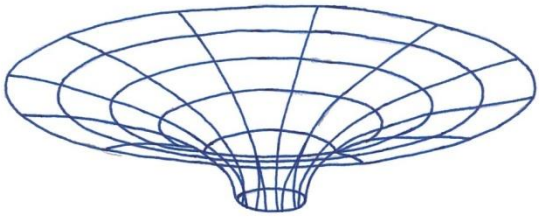
ja punanihke funktsioon Φ(r)

$$\Phi = -\frac{GM}{r} = +\frac{GM}{r}i^2$$

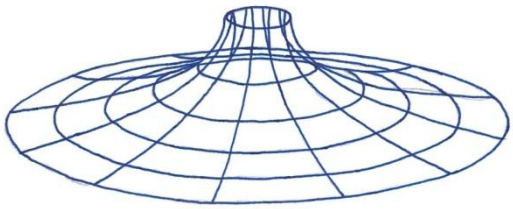
määravad ära sellise lahendi, mis on sfääriliselt sümmeetriline. See tähendab seda, et ussiurge on reaalsuses kerakujuline. Kuid mudelites kujutatakse ussiurget ikka tunnelina. Sellisel juhul on paremini näha seda, et see lahend ühendab omavahel kaks tasast aegruumi piirkonda (üks positiivne, teine negatiivne). Ussiaugu kurgust näitab l radiaalset omakaugust, mis tähendab seda, et l ei näita tunneli pikkust, vaid see kirjeldab ikka ruumi kontraktsiooni aegruumi tunneli ümbruses:

$$dl = \pm \frac{dr}{\sqrt{1 - \frac{R}{r}}}$$

Ruumi kontraktsioon tekitabki aegruumi tunneli. Näiteks l on esimeses ühendatud aegruumi piirkonnas positiivne:



ja teises ühendatud aegruumi piirkonnas negatiivne:



Positiivne ja negatiivne l tekitabki aegruumi tunneli efekti, mida me joonistel näeme. Näiteks eespool saadud ussiaugu meetrilise võrrandi:

$$ds^2 = -e^{2\Phi}c^2dt^2 + dl^2 + r^2(d\theta^2 + sin^2\theta d\varphi^2)$$

muutumispiirkonnad ongi järgmised: aeg

$$-\infty < t < +\infty$$

radiaalkoordinaat

$$-\infty < l < +\infty$$

ja nurgamuutujad

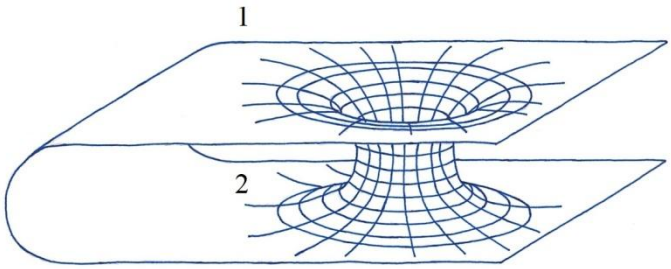
$$0 \leq \theta \leq \pi$$

$$0 \leq \varphi \leq 2\pi$$

Esimeses ühendatud aegruumi piirkonnas on l positiivne, mis tähendab seda, et see on reaalne. Kuid teises ühendatud aegruumi piirkonnas on l negatiivne, mis tähendab seda, et see on imaginaarne. Kuid positiivne ja negatiivne ehk reaalne ja imaginaarne l tekitabki aegruumi

tunneli efekti, mida me joonistel näeme.

Eelnevalt me nägime, et üldrelatiivsusteoorias kirjeldatakse aegruumi tunneleid ainult aegruumi kõveruse kaudu. Aegruumi kõverust võib kirjeldada meetriline võrrand, mis sisaldab endas reaalseid ja imaginaarseid avaldisi. Selle kaudu nähtubki tõepoolest ussiurgete geomeetriline kuju, mis on tuttav paljude jooniste pealt:



Kuid sellega üldjuhul ka asi piirdub. Relatiivsusteoorias ei nähtu selle seos ajas rändamisega minevikku või tulevikku ja ussiurgete pikkusi ei saa välja arvutada ega seostada seda sellega, et kui kaugele ajas minevikku rännatakse. Kõike seda kirjeldabki juba ajas rändamise füüsikateooria. See tähendab, et kui relatiivsusteoorias kirjeldatakse ussiurkeid ainult aegruumi kõveruse kaudu, siis ajas rändamise füüsikateoorias on see seotud peale selle ka veel tavaruumi K ja hyperruumi K' füüsikalise süsteemiga, millest nähtubki ussiurgete seos ajas rändamisega minevikku ja tulevikku.

Inimeste surmalähedastes kogemustes nähakse sageli tunneleid, mille lõpus paistab ere valgus. Inimese kehast väljumise füüsikateooria tõlgendab neid ametlikult aegruumi tunnelitena, mida kirjeldaks näiteks Albert Einsteini üldrelatiivsusteooria. Selline vaade on võimalik, kuna tunnelite kirjeldused viitavad üsna objektiivselt aegruumi tunneli olemusele, mida füüsikateoreetikud on juba ammu ennustanud. Kuid probleem seisneb selles, et kui surmalähedastes kogemustes nähakse tõepoolest ussiurkeid ehk haigla reanimatsiooni palatis tekib patsiendi surma hetkel ussiurge, siis miks ei näe neid haigla palati meditsiini töötajad? Neid tunneleid näevad ainult kehast väljunud inimesed. Osaline lahendus sellele võib seisneda ussiurgete füüsikateoorias, mida eelnevalt oli lühidalt esitatud. Näiteks, kuna aegruumi tunneli kui füüsikalise objekti moodustab reaalne ja imaginaarne osa vastavalt meetrilisele võrrandile, mis sisaldab kompleksarve, siis seega surmalähedastes kogemustes esinevad tunnelid peavad olema moodustunud ilmselt ainult imaginaarsest osast. Reaalne osa nendel puudub. Seetõttu näevadki neid ainult kehast väljunud inimesed ehk need, kes ise eksisteerivad dimensioonis, mida saab kirjeldada ainult imaginaarsete võrranditega. Ussiurke reaalse osa puudumise tõttu ei näe neid tavalised inimesed. Kuid nende tekkimine on veel suur mõistatus. Selge on see, et neid objekte tekitavad valgusolendid, kuid pole teada, kuidas. Iseenesest need kindlasti ei teki.

1.8 Death as a dream

Researchers believe that near-death experiences also include dream-like hallucinations, which are one of the most typical experiences just before death. Pam Reynolds, for example, encountered deceased relatives and family acquaintances in her disembodied state, who cared for her and even offered corporeal support. His experiences ended like an "enchanting dream". This means that when the operation began to come to an end, the dead relatives began to say a heartfelt goodbye to the woman. Finally, when doctors closed the woman's skull, dead relatives carefully helped Reynolds' "soul" to return to her body. Near-death experiences therefore contain very strange episodes.

Kevin Nelson, professor of neurology at the University of Kentucky, USA, has his own scientific theory about this. For example, if the brain confuses two levels of consciousness, this type of near-death experience can occur. Two levels of consciousness: one is the normal day-to-day experience of consciousness while awake, but the other occurs during REM sleep. REM sleep is rapid eye movement sleep. During REM sleep, there is sometimes as much electrical activity in the brain as during wakefulness. This means that the brain is not turned off during REM sleep, but sometimes works even more actively than when awake. Dreams also occur during REM sleep: these are such wonderful states of consciousness in which, for example, old memories, new thoughts and imaginative images are seen.

According to Kevin Nelson, the brain can go out of balance just before death, causing a person to enter a false level of consciousness, which in turn can cause a person to have a dream-like experience. Just before death, beautiful images appear. According to this theory, a near-death experience is simply REM sleep, which can occur during a heart attack, for example. This basically means that these phenomena are really nothing more than a sudden onset of a dream-like state. This theory also seems to explain the aspect of people experiencing things when their brains are dead. For example, the brain stem is an area of the brain that controls the basic functions of the human body. REM sleep also originates from such a brain region. The human brainstem is able to function even when the rest of the brain areas have stopped working. This is how REM sleep arose, which can be the cause of near-death experiences.

Researchers believe that a dream occurring in the brainstem can be a near-death experience, but the brainstem does not process out-of-body experiences. The area of the brain that processes out-of-body experiences has ceased to function at the time of clinical death. Likewise, the brainstem is not active at the time of clinical death. This means that the brain still cannot be dead enough to process the phenomena that occur in brainstem-induced REM sleep. Thus, the sleep theory cannot explain the nature of near-death experiences.

But how can a person know what was performed during his resuscitation when he was clinically dead? If a person was dead and saw illusions in the brain, as claimed by skeptical scientists, which could have been just like a dream (one of the manifestations of virtual reality created by the brain), then how can such events happen in a dream that also take place in reality, so-called. in the waking world?

If you see in a dream that you are walking or flying around the room of the ward, then in reality (i.e. when you are awake) the person does not do this. In this case, the realization takes

place only in a dream. There is no way a person can see in a dream what is happening simultaneously during his resuscitation procedures. In this case, it is not possible to conclude anything other than that the person could not be in such a virtual reality created by the brain as it is in a dream, but the virtual reality created by the human brain matched the reality very precisely in time and space, so the person had to be awake and present at the moment. It is a psychological fact that a person's dream world does not coincide temporally and spatially with the real world, that is, what is seen and heard in a dream does not materialize in reality. Consequently, a person's near-death experiences cannot be the result of illusions occurring in the dying brain, as they correspond to events that also occur in reality. Thus, consciousness was no longer dependent on the brain at the time of a person's clinical death, and thus no longer needed. It was necessary to leave the brain, that is, to separate, i.e. to be apart.

There is not a single case of such a dream known in the world, in which a person has seen himself in his own dream while sleeping. However, in case of NDEs, patients have seen themselves from the sidelines during the operation. They have been able to observe from the side how doctors and nurses try to revive his dying body. But in dreams, people do not see themselves from the side, how they are currently sleeping in their warm bed. There is no such aspect in dreams at all.

According to popular belief, a person's near-death experience is similar to a dreamlike experience. It is said to be similar to sleep, full of fantastic experiences and incredible visual experiences. This common belief about near-death experiences is actually a myth that is definitely not true. While a few people with NDEs do say so, the majority say otherwise. A near-death experience is extremely memorable, bright, deeply affecting the human psyche and very well perceived. For example, people who have experienced this about 30 years ago say it was like yesterday. All the details will be remembered for decades, and the accompanying "spiritual lesson" will affect a person for the rest of his life. All of these characteristics are completely opposite to the experiences of a normal dream. Dreams are not remembered for a long time, their contents do not affect the rest of a person's life (even in the case of nightmares), and dreams usually occur as if in a kind of "fog", which is difficult to remember afterwards. All of this strongly suggests that near-death experiences and dreams are two completely different phenomena.

> More specifically, the experiences of a person's dream can actually be as real as the experiences and feelings experienced in the waking state, i.e. in the real world. But the difference is that while what was experienced in the real world can remain in a person's memory for decades, the experiences of a dream often do not remain in a person's memory for long. The content of dream experiences seems "foggy" in retrospect precisely because they are difficult to remember compared to what was actually experienced in the real world. But nevertheless, the contents of a dream can seem as real and vivid as the events experienced in the real world.

Near-death experiences have also been widely associated with the effects of narcotic substances. On the surface, there are indeed many similarities between the effects of NDEs and narcotic substances (for example, the chemical processes in the brain during NDEs and the use of pleasure substances are similar, in both cases the experiences are well remembered by the person), but there are also important differences. The differences lie primarily in the details. For example, powerful narcotic substances (ecstasy, cocaine and LSD) create very strong euphoric

perceptual experiences for their users, which are indeed similar to the perceptual experiences experienced by NDEs. But NDEs are obviously more meaningful and educational than the experiences that come from recreational substances. In case of NDEs, one gets the impression that the wonderful perceptual experiences rather result from some kind of "background system of knowledge" that the person has entered outside of his body. In contrast to NDEs, narcotic substances are accompanied by euphoria, which has no deeper philosophical meaning, so it does not affect the rest of a person's life. This is a very big difference between the experiences of NDEs and narcotics. Narcotic substances create dependence, through which it affects the rest of a person's life. But the philosophical and educational experience of NDEs is what affects the rest of a person's life, not the resulting addiction, which has not really been observed with NDEs.

The philosophical and instructive subjective experience of NDE for a person consists precisely in those details that are not associated with the effects of narcotic substances at all. For example, in an out-of-body state, a person meets a being of light who shows him a retrospective of earthly life as an extraordinary three-dimensional panorama. Through this, a person learns from mistakes made during his life or feels joy from positive successes. The feeling of euphoria described in many NDEs does not simply occur with some kind of automatic feeling when leaving the body, but it only "occurs" when meeting an otherworldly light being or when reaching the light at the end of a dark tunnel. Indescribable happiness and joy often emanate from beings of light, and do not arise out of nowhere. But in case of use of pleasure substances, all those characteristics are absent, in which extraordinary perceptual experiences arise out of seemingly nothing. For example, the feeling of euphoria occurs in a person as a result of the release of certain neurotransmitters in the brain, and not from meeting light beings. Light beings, dead relatives and acquaintances, and light tunnels are not seen during the use of pleasure substances, including a flashback to earthly life, which is one of the most characteristic aspects of NDEs.

Near-death experiences (NDEs) are very well remembered by those who have experienced them. For example, people can remember the details of this experience even decades later, and its effect on a person's psyche and personality is long-lasting and large-scale. Why this is so cannot be explained exactly yet. But psychologically, it can be hypothesized that since the phenomena of NDE are so incredible and meaningful to the mind and personality of any person, that is why it is remembered in detail for a long time. This is psychologically understandable. For example, if a person were to meet a UFO that landed on Earth and an alien that floated out of it during picking mushrooms in the forest, such an event would probably remain in the person's memory for the rest of their life. This means that the more extraordinary, meaningful and incredible an event or experience is subjectively for a person, the better and longer the related details are remembered, although memories can change over time.

Memory psychologists emphasize that memory is very susceptible to external influences (for example, information from other people or seen on social media). Memories of events that happened are not really permanently the same in people's memory. This means that memories are constantly changing.

If a person's memories change over time, then "false memories" can occur. False memories are memories of events and experiences that did not actually exist. It is significant here that false memories are not known to occur with NDEs. This means that people's memories of NDEs mostly remain true, rather than changing over time. One reason for this conclusion is that a very large number of people's retrospective descriptions of NDEs match each other very closely. It can be fairly confidently stated that NDEs usually occur according to a very specific "script", so it

can be concluded that people's memories of NDEs do not change very much over time, which is again an interesting phenomenon with NDEs. Likewise, social and cultural influences have not played a major role in changing the content of NDEs and their remembrance. This means that people's descriptions of NDEs are the same 80 years ago compared to cases today. Cultural space changes over time, but the content and deeper meaning of NDEs for people subjectively does not change over time. It could be said that NDEs influence people's cultural space (fiction, theaters, films, cinemas, etc.), not the other way around.

1.9 A quarter of people in a coma due to brain damage are conscious

New research (such as neurologist Nicholas Schiff's research from the Weill Cornell Medical Center in New York) shows that a larger proportion of people in a coma or other incommunicado state are actually conscious than previously thought. This means that at least a quarter of people in a coma understand and hear what is happening around them. In 2024, the first major research was done on the consciousness of people who had severe brain damage or were physically unable to move for some other reason. Such people are unable to answer questions physically, for example by giving thumbs up. But even so, it has been observed that when they are approached, it makes their brains work, at least in a quarter, which is still extraordinary. Research of this nature shows that people who are seemingly completely out of touch can actually hear what is going on around them. Therefore, it is thought that it may be possible to communicate with them using brain-computer interface (AAL), or small devices that map brain activity when implanted in a person's head. The interface is able to decode the brain's work and translate it into the language of commands, for example, it can move the cursor on a computer screen.

353 brain-damaged patients whose brains had been damaged by heart attack, stroke or physical trauma formed the main sample of the study. In the beginning, completely normal tests of contact ability were performed on the patients, for example by holding up the thumb. Of the 353 patients, 241 had no response, but the remaining 112 patients responded in some way. After that, all patients underwent one or two different brain imaging procedures. One of them was a functional magnetic resonance imaging, or fMRI, which assesses the blood oxygen level in the brain. Therefore, it can be used to measure mental work, albeit only indirectly. The second was electroencephalography, or EEG, in which a hat with electrodes is used, which, when placed on the patient's head, measures the patient's brain waves. Each patient was asked to imagine playing tennis or opening and closing a fist during the imaging procedures. Such guidelines were arranged for 15-30 seconds, after which there was a small pause. The whole activity was repeated about 6-8 times.

> The human brain undergoes millions of nerve impulses per second. These impulses create an electric field around the head, the strength of which is measured by an electroencephalograph. The resulting graph is called an electroencephalogram, or EEG for short. Functional magnetic resonance imaging, or functional MRI (fMRI), is a method

> that uses MRI technology to measure brain activity by monitoring the dynamics of the brain's blood supply. Blood flow to the brain and neuronal activation are linked. For example, if a part of the brain is currently active, the blood flow in that area increases. Magnetic resonance imaging, or nuclear magnetic resonance imaging, is primarily known as a method for creating images of the interior of the opaque organs of living organisms and for determining the amount of water in geological structures. Therefore, the method is mainly used to visualize pathological or physiological changes in living tissues and to evaluate, for example, the permeability of rocks to hydrocarbons. Magnetic resonance spectroscopy provides a much more detailed picture of tissues than X-rays.

During such activities, brain activity could be seen in EEG or fMRI in about a quarter of the patients. In the first part of the study, 112 patients were found to be able to contact and also had better results in the brain activity test. But even so, this is not enough, as only 38 percent of them had brain activity that was consistent. According to Nicholas Schiff's assumption, the threshold is relatively high in studies of brain work. It should be noted here that this is not the first study that shows the consciousness of brain-damaged and immobilized people. For example, in a 2019 study, 15 percent of 104 patients showed activity during an EEG procedure in which they thought along despite external immobility. But the 2024 study had a larger sample size and was conducted at multiple hospitals, making it the first of its kind. Six hospitals from four countries (USA, UK, Belgium and France) participated in the study.

If a loved one knows that a comatose person may be conscious, it can influence their family's decision about further treatment.

A quarter of the patients who had brain activity were younger compared to the rest of the patients, the brain damage was mostly due to physical trauma, and they had been living with it for a long time. Not all hospitals organized their EEG or fMRI imaging procedures according to the same protocol, so there is a possibility that this could have influenced the results. The threshold for detecting brain activity was very high in the study. This may have underestimated the decision-making power of machines in estimating the actual number of conscious humans. Among those who underwent both (EEG and fMRI) examinations, the highest number of conscious patients appeared, so it can be assumed that the percentage of conscious patients would have been higher if all patients had undergone both examinations. However, performing brain imaging experiments for this purpose is logistically and computationally difficult.

In 2024, the first major research was done on the consciousness of people who had severe brain damage or were physically unable to move for some other reason. For example, when they were approached, it made their brains work. In the beginning, completely normal tests of contact ability were performed on the patients, for example by holding up the thumb. Each patient was asked to imagine playing tennis or opening and closing a fist during the imaging procedures. During such activities, brain activity could be seen in EEG or fMRI in about a quarter of the patients. This means that such patients turned out to be able to communicate and also had better results in a brain activity study. Circumstances like these show quite clearly that brain work did indeed increase because these patients were approached and tested for contact ability. Some skeptics may think that some other reason could have caused the brain activity to occur, but this is not plausible under the circumstances.

Studies show that a quarter of people in a coma due to brain damage are actually conscious, which means that not all people in a coma are conscious. Such statistics also coincide to some extent with the fact that not all people who fall into a coma or clinical death experience near-

death experiences. This means that only a certain percentage of people who enter the pre-death state experience near-death experiences, but not all. Such a general statistical coincidence may indicate that a near-death experience may occur for a conscious person in a coma, for example. Since the brain activity during coma or clinical death can sometimes resemble that of a conscious brain, this may explain the occurrence of near-death experiences immediately before the brain ceases to function. But it also has its own contradictions, which we will describe below.

The research described above shows that a greater proportion of people in a coma or other incommunicado state are actually conscious than previously thought. This means that some people in a coma understand and hear what is happening around them. From this, the researchers conclude that the information received during coma or clinical death, which is considered one of the best evidences of near-death experiences, is nothing more than the conscious memory of the conversations of doctors and nurses during a person's coma or clinical death. This may even be partially true, but here too there are contradictions. A person could indeed hear what was happening during resuscitation while in a coma or clinical death and later in life recall it to others, but during a coma or clinical death a person cannot possibly know about such things that are not talked about or heard during resuscitation. There are a number of cases where a comatose person knows things they were supposed to see, not hear. Such an aspect can no longer be explained by the fact that the person was actually conscious during the coma and heard everything the nurses and doctors did during the resuscitation. During coma and clinical death, the patient may indeed hear what is going on during resuscitation, but is nevertheless unable to see the resuscitation procedures that are otherwise described in his near-death experience. This is a very important shortcoming, which makes it unsuitable for describing the causes of near-death experiences.

Studies have shown that some patients remember their own death. About 40 percent of patients show electrical brain activity after cardiac arrest. Near-death experiences usually occur when a person dies, their heart stops, and the brain's electrical activity essentially ceases. But studies have shown that when a patient's heart has stopped, their brain continues to function, even during resuscitation. From this, scientists "assume" that this may be the biological basis of near-death experiences. Researchers hypothesize that neurobiological mechanisms present in the dying phase of a person can be linked to near-death experiences. Near-death experiences have often been considered hallucinations or dreams.

1.10 Electrical brain activity after cardiac arrest

During a person's clinical death, the person's heart has temporarily stopped. In clinical death, the general activity of the brain has ceased, as the brain usually no longer receives blood. In this case, activity (i.e. neuron charging) occurs only in very local brain regions. This means that the brain activity present at the time of clinical death does not exist within the entire brain, but is present in very individual brain regions. Different aspects of consciousness and the psyche are processed by many different regions of the brain, not by single regions. This would not be possible with individual brain regions. This means that a person's state of consciousness occurs

when the brain is generally excited, which is controlled by the subcortical mechanisms of the brain. This means that the state of consciousness is not localized in a certain brain region, but it is related to general activity of the brain, which can be measured from different regions of the brain. If the cortical feature-binding activity is not associated with a non-specific thalamocortical system, then it occurs unconsciously. Activities generated in this system spread throughout the brain. However, the activities that arise in the cerebellum remain local. They do not spread throughout the entire brain. Also, the activity wave propagation of neurons in the cortex is clearly more limited during general anesthesia and deep sleep and lasts less time than in the state of consciousness. Very few waves of activity appear.

Brain cells deprived of blood supply cease to function in clinical death or brain death. The activities of the brain regions are otherwise related to the discharges of neurons. For example, the activity of a specific brain area increases with the increase in the work of neurons. But neurons need a lot of energy to do their work. This energy comes to them from oxygen-rich blood pumped directly from the heart. A change in blood supply to a brain region is accompanied by a change in neuronal activity, but studies have shown that this is not always the case. However, the magnetic properties of oxygen-rich blood and oxygen-poor blood are different because it is the iron atom that binds the hemoglobin in human blood to oxygen. Blood carries oxygen (especially to the brain) throughout the body. Iron deficiency in blood can cause a heart attack. This can cause anoxemia, or lack of oxygen in the blood and tissues. In cerebral anoxemia, too little oxygen reaches the brain. A lack of oxygen in the brain triggers a chain of harmful chemical reactions that eventually destroy brain cells. This process can be slowed down by cooling the person immediately after resuscitation. A drop in body temperature gives a bit more time to resuscitate and the person suffers much less brain damage.

Some studies have shown that when a person's heart has stopped, the brain can still function, even an hour later during resuscitation. It should be noted, however, that this only occurs in a small proportion of patients who are later able to recall their resuscitation experience. Some people even remember the word that was repeated during the CPR.

NYU LangoneHealth Associate Professor Sam Parnia and his team have been investigating the possible biological basis of remembered death experiences. The research included 25 hospitals mainly in the US and the UK. Patients with cardiac arrest were given completely standard CPR, but in addition, small devices were attached to their heads that measured oxygen levels and electrical activity in the brain. They did not interfere with standard treatment. The researchers tried to find out whether the patients' brains were consciously or unconsciously aware of what was happening in the environment during the cardiac arrest. Therefore, the names of three fruits: banana, apple and pear were heard through headphones placed on the patients' heads.

A person may not consciously remember hearing the names of these three fruits. This is called unconscious learning in psychology. But when asked the names of three fruits, the person answers with the exact same words more often than expected. Studies have shown that people who have the names of fruits and cities whispered into their ears while in a coma can remember them.

In the hospitals where the studies were carried out, patients' hearts stopped 567 times between May 2017 and March 2020. In case of 53 patients, it was managed to collect data on brain oxygen levels and activity. Most of the patients had a complete cessation of brain activity, but about 40 percent of patients had electrical activity in their brains. The electrical activity sooner or later resembled the brain waves in the brains of conscious people, at least approximately. Such

activity was observed in some patients even one hour after cardiac arrest. The study sample included 567 patients, 53 of them survived, or almost every tenth. But "only" 28 survivors were interviewed. Another 126 people were interviewed to increase the sample. They had also survived cardiac arrest but were not directly involved in the study. Almost 40 percent of the interviewees perceived what was happening during resuscitation, although there are no specific memories. About a fifth of them remembered their own death experience, which was not a classic near-death experience or NDE. According to Parnia, patients described their near-death experience as a moral assessment of their entire lives.

Of all the survivors, only one person was able to remember the names of the fruit that were given to him through headphones during resuscitation. Since the sample was very small, this one person could have named these fruit names completely randomly.

Scientists hypothesize that people are not aware of most of what is going on in their brains because the brain has 'inhibitory mechanisms' for it. If such a mechanism did not exist, then a person would not be able to do well in the world. In this case, all attention would go to consciously perceiving the work of your brain. It can be concluded that the braking mechanisms begin to disappear in the dying brain of a person, which is why the dying person has access to all his consciousness. Parts of the brain that are normally at rest become active. Parnia hypothesizes that a person suddenly has access to everything that he has stored as memories during his life. Such a mechanism is hypothesized to be beneficial to humans in that it helps humans face death, although its evolutionary usefulness is unknown.

The research described above shows a greater resistance of the brain in conditions of lack of oxygen. Parnia hypothesizes that people who have been declared permanently dead by conventional treatment can still be revived. Until now, it has been believed that the human brain dies 5-10 minutes after breathing stops. But the research described above shows that in certain cases the brain can go much longer without oxygen.

Patients' hearts stopped 567 times. In case of the 53rd patient, it was managed to collect data on brain oxygen levels and activity. Most of the patients had a complete cessation of brain activity, but about 40 percent of patients had electrical activity in their brains. This means that the study sample included 567 patients, of which 53 survived. However, "only" 28 survivors were interviewed. Another 126 people were interviewed to increase the sample. Almost 40 percent of the interviewees perceived what was happening during resuscitation. About a fifth of them remembered their own death experience. Of all the survivors, only one person could remember the names of the fruit. Due to the small size of the sample, this one person could have named these fruit names completely randomly. The sample was too small to draw any fundamental conclusions about near-death experiences. Too small a part of the examined and interviewed patients perceived what was happening during resuscitation. A much larger sample and, consequently, a much larger amount of data are needed for thorough conclusions and the rigor of the scientific method in general.

Most of the patients had a complete cessation of brain activity, but about 40 percent of patients had electrical activity in their brains. The electrical activity sooner or later resembled brain waves in the brains of conscious people, at least approximately. Such activity was observed in some patients even one hour after cardiac arrest. This means that in such cases, the brain can be without oxygen much longer, which shows the greater resistance of the brain in conditions of lack of oxygen. For example, until now it was believed that the human brain dies 5-10 minutes after breathing stops. Almost 40 percent of the interviewees perceived what was happening during the resuscitation, although there were no specific memories. About a fifth of them

remembered their own death experience, which was not a classic near-death experience, or NDE. A classic near-death experience includes many different perceptual experiences, such as feeling out of body, feeling weightless, seeing beings of light, going through tunnels, looking back at the worldly life, and meeting dead people. All these aspects were not perceived by the study patients, at least they did not talk about them. Near-death experiences are extremely vivid, personal and memorable perceptual experiences that leave specific memories in people's memory for decades. All of this suggests that at least the patients who were included and interviewed in the studies did not experience near-death experiences, although they did have brain activity similar to the state of consciousness during the cardiac arrest and said they remembered their death experience. Thus, brain activity during cardiac arrest cannot be the cause of "real" near-death experiences, although logically it could have been plausible.

While about 40 percent of patients who survived a cardiac arrest had electrical activity in their brains, the majority of patients still had their brains stop functioning completely. This is in stark contrast to the explanation that NDE phenomena can be caused by electrical activity during a person's coma or clinical death. The reason is that near-death experiences have also occurred in such patients whose brain work had completely stopped, i.e. there was no electrical activity in the brain, at least brain activity similar to the state of consciousness. If those patients whose brain function had completely ceased, but nevertheless remembered their near-death experiences later after resuscitation, this could no longer be explained by brain activity occurring during coma or clinical death. Here we can cite the case of Pam Reynolds, whose brain stopped working completely during a coma. In addition, headphones were placed in his ears, through which a disturbing sound was played. In such a case, the experiences he went through cannot under any circumstances be explained by simple brain activity. Through the headphones, it is not even possible to hear anything of what the doctors and nurses were saying or doing during her resuscitation. Yet Pam Reynolds was able to describe in detail all the actions and stories that were done or said during her revival.

It must be admitted that scientists have tried to prove or disprove the real existence of NDE phenomena through experiments. To do this, they have hidden objects or letters in the reanimation wards, which should be seen by people with cardiac arrest in that ward. After resuscitation, these people should be able to describe these objects or letters. But such an experiment has not been successful so far, because people have not seen anything, noticed anything, or have not had a near-death experience at all. This is also one of the reasons for the continued critical attitude of researchers towards NDEs, in which they deny the real phenomenon of NDEs and try to create explanatory theories based on brain chemistry. But we have to face the truth that there are contradictions in this too. For example, despite the failures of such experiments, thousands of patients are resuscitated every year in the world whose brain work had completely stopped during cardiac arrest, but who later after resuscitation were able to describe in detail the actions that took place during the resuscitation. Medical personnel often witness all of this. No failed attempt can deny, ignore or disprove it. Such a fact shows that it is a repeated phenomenon over time, although the person himself cannot repeat or control it over time. But that's nothing, as there are thousands of documented cases in the world's hospitals and probably future NDE phenomena that are not purposefully controllable or caused by humans.

1.10.1 Experiments

Paljud teadlased on katsete kaudu proovinud tõestada või ümber lükata SLK-de nähtuste reaalset eksisteerimist. Selleks on nad peitnud reanimatsioonipalatitesse objekte või kirju, mille korral peaksid sellesse palatisse sattunud südameseiskumisega inimesed nägema. Pärast elustamist peaksid need inimesed suutma neid objekte või kirju kirjeldama. Kuid sellised katsed ei ole seni õnnestunud, kuna inimesed ei ole midagi näinud, tähele pannud või pole surmalähedast kogemust üldse esinenudki. Analoogiliselt on see nii ka inimese kunstliku kooma või tahtlikult tekitatud kliinilise surma korral. Võiks ju eeldada, et kui tekitame inimesel tahtlikult ajutise kunstlikku kooma või kliinilise surma seisundi, eesmärgiga saada tõendeid tema läbielamistest surma ajal või vahetult enne seda, siis peaks saama suure tõenäosusega soovitud tulemuse. Kuid sellest hoolimata ebaõnnestuvad ka sellised katsed. Need on tõsised põhjused teadlaste jätkuvaks kriitiliseks hoiakuks SLK-de suhtes, mille korral eitatakse SLK-de reaalset fenomeni, mistõttu püütakse luua ajukeemial põhinevaid seletavaid teooriaid.

Kuid sellised ebaõnnestunud katsed näitavad, et nähtus ise on ajas korduv ehkki inimene ise seda ajas korrata või kontrollida ei saa. Juba preagugi leidub SLK tuhandeid dokumenteeritud juhtumeid maailma erinevatest haiglatest, mis pole inimese poolt eesmärgipäraselt kontrollitavad ega põhjustatud. Ilmselt ka tulevikus leiavad aset seda laadi SLK nähtused. Sellised asjaolud viitavad hoopis sellele, et inimesel ei ole kehavälises olekus kontrolli oma elamuste ega tajude üle. See tähendab, et kui inimene väljub oma kehast, siis ei ole ta enam võimeline kontrollima oma keha ja keskkonna vahelist vastasmõju, vähemalt osaliselt. Selle kontroll on pigem selliste „olendite“ käes, kes kehast väljunud inimestega kohtuvad. Alati ei pruugigi kedagi kohata, kuid tavaliselt nähakse oma surnuid sugulasi või tuttavaid, sageli just ebamaiseid valgusolendeid. Kehast väljudes satuks inimene justkui teistsuguse juristdiktsiooniga maailma, milles kehtivad omad reeglid, standardid ja seadused. Sellest tulenevalt oleks loogiline järeldada, et SLK-de tõenduspärane uurimine või isegi teaduslik kinnitus „inimteadlaste“ jaoks ei ole taolise maailma huvides. See tähendab, et nähtus ise „soovib“ jääda väljapoole teadust, mistõttu peavad maised inimesed sellesse eelkõige uskuma, mitte võtma SLK-d kui teadusliku faktina. Sellistest järeldustest ja analüüsidest, mis esialgu paistavad pigem esoteerilised kui ratsionaalselt argumenteeritud mõtted, on pikemalt kirjeldatud inimese kehast väljumise füüsikateoorias, mis lahkab käesolevat teemat üsna üksikasjalikult.

1.11 Looking back at earthly life

According to the popular opinion, a person sees his earthly life when facing death. The earthly life of a person seems to pass before their eyes. It is thought to be triggered by the death of a person, which causes enormous trauma to the brain. But in reality, it's much more complex and

nuanced than most people think. The earthly life of a person does not actually pass before the eyes, but it is "visualized" according to a certain scenario and under certain circumstances, even in case of near-death experiences. This is a fairly widespread simplified myth that does not correspond to reality. In the following, we will describe in more detail how a person actually sees his lived earthly life at the moment of death.

After separating from his physical body, a person begins to realize that he is probably dying. Pretty soon he sees a big dark tunnel. He feels himself being pulled into this tunnel. But after a while, a very bright light shines at the end of the tunnel.

At the end of the tunnel, one is met by beings of light who radiate light in an extremely brilliant manner and whose personalities are extremely awe-inspiring, yet very likeable. They create an ultimate sense of joy and peace for the visitor. Many people with near-death experiences have described the feeling of love from these beings of light as the "*purest love*" that can exist in the universe. All of it seems to radiate a blinding light.

After some time, a person perceives the proximity of a very special being of light. Depending on one's religious or atheistic cultural background, one may see God, Christ, Buddha, Allah, or some other holy person in this holy light being. Such a supreme being of light is seen by believers, atheists and also agnostics. He radiates supreme love and supreme understanding. The light of this light creature is exceptionally bright. It is extremely dazzling.

In the presence of this supremely brilliant and awe-inspiring being of light, a person has the opportunity to see his earthly life, which he has lived so far, appearing before him as an extraordinary three-dimensional panorama. There, he sees all the events of his life from the side. The time dimension experienced in this is quite different from what we perceive when we are on earth. Time has acquired a rather special form of existence. It is now possible to see a person's entire lived life in detail. A person feels the effect of his actions on other people, which he has accomplished in his earthly life. A person perceives joy and satisfaction or pain and agony in the consciousness of other people, according to what he has caused to other people during his life. During the flashback, the light being is next to the person. A light being helps a person learn from his mistakes.

During near-death experiences, a person is out of his body, which in itself does not create any wonderful three-dimensional panoramas of his lived life. Only in the presence of a light being does a person who has left the body see his earthly life as a three-dimensional visualization. Its content "comes" directly from the person who has just left the body, but the visuals are created (caused to become visible visuals) by a light being, who with his extraordinary telepathic ability "sedates" the arriving person with his wonderful perceptual experiences. It can be said that the change of a person's physical body (i.e. leaving the body) is also accompanied by the possibility of conscious telepathy, through which communication with a light being takes place.

In the phenomena of near-death experiences, there are beings of light who communicate with the person who has left the body, or in this case, temporarily died, in a telepathic way. In the presence of a light being, people can see a flashback of their earthly life. This can also be interpreted as a telepathic communication, because its content "comes" from the person who has left the body, but it is the light being that comes to greet the person who has left the body as a visible visual.

All such visualizations are extremely powerful, deeply memorable and very believable. Such extremely powerful and very believable visualizations are actually evoked into visible visuals by beings of light with their wonderful telepathic abilities who are currently coming to meet the out-of-body people. The content of the visualization comes from the person, as it shows the earthly

life of the person, not the life experiences of a light being from somewhere in the universe.

1.12 Real and apparent near-death experiences

Besides Professor Borjigin, many other researchers have also studied near-death experiences. For example, in 2002, Olaf Blanke, a doctor at the Geneva University Hospital, conducted experiments. His experiments are said to explain why patients perceive their souls leaving their bodies shortly before death. Statistics show that only about a quarter of patients with near-death experiences perceive their soul leaving their body. Professor Olaf Blanke came to the conclusion in his research that a "crash" or "short circuit" of a dying patient's brain can cause a person to have the illusion of leaving the body. Olaf Blanke managed to cure one of his patients with electricity, who was currently suffering from epilepsy.

> Epilepsy is a disease of the human nervous system characterized by repeated seizures. Epilepsy is a medical disorder mainly characterized by convulsions, which is caused by abnormal electrical potentials generated in the nerve cells of the brain. Epilepsy is not a permanent condition, but a chronic disease in which a person experiences short periods of unprovoked seizures, accompanied by dizziness and black vision. Epilepsy is a disease whose symptoms appear suddenly, which is why it creates a constant feeling of uncertainty in a person. The disease can be of very different degrees of severity, from a few times in a lifetime to very frequent seizures. Epilepsy is not generally inherited, but some forms of epilepsy have been found to be hereditary. It has also been established that epilepsy is much more common in identical twins than in fraternal twins.

The treatment consisted in attaching electrodes to the patient's head, through which the electrical activity of the brain could be influenced by means of a weak electric current. When an electrode was applied to a certain area of the brain at the back of the head, the patient felt that his body was sinking deeper into the hospital bed. When the current strength increased, the patient felt much lighter, which then was able to rise up and float under the ceiling and could see himself from a distance. The area of the brain that was affected by the electrodes is called the gyrus angularis in Latin. It is located in a small angular area of the parietal lobe and regulates the positioning of the human body in space. If an electric current of a certain strength passes through this area of the brain, or if too many biological regulatory substances are released there, it disrupts the work of the entire area, so a "short-circuit" can occur there to cause the feeling of leaving the body.

But the experiments described above really only show that the human brain is able to imitate the exit from the body quite convincingly in certain situations and nothing else. The chemical imbalance of the brain due to the concentration of certain chemical substances or due to the specific electrical activity of a specific area of the brain produces phenomena similar to near-death experiences. That is why they try to explain these phenomena as disorders caused by human brain chemistry. However, all of this suggests that the human brain is capable of

simulating near-death experiences, but this does not mean that all such phenomena are automatically brain-generated illusions. It can be concluded that there are also real or actual exits of people, which are no longer illusory. This means that one must be able to distinguish between the illusion created by the brain and the real exit from the body, in the same way as, for example, between mental illness and giftedness, disorder and homosexuality, or between the benefits of vaccines and their alleged devastating effects.

On a large scale, near-death experiences are clearly divided into two groups:

1. Illusions of leaving the body created by the brain. The human brain can simulate exiting the body and near-death experiences in an extremely believable way. Scientists have been searching for the part of the brain responsible for near-death experiences.

2. Real or actual disembodiments of people. You have to be able to distinguish between the illusion created by the brain and the real exit from the body. The human brain is capable of simulating near-death experiences, but this does not mean that all such phenomena are automatically illusions created by the brain. It can be concluded that there are also real or actual disembodiments of people, which are no longer illusory.

Both groups have offered extremely convincing defenses for their validity, which are described and analyzed in the physical theory of human disembodiment.

In case of near-death experiences, we actually have to consider three factors, which are thoroughly analyzed in the disembodiment theory:

1. Leaving a person's body is actually a real phenomenon, as it is indicated by certain signs, such as seeing things or learning something that cannot be seen or known when dead.

2. Contact with extraterrestrial civilizations probably takes place at the time of a person's death, because exiting the body indicates the continuation of a person's life after death, and where can this "life after the grave" still be if not in the sky, where UFOs have also been seen.

3. Disembodied people experience “virtual reality manifestations” in the language we understand. For example, one sees the fire of hell, demons, various unknown landscapes, buildings, strange unearthly beings, the life events of a person who has left the body, etc.

All these factors are somehow related.

1.13 Final conclusion

Researchers believe that near-death experiences are the last neurophysiological functions of the dying brain. Brain chemistry can explain many phenomena that occur in near-death

experiences. On the face of it, this is an extremely plausible explanation that most scientists would favor. However, near-death experiences do not always occur when people enter the pre-death state. For example, people in clinical death do not always experience leaving the body, seeing the light, or going through a tunnel. This type of clinical death is experienced in an unconscious state, in which the characteristic features of a near-death experience are not visible. Therefore, near-death experiences cannot be explained by the release of mediator substances in the brain or lack of oxygen in the visual cells. For example, if they arise and cease definitely and always immediately before death (i.e. are not selective by person or time), then near-death experiences do not always occur at such a time. This means that, for example, during the release of mediator substances immediately before death, one does not always experience an exit from the body or see a bright light. Such a contradiction is of great importance to those who want to explain near-death experiences in terms of human brain chemistry that occurs immediately before death. Unfortunately, it follows from this contradiction that near-death experiences cannot be fully explained by chemical processes occurring in the brain immediately before death.

Statistics collected over time show that not all people who are clinically dead have experienced near-death experiences. This means that of all patients who have been in a coma or are clinically dead, only a fraction have had a near-death experience. The reason for this is not known, but nevertheless, some serious hypotheses can be made based on it. For example, there is a possibility that people who have not experienced a near-death experience in clinical death simply do not remember it. It is very unlikely, but it cannot be completely ruled out. Another possibility would be that the exits from people's bodies also take place in an unconscious state, which is why people later do not remember their near-death experiences. According to this, some exits from the human body would occur consciously, but other parts would occur unconsciously. In the first case, the person would remember their near-death experiences, but in the second case, they would not. This would be similar to the dark matter mystery in astrophysics: apart from the visible matter that exists in the universe, there is also invisible matter. Apart from the conscious exit from the body, there would also be an unconscious exit from the body, in which one does not later remember one's near-death experiences. However, this would raise a new question, what would cause the unconscious to leave the body? Why would a person not remember or be aware of their out-of-body experiences? It should be an extraordinary event for every person that will definitely be remembered. It would be analogous to ask, what else is this dark matter? These questions cannot be answered yet.

> See, et inimesed ei pruugi vahetult pärast elustamist mäletada oma surmalähedasi kogemusi, ei ole välistatud, kuna ka unenägusid ei pruugita vahetult pärast üles ärkamist mäletada. Paljud inimesed võivad väita, et hommikul üles ärgates ei näinud nad magades und, kuna mitte ühtegi mälestust sellest ei ole. Kuid sellegipoolest ei pruugi see tõsi olla, kuna nad lihtsalt ei mäleta seda ehkki und võidi siiski näha. Sarnaselt võib see nii olla ka surmalähedaste kogemustega, mille korral arvatakse, et mingit kehast väljumist ei ole olnud, kuid tegelikult inimene koges surmalähedast kogemust. Lihtsalt ei mäletata. See võib tähendada ka seda, et surmalähedased kogemused võivad esineda tegelikult palju sagedasemini kui seda ametlikud riiklikud statistikad näitavad. Kuna eelnevalt kirjeldati analoogiat unenäo ja SLK vahel, ei näita see seda, et SLK oleks inimese unenägu. Unenäol ja SLK-l on selgeid erinevusi, mida käesolevas töös ka laialdaselt kirjeldatakse.

Here we present the results of some studies that show that the characteristic features of a near-

death experience do not always manifest themselves during the clinical death of a person, but they occur in a certain percentage:

> For example, two large studies involving hundreds of cardiac arrest survivors confirm that near-death experiences are often very pleasant and associated with strong impressions. About 9-10% of survivors described near-death experiences that largely followed the same scenario.
>
> People usually experience the world very differently - in their own way, but near-death experiences often follow a very similar 'script'.
>
> More than half of the people who had been on the verge of death and then returned to us had felt positive feelings, a third of them had met dead relatives or acquaintances.

Several international studies have shown statistical data on near-death experiences as follows:

> About 8% of the survivors saw the border between life and death, 56% experienced positive feelings, 23% perceived a strong light, 31% moved through a tunnel, 29% saw a beautiful landscape, 13% saw the life they lived pass before their eyes, 32% met dead people, 24% left and about 50% of the survivors were aware of their death.
>
> About 4.2 percent of people have had a near-death experience. This has come out in studies conducted in the USA and Germany. Research also shows that the nature of near-death experiences is not influenced by a person's gender, race, religious affiliation, education, position, etc.

Near-death experiences, or NDE phenomena, occur during the clinical death of a person, in which the person's heart has temporarily stopped. In clinical death, the general activity of the brain has ceased, as the brain usually no longer receives blood. In this case, activity (i.e. neuron charging) occurs only in very local brain regions. Consequently, some researchers may argue that the activity of local brain regions during clinical death can lead to near-death experiences. However, brain activity that occurs during clinical death does not exist within the entire brain, but occurs in very individual brain regions. This suggests that such very limited brain activity cannot be the actual cause of a person's exit from the body. Otherwise, it should occur throughout the brain, not in individual brain regions. Different aspects of consciousness and the psyche are processed by many different regions of the brain, not by single regions. This would not be possible with individual brain regions.

People's near-death experiences have shown that in the disembodied state, in addition to the conscious state, there are also, for example, memories, thinking, perceptions, cognitive abilities, emotions - in other words, the entire human psyche, which does not lack anything that occurs while in the biological body. This means that leaving the body is not only the "separation" of consciousness from the biological body, but it means the separation of the entire psyche from the biological body. However, a person's state of consciousness occurs when the brain is generally excited, which is controlled by the subcortical mechanisms of the brain. This means that the state of consciousness is not localized in a specific brain area, but is related to the general activity of the brain, which can be measured from different areas of the brain. If the cortical feature-binding

activity is not associated with a non-specific thalamocortical system, then it occurs unconsciously. Activities generated in this system spread throughout the brain. However, the activities that arise in the cerebellum remain local. They do not spread throughout the entire brain. Also, the activity wave propagation of neurons in the cortex is clearly more limited during general anesthesia and deep sleep and lasts less time than in the state of consciousness. Very few waves of activity appear.

However, in contrast, the patterns of brain activity in a person's REM sleep are similar to those of the waking brain. However, during NREM sleep, brain activity patterns are much more localized and last for a short time. General studies have shown that in conscious state, the activity lasts longer and spreads throughout the entire brain. All of this means that there is globally coordinated activity in the brain during consciousness that is completely absent during clinical death. This, of course, makes it possible to conclude different local brain activities. After all, conscious experience is mostly unified. The global activity of the brain can also be understood as the sum of the local activities of the brain.

But despite this, it has been observed that immediately before clinical death, different areas of the human brain are activated. The most recent studies show in detail which brain regions are activated immediately before death. These include the posterior part of the cerebral cortex, such as the temporal, parietal, and occipital lobes. They are associated with consciousness, but they are not enough for a wider manifestation of the psyche. Near-death experiences show that in the disembodied state, a person has a very alert state of consciousness and quite extensive mental activity.

The central explanation of the brain of medical researchers about NDEs is on the surface very convincing and quite widely exploited, but if you go into the details, there are a lot of contradictions. We illustrate this through the following simple mathematical analysis. For example, if the values of the unknowns were:

$$x_1 = 3$$

$$x_2 = 3$$

then their sum would be equal to six:

$$x_1 + x_2 = 6$$

On the surface, such a result would be obvious, but it would only be valid if the unknowns were exactly equal to three, in which there were no decimal places. However, if this were not the case and the unknowns would be equal, for example, as follows:

$$x_1 = 2{,}7$$

$$x_2 = 2{,}7$$

then we would get a sum of 5.4 instead, which would be approximately 5:

$$x_1 + x_2 = 5{,}4 \approx 5$$

Number 5 is obviously different from number 6. Such a result was obtained when the unknowns no longer equaled exactly three. Such a trivial mathematical analysis illustrates how or in what way the scientists' central theory of the brain about NDEs is wrong. This means that on the

surface, that is, without going into the nuances, the brain chemistry explanation of NDEs is quite convincing, but when going into the details, the reality becomes completely different, in which case the arguments in defense of the brain chemistry theory no longer hold.

It's pretty safe to say that near-death experiences are a taboo subject in academia. This is reflected by the fact that the explanation of the phenomena of NDEs is widespread, in which it is due to the illusions of the dying human brain, but much less common are the shortcomings of this same explanation. The flaws in the mainstream theory would pretty quickly cast doubt on the common explanation. Since modern medical science relies very heavily on the brain-centered teaching of human biological and social behavior, the nature of consciousness and the functioning of the psyche, aspects that question this fact are generally overlooked. It is a taboo that is not talked about or even deliberately ignored. This shows that a fair explanation of near-death experiences, which would consider all aspects of the phenomenon, not partially or selectively, is a highly discriminated field in the academic world, from which conclusions can be drawn and information published only in favor of the brain-centric theory. Different conclusions are silenced, overlooked or simply deliberately ignored. Brain chemistry theories explaining NDE have arisen precisely because they try to explain this phenomenon selectively, without including all aspects of the phenomenon. This suggests that NDE phenomena in medicine are rather a matter of academic ethics and morality, or sometimes even a legal problem. For example, if there is a phenomenon in medicine (such as NDE), which has quite strong arguments for the real functioning of this phenomenon, but specialists in the field ignore it based on their own personal views or societal attitudes, then this is an attitude known as discrimination. Since it is difficult or sometimes even impossible to publish articles with a different conclusion from the mainstream, in which well-argued and water-tight positions are presented, in the international press, therefore, in addition to solving a medical problem, it is also a legal dilemma, which may end up in the courtrooms rather than in the auditoriums of universities or research institutes.

It is quite difficult for the academic community to accept the view that a near-death experience can still be a real phenomenon, even though there are plenty of plausible aspects that point to it. In this sense, parallels can be drawn here with the history of science, where some knowledge has taken a long time to be officially recognized. For example, on September 11, 1822, the Council of Cardinals announced that from now on it was officially allowed to publish works that presented views of the Earth's rotation around the Sun. The heliocentric worldview was thus officially allowed. On June 22, 1633, Galileo Galilei was imprisoned as a heretic for spreading such an idea. On October 31, 1992 (or more than 350 years later), the Catholic Church declared that Galileo was right after all. It seems that the scientists who are involved in the development of the physical theory and technology of exiting the human body will take as long an academic recognition of their views and knowledge as it did the Catholic Church with the heliocentric worldview.

It can be argued that one of the main reasons why medical professionals and other researchers try to ignore the true nature of NDEs is that it does not correspond to their personal views, academic rules or societal attitudes. This may seem like a trivial reason at first glance, but if NDE, for example, turns out to be a real phenomenon, it would have a very large social and cultural impact. In such a case, human life after death would not only be possible, but would also have existed all along, which is why it would be in sharp conflict with the academic approach to the world and human society. Such a contradiction would be too radical an undertaking for many scientists, which is why it is more convenient and easier to deny it, ignore it or hide behind an

atheistic world order. The real phenomenon of NDEs would bring with it more questions than answers: what is life after death, where do we all go after death, does God exist, has science lied to us, what are the legal rights in the afterlife, do heaven and hell exist, etc.? It is known from the history of mankind that when very radical discoveries or knowledge arise, the response is very strong at the beginning and social or institutional recognition requires a lot of time. For example, a parallel can be drawn here, that the recognition of NDE phenomena as real would probably be as big a challenge in science as it would have been, for example, the social recognition of the rights of sexual minorities, i.e. LGBT people, in the patriarchal and ultra-conservative society of the 19th century.

1.14 A new perspective on near-death experience research

Near-death experiences cannot be explained by the release of mediators in the brain or lack of oxygen in the vision cells, since, for example, during the release of mediators immediately before death, one does not always experience an exit from the body or see a bright light. Unfortunately, it follows from this contradiction that near-death experiences cannot be fully explained by chemical processes occurring in the brain immediately before death. This requires the creation of a new theory that explains all aspects of near-death experiences, not just partial or selective ones. The physics theory of exiting the human body (1) is the best option for this. While earlier attempts were made to explain near-death experiences as illusions caused by brain chemistry, the disembodiment theory explains it as a real phenomenon.

The brain chemistry-based theories and the disembodiment physics theory have different ways of thinking and methods. These theories, which attempt to explain NDE phenomena in terms of a person's medical condition and brain chemistry, assume that NDE is an illusion caused by a dying brain that must be studied with technologies widely used in neuroscience: EEG, fMRI, and PET. They are trying to use the kind of scientific method that has so far advanced neuroscience so successfully. But the physical theory of disembodiment sees NDE as real or real phenomenon, in which case new physical theories have to be created to describe real human leaving the body. In this case, the scientific method can also be used, but in a different way compared to the one used in neuroscience. This means that first new physical theories must be constructed to describe a real human exit from the body, and then ways to experimentally confirm these theories must be sought. Otherwise, the exit from a human body cannot be understood or proven. In case of gravity, for example, scientists initially assumed it existed because we all experience gravity on a daily basis. Consequently, gravity exists. After that, physical theories were created to describe it (Newton and Einstein), after which experiments were carried out to confirm them. The exact same way of thinking and method is also the case with the disembodiment theory. A physics theory is constructed, which must contain apparently new laws of physics between matter and spacetime, but at the same time it must be able to be proven at least theoretically and mathematically and be in line with the existing experimentally proven physical science. This means that the physics theory of exiting a human body (1) is a part of theoretical physics that uses the ways of thinking and methods specific to theoretical physics.

After that, is must be possible to experimentally prove or disprove this physics theory.

> Kuulus lambipirni leiutaja Thomas Edison sattus kaaskondsete naeruvääristamise alla, kui levis jutt, et ta töötab „kummitusraadio“ kallal. Edison uskus, et surnutega on võimalik ühendusse astuda. Ta uskus, et inimestel on kaks energiaüksust rakkude juhtimiseks. Üks meie keha jaoks ja teine iseloomu jaoks. Edison väitis, et kui sureme ja füüsilised rakud enam ei tööta, siis meie iseloomuga seotud osa energiast elab edasi. Õige tehnoloogia abil peaksime suutma selle osaga suhelda. Edison ei suutnud ehitada töötavat „kummitusraadiot“. Signaali lihtsalt pole. Edison väitis, et kui me sureme ja füüsilised rakud enam ei tööta, siis meie iseloomuga seotud osa energiast elab edasi. Tundub, et Thomas Edisonil oli selles osas siiski õigus. Energia, mis on seotud inimese iseloomuga, „asub“ inimese närvisüsteemis, eelkõige peaajus. Näiteks kui ajust „eralduksid“ elektromagnetlained, siis seega olekski tegemist sellise energiaga, mis Edison seostas inimese iseloomuga. Kuid Edison ei osanud arvestada elektromagnetlainete ja aegruumi omavaheliste seostega, mille korral eralduvad inimese ajust füüsilised väljad „väljapoole aegruumi“. Seetõttu ei saanudki Edison ehitada kummitusraadiot, kuna me ei saa kätte selliseid signaale, mis jäävad „väljapoole aegruumi“. Kuid Edisoni mõttelaadi üldine põhimõte ja suundumus sarnaneb väga praeguse aja inimese kehast väljumise füüsikateooriaga.

The fundamental basis for understanding the physics of leaving a human body is the physics theory of time travel (2). This also means that it is possible to derive the physics theory of exiting a human body from the physics theory of time travel (2). Leaving the human body cannot be understood without the physics of time travel. Leaving the human body is a special case of time travel. Before understanding the physics of disembodiment, one must first learn the physics of human time travel. This is because, according to the physics theory of human disembodiment, the disembodied state can only exist in hyperspace, which we understand as the outer dimension of spacetime. The physical system of hyperspace and normal space is described by the physics theory of time travel. In hyperspace it is possible to move in time to the past and the future, and the dimension of hyperspace also describes the seemingly mystical phenomena of relativity theory and quantum mechanics known in physics. Therefore, it can be argued that without knowledge of the physical system of hyperspace and normal space, the physics of human exit from the body cannot be understood. Understanding the physics of a person's disembodied state lies in the continuum of electromagnetic field and spacetime physics, which is described quite convincingly by the physics theory of time travel.

The exit from the body, i.e. the separation of fields from the human nervous system, is based on the generation of electromagnetic waves in the course of the electrical activity of thousands of neurons in hyperspace, i.e. out of spacetime. Such an aspect forms the basic physics of human exit from the body, or the basic law of the physics of disembodiment. Such a physical aspect determines all the basic physics to understand the separation of fields from the human nervous system, on which the real human disembodiment is based.

> The fields do not actually "separate" from the human brain. It's an illusion. The fields are created in hyperspace, i.e. outside of spacetime during the electrical nerve activity of a person. This means that the fields do not move directly from one dimension to another, but when an electromagnetic wave is generated in normal space, it is automatically

generated in hyperspace as well, since the electromagnetic wave exists exactly on the border of these two dimensions. In the course of human electrical nerve activity, electromagnetic waves are generated not only in the space of the brain, but also in hyperspace, i.e. outside of spacetime. This is why we put the word "separate" in quotation marks, as we will continue to use the word for simplicity.

As a result of the electrical functioning of brain regions, changes occur in the fields of neurons, as a result of which electromagnetic waves are generated. These waves do not propagate independently in space (i.e. vacuum), but due to their creation, they must also be created in hyperspace. This means that during the entire life of a person (from birth to death), the nervous system emits electromagnetic waves into hyperspace. In this sense, there is a physical energy field around the human body (including the brain) that cannot be detected or influenced in spacetime, but it exists in hyperspace. If the connections of neuron networks can cease, the existence of electromagnetic waves in hyperspace never ceases, therefore their interconnections in hyperspace do not cease either. Therefore, it can be said that if the psyche and consciousness can disappear in the brain due to the weakening or complete cessation of connections in the networks of neurons, this does not happen in the energy field surrounding a person. If a person dies and suddenly finds himself in a disembodied state, then in fact the person's consciousness has, so to speak, "awakened" in the energy field that surrounded the person during his lifetime.

When a person "leaves" his body, he exists in hyperspace as electromagnetic waves, or light. In this case, "man" can be considered as a "light being". This means that if photons "separate" into hyperspace, it can be concluded that when "exiting the body", a person exists as light, i.e. photons. But not every electromagnetic wave is light, or a light wave. The entire wavelength scale of electromagnetic waves is between about 10^{-12} – 10^{4} meters, but visible light only covers 380 - 760 nanometers of that. Here and from now on, we call any electromagnetic wave light only "conditionally", since any electromagnetic wave is still a "photon", which is understood in quantum physics as a "particle of light".

Võib väita, et footoneid on kahte liiki: reaalsed ja virtuaalsed footonid. Reaalsed footonid liiguvad vaakumis valguse kiirusega c, mille eluiga võib olla kuitahes suur. Footonitel puuduvad seisumassid ja elektrilaengud. Seetõttu ei saa need olla paigalolekus ja pole ka antifootoneid olemas. Sellised footonid saavad eksisteerida sõltumata neid tekitavatest protsessidest. Kuid teised footonid on virtuaalsed, kuna nende eksisteerimiste ajaperioodid on niivõrd väikesed, et katseliselt ei ole võimalik neid tuvastada. Sellised footonid vahendavad elektrilaengute vahelist elektromagnetilist vastastikmõju. Näiteks üks laeng kiirgab footoni, mille teine laeng neelab. Niimoodi tekibki jõud kahe laengu vahel. Ka sellistel footonitel ei ole seisumassi ega elektrilaenguid, kuid nende eksisteerimised sõltuvad neid tekitavatest protsessidest.

1.14.1 References

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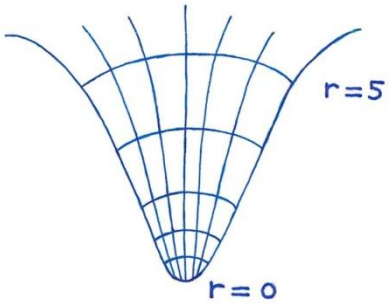
CERN: https://zenodo.org/communities/time_travel/.

1.14.2 The foundations of the physics theory of time travel

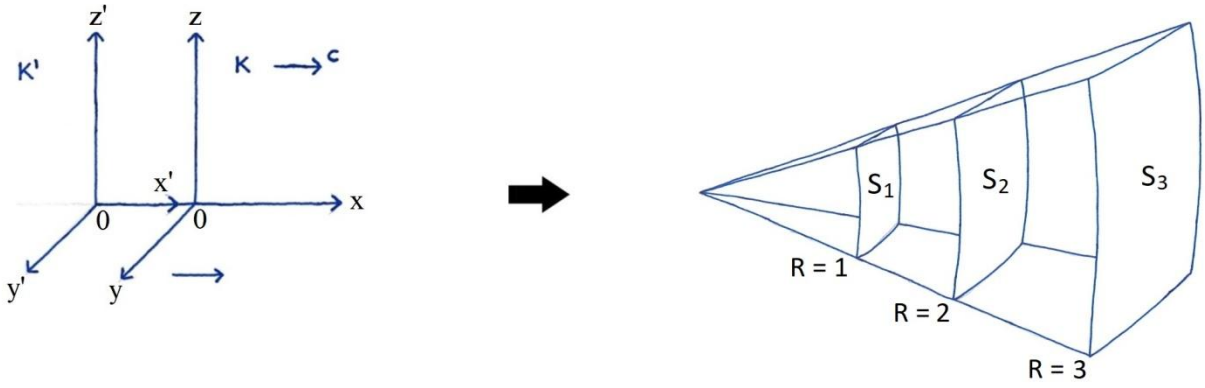
Ajas rändamise füüsikateooria üheks põhialuseks on postulaat, et erinevatel ajahetkedel on olemas samas ka erinevad ruumipunktid ehk ajas rändamiseks minevikku või tulevikku peab inimene liikuma ruumidimensioonis, mis eksisteerib väljaspool aegruumi. See tähendab ka seda, et mida kaugemal ajas (näiteks minevikus või tulevikus) mingisugune sündmus aset leiab, seda kaugemal see ka ruumis toimub. Selline seaduspärasus avaldub looduses Universumi kosmoloogilise paisumisena. Näiteks, kui Universumi ruumala suureneb ajas, siis seega on erinevatel ajahetkedel Universumi ruumala ja ka kõikide kehade ruumikoordinaadid Universumis erinev. Selline asjaolu on ilmselgelt seotud ajas rändamise füüsikateooria ühe alusväitega, mis ütleb, et erinevatel ajahetkedel on samas ka erinevad ruumipunktid. Tavaruumi K ja hyperruumi K’ füüsikaline süsteem tuletataksegi just sellest samast alusväitest. Kuid sellist süsteemi on võimalik tuletada ka ainult Universumi paisumisest.

Näiteks Universumi kosmoloogilist paisumist kujutatakse sageli ette just kera või õhupalli paisumisena juba eelnevalt olemasolevasse ruumi. Kuid universum ei paisu eelnevalt olemasolevasse ruumi. Sellisel juhul on väga selgesti näha seda, et kera pinnal oleva keha sfäärilised koordinaadid (ehk ruumipunktid) on erinevatel ajahetkedel erinevad. Sama on ka kera raadiuse pikkusega. Mida enam Universum paisub (ehk mida suurem on Universumi kujuteldav raadius r), seda enam suureneb kahe punkti vaheline kaugus ruumis. Universumi (meetriline) paisumine avaldubki punktide vaheliste kauguste suurenemisena ruumis. Kuid arvestama peab seda, et selline kauguste suurenemine ilmneb alles väga suures ruumi mastaabis – näiteks galaktikate parvede ja superparvede tasandil ehkki sellest hoolimata muutuvad kõikide kehade ruumikoordinaadid Universumis.



Joonis: Universumi ruumala on erinevatel ajahetkedel erinev.

Kuna tavaruumi K ja hyperruumi K' füüsikaline süsteem on kahtlemata seotud Universumi kosmoloogilise paisumisega, siis seega ei kasuta me enam Cartesiuse ristkoordinaadistikku. Järgnevad esitused tulevad nüüd sfäärilistes koordinaatides. See tähendab seda, et Cartesiuse ristkoordinaadistikust minnakse üle sfäärilistesse koordinaatidesse. Seda illustreerivad meile ka allolevad joonised.



Joonis: Cartesius´e ristkoordinaadistikust sfäärilisse koordinaadistikku, sest ajas liikumine avaldub looduses Universumi paisumisena.

1.14.3 The emergence of light in the outer dimension of spacetime

It is common knowledge that a changing electric field creates a magnetic field, and this changing magnetic field in turn creates an electric field, etc. Thus, the electric field and the magnetic field are inextricably linked and together they form a single electromagnetic field. However, electromagnetic fields can exist as electromagnetic waves. This means that the changing fields start to propagate as a wave. However, electromagnetic waves generated in this way are not permanent in space. This means that these waves cannot be stationary relative to

each other because they travel in vacuum at speed c. In this case, these waves disperse from each other and the mutual configuration of waves or fields cannot occur. But apart from the mutual relationship between electric and magnetic fields, these fields are also related to spacetime. Consequently, if the changing fields in the brain do not cause the separation of the fields from the brain, then perhaps the connection of the fields with spacetime?

Three very important aspects emerge from the relationship between the electromagnetic wave and spacetime:

1) At the speed of light c, time t and space l transform to infinity, i.e. the existences of time and space cease to exist:

$$t = \frac{t'}{\sqrt{1-\frac{v^2}{c^2}}} = \frac{t'}{\sqrt{1-\frac{c^2}{c^2}}} = \frac{t'}{0} = \infty$$

and

$$l = l_0\sqrt{1-\frac{v^2}{c^2}} = l_0\sqrt{1-\frac{c^2}{c^2}} = l_0 * 0 = \frac{1}{\infty}$$

At speeds smaller than the speed of light c, the transformations of time and space are no longer equal to infinity.

2) But at the same time, light moves in the space we perceive on a daily basis (i.e. in ordinary space) at speed $v = c$.

3) The creation/birth of light as an electromagnetic wave also occurs at the speed of light c. A photon has no rest mass, which means it cannot exist at rest. The photon acquires a speed c at the moment of its creation. When absorbed, the photon gives its energy to the body where it was absorbed and ceases to exist.

Time and space also "cease to exist" on the scale of the Planck length l:

$$l = \sqrt{\frac{Gh}{c^3}} = 1{,}616 * 10^{-35}\ m$$

which means that on scales smaller than the Planck length l, the universe no longer has a physical existence. The quotient of the Planck length l and the Planck time t gives us the speed of light c, or “Planck speed v”:

$$v^2 = \frac{l^2}{t^2} = \frac{Ghc^5}{c^3Gh} = c^2$$

The existence of the Planck time and the Planck length, i.e. its derivation from the physics of spacetime, shows that the dimension of hyperspace "exists" outside spacetime, which can be understood as the dimension "after" the Planck time and the Planck length. This means that hyperspace "begins" where our perceived spacetime ends. Our perceived spacetime is "bounded"

by the Planck time and the Planck length, or in this case the speed of light c.

Based on them, it can be said that light (electromagnetic wave) exists exactly on the "border between" two dimensions (normal space K and hyperspace K'). This means that the electromagnetic wave exists exactly on the "border" of both dimensions (ordinary space K and hyperspace K'). As a result, it can be stated that in case of light generation, i.e. radiation, light should be created in both dimensions at the same time. This means that light occurs in normal space and hyperspace at the same time, i.e. part of the light occurs in normal space and another part in hyperspace.

To illustrate this, we present an example with two empty containers below. Let's say we have empty containers next to each other. If you let water into them in such a way that the water is poured exactly at the border of the two containers, the water will penetrate both containers at the same time. Exactly the same principle applies to the creation of light, i.e. radiation in the universe. Light (i.e. an electromagnetic wave) exists exactly on the "border between two dimensions (normal space K and hyperspace K'), as a result of which it can be stated that in the case of light generation or radiation, light should be created in both dimensions at the same time, i.e. part of the light is created in normal space and the other part in hyperspace.

1.14.4 Neural emission

The emission of fields, a phenomenon underlying the actual process of exiting the human body after death, i.e. the existence of the human consciousness and psyche outside of a dead nervous system, depends mainly on the level of general and local electrical activation of the brain and thus on the death the human being. For example, when a person dies, their brain regions are no longer electrically active. The firing of neurons and the propagation of nerve impulses over the nervous system are therefore the determining factors for the emission of fields from the human nervous system, which would be the physical phenomenon underlying the actual process of exiting the human body.

It has been proven in the physical theory of exiting the human body that the human nervous system is ‘emitting’ electromagnetic waves into hyperspace precisely from the locations of electrical impulses. This means that simultaneously with the electrical impulses being generated and ceasing to exist (or being propagated), electromagnetic waves are generated. For this reason, they should also be ‘generated’ in hyperspace.

Electrical impulses are propagated practically everywhere in the human nervous system, that is, over the whole nervous system (wherever there are bodies of neurons, dendrites and axons), and it happens continuously over time. Therefore, the electromagnetic waves generated in these should also be generated over the whole nervous system in hyperspace, and in addition to that, a human being should continuously ‘emit’ electromagnetic waves (even while still alive). Such ‘emission’ does not, however, occur in our perceived spacetime surrounding us but outside of it, i.e. in the hyperspace dimension, and for that reason, such ‘neural emission’ cannot be experimentally detected.

> As a human being should continuously ‘emit’ electromagnetic waves into hyperspace (even while still alive) but such ‘neural emission’ cannot be experimentally detected, this could therefore some day provide an explanation for the scientific nature of human telepathy and clairvoyance.

The human nervous system is ‘emitting’ electromagnetic waves into hyperspace precisely from the locations of electrical impulses, while electromagnetic waves are also generated at those locations during the propagation of electrical impulses, and for that reason, they should also be ‘generated’ in hyperspace. This means that if the electromagnetic waves generated in hyperspace are related to the electrical impulses generated in the human brain, and these same impulses are in turn related to the frequency of the brain, or brain waves, then the electromagnetic waves generated in hyperspace must also be related to the frequency of the brain, or brain waves.

At this point, one would be justified to ask the following: considering the fact that electromagnetic waves are generated by the human brain while still alive, and they should then also be generated in hyperspace, i.e. outside spacetime, shouldn’t exiting the human body also happen while a human being is alive, not dead? However, exiting the human body does not occur in this case. Electromagnetic waves are also generated due to the firing of neurons and the propagation of nerve impulses within the nervous system, which is why electromagnetic waves should also be generated in hyperspace while a human being is alive and their brain is functioning perfectly normally. This means that exiting the body should also occur while a human being is alive and well, not only when they are dying, or actually dead.

> Electromagnetic waves should also be generated in hyperspace when the human nervous system is functioning normally. This means that exiting the human body should also happen while alive, but nonetheless it does not occur. This means that exiting the body does not occur with the nervous system functioning normally, when in fact it should.

As electromagnetic waves are also generated by a normally functioning nervous system, it can therefore be concluded that exiting the body actually occurs also while alive and well but this is not able to be perceived. This means that the human nervous system ‘emits’ electromagnetic waves into hyperspace while alive, but a person does not perceive this. Not being able to perceive this is directly due to the fact that the human brain is functioning normally, i.e. neurons are firing and nerve impulses are propagated along the axons, which is why, in this case, the human consciousness and psyche are residing within the brain structures. The emergence of the human consciousness and psyche outside of the nervous system is also possible in this case, but the human being in question does not experience it and it is therefore not relevant. This means that the existence outside of the human nervous system is not perceived while the nervous system is functioning normally, although the out-of-body existence might actually exist. The electrical activity of brain structures is what ‘prevents’ a person from being aware of the out-of-body state. What is meant here is not an illusionary out-of-body experience, but an actual out-of-body experience.

A person is not aware of their out-of-body existence while their nervous system is functioning normally. If, however, the electrical activity of the brain has ceased, for example, as a result of cardiac arrest, the human nervous system would no longer emit electromagnetic waves into hyperspace. Electromagnetic waves are no longer generated in the brain because the electrical firing of neurons and propagation of electrical impulses has ceased, and therefore

electromagnetic waves are also not generated in hyperspace. In this case, the human brain has no more consciousness and there is no mental activity going on. As a person would emit their last electromagnetic waves into hyperspace before the electrical activity of their nervous system ceases, we can assume based on this that the human consciousness and psyche are then already manifesting in the out-of-body state, i.e. in the field of the last electromagnetic waves that were emitted into hyperspace. This means that a human being only becomes aware of the out-of-body existence after the electrical activity of their nervous system has ceased either completely or to a large extent. After the electrical activity in brain structures has ceased it no longer 'interferes' with a person's ability to be aware of their out-of-body existence. This also means that the out-of-body existence of consciousness and mental activity can only manifest itself during the 'last phase' of the emission of electromagnetic waves from the human nervous system, i.e. just before this emission completely ceases.

While alive, the human nervous system 'emits' electromagnetic waves into hyperspace due to electrical activity, just as a light bulb emits light into ordinary space. This process is continuous over time. In that case, a human being is not aware of the emission into hyperspace, nor therefore of their out-of-body existence. There is reason to believe that when the electrical activity of the human nervous system is about to cease, it causes a person to become aware of their out-of-body existence. For example, when the brain structures no longer have any electrical activity or this activity is very weak compared to normal brain activity, then no consciousness or mental activity is occurring in the human brain. However, immediately before the electrical activity of brain structures ceased, the brain emitted its 'last' electromagnetic waves (i.e. emitted for the last time) into hyperspace – thus consciousness and mental activity might 'continue' in the field of electromagnetic waves emitted into hyperspace. This means that when the electrical activity in the brain ceases (also causing the human consciousness and mental activity to cease) and the human consciousness and mental activity can exist in the field of electromagnetic waves emitted from the nervous system, these circumstances might cause a person to become aware of their out-of-body existence after the electrical activity of their nervous system has ceased.

If any electrical activity is occurring in the brain structures, and this activity is comparable to normal brain activity, then consciousness and mental activity can occur in the human brain. Therefore, the electrical activity occurring in brain structures is what 'prevents' us from becoming aware of the actual out-of-body state, although it could exist in reality. When the electrical activity in the brain ceases (also causing the human consciousness and mental activity to cease) and the human consciousness and mental activity can exist in the field of electromagnetic waves emitted from the nervous system, these two circumstances might cause a person to become aware of their out-of-body existence after the electrical activity of their nervous system has ceased. Figuratively speaking, this means that the human consciousness and psyche 'change their location'; instead of residing in the brain, they now reside in the field of electromagnetic waves existing in hyperspace, as the former option has been 'turned off', so as to say. The electrical activity occurring in brain structures might cease to exist, and this would also cause the electromagnetic waves from the nervous system to cease to be emitted into hyperspace, but the field of electromagnetic waves previously emitted from the nervous system and existing in hyperspace will not cease to exist.

Human consciousness and mental activity occur when there is electrical activity in the brain. This electrical activity, sometimes referred to as 'bioelectricity', consists in the firing of neurons caused by the propagation of electrical impulses along nerve fibres, such as axons and dendrites. Bioelectricity is the kind of electricity that occurs in living organisms or is generated by living

organisms. Modern neuroscience has proven that human consciousness and mental activity are primarily related to electromagnetic interactions between firing neurons, not so much to the biological processes of neurons. Biological processes of neurons can be the processes occurring inside nerve cells or even chemical reactions occurring in synapses. The structures of electromagnetic interactions between millions of firing neurons are extremely complex, diverse, volatile, specific and variable, making it almost impossible to detect and study the interactions backing human consciousness and mental activity. What is certain, however, is that the human consciousness and mental activity are expressed in these interactions.

As electromagnetic waves are 'emitted' from the human nervous system also while still alive, and not just before death, it means a human being is continuously 'emitting' electromagnetic waves into hyperspace. We can call this phenomenon 'neural emission'. In that case, the actual exiting of the human body or the separation of consciousness and mental activity from the human brain is a special form of neural emission or its final phase. If, for example, the emission ceases because a person dies, then exiting the human body will in fact happen. Exiting the human body does not happen during the emission process i.e. during the normal functioning of the nervous system.

When brain activity ceases, the human consciousness and psyche 'change their location'; after cessation of the brain activity, they will reside in the electromagnetic wave field existing in hyperspace instead of residing in the brain, as this formerly available option has now been 'turned off', so as to say. The electrical activity occurring in brain structures might cease to exist, and this would also cause the electromagnetic waves from the nervous system to cease to be emitted into hyperspace, but the field of electromagnetic waves previously emitted from the nervous system and existing in hyperspace will not cease to exist. For that reason, a person is able to become aware of their out-of-body state in that case. However, it should be noted here that this is also true for the opposite case – this would not directly prove such changing of location by the human consciousness and psyche but would add credibility to such a concept. For example, should a person's brain activity start functioning again after a clinical death condition, they might regain consciousness in their biological body, so to speak, and remember their out-of-body experiences. This means that this person's consciousness and psyche are now residing in brain structures again, not in the field of electromagnetic waves existing in hyperspace, as brain activity as an 'option' for this is no longer 'turned off'. The brain has now started functioning again. The physical theory of exiting the human body does not describe the 'reunion' of the fields 'emitted' from the nervous tissue with the nervous tissue – it could be then interpreted as coming back to the biological body from the out-of-body state. The reason lies in the fact that the fields 'emitted' into hyperspace simply cannot return to the charges or fields existing in spacetime that were the source of their generation. Modern physics is not aware of such a possibility. The theory of 'change of location of the human consciousness and psyche', however, is able to explain returning from the out-of-body state to the biological human body. It also allows the preservation of the memories of the out-of-body state. For example, people have regained consciousness after clinical death and told the medical staff about experiences acquired while in out-of-body state. This means they remember their near-death experiences.

As the fields that must be emitted from the human nervous system are precisely the fields generated by millions of electrical impulses over the whole nervous system, the actual process of exiting the human body must therefore take place before the state of coma, clinical death or brain death has arrived. In the state of coma or death, electrical impulses have ceased to exist in the human brain. We are talking here about exiting the human body so that a person is aware of their

out-of-body existence. Such process of exiting the human body can only take place during the intermediate stage between the normal functioning of the human brain and brain death, i.e. during the actual dying phase of the brain, not after brain death has already occurred. A person is no longer conscious during the dying phase, and the functions of different brain regions start to stop one after another. While in the state of coma or clinical death, exiting the human body can no longer happen. By then, it will have already happened.

Emission of fields from the nervous system into hyperspace can only take place at the expense of the firing of neurons and moving electrical impulses, as electric fields exist e.g. in the space between the firing neurons. This means that only the fields generated by the firing of neurons and moving electrical impulses can be 'emitted' from the brain because in clinical death, i.e. during the brain's resting potential state, neurons no longer fire and nerve impulses are not propagated, and thus no fields exist in the space between neurons anymore. It is known from physics that with the disappearance of the field's source, the field itself will immediately cease to exist.

In almost all medical cases involving near-death experiences, patients cannot remember the feeling of being 'separated' from their bodies. People usually remember that at first they suffered terrible pains (just before death) caused by the body of the injured person, and afterwards they suddenly felt separated from their body. The out-of-body state is accompanied by a wonderful feeling of weightlessness and an extraordinary opportunity to actually see your body from a distance. From this, it can be concluded that a person exits their body while unconscious, i.e. the separation takes place in an unconscious state. This means that consciousness has ceased to exist at the moment of being separated from the body, and it begins to exist again only when already separate from the body, when a person will suddenly feel that they exist separately from their body. It can be said that a person is dead for a very short time before exiting their body but will 'revive' in the out-of-body state. This means that a person is actually temporarily dead between the corporeal state and the out-of-body state.

1.14.5 Emergence of consciousness and psyche in the 'field of light'

Electromagnetic waves generated in hyperspace that may be 'emitted' from the human brain can be stable in space. This means that these waves are stationary relative to each other, i.e. these waves do not disperse after being emitted from the brain. In this case, formation of a mutual configuration of waves or fields is possible, and this could serve as the vehicle for the mental and conscious activities of a human being.

When an electromagnetic wave is 'generated' in hyperspace, it starts to move relative to hyperspace at speed c immediately after generation but remains stationary relative to ordinary space, as ordinary space itself is also moving relative to hyperspace at speed c. This is the circumstance causing 'non-dispersion of electromagnetic waves in relation to each other'. The eigenvectors of light waves are not moving aimlessly around in hyperspace, their motion is directional – from hyperspace to ordinary space, which is physically manifested as motion relative to hyperspace and together with ordinary space at the speed of light c. This means that a

person could e.g. have a spatial region with innumerable non-dispersive electromagnetic waves existing in their immediate vicinity without seeing or perceiving it.

Mathematical expressions indicate that the electric and magnetic fields of electromagnetic waves are highly localized in space compared to the charge field of a body, which could theoretically extend to infinity. Therefore, the mutual contact between and configuration of the fields of different electromagnetic waves cannot be similar to that of the fields existing in the human brain, caused by the firing of thousands of neurons. The mutual contact between the fields of different electromagnetic waves and thus their configuration (that would serve as the vehicle for the human consciousness and mental activity) must be manifested in some other way.

As the spacetime interval is equal to zero throughout the entire hyperspace K', the distances between electromagnetic waves are actually non-existent, and different electromagnetic waves are therefore ‘physically’ bound to each other in a similar way to electrically charged bodies in mutual interaction, close to each other in spacetime, i.e. in ordinary space K. Such an abstract physical bond is possible only outside of time and space, i.e. in hyperspace, because time and space have ceased to exist in it, making the interval between instants of time and different points in space practically non-existent. For that reason, mutual interaction between the fields of different electromagnetic waves is possible in a similar way to e.g. the mutual interaction between electrically charged bodies sufficiently close to each other in spacetime. Electrically charged bodies influence each other through fields in time and space, i.e. in ordinary space.

Mutual interaction between the fields of different electromagnetic waves in hyperspace works in a similar way to the mutual interaction of electrically charged bodies sufficiently close to each other in spacetime. This sentence means that if something were to happen to one electromagnetic wave (for example, its frequency, spin, energy or momentum should change), this would instantly (i.e. within 0 seconds) also affect the other electromagnetic wave. We understand this interaction as quantum entanglement, which is much more abstract in nature than, for example, the interaction between electric charges in spacetime. In time and space, i.e. in ordinary space, electrically charged bodies affect each other via fields with electric forces.

It is known from quantum mechanics that quantum entanglement occurs between the spin states of particles. The quantum entanglement of particles is caused by time and space ceasing to exist in the hyperspace dimension. The quantum entanglement of particles is manifested by the phenomenon that the measuring of the spin of one particle affects the spin of another particle in just 0 seconds, at any spatial distance. For example, in the case of two particles, the other particle might even exist in another galaxy billions of light-years away. As photons can become quantum entangled, and photons are also particles of light (electromagnetic waves), we can in principle say that electromagnetic waves become quantum entangled with each other. Electromagnetic waves and photons are two aspects of one and the same phenomenon, similarly to two sides of one and the same coin.

There are billions of neurons in the human brain and they all generate electric fields by their firings, which all add up to a general electric field covering the whole brain. For example, when macroscopic bodies acquire a charge, the charge of a body is formed by the sum of charged particles, i.e. the electric field of the charge of this body is formed by adding up the fields of the charged particles. The human state of consciousness is only present while general brain activity is present, and certain contents of consciousness only appear by the activity of certain regions of brain. For neurons, however, activity means the firing of those neurons in time and space. An electrically charged body creates an electric field in the surrounding space and thus the emergence of consciousness (and its nature) is related to these physical fields (which are created

by neurons by their firings in the brain space), and not directly to the neurons themselves. This means that consciousness could be related to the fields of neurons, i.e. the general electric field of the brain, rather than to the neurons themselves. For example, if there were no neurons in the brain, but the fields of all those lost neurons would continue to exist and function in exactly the same way, then consciousness (the psyche) would probably also survive.

The system of fields emitted from the human brain lacks the neuronal structures required for the existence of ‘electrical impulses’ and the spatial extents of these fields are much more local compared to the charge fields of neurons; therefore, these fields cannot come into direct contact with each other in the same way as the charge fields of neurons in the human brain do. However, mutual communication occurs between the fields regardless (as spacetime has ceased to exist), and as a result, a configuration of these fields is also formed. This means that the mutual communication between the fields and the formation of the configuration (consciousness) of the fields is much more abstract in such a system of fields than, for example, in the case of neurons in the human brain.

The whole world-view is ‘partitioned’ between regions of the human brain. This means that different mental characteristics and experiences of the consciousness are processed by different local regions of the brain. As physical fields are ‘emitted’ from different regions of the brain over the entire brain in the case of exiting the human body, it follows that different mental characteristics and experiences of human consciousness should also be processed by different spatial regions of electromagnetic waves or fields while in out-of-body state. This means that in the human out-of-body state, the whole world-view should be partitioned between different spatial regions of electromagnetic waves just as it is between different regions of the brain. The similarities between the two should be quite obvious.

1.15 Introduction to the theory of supercivilisation

The physical theory of exiting the human body describes and examines the actual possibility of the human out-of-body state. This is, however, the first part of a scientific theory that can be provisionally named as the theory of supercivilisation or TSC in short. The second part describes and explores the impact of the human out-of-body state on society and civilisation as a whole. While the physical theory of exiting the human body was based on the physical theory of time travel, the theory of supercivilisation is based on the physical theory of exiting the human body.

The theory of supercivilisation is a seemingly futuristic branch of science that seeks to explore the possibility of the existence of the human out-of-body state and its social impact on human society and civilisation as a whole. Therefore, the term ‘supercivilisation’ refers to the structure, functioning and level of a civilisation formed by out-of-body intellects and no longer by biological intellects. Out-of-body humans can also create civilisations just as biological humans have created civilisations. As this branch of science includes the term ‘civilisation’, the terms used are those that are used e.g. in the fields of social sciences and humanities research. The research methods are rather theoretical in nature, as there is no possibility for observations or experiments. For example, string theory belongs to the field of theoretical physics and is thus

a scientific field of research, although experiments and observations are impossible for string theory.

The physical theory of exiting the human body convincingly shows us that a technology that enables exiting the body would be a technical achievement having an absolutely fundamental impact on our world. The physical theory alone gives rise to many aspects that distinguish technology for exiting the body from all other technical achievements that mankind has ever devised. It can be stated quite firmly that the technology for exiting the body would probably be the most important technical and scientific achievement that mankind would be able to create. This is not megalomania, wishful thinking, idealised dream or exaggeration – the rigorous and rational science of physics shows us this quite clearly and objectively. The out-of-body abilities, qualities and possibilities of human beings would be so extraordinary that everything else will pale when compared to all other technical achievements in the history of mankind. The theory of supercivilisation attempts to present an analysis describing the impact of the possibility of exiting the human body on the way of life of our human society, the technology of the world and all of humanity as a species. The physical theory and the technology of exiting the human body can therefore be considered a part of the theory of supercivilisation, since its seems that exiting the body would be the highest form of rational life in our known Universe. The opportunities brought about by exiting the human body would affect almost all areas of human activity, and this is what the TSC is going to analyse. This is done using concepts employed by social and sociological sciences, such as civilisation, society, economy, culture, politics, religion, and technology. In addition, the history of art, culture and civilisations is studied, and attempts are made to define what civilisations are as such and how they have been formed.

The existence of a life form lacking a physical body (perhaps only as a field of matter) has a huge impact on the structure of society and its vital functions. For example, the nature of life and its physical possibilities in the human out-of-body state also coincide exceptionally well with the concept of immortal human soul taught by Bahá'í Faith. In this case, the way of life of a society would be very different from the way we live today or have imagined life to be in the world of the future. The whole hierarchy of civilisation and its way of life would significantly differ from what is imagined by science fiction and fantasy. The problems concerning the quality of life of society and people together with today's economic life on Earth would also be completely eliminated. Our whole way of life would be vastly different and much simpler than the way people currently live on Earth.

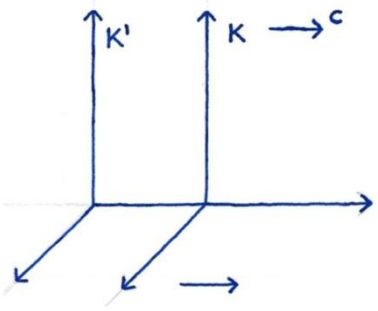
People living on Earth use a wide variety of technological tools – cars, computers, mobile communication, aeroplanes, etc. However, such technical aids only compensate for our mental and physical handicaps caused by biological and psychological limitations. For example, a person cannot physically move through space at a velocity of 200 km/h. It is precisely this 'human imperfection' we seek to compensate with the great achievements of our technology – cars, planes, ships, etc. If people were no longer dependent on their bodily limitations (i.e. they existed only in out-of-body state), they would acquire the new physical properties characteristic of this state, which would be unthinkable in the case of a biological body. In this case, we would no longer need cars and communication devices because our physical and psychological possibilities would be much greater than possible with biological bodies. Such human beings, called light beings, would no longer depend on the technological world at all. This means being completely independent of 'material constraints'. This is what the whole principle and concept of the supercivilisation theory is all about. Science fiction films and fantasy novels depict the worlds of the future as highly technological, with people needing microchips and hoverboards

everywhere. But a truly highly advanced civilisation will no longer need such technologies.

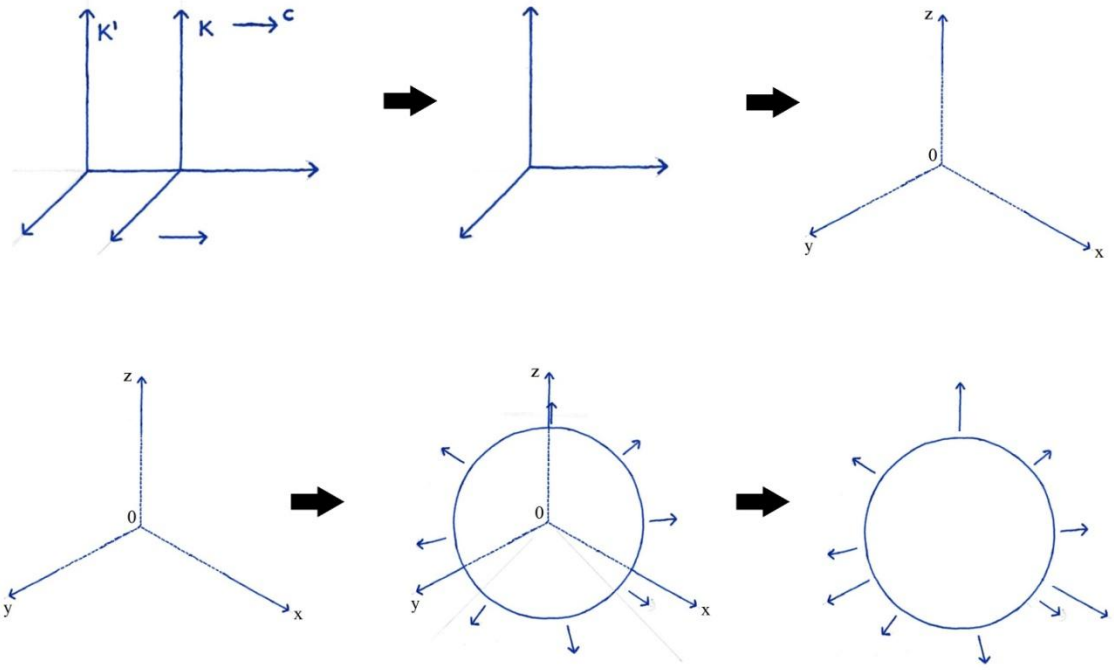
1.16 Visualization of exiting the human body

In this chapter, we show how to visualize a person who has left the body, a light being, the human brain and neurons, spacetime and hyperspace coordinates, and tunnels in spacetime. This means that this chapter will primarily focus on visualizing the important points presented above. This is actually also important because it shows how the exit from the human body and the related aspects look visually. The following are many images of the most important points of the physics theory of exiting the human body. The images are presented as realistically as possible, in accordance with the statements of people with near-death experiences and the basic principles of the physics theory of exiting the body. The images in this chapter are also presented in the physics theory of human disembodiment, but in this chapter they are supplemented and provide the proper context for the images presented in this chapter.

Time, space and movement are fundamentally interconnected, which in the models of the physics theory of time travel is expressed as the movement system of hyperspace K' (a timeless and spaceless dimension) and ordinary space K (the space we experience on a daily basis): ordinary space "moves" with respect to hyperspace at the speed of light c, whereas hyperspace K' and ordinary space K are not background systems (neither inertial nor non-inertial background systems). The following figure describes it for us:

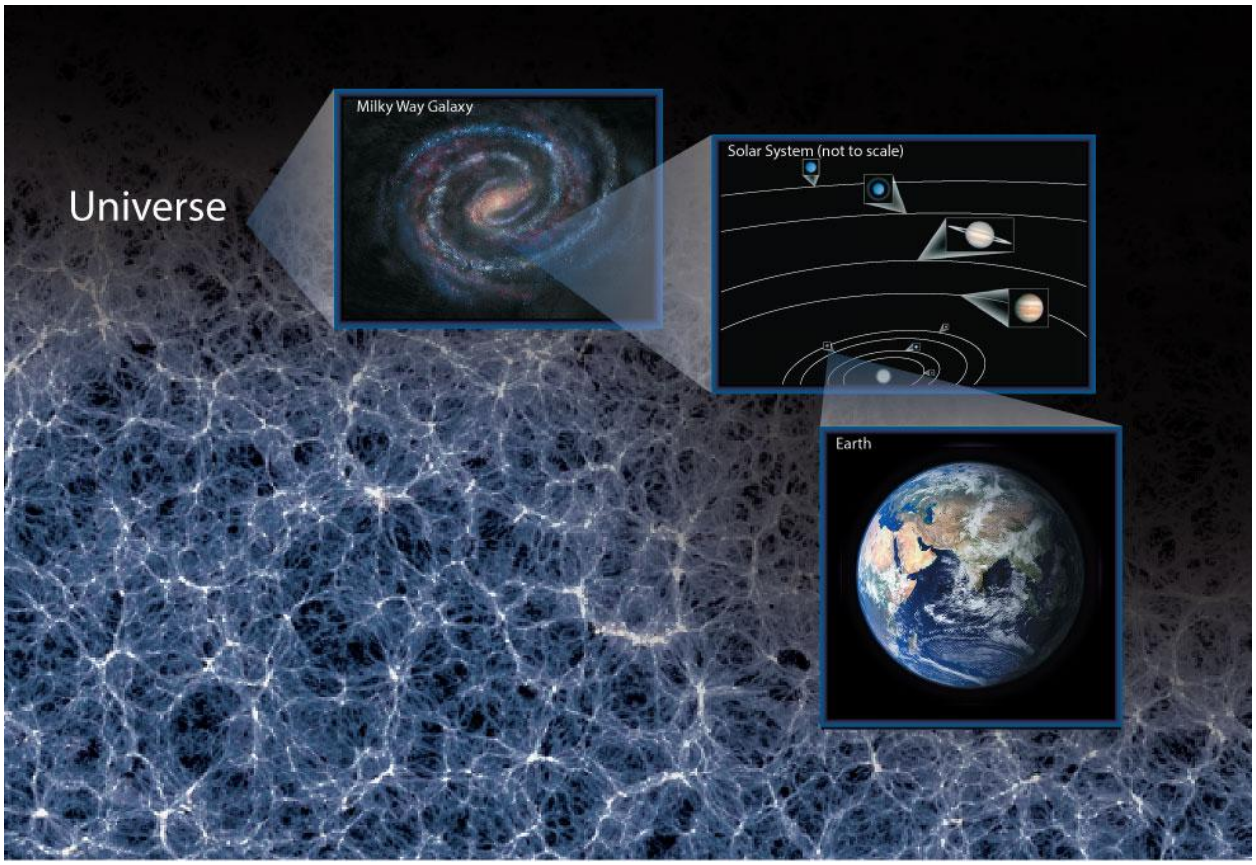


In reality, the kinematic system of ordinary space K and hyperspace K' manifests itself as a cosmological expansion of the universe:



The expansion of the universe manifests itself only on a very large spatial scale - for example, on the scale of galaxy clusters and superclusters. This means that the greater the distance between two points in space (i.e. the further away the clusters of galaxies are from each other), the faster they are moving away from each other. The distance velocities between space points in the universe approach zero on a very small spatial scale (for example, on the scale of planets and stars), but on a very, very large spatial scale (for example, even on a larger spatial scale than galaxy superclusters), they already approach the speed of light in vacuum.

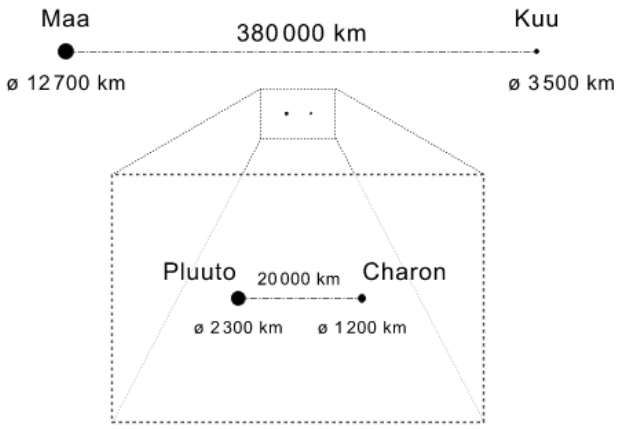
The spatial scale of the universe is visualized for us by the following figure, which shows the honeycomb structure of the universe, the Milky Way Galaxy, the Solar System and the Earth:



Source of the photo: https://grade8science.com/1-2-the-scale-of-space/

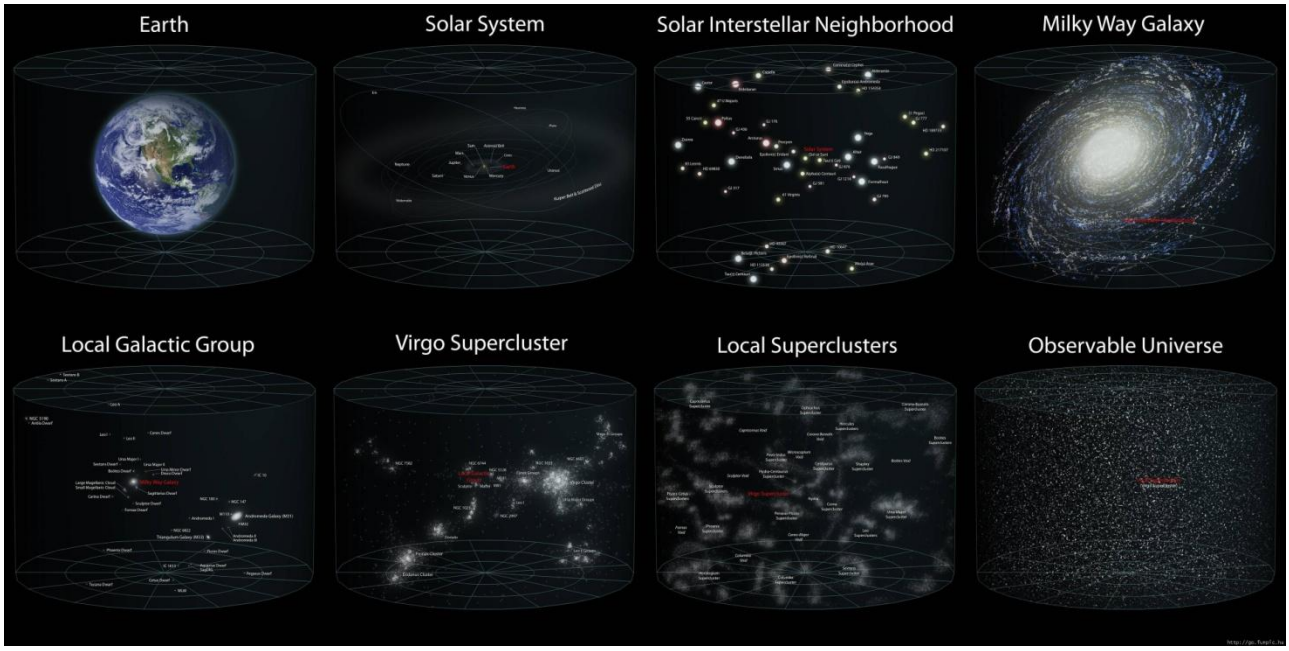
The Solar System belongs to the Milky Way Galaxy, which in turn belongs to the Local Group of Galaxies. There are about 30 galaxies in this galaxy cluster. The Large and Small Magellanic Clouds, which are actually irregularly shaped galaxies, orbit the Milky Way galaxy. The Milky Way, Andromeda (M31) and M33 are the three largest galaxies in the cluster. But the Local Group of Galaxies also belongs to an even larger group of galaxies - namely the Local Supercluster.

A good example of visualizing spatial scales is a visual comparison of the distance between Earth and the Moon and between Pluto and Charon:



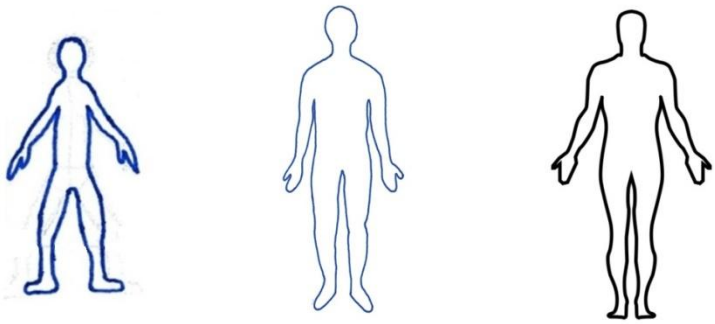
Source: http://opik.obs.ee/osa2/ptk10/pildid/kakspl.gif

Earth, the Moon, Pluto, and Charon are all part of the Solar System. But the scale of the universe, from planet Earth to the boundary of the observable universe, can also be visualized as follows:

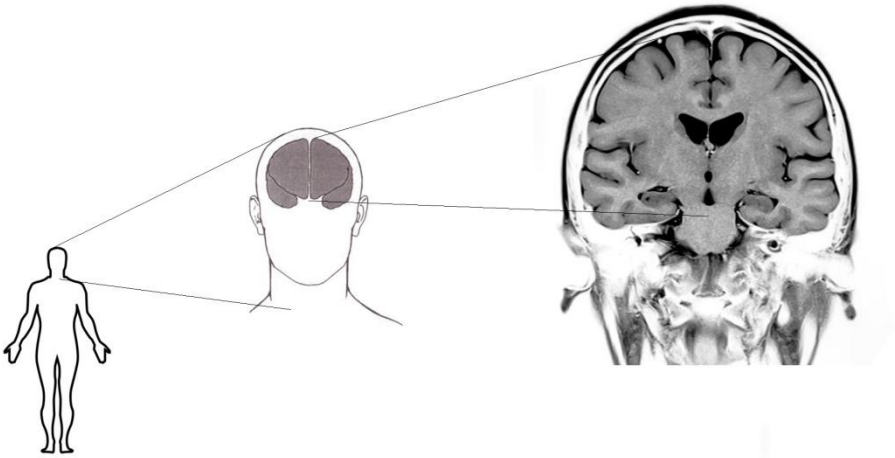


Source: http://www.funpic.hu/en/categories/others-graphics/40056_if-god-took-7-days-on-making-earth-how-long-did-observable-universe-take?categoryId=11&position=

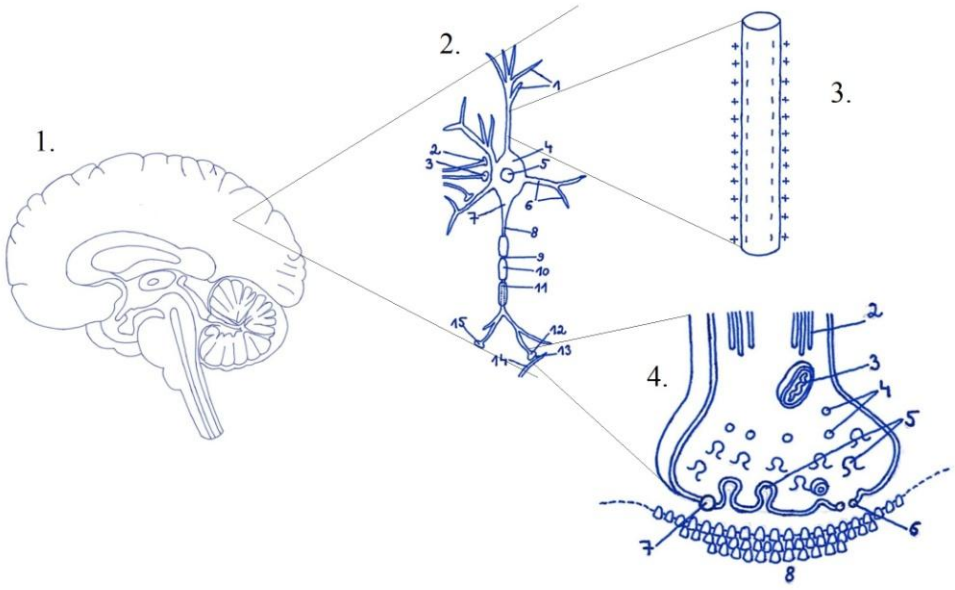
Different figures depict the human figure slightly differently, but all of them still clearly show the human silhouette:



The human brain is mostly depicted in drawings, but such images obtained by X-ray tomography are also presented:

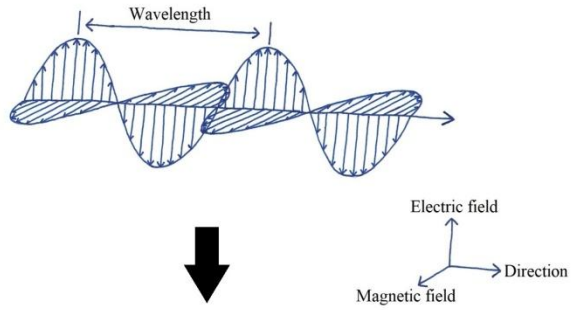


The human brain consists of billions of neurons and connections between them, which in turn reach trillions. Neurons are nerve cells so small that they cannot be seen with the naked eye. Microscopy allows you to view them magnified. Below is a drawing that visualizes the human brain (1), a single neuron (2), the neuron's residual polarization (3) and the synaptic cleft (4):

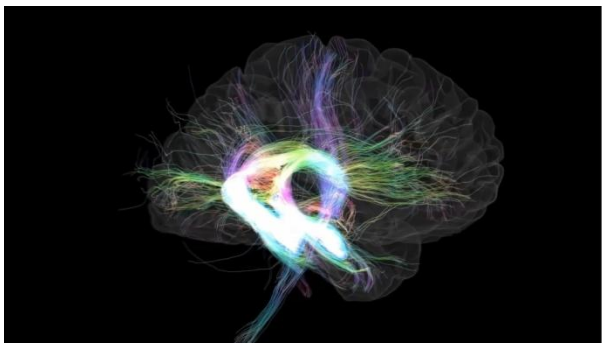


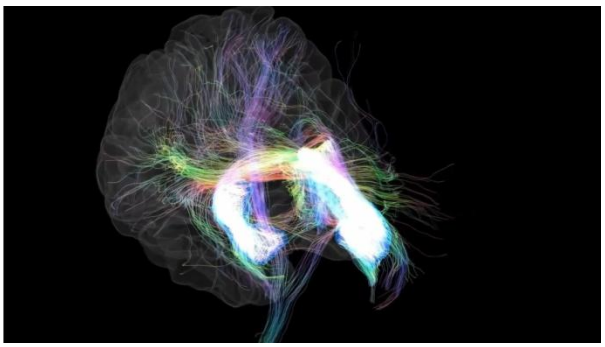
The figure shows that compared to the human brain, the neuron, the extension and the synapse have been enlarged thousands of times.

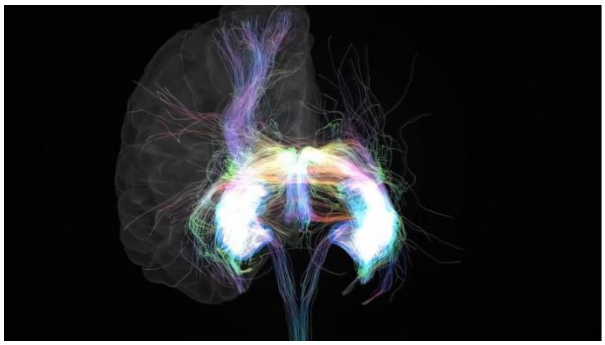
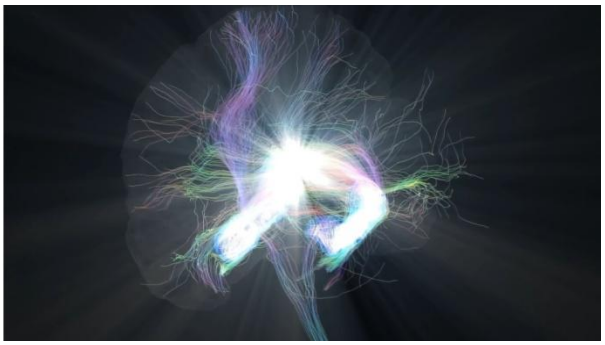
Light is an electromagnetic wave, i.e. the propagation of electric field and magnetic field change in space. This means that a change in the electric field at one point in space first causes a changing magnetic field, the change of which causes a change in the electric field at a neighboring point through electromagnetic interaction. Such a change in electric or magnetic field propagates in space as a wave. Since it is the electric field that creates the signal when recording the effect of an electromagnetic wave, the electromagnetic wave is described only through the change of the electric field. Light wavelengths range from 380 to 760 nanometers. For example, the human eye reacts to the electric field of an electromagnetic wave, or light, because the electric field of an electromagnetic wave causes electrical impulses to appear in the human optic nerves. The electric field and magnetic field of light as an electromagnetic wave are perpendicular to each other and perpendicular to the direction of propagation of the wave in space. This means that the field vectors in an electromagnetic wave are perpendicular to the direction of wave propagation. Thus, an electromagnetic wave is a transverse wave whose electric and magnetic fields change sinusoidally in time and space and in one phase. Figure:

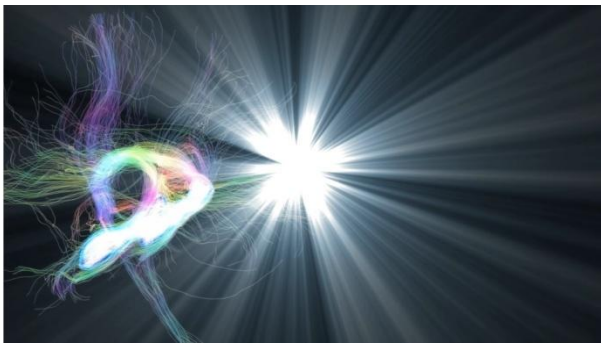


The fields are not separated from the human brain. It's an illusion. Fields are created in the course of human electrical nerve activity in hyperspace, i.e. outside of spacetime. This means that the fields do not move directly from one dimension to another, but when an electromagnetic wave is created in normal space, it is automatically created in hyperspace as well, since the electromagnetic wave exists exactly on the border of these two dimensions. In the course of human electrical nerve activity, electromagnetic waves are generated not only in the space of the brain, but also in hyperspace, i.e. outside of timespace. This means that a person does not really feel a direct "separation" from his body. It is perceived that one is suddenly separated from one's body. This refers to the creation of electromagnetic waves in hyperspace, not to the "separation" of electromagnetic waves from normal space to hyperspace, i.e. from one dimension to another. That's why we often write the word "separate" in quotation marks. The following images illustrate the foregoing statements:







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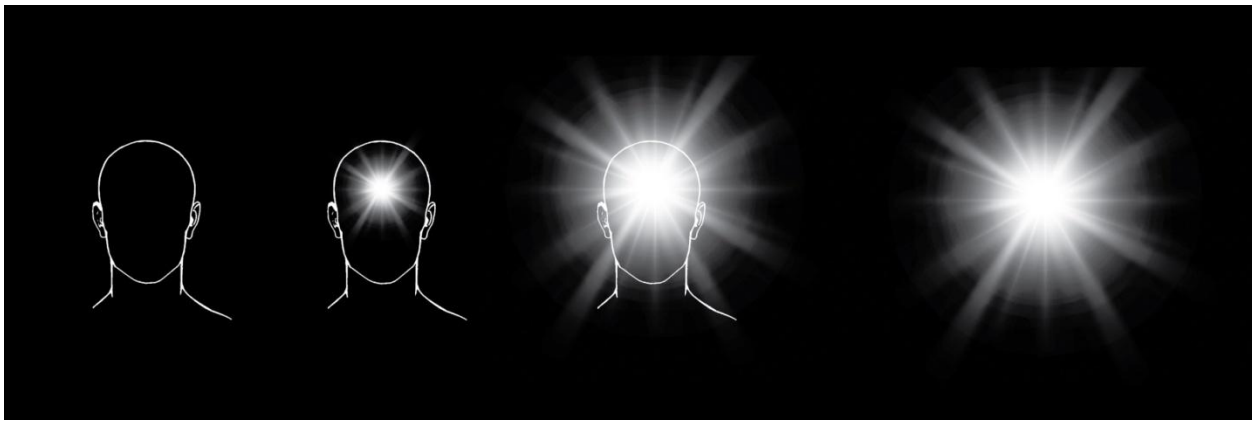
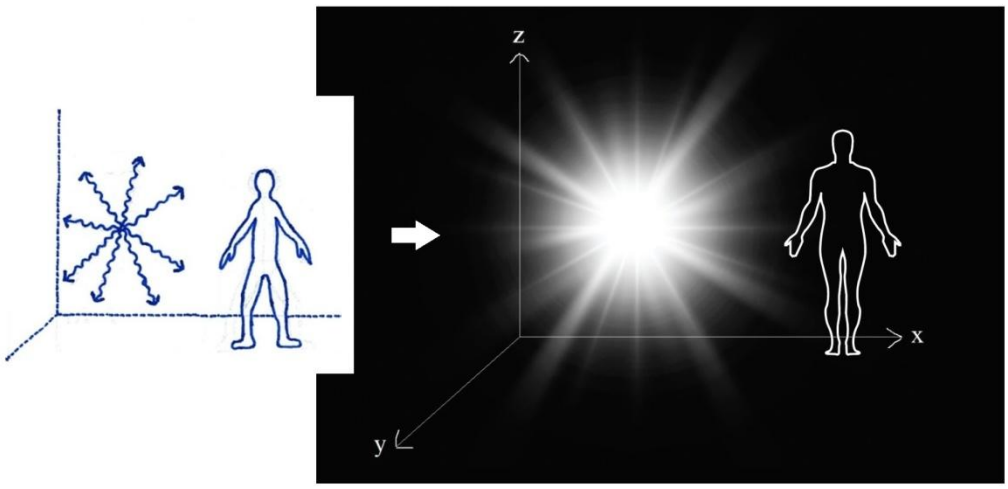


When a person "leaves" his body, he exists in hyperspace as electromagnetic waves, or light. In this case, "man" can be considered as a "light being". This means that if the photons "separate" into hyperspace, then it can be concluded that when "exiting the body", a person exists as light, i.e. from photons. But not every electromagnetic wave is light, or a light wave. The entire wavelength scale of electromagnetic waves is between about 10^{-12} – 10^{4} meters, but visible light only covers 380 - 760 nanometers of that. Here and from now on, we call any electromagnetic wave light only "conditionally", since any electromagnetic wave is still a "photon", which is understood in quantum physics as a "particle of light". An illustration of a light being and a person next to him in a three-dimensional cross-coordinate system:

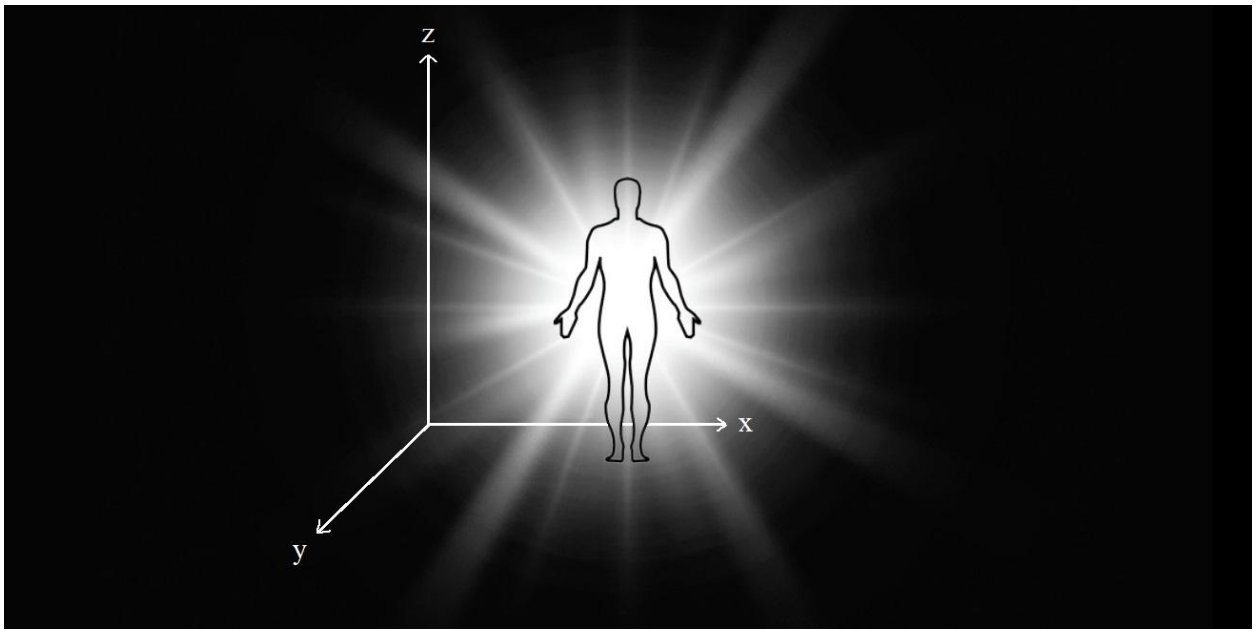


Above we stated that the electromagnetic waves that are generated in the human nervous system should also be generated in hyperspace throughout the entire nervous system, and besides that, a person should also "radiate" electromagnetic waves continuously, i.e. all the time (even while alive). However, such "radiation" does not take place in the surrounding spacetime that we perceive, but outside it, i.e. in the dimension of hyperspace, and therefore such "neuroradiation" cannot be detected experimentally.

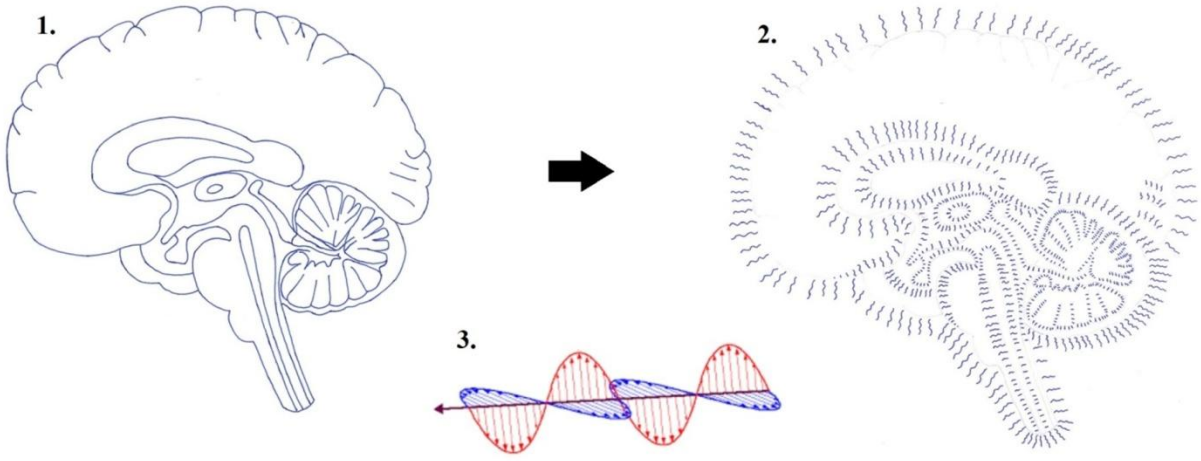
> This means that since electromagnetic waves are "released" from the human nervous system even while alive, and not just immediately before death, the person is therefore constantly "radiating" electromagnetic waves into hyperspace.

Such a phenomenon can be called "neuroradiation". The exit from the body does not occur during radiation, i.e. during the normal functioning of the nervous system.

The following figure shows a human figure and light that would illustrate human neuroradiation:



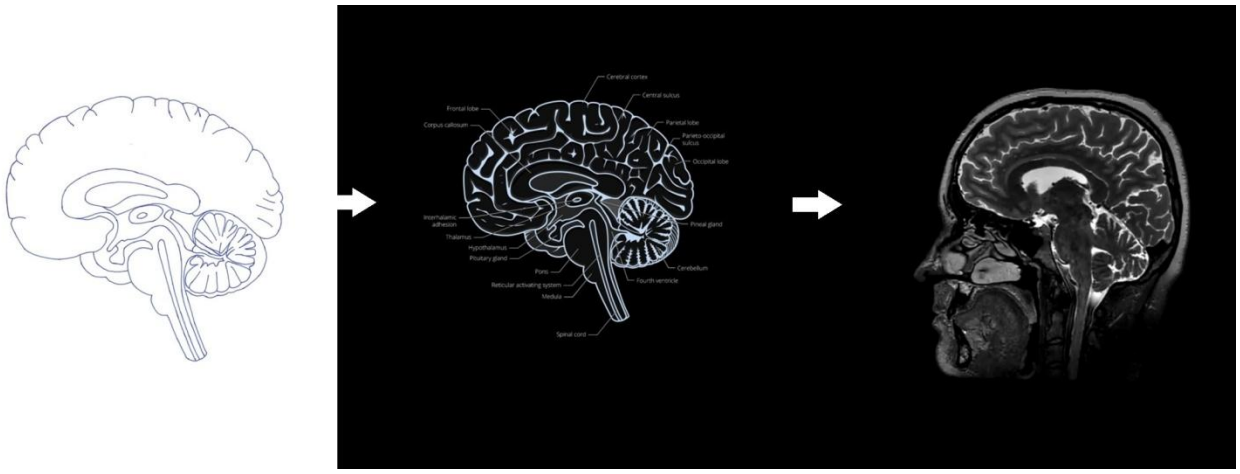
The exit from the human body is based on the fact that changes in the fields in the human nervous system are accompanied by the generation of electromagnetic waves in hyperspace. Since field changes occur everywhere in the nervous system and also in the brain, the "positions" of the millions of electromagnetic waves located in hyperspace must be similar to each other, as is the case with the electric fields of millions of neurons in the human biological brain. This is what the following figure illustrates for us:



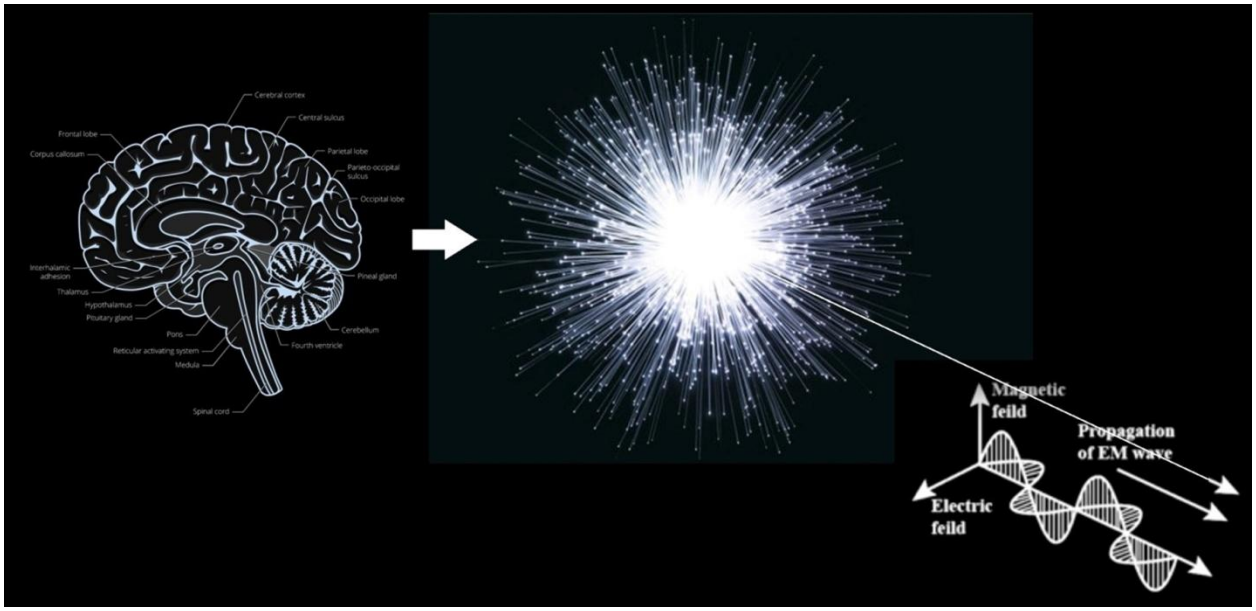
1. Visual representation of the human brain.

2. Electromagnetic waves, the locations of which in space are similar to the locations of neurons in the human brain. As a result, we see an image similar to the human brain (i.e. the silhouette of the brain).
3. Magnified image of an electromagnetic wave.

Next, we show a comparison of a drawing of a human brain with a real brain nuclear magnetic resonance imaging:

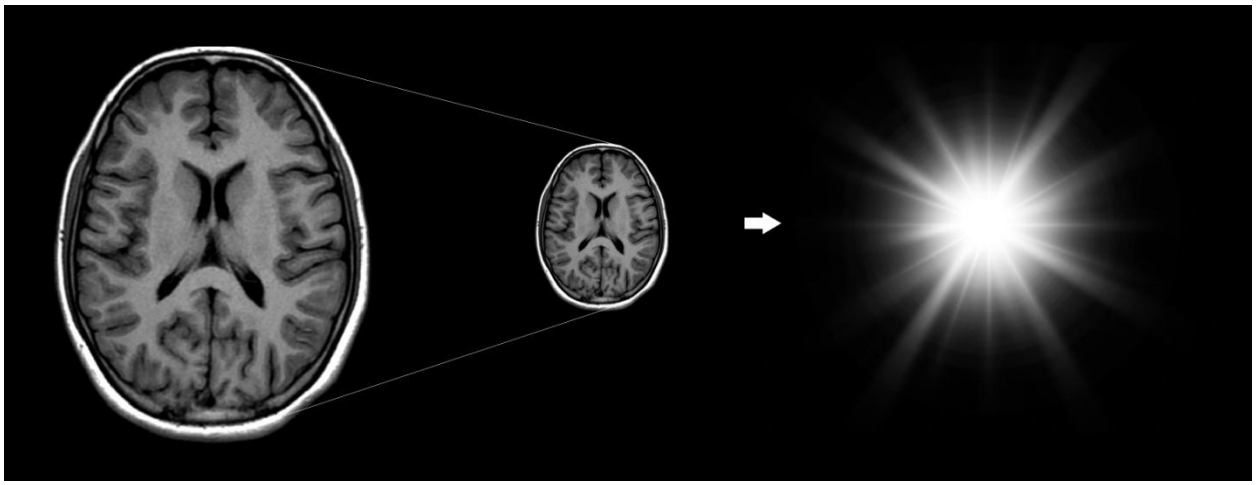


Millions of neurons form such a unified biological system, or network, that we can see from the outside as a complete brain (i.e. as the silhouette of the brain we know). Exactly the same principle should apply in hyperspace with millions of electromagnetic waves, but the electromagnetic waves released from the brain look like a "unified light field" from the outside, not the silhouette of the brain we know. We illustrated this above with the following diagram:

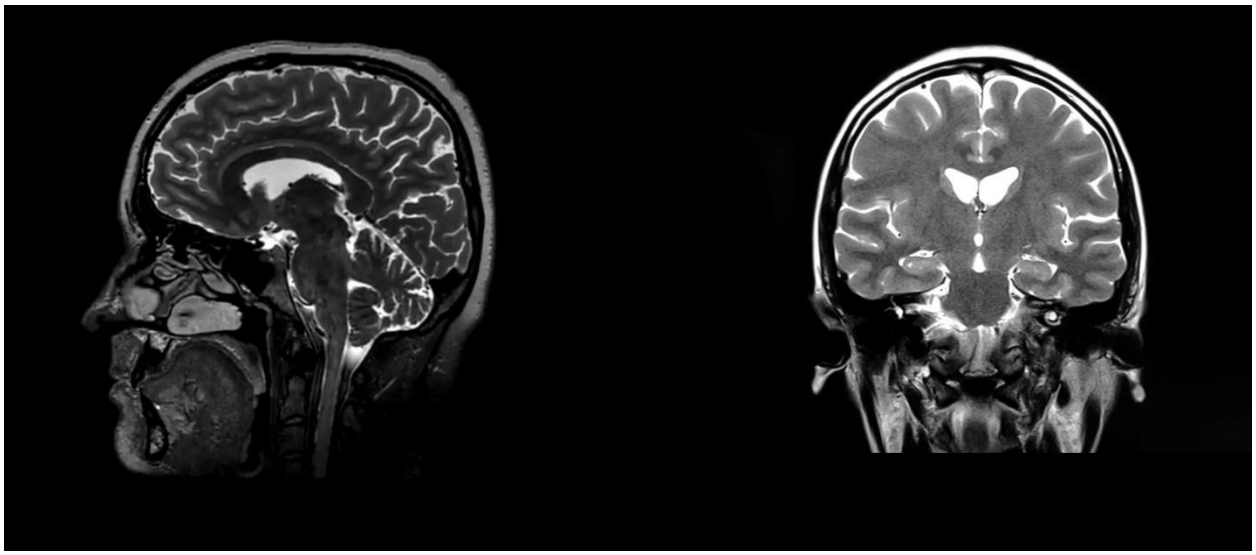


However, a more correct visual representation would be the following diagram, in which one can

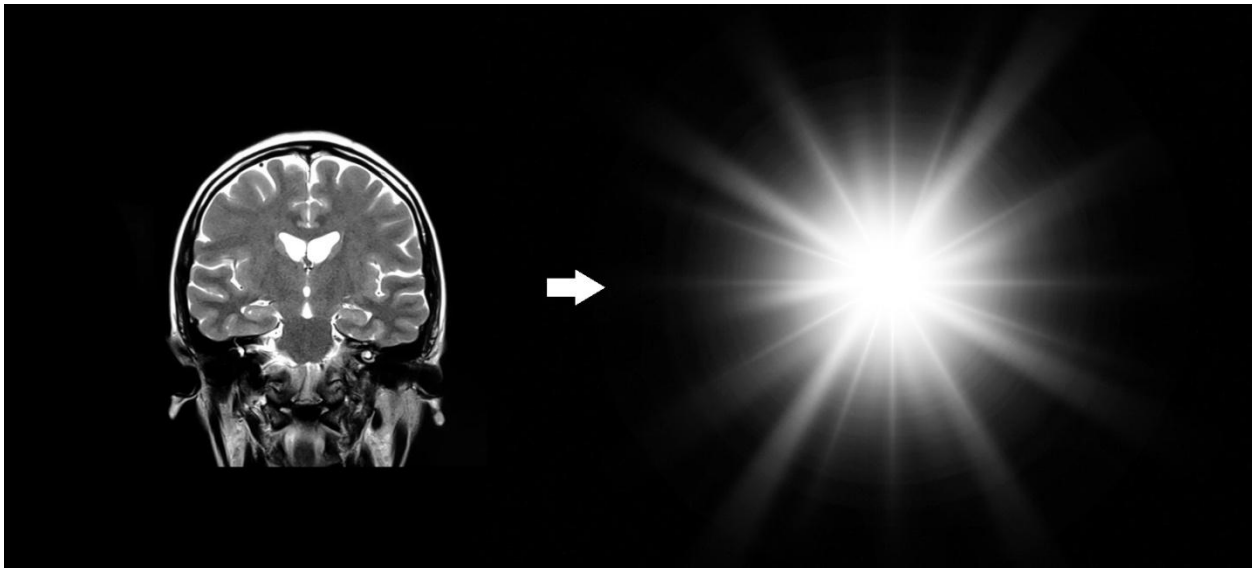
see an image of the MRI tomography of the human brain and the "light field" that would exist "in place of the biological brain" if the person exits the body:



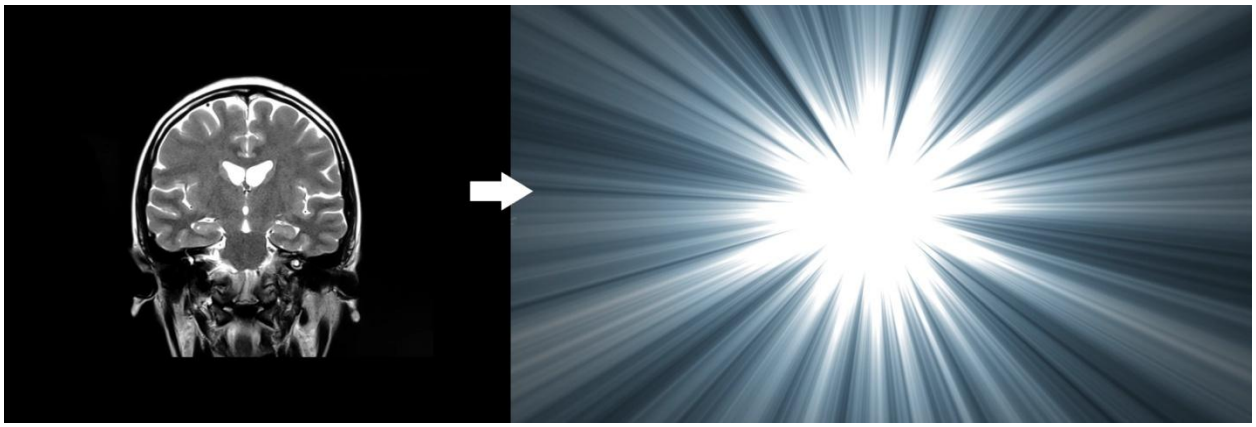
Nuclear Magnetic Resonance Imaging and Computed Tomography are technologies used in medicine that make it possible to make understandable and clear three-dimensional images of the human brain in a lateral or direct view:



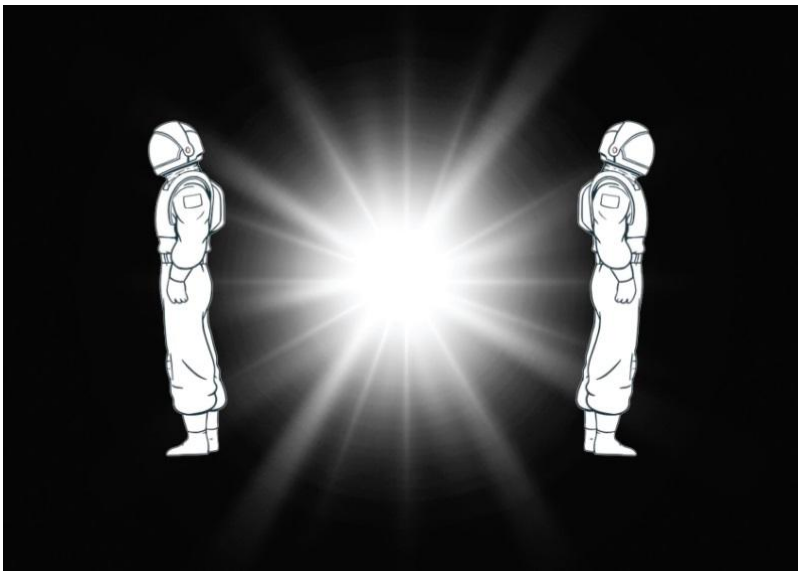
Tomographic pictures, or images, make it possible to visually see the internal structure of the brain. When a person has left the body, in such a state there are no biological (for example, neuronal) structures. Instead, only electromagnetic waves exist. It can be imagined so that instead of the brain there is a unified and interacting field of light:



The intensity of the light field can be represented differently in different images, but this does not change its basic nature:



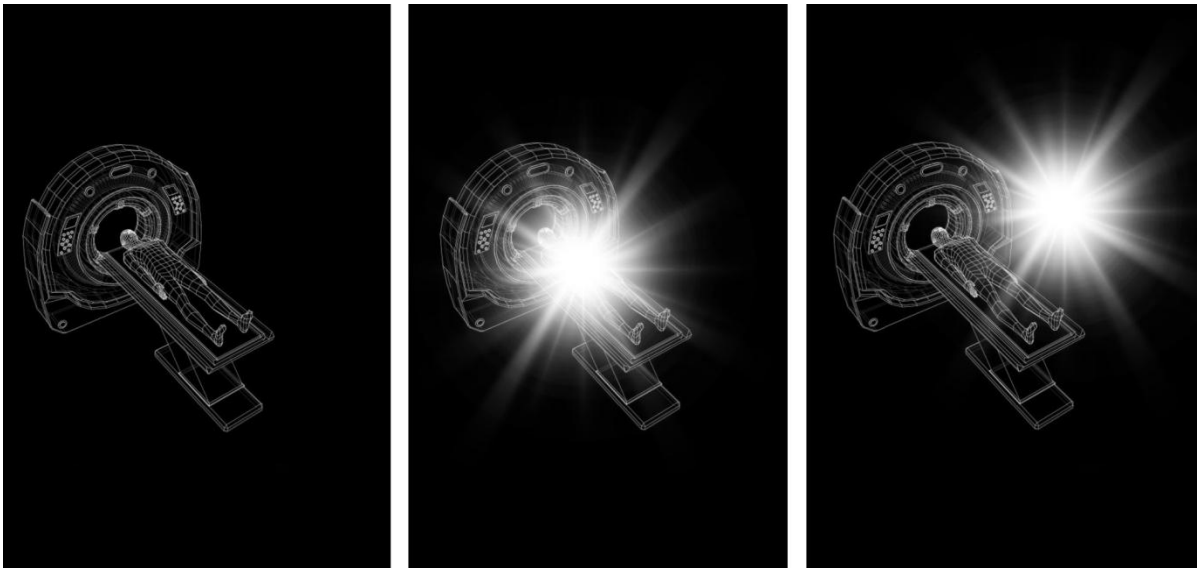
The disembodied state probably allows the best opportunity to exist in space, as the physical world no longer affects the disembodied person. In this case, there is no need to wear spacesuits or any other additional equipment. Cosmonauts and astronauts are equipped with special suits to survive in space. But in disembodied state, they are no longer needed. The following figure shows two astronauts and a light being in the middle of them, which represents a person who has left the body:



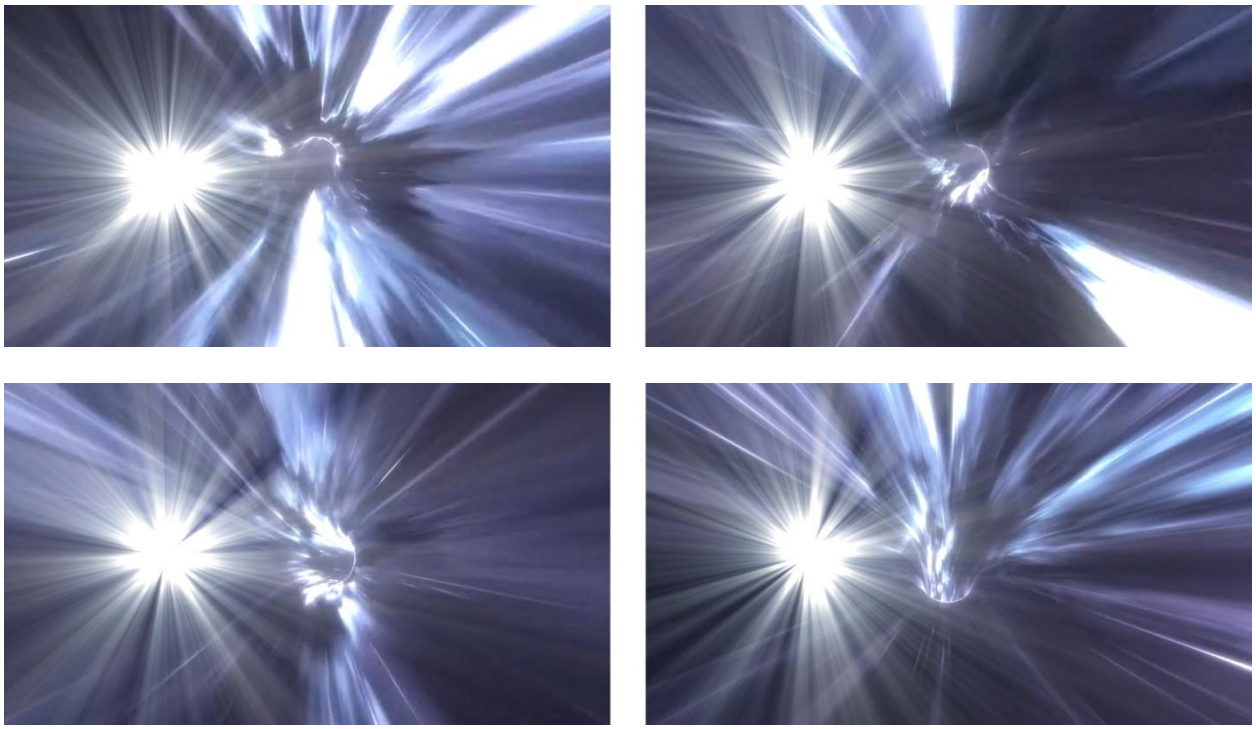
Since near-death experiences and exits from the body almost always occur before a person's coma or clinical death, it is therefore possible to induce a person's artificial or intentional exit from the body only if the person is brought quite safely into an artificial coma or clinical death with modern medical devices. With today's medical equipment, it can be done quite safely.

Statistics on near-death experiences and phenomena of disembodiment show that these phenomena generally occur when the person's heart has stopped working. For example, during coma, a person's heart may continue to work. From this fact, it follows that in case of a real exit from the body, the human heart must stop for a certain period of time. It also determines how to artificially or technically create a real exit from the human body.

A technology that would allow a person to actually leave the body could be visually similar to an MRI measuring device used in medicine. This is an arbitrary statement, but it helps to visually imagine what the technology that enables exiting the body could look like in the future. Magnetic imaging devices still allow electromagnetic waves to be generated and emitted from the human brain. But it cannot produce a real exit from the body. In case of magnetic imaging measuring device, a strong static magnetic field with a magnetic flux density of 2 - 3 T is created using a base magnet (a much weaker field may also be used). A magnetic field that changes in the x, y, and z directions is created using a gradient coil. The RF side sends and receives a radio frequency signal. After that, this signal is sent from the receiver to a computer, where the measurement results are processed and analyzed. Figure:

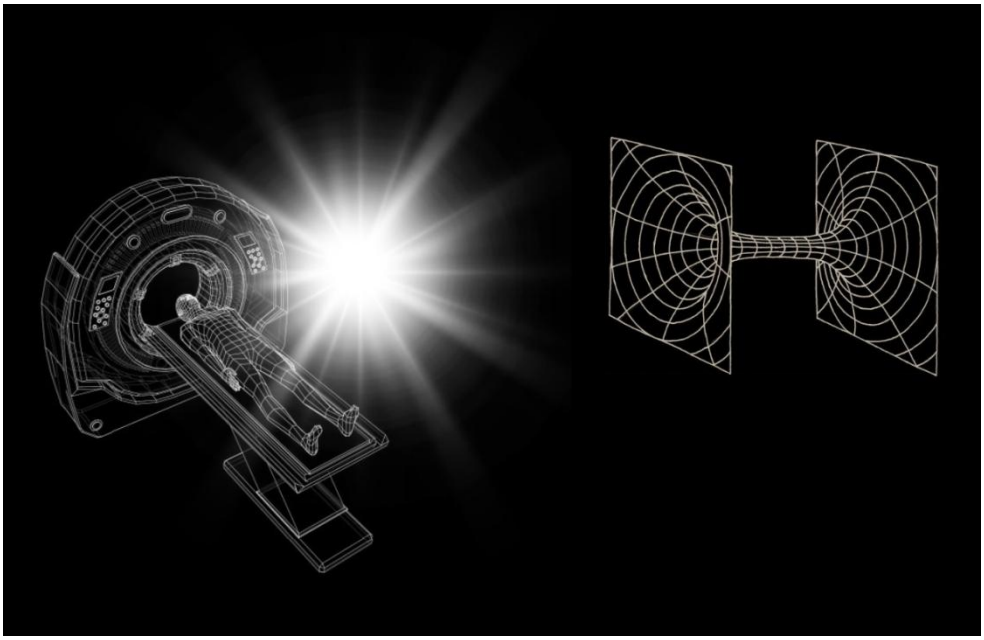


In many near-death experiences, tunnels in spacetime are seen, with the help of which it is possible to cross very large distances in space or travel in time in a very short time. A wormhole is a speculative structure that connects different points in spacetime and is based on a special solution of Einstein's field equations. A wormhole can be visualized as a tunnel with two ends at different points in spacetime (i.e. different places or different points in time or both). The following images visualize for us the movement of a light being in a tunnel in spacetime:

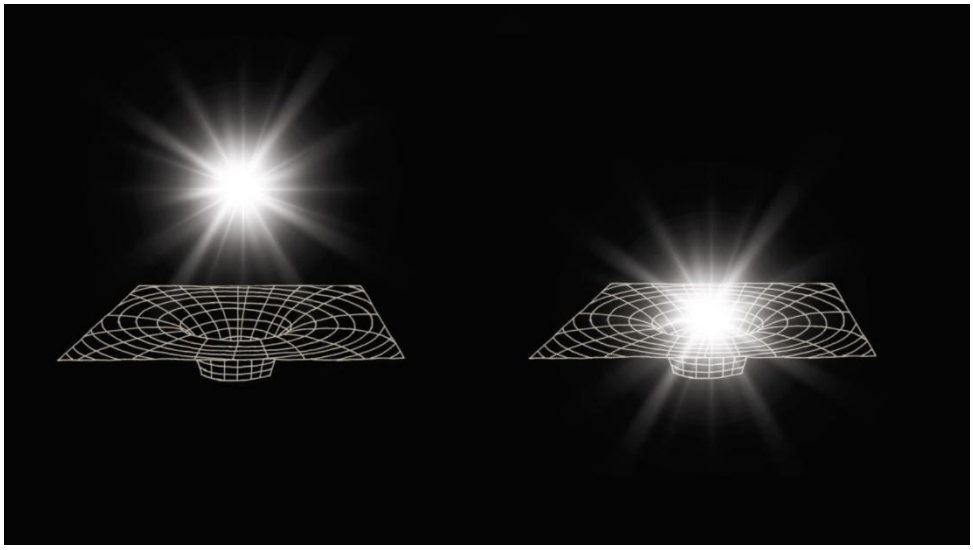


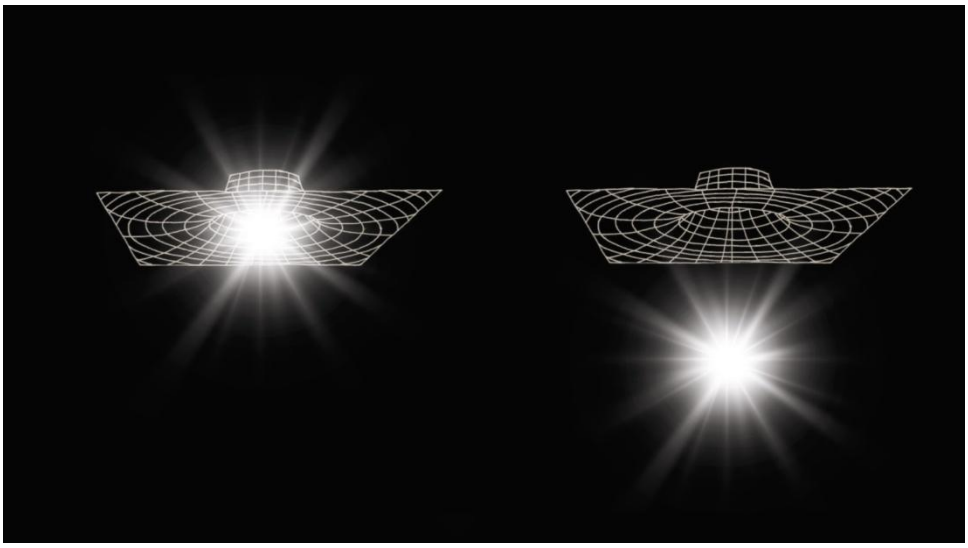
Since the disembodied state enables existence in space without any technical means and tunnels in spacetime allow intergalactic travel (as predicted in science fiction), then the human disembodiment technology and its development would be the best possible space technology,

and it would probably not be possible to come up with a better one. Figure:



The following drawings visualize for us the passage of a being of light through a tunnel in spacetime. A person of light can be a person who has left the body. A tunnel in spacetime allows its passerby to reach another location in the universe or another time:





It is safe to say that the possibility of exiting the human body would be fundamentally irreplaceable in the field of space technology. It can be imagined, for example, as follows: a person leaves his body, enters a tunnel in spacetime, the tunnel takes him to another location in the universe, then brings him back to the starting point from there, and then the person returns to his body. This means that such space technology would be similar to, for example, going to the dentist. No rockets, spacesuits, spaceports, training, or other space technology infrastructure is required. All it takes is an intensive care unit and technology similar to magnetic resonance imaging.

A technology or device that would allow a person to actually leave the body could be similar to the infamous death capsule. The external similarity would be obvious, but the substantive difference would be that if the death capsule is intended only for euthanasia, then in the other case it would be intended to produce an external state of the human body. Such a machine could create a temporary out-of-body state in which a person would enter the machine, leave their body, return to their body after a while, and then exit the machine. In case of euthanasia, the person remains in an out-of-body state forever, as the death capsule does not allow for resuscitation. The death capsule and its design:

Source: https://et.wikipedia.org/wiki/Sarco

Australian-born euthanasia activist Philip Nitschke presented the world's first suicide machine at a funeral fair held in Amsterdam in 2018. The device is called "Sarco", short for "sarcophagus". The invention is built in such a way that it allows a person to die. The Sarco is equipped with a removable coffin and also has a place for a nitrogen tank. In Nitschke's mind, the whole process could look like this. First, a test must be completed on the website, which would confirm that the person is mentally healthy. If the test is successfully passed, the user receives an access code valid for 24 hours and the customer can enter the capsule. The person who wants to leave this world then presses the button and the capsule is filled with nitrogen. The person feels a little dizzy at first, but then loses consciousness and dies. Sarco's design, created in collaboration with Dutch designer Alexander Bannink, resembles a spaceship, according to the creator of the suicide machine. It should make users feel like they are traveling to heaven.

Since a person who has left the body does not need and therefore does not consume any technical means to survive or move in space, it can therefore be said that the ecological footprint of a person who has left the body would be essentially zero. This means that the disembodiment technology would have essentially zero environmental impact, making it the greenest technology in human history. Out-of-body technology would probably be the only technology in the world that would have almost zero impact on Earth's environment. In the future, many scientists may realize that the development and elaboration of the disembodiment technology would probably be the only escape route to avoid a complete catastrophe of the Earth's environment. This is because a person who has left the body does not need to consume any technical means, products or services that are produced from fossil fuels or are in any other way related to the resources of the Earth's environment.

2 People's experiences in clinical death

2.1 Death of a person

Some thousands of years ago theories of body structure, functioning and disease were based on myths and magic. Scientific observations were not performed in ancient times. The first accurate anatomy studies were performed in the 16th century. More scientific methods have been applied in medicine since the 17th century. Medicine could evolve with the evolvement of the science of physics, as physics could invent technologies necessary for studying the human body.

> For example, the invention of microscope and x-ray technology was pivotal to the field of medicine. By the start of the 21st century medicine could understand many of the functions of human body and treat most diseases.

The parts of the human body are organised hierarchically - from the simplest molecules to the body as a whole. Building blocks turned into cells consist of molecules as carbohydrates, lipids, nucleic acids and proteins. These are also involved in chemical reactions called metabolism. Metabolism of the human body in coordination with the building blocks of the body forms tiny living units called cells. Every cells needs enough nutrients and oxygen to stay alive and give the body energy. Tissues are made of conjoined single cells that have a similar structure and function. Tissues perform various functions in the body.

Many different kind of tissues form structures that are called organs. Each organ has a certain function or functions. Human organs are for example lungs, stomach, liver, kidneys and eyes. For example the stomach stores and dissolves food during the digestive process. The stomach and other digestive organs form the digestive tract. The digestive tract digests food, absorbs the useful nutrients into the blood stream and eliminates residues. People have twelve organ systems in total and they all work together for the body to perform its functions needed to survive.

The causes of death of the human organism may vary greatly but the signs of death are similar in all cases. For example breathing and heartbeat stops, the elasticity of tissues reduces, the muscles relax and stop responding to stimuli. For example the person no longer has reflexes. These are called the primary signs of death and after that the secondary signs of death emerge. For example livor mortis appears. This discoloration of the skin is caused by settling of the blood into the lower parts. For example if the deceased is laying on their back, the blotches appear on the back. Later it haemolyses and is absorbed into tissues. Afterwards the blotches turn bluish-red.

Rigor mortis starts specifically in the diaphragm and the heart. For example it can occur in human masseter muscles in about two to four hours after death. Afterwards the rigor mortis spreads to lower muscles and disappears in the same order in about two days after the individual's death. It is also known that different tissues do not die at the same time. For example the muscles may react to electrical stimuli many hours after the heart has stopped. The

movement of ciliated epithelium in the respiratory tract may continue for over ten hours. Sperm cells may move for more than a day.

Nerve tissue dies the fastest. Upon circulatory collapse the brain dies very fast. For example if the brain does not receive oxygen for 3-5 minutes, there will be irreversible changes in the brain. Finite brain death causes the heart to stop, as the blood circulation regulatory centres in the brainstem are dead. Until now it was known that brain death is quickly followed by cardiac death or vice versa, but currently these views have already changed. It is possible for example to preserve circulation with intense CPR. However, in this case large part of the brain is also dead, for example due to high cranial pressure. This possibility assumes that the circulation centres in the brainstem are functional. This is the only way circulation can continue.

However, a person's breathing can be maintained by breathing apparatus and fluid-balancing infusions. People whose brains are largely destroyed, carry on living in a vegetative state without being able to mentally connect to the outside world. Their life resembles that of a plant. If a person's brain is no longer functioning, the person is dead, but the heart keeps beating. Cessation of consciousness and psyche and lack of brainstem reflexes are considered the main characteristics of brain death. Brainstem reflexes are for example breathing movements, swallowing and corneal reflex. In this case the repeated EEG tests show only a flat (i.e. straight) line.

USA scientists (led by Yale University scientists Nenad Sestan, David Andrijevic ja Zvonimir Vrselja) have managed to resuscitate pig organs hours after their death. For example pigs that were considered dead started to move themselves. Scientists managed to restore the function of many organ cells and the blood flow. In 2019 the same scientists managed to restore the function of the pigs' brain cells with the BrainEx system many hours after their death (i.e. after they were decapitated). In 2022 they tried to apply this technique on the whole body. The scientists caused the anesthetised pigs' hearts to stop. This stopped the blood flow which caused hypoxia of the cells in the body. As a result, the cells of the body should die in the common sense. However, after the cardiac arrest the scientists pumped fluid into the pigs' bodies. It contained the blood of the pigs, the oxygen-carrier protein in red blood cells i.e. the synthetic form of haemoglobin, and medicines that protect cells and prevent blood clotting. As a result the blood started circulating again after about six hours. This caused the heart, liver and kidney cells to resume function. This experiment demonstrates that it is possible to stop cellular destruction. The pigs did not regain consciousness after death, as there was no electrical activity detected in the brain. However they visibly moved their head and neck during the experiment. From this experiment the scientists conclude that the technique called OrganEx could be used in the future to save organs and even to resuscitate people. The synthetic solution pumped in to the body within this system contains 13 compounds intended to suppress inflammation, stop the formation of blood clots, prevent cellular death and correct the electrolyte imbalances caused by ischaemia. The OrganEx technique enabled the cells of the pigs in the experiment to heal, specifically in the brain, heart, lungs, liver, kidneys and pancreas. This caused the preservation of certain cell and metabolic functions during the six-hour experiment. The specific genes that are involved in cellular repair were also activated in the organs. This experiment with pigs demonstrates that the definition of medical/clinical death must be re-evaluated. It is thought that death can even be cured. Medical death may not be irreversible. The OrganEx technique could be used to treat the ischaemia occurring during strokes or heart attacks. This experiment with pigs demonstrates that cells die much slower than we have thought thus far.

2.2 Near-death experiences

People who have been brought back to life confirm that death is the most pleasant and striking experience of life. Near-death experiences have been quite thoroughly researched for example by an English paranormal phenomena researcher Dr. Kenneth Ring. For example the case of John Migliazzo in 1968 where he claims the following:

> "I was swimming near the coast of New Jersey and grew really tired. I remember not having any more strength to swim. Suddenly I felt I was leaving my body. I rose up to 150 meters and saw my body struggling in the water. Eventually I had somehow reached the shore. I only remember darkness. I cannot put it into words. I was part of the universe, part of everything. I knew and remembered everything... It radically changed my attitude towards death."

Dr. Ring has thoroughly researched thousands of people who have been in clinical death and had near-death experiences. If people have had a near-death experience, they are no longer afraid of death afterwards. This is because during death they have felt peace, liberation and understanding. For example, Ring studied a person who experienced cardiac arrest and therefore was declared deceased. However, that person says that they exited their body and saw their physical body from afar. They conform the following:

> "I did not feel fear or any pain. In a few seconds I reached a dark tunnel at the end of which I saw light. It got brighter and brighter. I felt I has flying through it... Suddenly I was in a completely different place. A beautiful golden light was flowing from everywhere. I felt a perfect peace, acquiescence and love come over me. I felt I was a part of all that."

A woman who had fallen into a river with her car, confirms the following:

> "I knew I was dead or about to die, but then something strange happened. This experience was so powerful that I stopped hanging on to life and only wished to see it from up close. I was in a long tunnel of light. It was not an usual light, rather an energy migrating into another state. At the end of the tunnel there was some kind of luminosity and for that I gave up the fight for my life. Having reached the Creature of Light, I discovered that I see what is further. I do not have the words to describe what I saw and experienced. I was an endless world, full of peace, love, energy and beauty."

UFO researchers have also noted the existence of people outside their biological body. For example, people have been in an out-of-body state inside a spaceship. Let's look at the following famous UFO case. In 1977 the first alien kidnapping case was investigated in Great Britain, however the incident itself had occurred in October of 1974. It involved a family of five - a mother, a father and three children. After spending the night with relatives in Essex county,

Aveley, on the way back they drove into an unusual greenish fog. It happed quite close to their home. Both adults later described stepping on board of the UFO hiding in a green foggy mass. They described how their car was pulled into the UFO with the power of a light beam. While on board, the kidnapped people were "outside of their body" and it allowed them to "float" around the UFO. At the same time they saw their actual (i.e. former) bodies "that" were still sitting in the car. UFO experts Andy Collinsi and Barry King were also involved in this research.

Many scientists and physicians do not believe in the veracity of the above-mentioned stories (near-death experiences and UFO cases). They are of the opinion that these phenomena occurring in brain death are caused by chemical imbalance in a person's brain. However, there is not enough data for scientists to verify this. Scientists are unable to evoke near-death experiences in laboratory conditions, therefore many scientists and also physicians do not believe in the veracity of near-death experiences.

It is a common scientific viewpoint that a person's consciousness is the result of electromechanical processes in the brain. According to this theory a person's consciousness and therefore their life ends with their death. However, this theory is yet to be proven. For example, the neurosurgical research of Wilder Penfield imply that a person's consciousness is independent of their biological brain. He concluded that a person’s consciousness is able to separate from the biological brain. Modern science usually cannot leave prejudice aside; therefore, science cannot rationally assess the reality of near-death experiences (NDEs). Science does not acknowledge continuation of life after death. Near-death experiences "appear to be" metaphysical phenomena which are not a part of rational science.

2.3 Raymond Moody and Kenneth Ring

The fast development of medicine has enabled to save many people from death. In these cases more and more people have told about their out-of-body experiences during which they have felt incredible joy and satisfaction, met previously deceased people and relatives, had a telepathic connection with Creatures of Light and seen panoramic flashbacks on their life on earth. Such messages have begun to interest many healthcare professionals and psychologists, as these phenomena are more and more common and also these have many similarities. Researchers have begun to scientifically investigate these phenomena and these are called near-death experiences or NDEs in short.

Dr. Raymond Moody is a philosopher and psychiatrist who is also probably the most famous NDE researcher. His two first books are probably some of the best studies on NDEs. One of the books is titled "*Life After Life"* and the other "*Reflections on Life After Life"*. During his research Moody questioned many people who had some kind of association to NDEs. Moody classified these people into two groups - those who could be brought back to life after clinical death, and those who were very close to death due to very severe trauma or disease.

In his book "*Life After Life*" Moody is generally of the opinion that experiences during NDEs are blissful in all cases. Very often people cannot describe these experiences in words, as these are so pleasant, joyful and exceptional. While at death's door, they did not wish to return to their life on earth. This is because the experience was so amazing and eye-opening.

However, in his book "*Reflections on Life After Life* " Moody presents negative NDEs as well

as positive. For example there are people who have had hell-like experiences while close to death, not Creatures of Light or deceased acquaintances and people. However, these are very unpleasant experiences that are completely opposite to a blissful experience. People having these experiences understood that they had done something wrong in their life on earth. Some of these people tried to end their life.

During positive NDEs a person experiences enormous happiness, peace and happiness. People see a Creature of Light, who has a very awe-inspiring and pleasant nature. They radiate ultimate love and satisfaction and they show the entrant a grandiose panoramic flashback on their life on earth. There are more Creatures of Light all of whom radiate ultimate love and have infinite knowledge about everything. They communicate only via telepathy. Positive NDEs are usually very memorable and the experiences very vivid, not vague or "sleepy". For example, a cultural anthropologist Patrick Gallagher spent weeks in a coma after a serious car accident in 1976. While in a coma, he had many striking and vivid NDEs which he described as follows:

> "I was free not only from gravity, but from all human limitations. I could fly, so skilfully that I felt transformed... After that there laid ahead a dark area, there was no light, it seemed like a tunnel entrance... At last I saw a circle of light far away...perfectly beautiful, yellowish-orange... As I went through the tunnel, I reached a blindingly beautiful place... It was a perfect place, I mean...thoroughly and plentifully illuminated... I saw many people (there), some were dressed, some without clothes. Clothing that appeared transparent was beautiful, but it...did not hide anything... The people themselves were very pretty... As I understood at that moment being there, everyone had some kind of knowledge, as bright and ideal as the glowing light. And I also acquired it... I felt that I only had to approach the person I was interested in and instantly I understood their nature. It is so simple, you only need one glance...into the person's eyes, without saying anything...and a perfect understanding follows. It is not possible to put this general understanding into words. Without thinking or words I understood them as well as they understood me, now I really felt why poets consider the eyes as gates to the soul... I also understood that this beaming light will never fade, no-one had the need to sleep... I also knew that everyone there was very sympathetic towards everyone and everything... We were free from all of the controversies that historians consider the cause of wars and other conflicts, including land, food and shelter. The only evident thing was love. These ideal conditions created an unique state of no anger or other disturbing emotion - there was only an overwhelming state of love... I felt I could return to my life on earth, I missed...my children, my wife and many others. I made the decision to return, although knowing that the price may be very high, considering the biological, physiological and material needs and shortcomings of my body, also the fact that this amazing experience will only be a memory. I have no idea how I got back, but as soon as I had decided to return, I lost EVERYTHING I would have wanted to be or know, I was back."

Millions of people in the world have experienced this kind of positive and negative NDEs, regardless of their education level. For example, in North-America alone 5 percent of the population has experienced NDEs. NDEs are independent of the person's religious background, as these are experienced both by atheists and deeply religious people. For example, atheists, not

just religious people, also see the tunnel, Creatures of Light, their relatives during positive NDEs.

But a person's cultural or religious background appears to be crucial in interpreting NDEs. For example, Christians may see the Creature of Light as Jesus Christ, while Muslims may interpret it as Allah. In almost all cases a NDE will have a crucial impact on the rest of a person's life. NDEs significantly alter a person's values. Another famous NDE researcher aside from Raymond Moody is Kenneth Ring. He questioned 26 people who had had near-death experiences. Their values changed significantly later on. In his book "*Heading toward Omega"* he published the results of his research:

> "After NDEs people tend to value their life more and give more attention and love to their loved ones, at the same time their interest in their position and material values decreases. Most of the people who have had NDEs also admit that afterwards they are living with higher spiritual goals and in some cases a deeper understanding of the core nature of life. It is important that these self-analysis reports are confirmed by those who have observed the behaviour of the people who have had NDEs as a bystander."

2.4 Characteristics of near-death experiences

Raymond Moody, one of the best researchers in the field of near-death experiences describes in his excellent book "*The Light Beyond"* the specific aspects of NDEs which have occurred in almost every NDE case thus far. These are also recorded in the book "*Life after death*", authored by the excellent expert in religion, Farnaz Ma´sumian. These recorded specific aspects of near-death experiences can be summarised as follows:

> After cardiac arrest many people have had near-death experiences or NDEs. At first they are confused and scared. They do not understand what has happened to them. They find themselves floating over their physical body and are astonished by the fact that they can see their body from afar now. It takes a long time for them to understand what is happening. Often they try to make contact with the healthcare workers who are doing CPR on them or any other person near them. Usually this fails. Moody once had the chance of doing CPR on a woman on death's door. The woman later told Moody that she tried to stop the resuscitation as she liked the existing situation. When the woman attempted to grab Moody's hand, her hand simply went through his hand.
>
> When it is not possible to make contact with others, the person begins to see their understanding of their own personality a lot more clearly than they could during their life on earth. They begin to feel their nature and individuality. The person begins to understand their "real me" that has been hiding inside them until then. For example, family ties somehow become less important, as the person's own nature and personality come to the fore. This has also been described as "cutting ties" or "a balloon taking off" as the string breaks. In case of NDE phenomena, people feel that they are liberated from the constraints of their life on earth and are able to feel their actual nature. Initial fears are

diminished and absolute elation emerges.

However, before "the ties" are cut, the ill or injured person feels terrible and excruciating pain. After this the person's feelings turn completely opposite - they experience an enormous elation and an indescribable sense of satisfaction.

After the severe pain has been replaced by a general feeling of joy and peace, the person suddenly feels raising up to the sky. They see their physical body from afar (usually looking below themselves). The person now feels that they are in a different body called "the spiritual body". They feel separated from their physical (or earthly) body. Generally the new body seen and felt during near-death experiences is not described. Some people have described it as a "field of energy" or "colourful cloud". However, one time Moody managed to get the descriptions of their "spiritual body" from one person: they saw that their hand consisted of very small "particulates of light".

After separating from their physical body a person begins to understand that they are probably dying. Soon they see a large dark tunnel. They feel being pulled into this tunnel. However, after a while a very bright light is seen at the end of the tunnel.

At the end of the tunnel the person is met with Creatures of Light who radiate light in a very bright manner and whose personalities are extremely awe-inspiring, but very pleasant at the same time. They bring the arriver a feeling of ultimate joy and peace. Many people who have had near-death experiences have described the feeling of love from these Creatures of Light as "*the purest love* that can exist in the universe. It appears to radiate blinding light. However this light does not damage vision in spite of it's very high intensity. The light is warm and in some cases even "*flickering*". Often the emerged Creatures of Light are previously deceased friends, relatives or acquaintances of the person. They communicate only telepathically which means exchanging information through thoughts. Understanding is instant and complete. Light emitted by many Creatures of Light is very bright, some even sparkle. It is similar to looking straight into the Sun from underneath clear water. Sparkling light is extremely bright. The light sparkles as the light of the Sun on the water surface of a rolling sea.

After some time the person feels the presence of a very special Creature of Light. According to the person's religious or atheistic cultural background they can consider this holy Creature of Light to be God, Christ, Buddha, Allah or some other holy entity. This ultimate Creature of Light is seen by religious people, atheists and agnostics. It radiates ultimate love and understanding. The light of this Creature of Light is exceptionally bright. It is extremely dazzling. The intensity of the light is similar to looking straight into the Sun from the Earth with the naked eye in the summer's midday. The only difference is that this light does not damage vision in any way. It feels as the light of a star filling the universe. One cannot look straight into the Sun with a naked eye, as this can cause blindness. However one can look at the Creature of Light without any damage to vision. This creature emits an enormous amount of light. The love and happiness it radiates cannot be described in words. An average person who has not experienced it cannot imagine it. Various people have described it as follows:

"As I reached the light, it was as if I was injected into a very loving cotton ball."

" There was so much light that I was swimming in it".

"As I stepped into the light I knew that God existed".

"I knew that I had never been loved like that".

"It was a light and incredibly loving feeling".

"And I understood that the light was the love of God".

The following series of photos illustrates the ultimate brilliance and glory of the awe-inspiring Creature of Light which is seen during people's near-death experiences:

The first photo depicts a field and a dense forest surrounding it visible from a distance. The second photo depicts a Creature of Light on the same field i.e. in exactly the same spot. The second photo is taken with the camera lens directed straight into the Sun. This causes the light effect seen on the photo. This is not a computer-animated image.

Creatures of Light have also been depicted in popular culture. For example in the movie called "*Lord of the Rings*" there is a character named Galadriel who is the Queen of Fairyland and the Lady of the Woods. In the movie, Galadriel is a tall woman, almost 2 meters, very sophisticated and intelligent, a powerful warrior. She is restrained and elegant, graceful and powerful. She has magical powers and her presence demands respect. All of these characteristics are felt by people who have perceived the presence of Creatures of Light during their near-death experiences. Similar to fairies in movies that are larger than life. They dominate every room they enter. They are above us, their aura is felt from a distance. They are beautiful and flawless, the ultimate people. Figure:

Source: https://www.technologyandscience.eu/near-death-experiences/

In the presence of this extremely bright and awe-inspiring Creature of Light the person has a chance to see their life on earth thus far, which appears in front of them as a three-dimensional panorama. There they see all of their life events as a bystander. The time dimension experienced is completely different from what we perceive while on earth. Time has acquired a completely unique form of existence. The entire life course of a person is now visible in detail. A person now feels the impact of their actions and deeds during their life on earth on other people. A person feels the joy and contentment or pain and suffering in other people's consciousness, according to what they have caused to others during their lifetime. During the flashback the Creature of Light is next to the person. The Creature of Light helps a person learn from their mistakes. The person now understands that they only need love and understanding going forward with their life. All of the people who experienced NDEs were much more gentle and impartial going forward. They were constantly striving towards knowledge.

Most of the people who have experienced NDEs go through some kind of a tunnel at the end of which there is bright light. But there are people who describe only floating over their physical body or even up in the sky. In this case they are quickly rising towards the sky. This was experienced for example by the famous psychoanalyst Carl Jung in 1944 when he developed cardiac arrest. Some people rise above the earth or rise up very quickly and see the starry sky around them.

The positive effect of near-death experiences is so great that they do not wish to return to their life on earth. Some people even get angry when the physicians are trying to perform CPR on them. But there are cases in which the Creature of Light gives them a choice. Sometimes people wish to return to their life on earth to raise their remaining children or for some other important reasons.

For example, Moody presents a case where a woman in Los Angeles even had two

> near-death experiences, although thirty years apart. The woman was involved in a car accident and fell into a coma afterwards. It happened about in the end of 1950s. The Creature of Light suggested that she needs to go to heaven now, but the woman refused that "amazing opportunity". The woman considered herself too young to die. She said to the Creature of Light: "I am too young, I have not danced enough yet". The Creature of Light thereafter "burst into laughter", but allowed the woman to carry on living. Time went on and thirty years later the woman developed cardiac arrest during a minor surgical procedure. This time she also had a near-death experience. She went through a tunnel and met that Creature of Light again who once again said that it is time to go to heaven. The woman once again refused to go to heaven as she still had to raise her children. "Alright", said Creature of Light", "but this is the last time". Next time you have to stay here."

It must be admitted that near-death experiences are very similar to a person being born into this world. All people have the experience of birth but it cannot be remembered. A person comes into this colourful and light-filled world quite painfully through the birth canal. Joyful and helpful healthcare workers help and carry out the birth process and receive the child after delivery. Healthcare workers are usually dressed in white, as in clinical death creatures existing as light are seen. In that sense NDEs are like the memories of being born which are visualised at the time of death.

People who have themselves had near-death experiences or researched these thoroughly, for example Raymond Moody, are completely convinced that these phenomena actually exist and are not caused by neurochemical processes in the person's brain. However acknowledged scientists and healthcare workers do not agree and present their own neuroscience theories. Authoritative and hypercritical scientists are of the opinion that all cases of NDEs are the result of a chemical imbalance in the human brain. This may be caused by endorphins released from the brain. In their opinion the cases of NDEs are similar to manifestations of mental illnesses. There are many opinions and theories on NDEs. Some scientists believe that near-death experiences are caused by narcotic drugs or hypnotics. They have also been considered temporary seizures or even targeted fictions of people.

The following outlines the descriptions of NDEs of different people. Such descriptions have been obtained by R. Moody, who has included these in his published books:

> "I remember being transported to an operating room and the next four hours were a very critical time. During this time I began to leave and re-enter my body and I could see my body from directly above it. But during doing that I was still inside some kind of a body, but not a physical body, rather something that I would namely call some form of energy. Since I have to word it, I would say that it was transparent, spiritual, the opposite of physical being. But it had different parts."
>
> „I was outside of my body, looking at it from about ten yards, but was still thinking the way I do in the physical world. And my thoughts were at the level of

> my usual body. It was not a body as such. I felt something like a capsule or something similar, like a transparent form. I could not really see it, it was sort of transparent, but sort of was not. It was like I was like some kind of energy, maybe like a small ball of energy. And I did not have any bodily sensations - warm sensations or nothing like that."
>
> „He was there, but had no physical body. It appeared as a transparent body and I felt all of its parts - hands, feet and everything else, but did not physically see them."

During their near-death experiences, many people have met an extremely pleasant, very genuine and awe-inspiring Creature of Light. People often cannot describe in words their exceptional meeting with this ultimate Creature of Light:

> "This Creature of Light seemed vague at first, but then a large glow appeared. There was an extreme amount of light, it was not like a bright flash, but just a big light. Warmth was flowing from it, I felt a warm sensation. It was light, yellowish-white, more white. It was extremely bright; I cannot describe it. It seemed to encompass everything, but did not prevent me from seeing everything else around me... I felt especially good, protected and loved. The love pouring from it was unimaginable, indescribable."

In the presence of this awe-inspiring Creature of Light the person sees a three-dimensional panoramic flashback on their life on earth thus far. This is apparent in both negative and positive near-death experiences. In case of positive NDE a person feels great joy in their lived life during the flashback:

> When the light appeared, the first thing it said was: "What have you done in your life that you have accomplished?". Or something like that. And then began the flashbacks... Well, I did not actually see the light during the time that the flashback lasted. As soon as it had asked what I had accomplished and the flashback began, it disappeared, but I felt it's presence the whole time, that it was leading me through these past events, I felt it's closeness and it commented occasionally. It was trying to prove something with these flashbacks. Not that it wanted to see what I had done, it already knew that."

During these near-death experiences people meet previously deceased relatives, friends, acquaintances or other so-called "souls".

> "All of them were people I had known in my past life, but who had left before me. I recognised my grandmother and a girl I had met in school, and many other relatives and friends... They all appeared content. It was very pleasant, I felt that they had come to take care of me or protect me. It was almost as if I had come home and they were there to take me in and greet me."
>
> "A few weeks before I almost died, my friend Bob was killed. At the time I exited

my body I felt that Bob was standing right there beside me. I saw him in my mind's eye and felt he was there, but it was a strange feeling. I did not see him as a physical being.“

2.5 Historical research of near-death experiences

Exiting the body is commonly known as "astral travel" or "astral projection". It is called a "bilocation" if the "fluidum statue" thickens and becomes visible to a living person. Exiting the body may be spontaneous or a person causes it themselves. "The astral body" usually remains close to their physical body. In some cases, this "spiritual body" travels long distances in space and "materialises" only when reaching its destination. For example, some witnesses have allegedly seen the same person specifically in both places at the same time. Having exited the physical body and travelling long distances in space, the physical body is sound asleep or in a cataleptic state. People who have returned to their physical body often have knowledge that they could not have acquired otherwise than being present somewhere far away i.e. actually being outside of their physical body. For example, information that describes faraway places and events can be verified by people living there.

During the last centuries many researchers have gathered a quite large amount of data which allegedly demonstrate human experiences of exiting the body. For a long time the specialists of the so-called field of "scientific (para)psychology" were quite sceptical towards the concept of spiritual or astral body. Currently these views have changed. This means that at least the researchers of paranormal phenomena have accepted this hypothesis and are researching it as a research object. For example in 1953 in the United States Professor Hornell Hart established a research centre for experiences of exiting the body in Duke University. Professor Hart of Duke University claims that the "astral entities" accompanying near-death experiences (or experiences of exiting the body) are very similar to specifically deceased people that reveal themselves to the living as ghosts. In the Unites States Charles T. Tart has also conducted studies on exiting the body in addition to Hart and Osis, however in England these phenomena have been studied by Oxford researchers Crokal and Celia Green.

A large amount of "subjective" experiences with exiting the body, as well as data on bilocation manifestations allegedly confirmed by bystanders, have over time been collected by researches as for example English Myers and Gurney, German du Prel, Italian Bozzano, French Durville and Lancelin. There have been excellent laboratory experiments conducted with people who allegedly have bilocation abilities. For example if a "thickened astral body" separates from the person, they are still able to knock on the table and move a chair, table or door. This was for example supposedly revealed in Durville's experiments. Allegedly it is determined that the "shape of spirit" weighs 30 grams if placed on a scale. In 1909 Durville published the book "Le fantóme des vivants" where he described his so-called experiments. Supposedly the fingerprints of a person's "astral shape" have been successfully taken. This was done by Lancelini and in 1913 he published the book "*Méthode de dédoublement personnel*" in which he describes his experiments.

The studies on people exiting their bodies conducted over time have noted that in case of

exiting the body the perceptions and emotions of people double.

The possibility of going out of the body has been established as a subjective experience, but has not been established as an objective phenomena according to sceptics. People that have experienced this phenomena do not doubt that it actually exists, but those who have not still remain sceptical about the actual existence of these phenomena and consider them "chemical flips" of the human brain. Only a few researchers have thought that a person's consciousness continues to live after death as a "fine-material ectoplasmic body", as this is claimed to have been experienced after exiting the body.

2.6 Are near-death experiences the signs of mental illness?

Scientists and healthcare professionals interpret the near-death experiences as symptoms of mental illness. It is thought that these occur as a result of a chemical imbalance or endorphins released in the brain. It is also thought that these result from the use of narcotic drugs and hypnotics, temporary seizures or are even a targeted fiction.

The associations between near-death experiences and several mental illnesses are analysed in the book „*Life After Death*“ (Tallinn, 1997, Farnaz Ma´sumian) which we will address here in detail.

Near-death experiences or their specific components are considered by most healthcare workers as the signs of mental illness. For example out-of-body experiences. These are classified as schizophrenic disorders like hallucinations, delusions and organic mental disorders as delirium tremens. Some physicians have referred their patients with near-death experiences to psychoanalysts or even a mental asylum.

Are near-death experiences actually caused by mental illness? To analyse this we will address the symptoms of schizophrenia which in the opinion of some medical professors are also present in near-death experiences:

> In case of visual hallucinations people see objects and phenomena that actually do not exist. Auditory hallucinations include hearing sounds that do not actually exist. It is analogous to visual hallucinations. In case of delusions a person is absolutely convinced that they are for example God or Picasso. Schizophrenics suffer from the loss of thought association. They struggle to associate their thoughts - they jump from one unassociated topic to another while interacting with others.
>
> > Schizophrenics are heavily tortured by what they see or hear or what they are not able tell other people. These aspects make the disease manifestations even more severe and many of them become deeply depressed. Some people cannot take care of themselves and are therefore placed in assisted living facilities. On the other hand, people who have had near-death experiences exhibit improved attitudes and societal engagement. In this state many people have seen Creatures of Light, but none of them have identified for example as God or Alexander the Great. Schizophrenic visions are incoherent and appear repeatedly, on the other hand, near-death experiences are always coherent and occur very rarely during a person's lifespan.

Medical professors have regarded near-death experiences as delirium - a severe chemical imbalance which usually subsides and does not cause permanent brain damage. Many near-death experiences occur when the brain is deprived of oxygen and the brain may manifest quite extreme reactions to this. However it is well known that delirium as a state causes confusion and disturbances in the perception of surroundings. In delirium people very often experience negative hallucinations in the form of animals or bugs. In this state many people have unassociated thoughts and present with concentration difficulties. When the period of delirium is over, the person usually does not remember it's details or remembers very vaguely.

> However none of these characteristics is present during near-death experiences. No-one who has experienced delirium, has given it a deep meaning or attributed to it a significant spiritual effect to the rest of life. Delirium experiences do not have any of the specific signs of near-death experiences, like seeing the tunnel, Creatures of Light, flashbacks on their life etc. Delirium is also considered "*a bad trip*", near-death experiences have in contrast been considered "*spiritual turning points* ".

Some clinical researchers consider out-of-body experiences (one of the characteristics of near-death experiences) "*autoscopic hallucinations*". These experiences are not well known, but these have been heard of throughout history. During such hallucinations a person sees a projection of themselves in front of them which is comparable to presence of a bystander. Modern medicine knows that many epileptic or migraine patients quite often suffer from these.

> This kind of hallucinations are much talked about, but one has to keep in mind that there is an enormous gulf between out-of-body experiences and autoscopic hallucinations. In case of out-of-body experiences a person's perception centre is located outside their physical body, however in autoscopic hallucinations the person perceives their projection from their physical body. This is a significant difference to take into account. The self-projection that a person sees is usually three-dimensional and not transparent - just as if was an actual person. However, in out-of-body experiences the bodies are seen as transparent. In case of out-of-body experiences people have been able to walk around without their physical body and give very accurate descriptions about that, however in autoscopic hallucinations people cannot have such experiences, as they perceive hallucinations from their physical body.

There is another very radical idea proposed to justify the nature of near-death experiences. Namely, near-death experiences are nothing else but memories of being born - the painful emergence of the child from the mother's womb, escape from darkness into the light and bright world, the nurses are like Creatures of Light who accept the newborn joyfully and good-heartedly into this world.

> This rationale for the emergence of near-death experiences and it's nature seems to

be believable. However, scientific research on the abilities of newborns has definitively rejected this "hypothesis". For example, Carl Buker, Professor of Philosophy of Southern Illinois University, has examined the work of paediatricians. The essence of his research was to determine whether newborns understand and remember the experience of being born. The results of research permit to confirm that human senses are not developed enough at the time of birth to receive or even remember anything. So the assumption that the Creature of Light seen during near-death experiences is someone's physician, midwife or father greeting the newborn exiting the birth canal, is unfortunately incorrect. Newborns cannot focus their gaze. If the contrast of light and darkness is not at least 70%, newborns do not react to light. These are scientific facts. The gaze of a newborn is brief and uncoordinated and even more so if they are crying as most newborns do. Tears disturb the vision. In their first month of life no child is able to concentrate their gaze on an object that is further than 1.5 meters.

A newborn cannot perceive what they experience during birth. This is because a newborn's senses are not properly developed at the time of birth and they do not have experience with the contours of objects and shapes. If near-death experiences are really residual memories of the experience of being born, these should be painful and difficult experiences, not sensory events that bring about bliss and peace.

Higher vertebrate life-forms (e.g. birds and mammals) have a very differentiated nervous system. The characteristics of such life-forms reveal that their behaviour is conscious. But these specific characteristics are entirely lacking or only partially present (or may be vague) in life-forms whose nervous system is not differentiated to such extent. Therefore, science concludes that consciousness is associated with complex neural structures. This suggests that consciousness does not exist outside of neural structures. Science also accepts that consciousness exists only as a cooperation between cortical and subcortical structures, however not alone in either structure.

2.7 Phenomena caused by brain chemistry?

Scientists (e.g. Zalika Klemenc-Ketis) have discovered a very strong association between having near-death experiences and increased levels of carbon dioxide and to some extent potassium in cerebral blood. Scientists also believe that carbon dioxide alters the chemical balance of the human brain and evokes sightings of light, tunnels and deceased people.

However the bright light experienced before death can be caused by increasing levels of serotonin, which Alexander Wutzler has discovered in his research. Neurobiologists have long thought that the reasons for near-death experiences are related to cerebral neurotransmitters. The main cause is thought to be the before-mentioned serotonin, as it regulates mood and processes information from sight and hearing. As serotonin regulates pain perception and also mood, it is therefore thought that a high serotonin level in the brain makes dying easier on a person.

But there are other scientific opinions on the reasons of near-death experiences. For example,

researcher Susan Blackmore finds that many near-death experiences are caused by cerebral hypoxia. Near-death experiences can be evoked by chemical compounds and therefore the reasons for near-death experiences are thought to be neurological mechanisms. For example, a quite small dose of a hallucinogen evokes exceptional conscious experiences and visions in the brain. This is also caused by a state where the brain does not receive oxygenated blood. The heart that pumps blood, is arrested during clinical death. These circumstances convince the researchers of a natural cause, instead of interpreting it as supernatural. Generally it is thought that near-death experiences are disturbances in normal brain functions caused by a traumatic event.

For example, fighter pilots experience a state of consciousness resembling near-death experiences. These occur if turns are made at a very high speed or in case of downward plunges. The brain is impacted by severe gravity in these cases. In a fighter taking a very fast turn the force is shifted from head to feet. This occurring force pushes everything down. The seat keeps the person's body in place in the aircraft, but blood still flows to the lower limbs and also stomach. This in turn means that a person's brain is temporarily deprived of blood. Researchers in various flight laboratories are using centrifuges mimicking the conditions of fast flying. In such conditions the researches are examining the effect of gravity on the human brain. The pilots start to lose consciousness for a moment, but before that the blood starts to "flow away" from the brain and a tunnel is seen after that. After that the person cannot move anymore and is not perceiving anything in the end. The person loses their consciousness. As blood returns to the brain, a person begins to twitch at first and then regains consciousness. At first the person is confused and does not understand the situation. A person can fly the aircraft only once the feeling of confusion resides. When people have lost consciousness, they have a short dream that has a specific nature and is very similar to near-death experiences. They see their family or relatives and feel floating. They feel like they are outside of their body and feel weightless. It is usually a very pleasant and euphoric feeling. These experiences are deeply engraved into a person's memory.

2.8 The reality of near-death experiences

We must consider three factors in case of near-death experiences, which we will further analyse here:

1. Leaving the body is an actual phenomena, as there are certain signs indicating it, like seeing things or becoming aware of something that you could not possibly see or become aware of being dead.

2. At the time of a person's death there is likely contact with extraterrestrial civilisations, as exiting the body indicates that life is continued after death and where else can this "*afterlife*" exist if not in the sky where UFOs have been seen.

3. People who have exited their body, feel something we understand as "*manifestations of virtual reality*". For example, people see hellfire, various unknown landscapes, buildings, strange unearthly creatures, life events of the person who has left their body etc

All of these factors are somehow related. However the near-death experience largely and clearly fall into two groups:

1. Illusions of exiting the body created by the brain A person's brain can credibly mimic exiting the body and near-death experiences. Scientists have searched for the part of the brain that is responsible for near-death experiences.

2. People actually exiting their bodies. We have to be able to distinguish between an illusion created by the brain and an actual exit from the body, as we do between talent, disorder and homosexuality or the benefits of vaccines and their claimed destructive effect.

Both sides have presented convincing defence arguments to prove their claims, which we will subsequently closely examine.

2.8.1 Out-of-body experiences caused by a person's brain

People's out-of-body experiences and near-death experiences cannot be interpreted completely literally. A person's out-of-body experience includes only leaving their body and nothing else. At the same time, a near-death experience includes many other aspects in addition to exiting the body, for example seeing the "spirits" of the deceased, a tunnel of light, beautiful landscapes and the feeling of bliss. A near-death experience includes leaving the body, but it is a much wider and diverse phenomena than a common out-of-body experience. In that sense these two have different depths and reach.

However, most descriptions of near-death experiences clearly include a combination of near-death and out-of-body experiences. Neuroscience has attempted to explain these two aspects separately, not tied together. But in Pam Reynolds case these phenomena emerged together, not separately. But how and why? This and the artificial induction of out-of-body experiences have been discussed by Villu Päärt in his articles from 2007 that can be found at the website: www.novaator.ee.

Fow example, according to official statistics, 18 percent of myocardial infarction survivors have had near-death experiences. It must be noted that near-death experiences do occur during clinical death, but not in all cases. It means that near-death experiences do not occur in all clinical death cases. Near-death experiences are not new or condemnable for the religious world, but current science views the dualism of the body and mind as absurd and unacceptable. However, it is a scientific fact that a brain-dead person is not capable of storing memories or being conscious, although this does occur during near-death experiences.

A scientific study conducted in the University of Kentucky in the US is considered the best explanatory theory of near-death experiences currently in the world. The university's research revealed that these strange phenomena are allegedly caused by a person's sleep disorder. This is because while clinically dead, the person's REM sleep phase actually continues. This is why a person's consciousness wakes up before the body, and emotions and hallucinations not associated

with the body occur. According to this theory a near-death experience is just REM sleep which may occur for example during a myocardial infarction. This basically means that these phenomena are nothing else but a sudden onset sleep-like state. This theory seems to explain the aspect of people having experiences while their brains have stopped functioning. For example, the brainstem is a brain region that controls the main functions of the human body. REM sleep also originates from this brain area. However, it is known that human brainstem can function if the rest of brain regions have stopped functioning. This is how REM sleep occurs, which may be the cause of near-death experiences.

However, this proposed theory does not explain out-of-body experiences and the aspect in which a person sees their body as a bystander while being dead. Near-death experiences and out-of-body experiences sometimes occur together and sometimes separately.

An out-of-body experience can occur also when certain brain regions are stimulated. For example, a Swiss neurologist Olaf Blanke has researched people's out-of-body experiences. One of his patients was a 43-year-old woman who suffered from very severe epileptic seizures. The researched attempted to find the cause of these seizures. In order to do that, he stimulated the woman's brain with weak electric shocks, as this enables to determine specific brain regions responsible for certain functions. Upon stimulating a certain brain region the women had an out-of-body experience during which the woman looked at her body from somewhere above. An important conclusion of this study was that when *angular gyrus* (located near the conjunction of the temporal lobe and the parietal lobe) of the human brain is electrically stimulated, a person has continuous out-of-body experiences. Such experiments are repeatable in time.

A highly appreciated neurologist Michael Persinger of Canadian *Laurentian University* has conducted quite astonishing studies that must be noted in association with this topic. He has done experiments with people for 20 years and has consistently published his findings in medical and scientific literature. Persinger designed a machine that generates a strong electromagnetic field in order to stimulate human brain. This triggers a different state of consciousness and evokes visions in many of his test subjects. A feeling of spacelessness and timelessness and exiting the body often occurs, which is similar to the experiences of brain-dead people.

Many people who have suffered from migraines or epilepsy, have felt themselves being outside of their body. However, until now it has been demonstrated that people with epilepsy are more likely to have near-death experiences. A person's brain is able to convince the person that they are outside of their body. Scientists have begun to systematically research this phenomenon. For example, neuroscientists have attempted to evoke out-of-body experiences in healthy people. For example, in some experiments the subjects were equipped with video eyewear that enabled them to see their body from a different angle. The people participating in this experiment later said that they felt that they had exited their body. Such experiments provide new knowledge on people's body perception and it is possible to evoke the real feeling of being somewhere else but here using virtual reality technology. For example, experiments by scientists like Ed Jong with virtual reality technology in humans demonstrate that they can create illusions like that someone else's body is theirs, they have three arms or they are monsters or dwarfs. Similarly they can also induce the illusion of being outside of their body. These brain tricks are so convincing that the participants themselves do not believe that their brain creates these tricks. This clearly demonstrates that consciousness is directly related to the sense of "self".

These experiments demonstrate that it is possible to experimentally evoke and manipulate out-of-body experiences. It means that one can influence the brain's understanding of a physical body simply with the information passed through the senses.

For example, one experiment with stimulating out-of-body experiences, was conducted in Swiss Federal Institute of Technology Lausanne. In the experiment lead by scientists Bigna Lenggenhager and Olaf Blanke, people wearing video eyewear were standing in front of a camera. Participants were able to see a three-dimensional image of their own back from the camera shots in the eyewear. When their bodies were poked with a marker, the poking of the virtual body was also seen, but from the eyewear. During this poke the participants felt that the virtual body was their own body, which is clearly not the case. After that the video eyewear was switched off. After that the participants were asked to take a few steps away and then return to their previous location, only blindfolded. However, an unexpected incident occurred. The participants walked over their actual location and closer to the spot where they saw their virtual body.

Out-of-body experiences have also been studied by scientists of Swedish Karolinska Institutet. For example, scientist Henrik Ehrson conducted a study in which participants also saw the three-dimensional images of their backs through video eyewear. But in this case a woman and a man were sitting on a chair. As they were looking at their backs through the video eyewear, Ehrson touched the backs and chest of the participants with two plastic sticks at the same time. The participants felt that they are sitting behind their physical body, i.e. outside of the body, even when they saw from the video eyewear how Ehrson was touching their actual back. Ehrson performed a similar experiment on himself. He experienced the same as the prior participants. He felt himself sitting in a different place although he was still sitting in the same spot. The body seen from the video eyewear appears as your actual body, although it is not. However, Ehrson admits that this body does not feel like himself, but it feels like looking at a doll.

Ehrson admits that this body does not feel like himself, but it feels like looking at a doll.

All of these experiments are repeatable in time. While repeating the experiments Ehrson measured the electrical conductivity of the participant's skin, as this gives an idea of the person's emotional alertness. The measurements demonstrated that the participants became afraid when Ehrson was pounding with a hammer in front of the camera at a spot where the people thought they saw themselves. It was clear that there was no actual threat, but the participant's emotional alertness nevertheless increased.

These experiments convince neuroscientist Peter Brugger of University Hospital Zurich in Switzerland that the feeling of being inside one's body is based on a visual perspective and coordination between the senses and perception. But Peter Brugger was also convinced that a complete separation from the body did not occur in these experiments, in which case the participants would have felt completely separated from their body. Very similar phenomena were however created in laboratory conditions.

But Peter Brugger was also convinced that a complete separation from the body did not occur in these experiments, in which case the participants would have felt completely separated from their body. Very similar phenomena were however created in laboratory conditions.

Olaf Blanke has also noted that out-of-body experiences may occur in many brain regions, for example in the conjunction of the temporal lobe and the parietal lobe. This has been

demonstrated in earlier studies. However, such experiments demonstrate which brain regions and functions can induce out-of-body experiences and how the sense of self develops in the brain.

The brain processes a large amount of information each second. In the conjunction of the temporal lobe and the parietal lobe an actual and uniform image is created, leaving out information which does not fit in. However, it is known that this brain region processes information that gives a person an understanding of their body and its location in space. It would be reasonable to conclude that when this area is damaged or misprocessed, out-of-body experiences may occur.

Out-of-body experiences are explained by Blanke's theory and scientists of the University of Kentucky are trying to explain near-death experiences. However, these theories fall short when looking at Pam Reynold's case where these two phenomena occur together. For example, Pam Reynolds saw her body from the outside while brain-dead. How is this possible? A dream occurring in the brainstem may be a near-death experience, but the brainstem does not process out-of-body experiences from brain regions that have stopped functioning. The brain cannot be dead in order to process phenomena that occur in REM sleep induced by the brainstem. It is clear that these two proposed theories cannot explain the essence of near-death experiences.

Experiments with virtual reality technology only demonstrate that a person's brain is capable of convincingly mimicking exiting the body in certain situations, and nothing else. The chemical imbalance in the brain induced by the concentrations of certain chemical substances causes phenomena that are similar to near-death experiences. Therefore it is attempted to explain these phenomena as brain chemistry induced disorders. However, it can be concluded from all of the above that a person's brain is capable of mimicking near-death experiences, but this does not mean that all of these phenomena are automatically illusions created by the brain. We can assume that people experience actual or real exits from the body that are no longer illusionary. This means that we have to be able to distinguish between an illusion created by the brain and an actual exit from the body, as we do between talent, disorder and homosexuality or the benefits of vaccines and their claimed destructive effect. As a rationale for these claims we present a thorough analysis in the next chapter.

2.8.2 Why must a person's exit from their body be an actual phenomenon?

Until now the near-death experiences can be considered the remaining functions of the dying brain or simply hallucinations created by the brain of a dying person. In order to completely agree with this view we must include aspects such as when a person witnesses their resuscitation attempts as a bystander. These aspects force to rebut current assumptions on why do near-death experiences occur. These aspects of this phenomenon are the hardest to explain and therefore near-death experiences cannot be considered the illusions of a dying brain. Considering these aspects the only possible conclusion is that consciousness can actually separate from neural tissue at the time of a person's clinical (and therefore also biological) death.

The most difficult element of near-death experiences to explain for scientists and practising healthcare workers are the out-of-body experiences. Currently there is no scientific explanation (except for this theory) that explains how people who have notified of their out-of-body experiences, are able to give such detailed overviews of what the healthcare workers were saying

or doing during their resuscitation. Even more surprising are the astonishingly accurate overviews of the out-of-body experiences in which people are able to describe what happened somewhere else, as their physical body was laying on an operating table in a hospital. In the descriptions of near-death experiences there is very often the aspect of seeing the resuscitation attempts as a bystander while being dead, that the person later tells the physicians and they in turn confirm the person's claims.

> For example, former Director of Estonian Puppet Theatre Meelis Pai has also had a near-death experience when he fell into a coma for 21 days. After waking from the coma he knew things that occurred when he was completely unconscious.

A person had to actually exit their body to explain such things. It's scientific conclusions are quite clear, but it's counter-argument is whether these "*stories of resuscitation attempts*" are to be believed. As the aspect of seeing their resuscitation procedures as a bystander while being dead is a part of the near-death experiences, and physicians can confirm this adequate information after resuscitation, it must be considered in research, otherwise stories of near-death experiences in general become unbelievable, which is basically impossible. Here we will further outline some examples of such strange cases.

> A 41-year-old man had such a severe heart attack that after 35 minutes of complicated resuscitation attempts the physician ceased the efforts and began to fill out the death certificate. Then someone noticed some sign of life, the physician resumed the attempts with electrical resuscitation devices and a ventilator and managed to restart the patient's heart. On the next day when the patient was becoming more responsive, he could describe almost everything that had happened in the resuscitation room in detail. The physician was very surprised. But he was most amazed by the patient's vivid description of the ER nurse that had stepped in to help the physician. The patient described her in great detail, including her hair and surname. He described how the woman had wheeled the cart with the electric shock device (main resuscitation device used in medicine) along the hallway. When the physician asked how he had learned the nurse's name and what she had done during his cardiac arrest, the patient said that he had exited his body and gone through the nurse's body - when he had gone to see his wife in the waiting room. While going through the nurse's body he had read her badge and remembered it in order to thank her later. The physician was truly astonished by the patient's story. He said that the only way to describe everything in such detail would be if the patient was present during the events.
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> A person born blind got into such a severe car accident that he went into clinical death in the hospital. The healthcare staff managed to successfully resuscitate him. In the next day when he was recovering he told the physicians in amazing detail about what took place during his resuscitation attempts. Although he has blind from birth, he could describe the appearance of physicians and the shapes of tools very accurately. Physicians were stunned by his story and did not know how to respond.

Even world-renowned scientists have had near-death experiences. For example, neurosurgeon Dr. Eben Alexander went into a coma in the fall of 2008 due to bacterial infection. One part of his brain called the cortex had completely stopped functioning, however the other parts continued to function. It is thought that consciousness is in particular related to the cortical area of the brain and therefore NDEs are considered disorders of the cortex. However, Dr. Alexander could not have felt or seen anything as the cortex had completely stopped functioning, it was not just impaired.

Pam Reynolds, singer and songwriter from Atlanta, was put into the state of clinical death during a surgical procedure in 1991. The Pam Reynolds case is one of the most famous in the world, as this case has been factually proven. Exiting the body and seeing a tunnel has been noted in many other near-death experiences. Nevertheless, the circumstances that Pam experienced during general anaesthesia and afterwards in clinical death, were later confirmed by the healthcare workers that had been present during her surgery.

Pam Reynolds experienced serious dizziness. The singer's ability to speak and move diminished. She had a computed tomography scan which revealed that she had a huge aneurysm in a cranial artery near the brainstem. This is very dangerous as it may burst and have lethal consequences. Death may occur during a common surgical procedure. The woman was treated by neurosurgeon Robert Spetzler, a specialist on therapeutic hypothermia. This procedure involves bringing the patient's body temperature so low that the heart stops. Clinical death follows. A person's brain is no longer functioning, but it handles hypoxia longer in low body temperature. Extended vessels are softened by the low temperature and the risk of vessels bursting decreases. Therefore the aneurysm empties and it can be removed.

The woman was treated by Spetzler and also more than 20 of his healthcare staff. She was put under general anaesthesia. To prevent her eyes from drying out they were lubricated and taped shut. The electrical activity of Pam's cerebral cortex was monitored with the electrodes of an electroencephalograph. Small speakers were put inside the woman's ears that measured the activity of the brainstem. 100 decibel clicks were emitted from these speakers. But it was during drilling of the scull that Pam felt herself exiting her body and after that saw how physicians were treating her physical body. The woman talked about this after the general anaesthesia. During such a surgery Pam could not have used her eyes or ears in any way. Nevertheless, she still remembers these thoughts (what she saw and heard) while she was floating in the air.

"I think it was strange how they had shaved my head. I had thought that they shave all of the hair off, but they did not," said Pam later. She very accurately described the bone saw and the noise it made: "The contraption

> that made an awful sound looked like an electrical toothbrush and it had a dent." Spetzler tried to cut open the upper layer of Pam's brain with scissors as a heart surgeon tried to puncture the femoral artery in Pam's right groin. Later on Pam had remembered the heart surgeon saying: "We have a problem". Her arteries are too narrow. After that a male voice had said "Try the other side". This conversation was later confirmed by the physicians, but Pam could not have heard it in any way, as she was under general anaesthesia and his ears were filled by the "deafening" clicking of the small speakers.
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> As Pam was put into clinical death as a result of low body temperature, the usual characteristics of near-death experiences began to emerge. She had flown out of the operating room and gone into a white tunnel. At the end of the tunnel they saw deceased friends and acquaintances. The woman felt that her soul was a part of God. She understood that everything that exists is created from this light or God's breath. However after this Pam's uncle lead her back to her body. She compared it to diving into an icy pool.

About 4.2 percent of people have had a near-death experience. This has been shown in studies performed in the USA and Germany. Studies also reveal that the nature of near-death experiences is not affected by a person's sex, race, religion, education, position etc.

The repeating nature of the before-mentioned near-death experience cases is that the patient sees their resuscitation attempts as a bystander while being clinically dead. This aspect of the cases is repeating in time and therefore it can be objectively verified. For example, all over the world people are being resuscitated from clinical death almost every day and the confessions of these people contain a certain aspect. It means that if a person is clinically dead after a serious illness or accident, after their recovery (i.e. after successful resuscitation) it is possible to get their confessions of the experiences that took place at the time of their clinical death. This can be confirmed by the people who were present during the resuscitation attempts. Most of these cases include this aspect.

> Although near-death experiences are allegedly illusions created by a dying brain, than why do we not see something else, like us sunbathing on a beach or swimming, hanging out with friends, driving a car, travelling to a nice place or performing our work tasks, as we do during usual dreams. Why do near-death experiences instead include unknown tunnels, Creatures of Light, a strong feeling of bliss, weightlessness, flashbacks on life and many other phenomena associated with near-death experiences that most people have never experienced in their lifetime?

As stated before, some authoritative scientists explain near-death experiences with the increase of carbon dioxide levels in blood. This means there is a strong association between near-death experiences and increased levels of carbon dioxide and to some extent potassium in the blood. Many scientists have considered the possibility that the patient could have briefly regained consciousness or felt something while half-conscious. It has been considered possible that nurses or physicians could have told the patient something later. Some scientists are of the

opinion that the patient's descriptions may be so general that they fit into any situation. Nevertheless this does not explain the fact that a person is clinically dead, but at the same time sees and hears what is happening in the resuscitation room. It follows that carbon dioxide can change the chemical balance in human brain, but it clearly does not explain the out-of-body experiences during which a person, while being dead, sees how the healthcare workers are trying to resuscitate them. If a person can know something on the events occurring during their clinical death, this actually proves the existence of this phenomenon which many sceptically-inclined scientists in the world are just trying to ignore.

Nevertheless, near-death experiences are mostly considered illusions of a dying brain. There is a conviction that something is happening inside the brain, not outside of it. Almost all scientists are fairly convinced of this view. Nevertheless, there are aspects that call this claim seriously into question. For example, a person is clinically dead, but is still able to see the procedures the physicians are performing during their resuscitation. Later on when the person has recovered and is awake, they accurately describe what was done during the resuscitation and this description is very detailed and precise. This aspect has later surprised many physicians, including even sceptics. It is bewildering how a person can now exactly what was done during their resuscitation while they were clinically dead. If a person is dead and according to sceptical scientists sees only the illusions in their brain, which may resemble a dream (one of the manifestations of virtual reality created in the brain), how can a dream depict events that also take place in reality or in the awake world?

When dreaming about walking or flying around a hospital room, a person does not do it in reality (i.e. while awake). In this case it is only performed in the dream. A person cannot possibly dream of what is happening at the same time during their resuscitation attempts. In this case the only possible conclusion is that a person could not have been in a virtual reality created by the brain, like a dream, rather the virtual reality created by the brain was very accurately matched to reality in space and time, therefore the person had to be awake and present at the time. It is a psychological fact that a person’s dream world does not match to the real world in space and time, i.e. what is seen and heard in a dream does not materialise in reality. Therefore, a person's near-death experiences cannot be the result of illusions of a dying brain, as they match events that actually happen. Therefore consciousness was not dependant on the brain at the time of a person's clinical death, thus it was no longer necessary. One had to leave or separate from the brain, or to be apart.

There are no known cases in the world where a person dreams of seeing themselves sleeping as a bystander. However in NDEs patients have seen themselves as a bystander during a surgery. They could watch as the physicians and nurses were trying to resuscitate their dying body. However, in dreams people do not see themselves as a bystander as they are sleeping in their cozy bed. There is no such aspect in dreams.

People occasionally remember the dreams they have while sleeping, but usually they are not remembered. Remembering events from dreams later on while being awake is in principle the same as remembering actual events that have occurred while being awake. But we tend to forget dreams very quickly in contrast with actual events. Later in life we do not remember experiences from dreams almost at all or only remember very little and vaguely. However, in contrast with dreams, near-death experiences are remembered very clearly and in great detail, also for a long time after these were experienced.

The book "*An Encyclopaedia of Curious Phenomena*" describes much longer and in greater detail the research on whether NDEs are actually the last remaining functions of a dying brain or

is there evidence that exiting the body is not merely an illusion created by the brain. It underlines a more thorough analysis on cases in which people see and hear things while being dead. This theory is also largely based on the data presented and analysed by the authors of this book.

2.8.2.1 Objections of sceptical scientists to Pam Reynold's case

Pam Reynold's famous near-death experience has been presented as proof of near-death experiences by many researchers and healthcare workers. It has been accepted as proof for example by cardiologist Michael Sabom in his book "*Light and death*". Sabom claims that Pam Reynold's near-death experience occurred at a time when her brain had completely stopped functioning. This is the most important aspect of the whole case.

However, critics and sceptical scientists around the world claim that the time spent on Reynold's surgery is misrepresented in general and imply that her near-death experience occurred while under general anaesthesia when the brain was still electrically active, that is hours before Reynold's heart was hypothermically stopped.

> "Hypothermic cardiac arrest" is a myocardial infarction or heart muscle infarction or simply an infarction caused by hypothermia. Hypothermia is a condition where the body temperature of an organism has dropped below normal. For example, human body temperature is consistently around 37 degrees due to thermoregulation, but hypothermia occurs when the body temperature drops below 35 degrees. If left untreated, hypothermia can lead to a heart attack or infarction. A myocardial infarction is a condition where the circulation of the heart muscle is reduced or interrupted due to occlusion or narrowing of the blood vessels in the heart. This causes heart muscle necrosis and therefore interrupts normal heart function.

For example, anaesthesiologist Gerald Woerlee thoroughly analysed the case and concluded that Reynold's ability to perceive the events during the surgery may have been the result of anaesthesia awareness.

> Anaesthesia awareness is being conscious of general anaesthesia which is sometimes called intraoperative awareness or accidental awareness during general anaesthesia. This is a rare complication in general anaesthesia in which patients resume consciousness during their surgical procedures. There are patients in the world who report various experiences, from vague, dream-like states up to complete wakefulness, inability to move and surgery-related pain. This is usually caused by administering an insufficient dose of anaesthetics (intentionally or accidentally) compared to the patient's actual needs which results in the patients waking up and becoming conscious during their surgical procedures.

However, as the cases of anaesthesia awareness are characterised by vague disturbances in consciousness or extreme fear caused by conscious bodily awareness accompanied by paralysis, the hypothesis of anaesthesia awareness cannot be considered. Reynolds confession includes very important components that are remarkably clear and especially free in nature. For example, her claims of complete lack of bodily pain or asthenia caused by the accidental physical experience of her lengthy surgical procedure.

The hypothesis of anaesthesia awareness cannot be considered due to the fact that Pam Reynold's near-death experience occurred when her brain had completely stopped functioning. This is an important aspect to take into account.

The clinically experienced anaesthesiologist Woerlee has examined this case in detail for many years and concluded that there is no direct need for a paranormal explanation. He points out that Reynolds was able to give testimony of her experience some time after recovering from anaesthesia, as she was still intubated while regaining consciousness. This would enable her to associate and elaborate the sensations experienced during the surgery with existing knowledge and expectations. The fact that she described the small pneumatic saw used during the surgery, does not impress Woerlee, as the saw sounds and somewhat looks like pneumatic drills used by dentists.

However, this argument cannot be taken seriously as Reynolds does not describe only the objects used during her surgery, but also the actions performed (movements, their order, positions in the room etc.) during her surgery. These testimonies are more than just descriptions of a pneumatic drill or saw that everyone can memorize from textbooks.

Nevertheless, the well-known psychologist Chris Frenchi also agrees with anaesthesiologist Gerald Woerlee's views.

Leading neuroscientist Steven Cordova of Barrow Neurological Institute who has the pre-operative technician on Pam Reynold's surgery and responsible for inserting the speakers into Pam Reynold's ears before the surgery, gave Michael Sabomi a personal testimony in 2006, in which he explained that the speakers were moulded into both external auditory canals and secured with excessive tape and gauze in order to fix the earphone securely into the auditory canal. In the supplement part of his controversial article from 2011 that challenges the survival interpretation of Reynold's near-death experience, Woerlee gives the reader instructions on how to recreate the hearing conditions in which Pam Reynolds was able to register the sounds in her operating room. However, in his sceptical articles Woerlee only notes the use of padded headphones or just headphones and does not mention that lots of tape and gauze was placed on top of the headphones.

By now it can be stated with certainty that the general consensus within the researchers of near-death phenomena is that Pam Reynold's recorded near-death experience represents a serious challenge for a materialistic world-view. The renown anaesthesiologist Woerlee's attempts to explain in materialistically cannot objectively be the only correct interpretation, as he cannot consider all aspects of this phenomenon.

2.8.2.2 Contact with extraterrestrial civilisations

There is a medical issue in near-death experiences that does not have a proper and all-encompassing scientific explanation for exiting the body. There is also the aspect that if the actual existence of NDEs could somehow be proven, it would basically also prove that life continues after (brain) death. However, this also means that all deceased people who have lived on Earth, have to be living "somewhere" in an out-of-body state. If this is the case, than the question is why have these previously "deceased people" not contacted us (i.e. the living) and in what world are they indeed living in? Perhaps they have contacted us but in a way we could not have expected.

They (i.e. the people who have left their body) may for example be contacted by clairvoyants and other psychics who claim to get information from "the dead" that cannot be obtained by any other earthly means. These "special people" themselves claim that "the spirits" of dead people or people who have exited their bodies (whose "physical" bodies may have been deceased for a long time), give them information on certain situations or phenomena. However it must be noted here that in case of NDEs the deceased relatives and acquaintances are often encountered.

NDEs do not only include the separation of consciousness from the biological body, as in addition to deceased acquaintances and relatives people see some kind of a tunnel, which is sometimes called "*the entrance*". It strongly suggests that these are space-time tunnels or wormholes that could be described by Albert Einstein's general relativity equations. The existence of such tunnels is described by the physics theory of time travel. These space-time tunnels mediate the teleportation of physical bodies in time and space. If these are actually seen during NDEs, then if the phenomenon of NDE would be proven so would the existence of these tunnels. It can be assumed that these space-time tunnels take people who have exited their body from the Earth to somewhere far away, as space-time tunnels are used only if travelling to great distances. For example in science fiction literature these are used for intergalactic travels. All of this suggests that a person can find themselves in an extraterrestrial civilisation after death.

The above-mentioned conclusions and claims would be valid only if the existence of the NDE phenomena could be proven. However such a discovery would lead mankind into culture shock, as it would rebut almost every aspect of today's scientific world view. If the existence of NDEs could be scientifically proven, it would also be possible to make very substantial and definitive conclusions about the existence of extraterrestrial civilisations, in which case it can be stated that intelligent life exists in a form which we would understand in an out-of-body state.

However the core issue is that why have attempts to prove the existence of NDEs failed? The greatest assumption of modern science is that it must be based on empirical (i.e. experiential) data which can only be a human-designed experiment. However this greatest assumption of science is the biggest hurdle in researching NDEs, as the lack of empirical proof means that science does not acknowledge this phenomenon. However, a very specific fact must be taken into consideration here. For example, an extraterrestrial civilisation (including deceased people) could knowingly use in their advantage the strict rules of the scientific world view created by the people on Earth. This means that extraterrestrial civilisations likely wish that their existence would remain on a religious level, not be a scientific fact. The scientific experience to determine the nature of the NDE phenomena would include asking the patient about a hidden object upon

waking, which would be in a place during their clinical death that the patient could not have seen from the bed. This is probably not feasible, as extraterrestrial civilisations would simply not want it. Otherwise our whole world view would be seriously "ruined" which would cause aliens to populate the Earth, as they would no longer need to hide themselves from us.

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Author's declaration

The author have declared him have no conflict of interest with regard to this content and ethics committee/IRB approval is not relevant to this content.

Data availability statement

Data sharing not applicable to this content as no datasets were generated or analysed during the current study.

About the company

"*MLK Technology and Science Ltd*" is a startup company primarily engaged in scientific research on wormholes and technology development. The official data of the company can be seen on the websites:

1) https://ariregister.rik.ee/eng/company/17008425/

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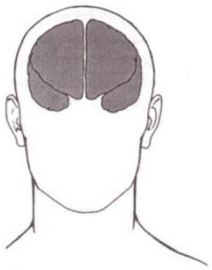

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