

V. V. Korpachev
CIVILIZATIONS DEVELOPMENT
AND SPECIES ORIGIN
TECHNOLOGIES

*This book is dedicated to the
memory of the outstanding scientist,
Cambridge University Trinity
College professor, my distant
relative and like-minded person
William Whewell*

INTRODUCTION

The protein life's origin on Earth turns out to be one of the fundamental world views concepts in a human beings' society. There are several theories existing to explain the Universe's occurrence. These are the Big Bang theory and Penrose-Hawking singularity theory to complement it, Hoyle-Bondi-Gold theory of stationary Universe, Alfevn-Klein cosmological theory and so on. But, none of them is completely proved and taken for granted by all the scientific society members. At the same time, such an important phenomenon as the life origin on Earth is being explained on the basis of

two polar points of view. According to one of them, Universe, Earth and protein life have been created by the Creator within a short period of time. In accordance with the second one, life on our planet has originated from the inanimate matter as the result of accidental evolutionary transformations. The existing contradictory world views on the life origin on Earth's settlement is of vital importance as it is impossible to develop the mankind future development programs without actual views on the environmental development.

It is worth mentioning that existing concepts are not pure scientific in the literary meaning of this word, as they are based neither on observations nor experimental researches which are possible to be reconstructed with the certain degree of credibility. The events under review took place in past and cannot be checked in present. One can judge about them by certain palaeontological and archaeological facts to evidence previous eras. Each of these world views is just a supposition, one of which has been turned into religion while the second one has been granted the scientific status. The facts which can be treated in different ways and viewed from other theoretic point of view are used to justify one's views.

The accumulated data states that the events sequence can neither be explained by the spontaneous evolutionary processes nor by God's activity; they need

quite another interpretation based on the scientific approach.

From the point of view of the evolutionary theory, it is impossible to explain the way the nucleic acids and a single genetic code were formed from inorganic elements many millions of years ago on Earth. Within the process of experimental studies, it turned out to be possible to get some simple organic compounds under conditions supposedly existed on Earth many millions of years ago, but this does not mean that they did take place in the past. Moreover, the possibility is perceived by the scientific community as a reality. The arguments given can only confirm certain changes, but they do not prove that they did take place. Many modern evolutionary theory conclusions are not obvious and require sophisticated justifications.

However, this is the only fundamental theory in biology nowadays that explains the development and diversity of life on Earth. Despite the great number of shortcomings, it turned into an indisputable faith. Until now, the grounds for abandoning it were not enough, since no other alternative scientific theory existed. At the same time, a huge amount of facts has been accumulated nowadays that either contradict the evolutionary theory, or which cannot be explained by this theory. It is difficult to imagine the lack of expediency and programming nature in an increasingly complex development that occurs according to the

pre-defined program similar in different representatives of the animal world and embedded regardless of the each individual's desires. Therefore, a contemporary educated person is often in uncertainty. On the one hand, he/she cannot accept the evolutionary theory of the species origin by Charles Darwin as a basic concept, realizing that the complexity of protein organisms on Earth cannot have occurred spontaneously, and on the other hand, a person cannot accept religious and mythical views because of their primitiveness and implausibility. Realizing the limited possibilities of a blind evolutionary process, some researchers have put forward a number of other alternative hypotheses. For example, it was assumed that life was brought from outer space by meteorites or particles of light (panspermia), or by intelligent creatures from other planets as an experiment. None of these hypotheses has ever been proved and arises a number of objections.

The current situation emphasizes the need to analyze the known facts from different perspectives and formulate a new concept of the life origin on Earth, which could provide answers to controversial questions and explain many obscure phenomena and events on the planet. William Whewell, a distant noble relative of Maria Wevel, my grandmother, once advocated an inductive method of cognition in science. He stated that the facts should be strung like beads on the thread of an

idea that arose in the brain of the researcher and depends on the individual characteristics of the mind. Until nowadays, there were two life and biological species origin ideas threads to string the facts of observation and the environmental research results, which were often customized. One thread was a religious one, and it provided a very simple way to explain the diversity of life by the supernatural deity's activity. Another thread suggested a gradual organisms' complication through random natural selection and evolutionary changes. It is considered a scientific one.

Unfortunately, other scientific threads capable of forming a plausible necklace of the protein life occurrence and development on Earth's theory had not existed yet. Nowadays, there is every reason to consider the creation of the vegetable and animal world on Earth as a thought-out highly intelligent biotechnological process. Therefore, this publication is an attempt to string the already known facts onto the thread of the «technological theory of the species origin». It considers the protein organisms on Earth's occurrence as a technological process being developed and implemented by a highly developed civilization, the material nature of which is significantly different from protein forms of life.

Charles Darwin and Alfred Wallace developed the evolutionary theory at a time when highly intelligent technological production was not developed

and modern scientific achievements of human civilization were not available. Therefore, they explained the accumulated facts on the basis of the animals' intraspecific improvement observations during selection.

It is obvious that the self-organizing processes do exist, but, in accordance with the evolutionary theory, the natural selection leads to the occurrence of capable of thinking organisms from the protozoon organisms. Homo Sapience can serve the example. After that, the further environmental development is subordinated to their natural activity. A lot of scientists have no doubts regarding the existence of the intelligent life in the Universe. But this intelligence can exist not on the distant planets but on the very Earth and the protein life complexity can be the result of its activity.

If the protein world could not have occurred spontaneously as a result of evolutionary processes, the obvious question arises: who has created it and what for? This requires a scientific explanation, leaving religious beliefs beyond. This publication provides ideas regarding the possible material nature of the highly developed intelligence's carriers. Nowadays, the army (military) archives have accumulated tens of thousands of the unidentified flying objects (UFOs) reported sightings, and Joseph Allen Hynek, Professor of astronomy at North-Western University, USA (Josef Allen Hynek), who had been the U.S. Air Force

consultant on the UFO issues for 20 years, and Jacques Vallee, his student, Bachelor of Mathematics and Master in «Astrophysics» of University of Lille, confirmed the existence of UFOs having thoroughly analyzed the data accumulated. Moreover, the USSR Navy commander, the Hero of the Soviet Union, Vladimir Chernavin, Admiral of the Fleet, Nikolay Smirnov, Admiral of the fleet, submitted data regarding the observation of the high-tech facilities in the depths of the ocean and Professor Vladimir Azhazha, the four-striper (post-captain), the Academy of Sciences of the USSR Oceanographic Commission Undersea Research Section Deputy-Head, and many other researchers have revealed the facts of numerous cases of UFO observation.

On the other hand, leading specialists in the field of genetics claim that it is impossible to generate a genetic code spontaneously, and the data by biologists, paleontologists, geologists and volcanologists, complementing each other, line up in one line, confirming the possibility of the existence of an intelligence that controls a lot of processes on Earth. Therefore, it would be logical to combine these observations, what the author of this book has tried to do.

The fact that it is the creationism that is the only alternative to Darwinism and that all ideas to justify the creation and not a spontaneous occurrence are

classified as religious ones in the view of society constitutes the ideological problem. In this regard, religion has caused significant harm to the development of a real worldview. However, truth is not based on God but on scientific ideas. Therefore, the modern science's task is not to neglect the idea of creating the world surrounding us just because it is close to religious dogmas.

The book attempts to overcome the barrier of the laws governing the protein life creation on Earth's rejection only because these views somehow coincide with the divine creation and are used by theologians. Any scientific concepts that do not share the idea of God will expand our understanding of this most important process on Earth. The book is aimed at replacing both blind faith in the divine creation of the world, and existing views on the evolutionary spontaneous species origin. Even judging from religious positions, the faith of millions of people in the Creator determines the need to answer the question regarding His probable existence on a scientific basis. Then the mythical and deceitful ideas used by theologians to seize the minds of believers will disappear.

The purpose of the given book is to lay the foundation for a new scientific trend in the origin of life on Earth's study, based not on religious beliefs or the evolutionary theory, but on the basis of universal

principles of the intelligent matter development, from primitive thinking to a highly developed civilization, and also to determine the focus and causality of its behaviour. In order to perceive new ideas, it is necessary to get rid of the pressure of the knowledge system imposed by education and try to look at the surrounding phenomena from a different point of view.

The book systematizes numerous well-known facts gleaned from extensive scientific and educational literature, but interpreted from the point of view of the protein life technological origin. They do not pretend to be absolutely accurate, but they provide quite another point of views on the life on Earth's occurrence and the role of a human being in this process. The task of the book is to show that the creation of protein life is the result of the highly developed civilization's activity in order to satisfy its energy needs.

The protein life on Earth's occurrence vagaries and consistent patterns' analysis is provided, which allows any reader to figure out where and in which cases one deals with random events, random probabilities and possible patterns.

The stated views are the basis for the fundamentally new trends in the scientific, technological, political and religious activities of a human being. They have the same rights to existence as well as the traditional evolutionary and religious views. If the protein world, including human beings, has been

created for a specific purpose, then humanity should follow this goal and should not violate its implementation. At the end of the book, the need for the relationships reforming within the human society in accordance with biological laws and the programmed purpose of Homo sapiens as a species is being emphasized, and the possibility of the similar self-replicating structures' creation to colonize areas unsuitable for living is substantiated.

The book is of a worldview nature and is designed for a wide range of readers of various specialties. The use of specific terms is as reduced as it has been possible. It is neither a popular nor a specialized monograph, since it examines well-known information, but from other scientific positions. Therefore, the book cannot be treated as a popular science one. The style of writing is best suited for the essay regardless of the relatively large volume.

The author has not knowingly set out factual material in accordance with the requirements of academic science while citing published sources. Thousands of various biological specialties' researchers have already perfectly done it. Taking into consideration the fact that in most cases data provided can be found in any textbook or manual, as well as data by well-known authors, there has been no point in referring to them. At the end of the book there is a list of authors cited, whose papers are well known, and the

reference to the main literature used for familiarization by interested readers is provided as well.

Chapter I

ARCHEBIOSIS ON EARTH: CRISIS OF VIEWS ON THE PROBLEM

1.1. RELIGIOUS VIEWS ON THE DIVINE CREATION OF THE WORLD

People have been asking themselves the question «How has the life on Earth originated and developed?» since ancient times, and the answer to it depended on one's imagination, knowledge and worldview. It is believed that there are three historical types of worldview: mythological, religious and scientific-philosophical one. Historically, religion has always been an instrument for the unification of peoples around a single power, the education of humility and equanimity of power, which, the way it was justified, was given by God.

Despite the fact that basically people agreed on the existence of higher forces in nature, they were represented differently in each tribe and each people had its own understanding of them, developing myths or certain religions. The essence of the religious type of worldview is based on the divine creation of the world

and the life on Earth's occurrence. Most religions set forth common themes about the origin of the Universe and Earth from abyss, as well as the animal and vegetable world by means of a «creation» volutionary act on the part of a higher being.

Paganism when people worshiped certain gods symbolized by them in the form of idols can be considered the earliest religion. The ancient Egyptian mythology does not provide a single version of the world creation; different theories existed in different regions of the country. Ra, the Supreme Sun God, considered the main Creator of the world, was the central point to unite all the theories. According to one version of the God RA emerged from a comprehensive chaos, that is, out of nowhere. He appeared to be the father of all other gods who embodied different elements and forces. An animal or a bird represents the deity giving birth to the Sun and creating the world in many ancient Egyptian legends. There are the traces of the legend according to which the Sun was believed to be borne by the sky in the form of the golden calf; the sky was believed to be a huge cow with the stars scattered over its body.

In other legends, neither animals nor birds are the creators of the world, but gods and goddesses. In one of these legends, the sky is represented in the form of Nut, the female goddess, whose body is curved above Earth, and the fingers and toes rest on Earth. Nut gives birth to

a sunny baby, who then creates gods and people. According to later ideas, the creator god Khnum modeled the whole world on a potter's wheel and created humans and animals in the same way.

As for the Chinese mythology, it was a man who occupied the central place, not God or any other higher power, and the male and female inception, not the elements, were the main active forces. According to the oldest and most famous ancient Chinese legend, Chaos initially reigned in the world, but once upon a time, two opposite inceptions, Yin (Darkness) and Yang (Light) spontaneously appeared from Chaos; they gave birth to the sky and Earth. The first man, Pangu, appeared immediately after it. He was not an ordinary man; he was huge and lived for a very long time. And when his hour came round at last, his body gave birth to nature and people.

His breath turned into wind and clouds, his voice became thunder, his left eye became the sun, and his right one became the Moon. Earth was formed from the Pangu's body. His arms, legs and torso turned into 4 cardinal points and 5 main mountains, and the sweat on his body turned into rain. Blood flowed through the land in rivers; muscles became the soil, hair turned into grass and trees. His teeth and bones formed simple stones and metals, while his brain formed pearls and precious stones. And the worms on his body turned into people. According to the ancient Greeks' views,

initially there was only Chaos, and the first 6 primordial gods, the ancestors of everything, appeared from it. As in the Egyptian mythology, the Greek gods also personified some forces and elements: Chronos – time, Gaia (Gaea, Ga) – Earth, Eros – Love, Tartarus – the abyss, Erebus (Erebos) – darkness Nyx – night. Later, the first primordial gods children, and then every generation of their descendants have filled the world with new and significant phenomena. Thus, the Nyx's children introduced the world of light (God Aethir) and day (Goddess Hemera), and the children of Gaia (Gaea, Ga) became the personification of heaven (Uranus) and the sea (Pontus) and so on. There is also the known number of gods who had nothing to do with the world creation; they just governed the world and natural forces. Finally, gods gave rise to Titans who were later precipitated to the Tartarus bowels during the war.

According to the Judaism provisions, the foundations of which are set forth in the Talmud, the first day saw 10 creations: heaven and Earth, confusion and emptiness, light and darkness, spirit and water, the day and night properties.

The Christianity's central dogma of creation is the «Creation out of Nothing» (Creatio ex Nihilo), when God, with his free will, transforms everything from a non-being state to a state of being. This faith found its first expression in the first three chapters of the first book of the Bible – the Genesis book. All

people are created by two definite persons – Adam and Eve. God provided the created angels and man with freedom that was used by them for evil (Genesis 3: 1–6).

As for Catholicism, the first chapters of Genesis are not treated as a literal description of the creation process, but as an allegory. Traditional Lutherans also do not accept the first chapter of Genesis in its literary sense. Some Orthodox theologians instruct to interpret the term «day» as some very long stage of the Universe creation. Jehovah's Witnesses also point out that the word «day» does not mean a day only, but it often means an indefinite period of time. At the same time, in case of modern Protestantism fundamentalist currents and in Orthodoxy, theologians insist on a literal understanding of the first chapters of the Genesis book: the creation of the world within six days.

As for Islam, the creation of the world is described in other way than in the Bible. The Qur'an does not reject the idea of a weekly holiday, which is Friday in Islam. In Islam, contrary to the Bible, it is considered sacrilege to attribute the property of fatigue to the Almighty God, who rested on the seventh day from the work that He spent on the creation of the world. The Bible treats the Sun and the Moon as two luminaries – for controlling the day and controlling the night, the Koran distinguishes them by the use of different epithets: light (nur) – to determine the Moon

and torch (siraj) – to determine the Sun.

Hinduism provides at least 3 versions of the world occurrence: from the «cosmic egg», from the «primordial heat» or from parts of the body of the original man. The Rig-Veda (Rigveda) mentions a certain cosmic intercourse.

Buddhist cosmology claims that there is an alternation of the cycles of the Universe emergence and destruction. The Buddhist religion does not have the concept of creating the world by the highest non-material being as God is. The emergence of each new Universe is due to the action of the aggregate karma of living beings of the previous world cycle. Similarly, the cause of the Universe destruction, which has ended its period of existence, is the accumulated bad karma of living beings. Each world cycle is divided into 4 stages: 1) emptiness (from the destruction of one world till the beginning of the formation of other one); 2) the world formation; 3) a stable state period; 4) the world destruction (coagulation, extinction). Each of these stages (kalp) consists of twenty periods of increase and decrease.

Buddhism provides no answer to the questions related to the beginning of world cycles, its end or infinity. The God Brahma appears to be the first creature in the new Universe, who is considered the Creator of the world in Hinduism. As for Buddhism, he is not a Creator but the first divine creature to be

worshiped. As any other creatures, he is not immutable and is the subject to the karma cause and effect (consequence) law.

According to the Zoroastrianism universe concept, the world has been existing for 12 thousand years. Its entire history is conditionally divided into 4 periods; each of them lasts for 3 thousand years. The prototypes of everything later created on Earth had already existed in the first Divine Creation period. God creates the sky, planets as well as the first man and first ox during the second period. The first man gives birth to a man and a woman who generate mankind while the first ox generates all the animals. The clash of opposing elements sets the world to motion: water acquires fluidity; mountains arise, celestial bodies run.

In accordance with the Taoism concept, the Universe's creation is the result of two main forms of energy processes' occurrence out of nothing: Yin and Yan. Their combinations and interaction generate the «Chi» energy and everything existing in the world as the result.

Realizing the religious doctrines' insolvency, the attempts to improve them have been made. Thus, Deism, the religious and philosophical trend, acknowledges the God's existence and the Divine Creation, but disclaims most of supernatural and mystic phenomena, the Divine Revelation and religious dogmatism. Lord Herbert Cherbury is the founder of it.

Most of deists believe that God does not interfere in the events taking place in the world after He has created it. They state that intelligence, logics and nature observation are the only means to the God and His Will's perception. Deism seeks to harmonize science and the idea of the God's existence, and not to oppose them. The deism followers believe that the scriptures, judging by modern standards, are quite controversial and disputable. They are just the result of a human thought, not the God's words, and therefore it is impossible to base a worldview on their basis. Traditional religions excessively speculate on the promises of posthumous blisses and threats of hellish torment, which is the way to keep their flock, depriving it of freedom of thought and religion.

Another religious trend is Ietsisme. Its followers believe that, on the one hand, there is something between Heaven and Earth, but, on the other hand, they do not perceive and do not support the established system of beliefs, dogmas and existing explanations of the God's nature by any particular religion.

Agnosticism doubts the truth or possibility of either proving or refuting the existence of God. According to one point of view, the term «agnostic» can also be used to describe those who believe that the question of the God's existence can be resolved, but considers the arguments presented in favour of the God's existence or non-existence of to be unconvincing

and insufficient for the firm conclusion.

Ignosticism, or igtheism, is a point of view on theology, according to which the problem of the God's existence is considered insoluble, since there is no evidence that the theist creature discussed by theologians and philosophers, is intelligible. Igtheists are neither atheists nor agnostics. While atheists do not believe in the God's existence and agnostics do not know whether God exists or not, igtheists do not understand what is meant when one says that God exists.

The reference to the religions' gods allowed everyone to answer the most complex and different questions. M. Lomonosov said it well:

«It is easy to be philosophers, having learned three words by heart: God has created in such a way, and giving these words as an answer instead of all the reasons». As for science, such answers are unacceptable. Religion based on faith rejects doubts. Faith is a simplified way to explain the surrounding world phenomena difficult to understand by God's activity, while religion is a way to cash in on this faith.

From a scientific point of view, the hypothesis about the God's existence (and «soul», «spirit», «heaven», «hell», concepts related to it, etc.) cannot be verified. Therefore, any speculations about the God's existence are not scientific by their nature. While science widely uses observation in pursuit of the truth,

theology perceives the truth through divine revelation and faith. In science the truth always contains the hypothesis element, preliminary character, but the divine truth is an absolute for the believer. Moreover, the generally accepted evidence of the God's existence has not been formulated as the definition of God has never been generally accepted. For the same reason, the generally accepted evidence of the God's non-existence cannot be formulated. However, the issue of His existence remains the subject of lively philosophical disputes and discussions.

Clinton Richard Dawkins, the author of «The God Delusion», published in 2006, argues that the likelihood of any supernatural creator is extremely low and the religious faith is an illusion. According to him, «God is not a convincing explanation, so we can only wait and hope that someone will offer something better».

1.2. SCIENTIFIC HYPOTHESES OF THE LIFE OCCURRENCE ON EARTH

There are a number of theories to explain the life occurrence on the planet that are difficult to prove their accuracy. A lot of these theories and their points to explain the existing species diversity exploit the same data but emphasize the data different aspects.

The assumption of spontaneous life occurrence

was common in ancient China, Babylon and Egypt as an alternative to the divine creation of the world. Aristotle, on the basis of his own observations, joined all organisms in a continuous row. He stated that «Nature makes the transition from lifeless objects to animals with such a smooth sequence, placing creatures living without being animals between them so that one can hardly notice the differences between neighboring groups due to their close proximity». According to Aristotle's hypothesis of spontaneous nucleation, certain «particles» of a substance contain a certain «active principle (source)», which can lead to the living organism's creation. He falsely believed that source was also present in sunlight, mud, and rotting meat. With the spread of Christianity, the theory of the life's spontaneous origin was not recognized with the spread of Christianity, but it continued its existence as an idea for many years.

According to the stationary state theory, Earth never occurred, but always existed and was always able to support life, and if it changed, the changes were very insignificant. Species also never occurred, they always existed, and each species has only two options – either its quantity change or extinction. Most of the arguments in favour of this theory are associated with inexplicable gaps in the fossil record. This theory is most precisely developed in this trend.

According to the panspermia hypothesis

formulated by Herman Richter in 1865, life could have occurred one or more times at different times and in different areas of the Galaxy or the Universe. This idea was supported by G. Helmholtz, S. Arrhenius and W. Thompson were among this theory supporters.

S. Arrhenius believed that life did not occur on our planet, but was brought in by spores travelling through the outer space. After getting on a planet with suitable natural conditions, spores are transformed into cells, and cells give birth to life. S. Arrhenius having carried out calculations, in particular, proved the fundamental possibility of the bacterial spores transfer from planet to planet under the influence of the light pressure. The discovery of cosmic rays and the clarification of the radiation effect on biological objects have greatly weakened this hypothesis's position.

Sankar Chatterjee, a professor of Texas Tech University and the University Paleontology Museum's curator, having analyzed information about the early geological history of the planet and compared these data with various theories of chemical evolution, arrived at a conclusion that the simple life early forms occurrence on the planet would be impossible without the participation of comets and meteorites that fell on it. Organic compounds capable of the development of life's launch were discovered in them during the study. This circumstance, to this or that degree, was taken into account by different authors of the life occurrence

hypotheses. The fact of the organic substances in meteorites availability deserves special attention. According to the nuclear geochronology, their age stands for 4.6-4.5 billion years, which basically coincides with the age of Earth and the Moon. Hydrocarbons, carbohydrates, purines, pyrimidines, amino acids, i.e., chemical compounds that make up living matter constituting its base, have been found in meteorites. Also, more than a hundred different minerals have also been discovered. Furthermore, 20 minerals not presented in Earth's crust have been found in the meteorites. Carbides, sulfides, etc. are among them. The proximity to the organic complexes composition of biological origin turned out to be so great that some authors suggested that living organisms were found directly in the very meteorites in the past. However, careful examination of organic compounds taken from meteorites has not confirmed the presence of optical activity, which indicates their abiogenous origin. At the same time, the data obtained demonstrated that the organic compounds' formation in the Solar system on the early stages of its development was a typical and massive phenomenon. However, the outer space chemicals and most of the Solar system bodies do not have the complexity of living matter, as is observed on Earth.

Academician V.I. Vernadsky also adhered to the panspermia hypothesis. In his opinion, life in the

Universe is spreading with the help light quanta. As for Earth, life could have occurred when a meteorite being a particle of other planet that disintegrated as a result of some kind of disaster hit our planet. The fragments of such a planet with bacteria or other microorganisms could go beyond the planet and get to Earth.

Fred Hoyle and Chandra Wickramasinghe, while studying the interstellar matter properties, noted that the cosmic dust's infrared spectra are very similar to the organic matter's spectra, to the dry bacteria, in particular. These scientists' observations served the basis for putting forward the idea of the microorganisms' possible existence in the interstellar space cosmic dust's clouds. They suggested that within the period of 4.6–3.8 billion years ago, the life occurrence on Earth was the result of the microorganisms' ingress from outer space. According to their calculations, a large number of space spores annually enter the upper atmosphere of Earth as the remnants of solid material scattered in the solar system. According to their ideas, comets are the life embryos' carriers that were earlier formed in the interstellar space.

Francis Crick, the Nobel Prize winner for the DNA code discovery, also suggested in his book «Life Itself: Its Origin and Nature» (1982) that life on Earth did not occur by itself, it occurred through controlled panspermia, that is, through Earth's deliberate

colonization by microorganisms delivered on unmanned spacecraft by a developed alien civilization, which may have tried to perform terraforming for future colonization.

M. Sherman, a professor of Boston University, put forward the hypothesis of the «universal genome's» artificial occurrence in Cambria to explain the causes of the so-called Cambrian explosion in the evolution of multicellular organisms. Moreover, he insists on the possibility of his hypothesis's scientific verification.

In favour of their views, supporters of the panspermia hypothesis provide two indirect evidences in favour of their views: the genetic code universality and the need of molybdenum availability for the normal metabolism for all living creatures, which is currently extremely rare on the planet. Supporters of the comet panspermia theory deny the life spreading from one planet to other one process's controllability, and suggest its spontaneity and chance.

Taking into consideration the fact that the life spontaneous occurrence's probability on Earth is extremely negligible, the panspermia hypothesis is the most real in comparison with both the evolutionary theory and religious beliefs. Its disadvantage is that it does not explain how and where the first microorganisms to come to Earth were formed; it only indicates the other place where it could have occurred, but does not explain the process and the reasons for the

given occurrence.

1.3. THE EVOLUTIONARY THEORY

The evolution theory is highly ranked in the study of the history of the origin of life on Earth. Jean-Baptiste Lamarck was the first to identify two most common trends of the life on Earth's development: the upward development from simplest forms to more complex and advanced ones and the adaptations' formation in organisms depending on environmental conditions (vertical and horizontal development). In his works, the scientist noted the organisms' historical development, which is not of random but of regular nature and occurs in the direction of gradual and steady improvement. He believed that the organisms' development is not a spontaneous process. In his opinion, «the nature's drive for progress», «the drive for perfection» was originally inherent in all organisms and laid down in them by the Creator. He argued in his paper «Philosophy of Zoology» that subsequent generations are able to inherit acquired useful properties thus forming new species. For example, in his opinion, giraffes generated from antelopes due to the constant extension of their necks when they tried to reach the leaves on the tops of trees.

Ch. Darwin, being inspired by similar examples,

continued the Lamarckian series of assumptions. In his book «The Origin of Species through Natural Selection,» he revealed the main organic world's evolution factors. Approximately at the same time, Alfred Russel Wallace published an article entitled «On the Law Which Has Regulated the Introduction of New Species», in which he came up with the idea of «survival of the most adapted ones».

Ch. Darwin grounded the theory of the gradual evolution of some species into other ones under the influence of such factors as the survival of the most adapted, the struggle for existence, natural selection, and adaptability to environmental conditions.

The essence of evolutionary doctrine lies in the following main points:

1. All the living creatures' types that inhabit Earth have never been created by anyone.

2. Having occurred in a natural way, organic forms slowly and gradually transformed and improved in accordance with the surrounding conditions.

3. The species' transformation in nature is based on such organisms' properties as heredity and variability, as well as natural selection constantly occurring in nature.

4. Natural selection is carried out through a complex interaction of organisms with each other and with factors of inanimate nature; Ch. Darwin called this relationship a struggle for existence.

5. The adaptability of organisms to their living conditions and the diversity of species in nature is the result of evolution.

According to the mentioned above provisions, a variety of species possessing new specific features allowing a better adaptation to the environment (habitat) can be formed within each species. If the newly acquired qualities are inherited, then genetic differences are amplified in subsequent generations due to the selection of properties that ensure the genotypes' survival and the new mutation's accumulation. The mentioned above variety of species adapts better to existing conditions, phenotypically moving away from the parent species. Intraspecific competition leads to the deliberate (selective) removal of the least adapted to the environment individuals and an increase in the number of individuals whose properties favour the survival and reproduction in this habitat. According to the evolutionary theory proponents, such a natural selection is the main mechanism for the new species' occurrence. Evolution is a process of long-term and gradual qualitative changes that ultimately result in the new species' occurrence.

According to some evolutionary theory's advocates, the palaeontological, biogeographic, systematics, plant and animal breeding, morphological, comparative embryology and comparative biochemistry data confirm the evolutionary occurrence of species

through natural selection, although they are not indisputable evidence. Three groups of facts are used to confirm the theory. The first group represents examples of species' minor changes observed within a geologically short period of time in the wild nature, as well as the results of agricultural plants and domestic animals' breeding. The second group is the fossil record, which indicates a significant variability of life throughout the history of Earth. The third group of evidences deals with the similarity of the morphological features of the all organisms' structure, which may indicate their common origin. All explanations of the facts discovered are reduced to a spontaneous random process without any intellectual interference in the programming system.

Charles Darwin formulated his theory of evolution in accordance with the morphological and physiological characteristics, using the natural selection ideas, but did not determine the source of variability in the population. A synthetic theory of evolution combining the Darwinian natural selection's idea with the laws of heredity and population genetics was developed in the middle of the last century. Currently, it is the most developed system of ideas regarding the speciation's processes. The hypothesis of the new genes' recessivity was the impetus for its development; according to it mutations constantly arise in each reproducing group of organisms during the gamete

maturation as a result of errors in the DNA replication. Therefore, the mutation process is the most important evolutionary factor, and the bulk of evolutionary material is represented by various forms of mutations, which are manifested by means of changes in the hereditary properties of organisms that occur naturally or are caused by artificial means. After the different types of isolation's occurrence between populations, they begin to evolve independently, and as a result, genetic differences are gradually accumulated between them, and with time genetic incompatibility is achieved, and crossing becomes impossible.

Julian Huxley, the English biologist and naturalist, indicates in his famous book «Evolution: The Modern Synthesis» (1942) that the species is a system of populations that are reproductively isolated from other species' populations, and each species is ecologically isolated; speciation lies in the genetic isolating mechanisms' occurrence and is carried out mainly in conditions of geographical isolation. According to the J. Huxley's ideas, reproductive isolation is the main criterion that indicates the speciation's completion.

According to the synthetic theory of evolution, the formation of new species occurs as a result of the separation of individuals of one species into groups that do not interbreed, and the very evolution is defined as the populations' genetic structure change over time.

The allele's frequency changes thus becoming more or less common compared to other forms of this gene. The acting evolution forces lead to changes in the allele frequency in this or that direction. The change disappears when the new allele reaches the fixation point – it completely replaces the ancestral allele or disappears from the population. Mutations increase the population's variability due to the emergence of new genes' allelic variants – mutational variability. If any allele increases the organism's adaptability more than other ones of the given gene, then the share of this allele in the population will increase with each generation, i.e., selection takes place in favour of this allele. Evolution through the natural selection is a process in which mutations increasing the organisms' adaptability are fixed. As a result, three processes are necessary for the evolution's implementation: mutational (to generate new variants of genes with a low phenotypic expression); recombination (to create new phenotypes of individuals), and selection (to determine the compliance of these phenotypes with the given living conditions or growth).

Judging by the palaeontological chronical and by the mutations' speed indexes, this concept advocates believe that it takes in average 3 million years to reach the complete incompatibility of genomes, which makes crossing impossible. Therefore, it is a rear event to witness the new specie's formation in natural

environment.

In addition to mutational, there is also the combinatorial variability distinguished, which is determined by recombination, but it leads not to the allele frequencies' changes but to their new combinations.

The gene drift is one more factor contributing to the allele frequencies' changes.

The synthetic theory of evolution differs from the Ch. Darwin's evolution in the following points:

1. It distinguishes a population in which the same species individuals are able to interbreed, and but not an individual or a separate species.

2. It considers a steady change in the population genotype's change the process of evolution.

3. Mutational processes and isolation are treated as the leading factors.

4. The mutational and recombinative variability are the material for evolution.

5. Natural selection is considered as the main reason for the adaptations and speciation's development.

In accordance with the synthetic theory of evolution speciation is a time-consuming process. However, J. B. S. Haldane found a discrepancy between the real speciation speed and the expected one based on the population genetics models (Haldane's dilemma) by means of mathematical calculations. He

published an article «Cost of Natural Selection» on the basis of his research in the «Journal of Genetics» scientific edition. D. Haldane calculated the mathematical relationship between the intensity of selection and rate of the existing alleles' substitution in the population by other, more adapted ones. He also evaluated the mortality rate caused by the positive natural selection, while maintaining the mutant gene. According to his calculations, the speciation would have taken much more time for the stage-to-stage formation than it has actually taken (according to the paleontological data) for the implementation of speciation would require much more time than is actually observed (according to palaeontological data).

Later, M. Kimura, while studying the rate of amino acid substitutions in proteins, found that for mammals the substitution rate for the genome per generation was several hundred times higher than the Haldane's estimation. Kimura showed that in order to maintain a constant population size while preserving mutational substitutions, the rate of occurrence of which stands to one substitution in two years, each parent should produce $3.27 \cdot 10^6$ descendants so that one of them survives and begins to breed. The mismatch of this impressive number with real data served as the basis for the «Neutral Molecular Evolution Theory» development.

Another argument in favour of this theory's

development was the fact that the assumption regarding more frequent occurrence of favourable mutations (in reality, such mutations are rather rare compared to the adverse ones) was necessary in order to explain the molecular evolution rate provided it proceeds under the natural selection influence.

The «neutral evolution» hypothesis' main content lies in the point that majority of the changes at the macromolecular level are not controlled by natural selection as Darwin's theory states, but are determined by the random drift of neutral mutations. According to the authors, this theory is proved by a number of direct and indirect arguments. At the same time, the neutral molecular evolution theory does not turn down the role of natural selection in the development of life on Earth, but emphasizes the proportion of mutations that possess adaptive significance. This theory has demonstrated that the processes associated with speciation are still far from a final explanation based on population-genetic models.

Modern synthetic theory of evolution has a number of disadvantages. It makes no distinction between macroevolution and microevolution, considering one the continuation of other one on a larger scale. Such view's advocates have detected genetic changes from the population's original composition from generation to generation, in various laboratory scientific experiments, including the model

organisms' development (drosophila, mice, and bacteria). It gave the grounds to assume that both microevolution and macroevolution are based on the same mechanisms and, in their view, minor changes can lead to significant ones over time, but the authors provide no evidences to prove it. Experts have no doubts regarding the microevolutionary processes within the species, for example, the hair colour or skin colour change, the beak shape, etc., due to which many types of breeds and sorts can exist within the same species. However, microevolution is determined by the alleles frequency's change in a population (i.e. genetic variability due to such processes as selection, mutation, genetic drift), while the macroevolution involves changes at the species level or higher.

Fred Hoyle argued in his books «The Intelligent Universe» (1983), «Mathematics of Evolution», «Evolution from Space» (1981) and «Why Neo Darwinism Does Not Work» (1982), that the calculation results state that the Neo-Darwinism theory either does not work at all, or works only partially. Many of the common arguments that biologists use to confirm evolutionary theory turn out to be doubtful.

Academician Yu. P. Altukhov (Алтухов Юрий Петрович), a Director of the Russian Academy of Sciences' Institute of General Genetics named after N. I. Vavilov, the «Successes of Modern Biology» journal editor-in-chief, points out in his book «Genetic

Processes in Populations» (2003) criticizing the synthetic theory of evolution:

«In any case, it is becoming more and more obvious that evolutionary consequences are not necessarily concluded from the results of a study of both natural and experimental populations with their systemic organization taken into account. On the contrary, it confirms once again that the genetic variability of the simplest populations, traditionally regarded as the evolutionary process's elementary units, is nothing but a stabilization mechanism for the species' hierarchical, historically formed structure. Such a conclusion contrasts with the population genetics' tradition, which has always been focused on the dynamics of populations, identifying it with the very evolutionary process».

However, the synthetic theory of evolution still remains the only scientific model to explain the known facts of the species' origin and development. At the same time, the contradictions accumulated require the development of other theoretical concept of the of life occurrence on Earth.

1.4. THE THEORY OF EVOLUTION'S DISPUTABLE ISSUES

Many scientific researchers have been focused on the evolution doctrine's problems, but it is absolutely

clear that the unity of opinion regarding all its provisions has not been achieved yet. A rather general descriptive definition of the term «evolution» is the only aspect that arises no discussions. Many of the evolutionary theory critics drew attention to the low, in their opinion, probability of certain facts and events in the living beings' development.

Among the number of the Darwinism critics appeared immediately after its appearance, the Russian philosopher N. Ya. Danilevsky is worth paying special attention, who carefully analyzed all the papers by Charles Darwin, as well as the critical papers related to them and introduced his own views on evolution. In his three-volume work, «Darwinism. A Critical Study» (1885), containing almost 1,500 pages, he comprehensively criticized Darwin's doctrine. He wrote the following: «On the one hand, it is impossible for a mass of accidents not related to each other, to produce order, harmony, and surprising expediency; on the other hand, a talented scientist, having all the data of science and extensive personal experience in hand, shows you in a clear and obvious way how simple, however, it can be done. Only after a long study and even longer consideration I saw the first way out of this dilemma, and it was a great joy for me. Then a lot of such exits had been opened so that the entire theory building was riddled with, and finally fell apart in my eyes into an incoherent pile of garbage».

Much of written by N. Ya. Danilevsky still remains valid nowadays. In his papers, he provides 15 main incorrect conclusions formulated by Ch. Darwin and 10 logical errors that had led to them. Thus, Ch. Darwin did not indicate any single breed that could have arisen through the minor individual changes' gradual accumulation, and greatly exaggerated the role of artificial selection in the formation of the plants' arable forms and cultured animals, and also ignored large spasmodic changes, as this made his theory useless and ruined the natural explanation of organic expediency. He considered it inappropriate to extend the conclusions drawn from the domestic animals and arable plants' observations to organisms living in natural conditions. Despite the domestic animals' high degree variability obtained through the artificial selection, it does not go beyond the species. The role of the very artificial selection is greatly exaggerated. Selection is valid only within the species. It is impossible to cross the border between species, and if selection is stopped, the species returns to its original wild form. The thesis regarding treating varieties as «beginning species» is based on facts that cannot lead to such conclusions.

N. Ya. Danilevsky pointed out that free crossbreeding in natural conditions leads to the fact that all individual differences cannot be accumulated and are constantly destroyed. In his opinion, the vitality of

an organism in case of the environmental conditions change depends on the simultaneous change in a large complex of features, and any single change will be harmful, as it disrupts the existing relationships. If the trait turned out to be useful, it should be called not an individual variability, but a significant change in the entire population, i.e., the change should affect the majority of the population at once. Recognition of the changes' simultaneity equals the recognition of the principle of the development appropriateness by Baer (Karl Ernst Ritter von Baer Edler von Huthorn).

The critical paper author stated that the struggle for existence does not possess selective properties, which means that natural selection will not work. It is confirmed by the absence of transitional forms between both living species and fossil forms.

N. Ya. Danilevsky believed that the numerous facts that species have useless traits for them despite the fact that they are useful for other species contradict the selection theory. Such «useless» signs often include the most significant ones which serve the basis for the taxonomy from genus to type is built. Ch. Darwin, constructing hypothetical examples of the trait advantage's increase from generation to generation, relied on the usefulness of new traits, taking them in ready-made form presented in the formed species because of the lack of real transitions.

N. Ya. Danilevsky stated in his scientific papers

that development is performed in accordance with the law that while its implementation makes expediency turn out to be a form of some inner plan. The types' transformations are conceivable only in case of recognition of the internal law of development (every living organism possesses it). It is absurd to think that chance and probability could substitute mind and intelligence. The issue of expediency in nature has a much more important and profound philosophical meaning. In addition, natural selection provides a constant adaptation of species to a changing environment, but the process does not have the gift of foreknowledge; the natural selection responds only to the environment in the present and therefore, evolution cannot have any goals.

The evolutionary theory supporters believe that it is confirmed by the fossil evidence (fossils), the age of which approximately stands for 3.5 billion years. They show a story of the diversity's gradual complication and expansion, which has led to a great diversity of life forms that inhabit Earth today. There are now doubts that there is a strict order in the geological strata, and the typical fossils are detected in various layers. Sedimentary rocks typically occur in layers, so the deeper layers contain fossils formed at an earlier period. The evolutionary theory's supporters draw their conclusions about the main directions of the living organisms' evolution while comparing fossil forms of

the successive layers. When the evolutionary theory became the scientific Orthodoxy (dogma), any fossils found by paleontologists, were a priori adjusted to the generally accepted points. Their interpretation in any other way was treated as unscientific one.

However, these were the data accumulated in paleontology that hit the evolutionary theory. While examining the remains and layers of Earth's crust, one can be sure that many organisms appeared on Earth all of a sudden. For example, remains were found in the Cambrian layer that belonged to such complex invertebrates as snails, Trilobite, sponges, worms, *Aurelia aurita*, starfish, floating crustaceans and sea lilies. An interesting fact is that all these species, different from each other, appeared at the same time and had a complex structure. Therefore, this amazing phenomenon was called the «Cambrian explosion» in Geology.

According to the concept by Ch. Darwin, there had been minor changes for a long time that being «accumulated», gradually led to the evolution of simple species into more complex ones. Judging from such an assumption, paleontological excavations eventually should have detected transitional forms from one species to other. Their number should have been huge and should have demonstrated how various species, classes, orders and families had been evolving. However, Cambrian rocks lack transitional forms from

primitive organisms to organisms with a complex perfect structure. In geological deposits, it is not the stepwise appearance of new species, genera, and families in the process of evolution that is observed, but their sudden occurrence. They are not preceded by any transitional forms. For example, there are no traces of ciliary worms, the class of which unites more than 3,500 species.

The living organisms found in the Cambrian layer possess such developed and complex physiological systems as the eyes, gills, and circulatory system, which do not differ much from modern ones. These complex invertebrates are by no means associated with unicellular, which were the only living organisms preceding them. The trilobite has complex eyes (consisting of hundreds of hexagonal fragments) that have a two-lens system and, as David Raup, professor of geology, said, «Have a design that can be developed by a well-educated and gifted contemporary optical engineer». Moreover, such organized and complex animals have nothing to do with the simplest unicellular organisms that were the only living inhabitants of Earth prior to invertebrates. This fact clearly refutes the evolutionary theory point that living organisms evolved from primitive into complex ones. It should be noted that nowadays dragonflies and bees have the similar system of the trilobite eyes' structure.

The Mesozoic era also impresses one by the

sudden transition of reptiles to the mammals period, many of which are already significantly different from each other despite the fact that they appeared within the same geological period.

The alleged transitional forms were found only for the phylogenetic series from Hyperion to modern horse. The archaeopteryx's discovered remnants, according to some experts, can be considered an intermediate form between reptiles and birds with significant part of a hypothesis. The fossils' state indicates that Archaeopteryx had feathers, wings and a beak, like a bird. However, this fossil representative had signs that gave palaeontologists the grounds to suggest its affinity for reptiles – teeth on its beak and claws on its wings. None of these two features confirms that Archaeopteryx evolved from reptiles. In addition, according to radiometric dating, Archaeopteryx cannot be considered the missing link between reptiles and birds.

Nowadays it has become apparent to many palaeontologists that the fossils do not contain any alleged transitional forms at all. No transitional links' sequential series, as well as individual random transitional forms, have ever been found among the minerals. At the same time, long periods of the same organisms' stable existence within a relatively short time gave way to the new species' rapid formation; they appeared completely formed in the fossil record.

Despite the lack of continuity in the fossil record, which is strong evidence to oppose the theory of the new species' formation through gradual evolutionary changes, fossil evidences do confirm the progressive increase in the organisms' complexity.

The evolutionary theory supporters, in an attempt to explain the lack of transitional forms in the geological record, put forward the «discontinuous equilibrium» (punctuality) hypothesis, according to which evolution is carried out at an uneven rate with long periods of stability, with rapid qualitative leaps alternating the stability period that occur in small populations of organisms. Due to this, some new species arise very quickly, and the intermediate links are practically not found in the geological record because of their minor quantity.

These evolutionary sequence «leaps» originated the term «spasmodic evolution».

The evolutionary theory supporters believe that the paleontological data' incompleteness can be explained by the fact that dead organisms were quick to decompose or were eaten by carrion-feeding animals. But then a natural question arises: why did this happen to transitional forms and did not affect existing species?

Charles Darwin and Louis Dollo formulated the «law of irreversibility of evolution,» according to which species cannot return to the state of their ancestors. At the same time, the examination of the

fossilized remains of the *Gastrotheca guentheri* species frogs stated that they lost their lower teeth 230 million years ago, but the teeth reappeared about 20 million years ago. Thus, this does not fit the proposed concept.

Cases of the useful genes' loss are also inconsistent with the evolutionary theory. Such a phenomenon was found among the stick insects' winged species evolved from the wingless ones, which, in turn, had ancestors with wings. This case of the complex trait loss and its subsequent restoration in the evolutionary development may indicate that in this case the genetic information is regulated not by living conditions and selection, but by purposeful and thought-out changes. The giant forms of almost all types of contemporary living creatures have been discovered among the fossils. Mammals were often twice the size of their modern representatives: turtles, bears, camels, panthers, pigs, rhinos, elephants, tigers, wolves, birds and insects. The very fact of such giant fossils' existence contradicts the evolutionary theory according to which animals evolve into more complex forms with an increase in their size.

It is also difficult to explain from the point of view of the evolutionary theory why the mental abilities improvement was accompanied by the loss of the ability to regenerate organs, the ability to detect radiation and earthquakes, as well as many other useful properties that could be improved along with the

development of thinking. But that did not happen. If regeneration is the result of evolution, then why the ability to regenerate organs has been lost? It seems to be a necessary process that contributes to the preservation of the species. The inexplicable appearance of organs with a complex structure, such as eyes is one more weak point of the evolutionary theory. Ch. Darwin stated that the sensitive to light organs which even the simplest creatures possess, can be improved, beginning with simple pigment spots up to the facet eyes of insects or the human eye's complex high-precision visual system. This assumption does not provide a description of each intermediate stage formation and why each of the stages, taken separately, is useful for the survival of the body. It is also fundamentally impossible to explain the emergence of such complex organs as the liver or brain, or complex behavioral programs such as bee dancing – since these objects and phenomena favour survival only when they are fully «packed» and individual minor changes do not lead to any evolutionary advantage and therefore could not gain a foothold.

The supposed evolutionary transition of living beings from water to land is also doubtful. There are a number of facts to testify the impossibility of such a process. Organisms that lived in water and subsequently left it, should have had developed muscles and skeleton capable of withstanding the weight of the

body as well as providing energy for movement. A major part of terrestrial creatures consume up to 40 % of energy on the transfer of their bodies. In addition, it is pointless to try to explain the complex of organs and internal secretion substances involved in this process by random mutations. Besides, aquatic and terrestrial inhabitants have different temperature regimes. The temperature conditions are unstable and fluctuate on land, whereas the temperature of the habitat is changing slowly and insignificantly in water. Earth creatures have the developed metabolism system, due to which a relatively constant body temperature is preserved, regardless of the ambient temperature changes. Thus, aquatic animals are equipped with physiological mechanisms that are designed for life in conditions of constant temperature, and for transition to dry land they had to transform the body quickly, by means of the protective means of body temperature regulation's use with the environment state taken into account. It is doubtful that random mutations could lead to such serious and highly organized changes. Therefore, there is every reason to believe that land animals were created on the basis of aquatic organisms by creating special systems for existence in the atmospheric environment. For example, aquatic animals are capable of filtering and excreting excess chemicals, particularly ammonia, while land representatives use a well-developed system of kidneys,

excreting toxins in the urine consuming as little liquid as possible of the for cleaning the body.

If, according to the evolutionary theory, species had been evolving and adapting to the environment for millions of years, the question arises: why the humoral regulation of living organisms which have been living in the atmospheric environment for millions of years has neither reduced nor modified? The existing system of humoral regulation, provided by the system of blood vessels and heart, is adapted to the aquatic environment and is imperfect and vulnerable in the atmospheric one. At the same time, despite the new species' occurrence on land, the principle of regulation has not been changed. If evolutionary processes can contribute to significant changes in the living organisms' properties, adapting them to the conditions of the environment, why not a single species capable of existing in the atmospheric environment regardless of the water supply has ever occurred within millions of years? Why has the water dependency not disappeared? The humoral regulation of the body should have disappeared and been replaced by other regulation system more adapted to the atmospheric environment when animals moved to land. However, this did not happen on land and functional system has not been changed.

If animals, including humans, have been existing on the surface of Earth for a huge period of time, why are many physiological biorhythms adapted to the lunar

rhythms that most aquatic animals follow?

Dolphins are known to communicate in the infrasonic range. If for them, the aquatic animals, it is understandable, it becomes rather incomprehensible why elephants living on land communicate in the same range? It contradicts the evolutionary views of natural selection. The development of moral qualities inherent to a human also contradicts the evolutionary worldviews. If a human has descended from a wild ancestor, then the one who survives within the natural selection should not have such categories as conscience and morality as they should have disappeared in the process of evolution. A conscientious human would not have a chance to survive. Meanwhile, this concept remains in humans, although not yet sufficiently fixed as an echo of the animal state. A human has the opportunity of daily choice between good and evil, and society analyzes his choice and assesses this choice on the basis of moral considerations formed on the grounds of mind, but not evolutionary principles. According to Kant, this is proof of the Creator's existence.

Fred Hoyle questioned many of the arguments used by biologists to support the evolutionary theory. In his books «Evolution from Space» (1981), «Why Neo Darwinism Does Not Work» (1982), «The Intelligent Universe» (1983) and «Mathematics of Evolution» (1999) he provided a profound analysis of the

quantitative aspect of the biological evolutionary theory and came to the conclusion that its speed is too slow for the life improvement within several billions of years. The calculations results allowed him to conclude that the probability of the life formation from the inanimate matter is one out of the number with 40 thousand zeros (Nature, 1981, 294, No. 5837, 48). F. Hoyle with meticulous accuracy calculated that the level of complexity of a simple living cell is comparable to the number of parts of an airliner. In the book «The Intelligent Universe» (1983), he compared the spontaneous occurrence of life with the possibility of the Boeing 747's appearance after a hurricane over a dump. At the same time, the chances are not less than the chance to assemble a simple living organism from the separate chemical «bricks».

A similar idea was expressed by Edwin Conklin, a zoologist and a Princeton University professor, specialist in the field of the evolutionary theory. In his opinion, the assumption of the life occurrence through a chance can be compared with the assumption that a fledged dictionary is the result of an explosion in the printing house. Only by means of the common sense's rejection can the Universe be considered as a product of pure chance.

According to the dogmatic nature of its ideas, the evolutionary theory is not inferior to the religious worldview, as both points of view are based on the

belief of their views truth. Both worldviews require belief in their own rightness and categorically reject evidences that go beyond the concepts of these views. The scientific community does not recognize the validity of the arguments provided referring to the fact that critics misinterpret the scientific evolutionary theory's concept. Therefore, critics of evolutionism believe that Darwinism has turned into a kind of religion which preaches faith under the guise of science. The phrase «God has arranged it» or «This has happened through evolution» can serve the answer to any question. Leonard Matthews, the British zoologist, admitted in the preface to the edition of the Charles Darwin's book «The Origin of Species» (1971): «Thus, a belief in the evolutionary theory is completely analogous to the belief in a special (premeditated) creation. Faith cannot be denied, unlike scientific views. Proponents of both theories consider only their own one to be true, but the truth of any of them has not yet been proven.

The evolutionary ideas contain too many contradictions for a single scientific theory and they are the ones people try not to notice or discuss. Today it is the only fundamental theory in biology that can explain the life's development and diversity. Often, when a scientific theory gains fame, it hinders the critical understanding of scientific facts contradicting it. No one can decide to abandon it, since there is no

alternative to it. At the same time, the data accumulated up to now demonstrate the existence of a complex process of the organisms' complexity progressive increase, which can be interpreted on the basis of other concepts.

1.5. SCIENTIFIC CREATIONISM

Pope Pius XII, the head of the Catholic Church, in his report «Evidence of the Existence of God in the Light of Modern Science», delivered at a meeting of the Vatican Academy of Sciences on September 28, 1951, stated the following: «The creation of the world in time, and therefore the Creator of the World, and therefore, God is the word that we demand from science and which the contemporary generation (churchmen) expects from it». According to him, «true scientists» are only those who scientifically substantiate and prove «the infinite harmony of the Almighty God». The creationism (creatio – creation) is such a trend in the natural sciences, which explains the origin of the world through an act of the supernatural creation and denies evolution. His supporters claim that scientific evidence of the biblical creation act and biblical history can be obtained. Henry Morris who is de facto considered the founder of the modern «scientific creationism» (Creation Science), established the Creation Research Institute, which has become the main center of this trend.

A religious worldview advocates argue that if matter is eternal, then God granted it the ability to move and change. Life occurred as a result of a supernatural event in the past.

Creationists of the past centuries, describing various animals and plants' species, assumed that the species are unchanged, and the number of existing species equals the number of originally created ones by God with the exception of the deleted species. From the point of view of creationism, no accidental genes recombination could produce such a huge number of the living creatures' species, each of which is so well adapted to its environment. The evolutionary theory's opponents put forward a hypothesis according to which representatives of each originally created genera were created with a set of certain characteristics and the potential for a limited number of changes.

The creationism supporters also claim that conditions on the ancient Earth ruled out the possibility of abiogenesis (spontaneous generation). In particular, the absence of oxygen and its recovery nature in the early atmosphere is denied.

According to the «Flood Geology» supporters, representatives of all taxa occur «fully formed» in the fossil record, which refutes evolution. Moreover, the occurrence of fossils in stratigraphic layers reflects not the sequence of flora and fauna that had been succeeding each other for many millions of years, but

the sequence of ecosystems tied to different geographical depths and heights. The extremely slow speeds of geological processes such as erosion, sedimentation and mountain building cannot ensure the preservation of fossils, as well as the intersection of several layers of sedimentary rocks with some fossils (usually tree trunks).

The scientific creationism's advocates believe that if one analyzes any process of change that possesses the global nature, one will find out that almost all such calculations will indicate the much younger age of Earth than is necessary for the life and man's occurrence through evolutionary processes. Usually, young-Earth creationists consider this age to be approximately 6 or 7.5 thousand years. The old-Earth creationists on the contrary acknowledge modern scientific estimations of the age of Earth – 4.6 billion years and the Universe – 13.7 billion years.

Creationists claim that certain evidences do not provide reliable information about the past. Radiocarbon analysis, which is based on a comparison of the stable carbon isotopes' content in the materials with the amount of the ^{14}C radioactive isotope, is the most often criticized one. In their opinion, radioisotope dating methods based on some isotopes half-life's constancy may be inaccurate and provide unreliable results. However, independent methods have confirmed the radioisotope method's accuracy, and some of these

provisions have been defined more precisely during the method's development. In addition to the carbon isotopes, there are a number of other isotopic elements that refine and correct the analysis results.

On the contrary to the modern synthetic evolutionary theory's advocates who make no differentiation between macroevolution and microevolution, considering one of them the continuation of the other, creationists claim that microevolution and super macroevolution are different. According to creationists, experimental evolution study used microorganisms and the data obtained cannot be transferred to more highly developed organisms. Such processes indicate the microevolution only, and thus, cannot be extended to macroevolution. The creationists do not deny the existence of microevolution, and it can easily be confirmed: its existence is indisputable on the example of the dog breeds' variety of.

Creationists have established museums in four countries of the world: 21 museums in the USA, 5 museums in Canada, one in the UK and one in Turkey. «The Creation Testimony Museum» was established by Carl Baugh in Texas. In the American city of Cincinnati, there is one larger museum of creationism, in which a special section is dedicated to the Flood, Noah's Ark and the substantiation of the idea that the world was created no more than 10 thousand years ago. Creationism does not provide a satisfactory answer to

the question about the causes of the very Creator or the Supreme Being's occurrence and existence, postulating its eternity. In addition, the question arises: if the world has been created by God, then where has God himself come from? One has to assume that there is a creator for the very God («Who created God?»). This disputes the claim that God is the first cause of everything («chicken-and-egg problem»).

According to Karl Popper's criterion of scientific character, creationism is not a scientific theory; it is a metaphysical concept and religious faith, since the introduction of concepts untestable by scientific methods (such as the Creator God) does not meet the principles of verifiability / falsifiability.

In 2011, 42 Nobel Prize winners in Chemistry, Physics, and Medicine wrote an open letter supporting the repeal of the Louisiana Science Education Act, which actually allowed the school to teach creationist views instead of scientific ones. Creationists in Kansas demanded the evolutionary theory's teaching in schools because of its controversial nature. In their view, students should be taught alternative points of view in secondary schools. Such a proposal was supported by the then US President George W. Bush. It served as the basis for the «Teach the Controversy» campaign, launched by the «Discovery Institute» public organization. The purpose of this campaign was to popularize the «Intelligent Design» doctrine. However,

the US academic circles and judicial bodies rejected these arguments.

On October 4, 2007, the Parliamentary Assembly of the Council of Europe issued a resolution titled «The Danger of Creationism in Education», which stated that «creationism in all its forms, such as «intelligent design» or «higher intelligence», is not a scientific discipline and is not subject to scientific study in European schools along with the theory of evolution or even instead of it». By this resolution, MPs called on the governments of 47 Council of Europe member states to «strongly oppose» the teaching of creationism as a scientific discipline.

1.6. INTELLIGENT DESIGN THEORY

The earliest logical arguments for intelligent design's substantiation were laid out as far back as 1806 by William Paley in the book «Natural Theology». The author proposed a «watchmaker concept,» which is called «argument from design». It is grounded on the following example: imagine that we have found a watch in a field. It would never occur to anyone to speculate that this watch had occurred itself as a result of a chain of random interactions of molecules. It is quite evident that the watch occurred as a result of the intelligent design, with a watchmaker as the author of it. The Universe and biological systems

are much more complicated than watches. Paley argued that life obviously could not have existed if it had not been created by a «watchmaker» with an immeasurably more powerful mind than that of simple watches' creator. The popularity of this analogy has prompted Clinton Richard Dawkins, an American biologist and distinguished Darwinist popularizer, to continue arguing with Paley in his book «The Blind Watchmaker». He showed that the blind process of evolution acts as the «creator» of complex organisms observed by people. Dawkins's position is that natural selection fully explains the apparent practicality and complexity of biological diversity, and even if we draw an analogy with a watchmaker, we mean a soulless, unreasonable and blind watchmaker. In his opinion, the human genom «contains a huge amount of «garbage», idle and even deadly genes, such as, for example, oncogenes. Only a blind watchmaker but not a «wise» creator could create all this. «Dawkins turned out to be wrong, as the important function of this «garbage» has been defined.

In addition, Dawkins's findings in favour of evolution were criticized by Jonathan Sarfatti in his book «The Greatest Hoax on Earth? Refuting Dawkins on Evolution» (2010).

Stanislav Lem in his paper «Are We Alone in the Universe?» (Czy jesteśmy sami w kosmosie? Nurt. Poznan, 1977, №. 5) noted that «The action of the

forces of nature can explain, for example, the occurrence of a star, amoeba or thunderstorm can be explained by the nature forces actions, but not the occurrence of a watch. The watch would not arise «itself» if we had been waiting for this for billions of years.

«The Intelligent Design» movement and theory's modern founders are William Dembski, the American mathematician and philosopher, and Michael Behe, the American biochemist, Professor of the University of Pennsylvania at Lehigh and a Senior Fellow at Discovery Institute's Center for Science and Culture. They treat their views as a scientific theory, according to which certain features of the Universe and life are best explained by an intelligent first cause and could not occur as a result of natural processes without conscious control.

William Dembski, the mathematician, philosopher and theologian, developed the notion of «specified complexity». In his opinion, if an object possesses a certain level of complexity, it is possible to prove its creation by the intelligent creator, as it could not occur due to the natural processes. For example, a letter of the alphabet makes sense, but does not have complexity; a sentence composed of a random set of letters has complexity, but does not make sense, while Shakespeare's sonnet is both complex and definite. The same principle, in his opinion, is applicable to

biological objects, especially to the DNA sequences. W. Dembski believes that systems with the too low natural occurrence's probability belong to a «certain complexity». The point of view of W. Dembski regarding the relationship between the «Intelligent Design» theory and Christianity is the contradictory one. He argued that «Intelligent Design» does not stand for God, but may be of a cosmic origin: «It could be space aliens. There are many possibilities. «One of his books is entitled «The End of Christianity: Finding a Good God in an Evil World» (2009). At the same time, in a number of cases, he defined the idea as the Christian God's plan and associated it with the Christian materialistic replacement. W. Dembski entitled one of his books as «Intelligent Design: The Bridge between Science amp; Theology» (1999). In my opinion, the «Intelligent Design» ideas cannot be associated with the religious ideas about God, which are preached by creationists and modern theologians. If the «Intelligent Design» advocates the idea of God, they contribute to the Christianity's false and harmful ideas. The creation of the surrounding world has deeper roots than bizarre religious ideas about God, his son and the Holy Spirit and all saints.

Michael Behe, in his book «Darwin's Black Box» (1996), with the subtitle «Biochemical Challenge for the Evolutionary Theory,» claims that the modern biochemical science's findings are incompatible with

both Darwin's evolutionary theory and its more modern modifications often referred to as Neo-Darwinism. The book contains numerous scientific facts, which, according to the author, provide evidence of the spontaneous life occurrence's impossibility.

M. Behe introduced the «Irreducible complexity» term which means that a single system, composed of several well suited to each other parts provides its main function. Elimination of one of the parts leads to the function's failure. Natural selection could not have created irreducible complex systems, since they function only if all the components are available. According to M. Behe, such systems are the colon bacillus (*Escherichia coli*) bacterial flagella, the blood coagulation cascade, eyelashes, and the acquired immunity system. He provides several examples of complexity that cannot be simplified. For example, the absence of at least one of the many proteins involved in the blood coagulation mechanism will lead either to inability to coagulate and bleeding, or to complete coagulation of the entire blood mass in the body and to death, on the contrary. This complexity presumably means a very low probability of an accidental occurrence of such a system as a result of uncontrolled chaotic chemical interactions between its components.

The eye also cannot be simpler, since the absence of any part will lead to a disruption of its functioning. The creation of such a system should be planned and

programmed by a highly developed intelligence. On this occasion, Isaac Newton, the great physicist, said the following: «Was the eye created without understanding optics, and the ear – without the knowledge of acoustics»?

In another example, having listed the bacterial flagellum numerous components, M. Behe demonstrated that such a system was too complicated to develop from a simpler predecessor, and Darwin's evolution could not lead to the occurrence of such an uncomplicated complexity. The flagellum is designed specifically as a means of bacteria transportation and is composed of many interacting parts. In the absence of any of its components, functioning becomes impossible in case of any of its components' absence.

M. Behe argues that the «irreducible complexity systems» existing in the body cannot be formed by means of the sequentially added elements, since the each element's useful function is launched only when it is integrated into a complete system. But in such a case, organisms are the product of rational consciousness; that is, created in accordance to the plan. If the morphological evolution of animals can still be somehow imagined, then molecular one is difficult to imagine. The key point of M. Behe's argumentation is that in no scientific source provides one with the detailed, testable scenarios of how incredibly complex biochemical systems could be formed under the

influence of the evolutionary processes. In his opinion, the more complicated the system, the less its spontaneous occurrence likely.

M. Behe states that the alleged irreducible complexity could not be the result of an evolutionary process and therefore it can only be explained through the intelligent design. He does not deny microevolution based on Darwinian mechanisms that adapt the species to specific environmental conditions, but these mechanisms are not able to carry out structural changes in the body and generate the «inexcusable complexity» systems. As a result of the calculations, the scientist was able to establish extremely low values of the complex organic molecules' spontaneous nucleation probability by means of calculations performed. Opponents of M. Behe believe that this value is explained by the extreme scarcity of information regarding the conditions under which chemical reactions can take place leading to the occurrence of such molecules. Therefore, this number cannot be considered as seriously justified one.

The irreducible complexity concept's critics believe that in the course of evolution something which was just beneficial at first, may later, with the change of other parts, become necessary. Moreover, various parts of the system can spontaneously change, acquire other functions, or, having lost their functions, be removed from the system. For example, scaffolding supporting

the «irreducible complex building» is necessary until the building can stand on its own. There are also the evidences provided that the bacterial flagellum has a precursor possessing proteins that are homologous to ones found in the bacterial flagellum. It should be noted that there should have been someone to create scaffolding and the flagellum predecessor. Nothing comes out of nowhere.

M. Behe's doctrine opponents suggested that some parts could be temporarily borrowed from other organisms and simpler molecular systems. However, Scott Minik, who has been studying flagellar bacteria for 20 years, refuted this assumption having proved that 30 out of 40 parts that constitute the bacterial flagellum are unique and could not have been borrowed from any other system. Even if such parts had been found, borrowing would have been just a part of the problem, since its functioning requires not only specific details, but the exact assembly sequence as well.

Kenneth Miller, a biologist from Brown University, demonstrated a computer animation of the flagellum's performance. He began to disassemble the «mechanism», removing dozens of parts from it, not one at a time. In the end, he removed a significant portion of the complex system, but the remaining parts continued functioning. It is believed that these data have refuted the main argument of M. Behe regarding the indivisible complexity. However, I have a question:

can a computer animation, in which the movement of each flagellum part is programmed, correspond to the living organism's functional characteristics?

Mark Perakh, a professor of Mathematics and Statistics of California State University, Fullerton, in his critical article «Intelligent Design or Blind Accident? «A clash of Two Worldviews» expressed the opinion that many biochemical systems described by M. Behe are characterized by excessive complexity. If so, it can be explained either by the result of the chaotic uncontrolled events' sequence, or by the irrational design. In the absence of evidence that the complexity of the system is irredundant, this complexity is more likely to indicate a blind incident than the rational design. However, I believe that M. Perakh is also wrong in this aspect. It is not the excessive complexity that is observed, but the minimal complexity capable of the function's provision.

Many biochemical systems described by M. Behe are not characterized by excessive complexity; they are the rational complexity necessary to perform certain complex functions. These difficulties are not excessive, but rational.

Rukhlenko I. A. (Рухленко Илья Александрович) (Dean of the faculty of ecology of Volzhsky University named after V. N. Tatishchev) in his two-volume book «What is the Answer to the Darwinist?» gives practical advice to people who have

skepticism towards the modern theory of evolution, but are engaged in verbal disputes with sticklers for Darwinism. The author explains in detail that they should respond, if they refer to the following:

1) Palaeontological; 2) molecular genetic; 3) comparative anatomical; 4) embryological; 5) bio-geographical «evidences of evolution». Especially considered in detail the examples of observed evolution, based on the empirical void. They are unacceptably few and most of them are not examples of evolution. In addition to the of «evidences of evolution» criticism, the book covers a large number of facts related to different areas of biology that contradict the concept of natural evolution, and explains them by means of the Intelligent design's different theories. The analysis of the advantages and disadvantages of the Intelligent design's theory compared to the theory of natural evolution is provided. The conclusion is that it is the concept of continuous creation that successfully explains most of the biological facts today.

The «Intelligent Design» movement's leading representatives, working for the «Discovery Institute» non-profitable public organization, consider it as a scientific theory, according to which certain features of the Universe and life are best explained by an intelligent first cause and could not occur as a result of natural processes without conscious control. Intelligent design argues that there are enough evidences in nature

that life and nature are the result of a thoroughly thought-out design plan. Nature can be treated more as a result of preliminary planning, but not as a simple adaptation's consequence.

Books dedicated to the Intelligent Design «The Signature in the Cell», «Darwin's Doubt» (S. Meyer), «Undeniable» (D. Ax) and «Darwin on Trial» (Ph. E. Johnson) are published in significant circulations and are sold well. However, works dedicated to this problem are not accepted by the peer-reviewed journals and scientific conferences. The «Intelligent Design» concept does not find recognition as a scientific theory and is considered as pseudoscience in the vast majority of American scientific organizations.

The «Intelligent Design» movement's leading representatives work for the «Discovery Institute» non-profitable public organization based in Seattle (USA). It supports the promotion of the introduction of the creationist anti-evolutionary beliefs in the US curriculum along with generally accepted scientific theories. In 2005, the «Kitzmiller against Dover School District» lawsuit's verdict was that the directive to teach Reasonable Design as part of natural science subjects as an alternative to the evolutionary theory contradicts the First Amendment to the US Constitution. The «Intelligent Design» is not a scientific theory and has a religious nature served as the basis for such a verdict.

Within 2001 to 2010, the Discovery Institute staff collected about 700 scientists' signatures under the «Scientific Disagreement with Darwinism» thesis to show that there are many scientists who disagree with the so-called Darwinian evolution. This thesis says: «We are skeptical of statements about the random changes and natural selection's possibility to be responsible for the complexity of life». This resolution has led to several campaigns aimed at showing the level of the evolution in the scientific community's support, including the «Scientific Support for Darwinism», which collected more than 7 thousand signatures in four days. It should be noted that such issues are not resolved by the vote of people who do not have in-depth knowledge on this issue. The propaganda of the theory of the «Intelligent Design» in order to justify the divine creation of life fundamentally contradicts science and harms the development of mankind, as any other religion does.

1.7. OUTSTANDING SCIENTISTS AND THINKERS' DOUBTS

Many thinkers at various times thought about the complexity of the origin of the surrounding world on Earth. They realized that there were a lot of inexplicable facts and phenomena that may be associated with the highly developed intelligence's

activities. The ancient Greek philosopher Anaxagoras, observing the expedient arrangement of the world, came to the idea of a «supreme intelligence». Socrates and Plato also saw evidences of the existence of a supreme intelligence in the structure of the world. «The world is too complicated to occur by chance». M. Bakunin wrote the following about it: «The great philosophers from Heraclitus and Plato to Descartes, Spinoza, Leibniz, Kant, Fichte, Schelling and Hegel, if not to mention the Indian philosophers, wrote heaps of volumes and created systems as witty as sublime in which they in passing revealed many beautiful and great things and discovered immortal truths, but also left this mystery, the main subject of their transcendental research, as impenetrable as it was before them».

Many thinkers associated the complexity and thoughtfulness of the world with religious beliefs, when all facts unexplained by science were associated with the divine power. Other scholars, understanding all the theological views' mysticism and savagery, spoke about the role of the creative principle, about the Creator participation, the abstract Supreme Intelligence or Creator in their statements about the world's structure.

V. I. Lenin is attributed the following statement: «If nature is creation, it goes without saying that it can be created only by something which is greater, that is

more powerful than nature. To be created from something that already exists, since in order to create nature, something should already exist independently of nature. So there is something existing besides nature and, moreover, it is something that creates nature. It is called God in Russian».

The points of view of mankind's prominent personalities are more powerful than the views of ordinary scholars repeating orthodox truths learned from the student bench. I am pleased to realize that they correspond my beliefs. So I decided to cite some of them. Theologians used all these statements to strengthen their power over the minds of gullible believers. Some of them are taken from the book by Ivan Klimishin, a professor of the Carpathian National University named after Vasily Stefanik, Doctor of Physical and Mathematical Sciences, titled «Scientists Find God», as well on the following sites: [https://rationalwiki.org/wiki/Lists of creationist scientists;](https://rationalwiki.org/wiki/Lists_of_creationist_scientists)

<https://www.pravmir.ru/velikie-fiziki-o-vere-i-boge/>

The desire to find a supernatural explanation for creation in the distant past was well expressed by Giordano Bruno: «We seek God in the unchanging, unshakable law of nature, in the reverential mood of the soul governed by this law... in the true reflection of His essence, in countless constellations glowing on the invariable space of a single sky...».

Georg Lichtenberg noted many years after that: «Is our concept of God not the personification of the incomprehensible,» and Gottfried Wilhelm Leibniz argued that «only the trivial throats of scientific knowledge alienate man from religion and God, while the more profound ones return Him to them again».

Carl Linnaeus, the founder of the flora and fauna taxonomy, exclaimed: «I watched animated creatures follow each other in a continuous chain, adjacent to the vegetable kingdom, plants linked to the mineral kingdom, going into the interior of the globe, while this globe is whirling in the stable order around the Sun, giving it life. Finally, I saw the Sun and all other luminaries, the entire star system, infinite, uncountable in its infinity, moving in space, being hung in the middle of eternal void by the First Incomprehensible Mover, the Being of the Beings, the Cause of the causes, the Leader and Keeper of the Universe, the Lord and Worker of all things in the world! So, it is fair to believe that there is God, the Great and Eternal one,

not born of any being that has created these universal things and established the order». According to C. Linnaeus, «We have as many species as the Infinite Being first created... these forms, according to the laws of reproduction, have produced many others, but always similar to themselves».

Similar thoughts were expressed by Claude Bernard, one of the founders of experimental medicine and endocrinology: «No matter how far experimental science goes forward in the progressive course in its development and no matter how great its successes and discoveries are, it's never able to answer about the primary cause of everything, about the origin of matter and life, and about the ultimate fate of the universe and man without crossing its own limits. Trying to answer these questions, I enter the field of metaphysics and cease to be a naturalist, exploring nature and learning the truth through observation, my opinions and views in this case no longer hold the authority of accurate and positive knowledge, since I am already outside the areas of competence of physical and physiological sciences here. «Jean-Baptiste Lamarck wrote: «The Supreme Creator of everything that exists is the direct creator of matter and nature and only indirectly is the creator of all products of this latter». Further, developing the idea of evolution, he argued: «The Higher Power has created matter, laid the foundation for the existence of its various species... Therefore, the

duration of the matter's existence will entirely depend on the will of its Creator, and nature with all its power can neither diminish nor add the slightest particles to the amount of what has been created».

Georges Cuvier, who rejected Lamarck's theory of evolution, was convinced that «the Creator of all creatures, while creating them, could have been guided by only one law – the necessity to give each of his creations, which should continue life, means to sustain existence». Jean-Henri Fabre, the French entomologist, echoed him: «The world is ruled by an Infinite Intelligence. The more I observe, the more I discover this Intelligence, shining behind the mystery of the existing world. I know that they will laugh at me, but I care little about it; it's easier to strip my skin off than deprive me of my faith in God». The Russian academician P. S. Pallas argued: «... A species is a constant unit, and species should be considered to be designed in the first plan of creation and assigned to form the chain of creatures that we admire not being able to explain this chain».

John Stuart Mill in his posthumously published essays «On Religion» (Thee Essays on Religion, 1874) noted that the world order indicates the existence of an ordering intelligence. However, this does not give us any reasons to believe that God has created matter, that he is omnipotent and omniscient. God is not the Absolute Everything; a man collaborates with God in

restoring the order, harmony and justice. A number of scientists in their judgments avoided the word God and used the word Creator instead. So, Louis Pasteur, the founder of modern microbiology and immunology, stated: «the more I study nature, the more I stop in awed amazement at the Creator's affairs».

Georg Hegel believed that there is the Absolute Spirit which is the basis of everything that exists, which, because of its infinity only, can achieve true selfknowledge. It needs a manifestation for selfknowledge. Self-disclosure of the Absolute Spirit in space is nature; and self-disclosure in time – history. The mission of world-historical personalities was to be agents of a universal spirit.

William Whewell argued that «...it is impossible to practice biology without the objective purposes in nature's assumption and ultimate cause». In his view, the common feature of «palaiologina Sciences» (historical casualty sciences) is the inability to explain the origins of the modern state of things through a natural way from some «initial state» without the assumption of supernatural intervention». Being a principled evolutionism opponent, he believed that «a creative power manifested» itself at the beginning of each new geological period. He did not admit transformism in biology, saying that «admission of the new species' as a natural phenomenon in nature, without pointing at the same time on the real facts

confirming such an assumption, therefore, stands for the completely unfounded rejection of the creation hypothesis». This statement is not an object of faith, but a scientific axiom. Its essence is reduced to the cosmological argument («History and science», 1894, Russian translation, 1900).

Johann Goethe, the German poet, thinker and natural scientist, the founder of the plants metamorphosis's doctrine, drifting towards the idea of evolution, believed that it can only occur within certain limits under the guidance of the Creator. He wrote: «All parts are formed according to the eternal laws, and the rarest form is secretly similar to the original image».

Voltaire said: «One needs to be blind, so as not to be blinded by this picture, one needs to be a fool to reject its Creator, one needs to be crazy not to bow before Him».

K. E. Tsiolkovsky noted in his scientific paper «Unknown Intelligent Powers»: «The will of man and all other beings – both higher and lower ones – is only a manifestation of the Universe's will. The voice of a man, his thoughts, discoveries, concepts, truths and delusions – is only the voice of the Universe».

Pierre-Simon de Laplace addressed Napoleon Bonaparte with the following statement: «My religion is simple: I look at the Universe and I am convinced that it could not be a matter of blind chance, but was created by some unknown and almighty being that is as

much exceeds a man as far the Universe exceeds our best machines». His answer to Napoleon's question whether God was offered a place in the world's system proposed by Laplace was as follows: «I did not need such a hypothesis».

Justus Liebig, the German chemist, exclaimed: «Do not forget that with all our knowledge and researches we remain short-sighted people whose strength is rooted in the fact that we have support in the person of the higher Creature».

Jöns Jakob Berzelius, the Swedish chemist, wrote: «All organic nature gives evidences of the wise goal's existence and is a product of a higher intelligence... Thus, a person's mission is to consider his higher ability – the ability to think» in accordance with the Creature to which he owes his existence».

A whole series of statements dedicated to the Supreme Intelligence belongs to famous physicists. Isaac Newton, one of the greatest geniuses of mankind, who introduced his own version of biblical chronology, left after himself a significant number of manuscripts on these issues. In his *Principia Philosophiae*, he wrote: «The Heavenly Sovereign rules the whole world as the ruler of the Universe. We marvel at Him because of His perfection, worship Him and bow to Him because of His infinite power. From a blind physical necessity, which is always and everywhere the same, no variety could have occurred, and all the variety of created

objects corresponding the place and time, which constitutes the structure and life of the Universe, could have happened only by the thought and will of the Original Creature, which I call the Lord, God». «The wonderful arrangement of the space and harmony in it can only be explained by the fact that the space was created according to the plan of the omniscient and omnipotent Creature. This is my first and last word». Isaac Newton also noted: «How do bodies movements obey the will and where does animal instinct come from?... And if He did so, then philosophy should not look for other origin of the world or believe that the world could have occurred out of chaos only in accordance with the laws of nature...». The economist John Maynard Keynes, who purchased Newton's alchemy notes, said at the jubilee of Newton's three hundredth birthday: «He considered the Universe to be a cryptogram composed by the Almighty God».

Albert Einstein in his letter to the New York rabbi Goldstein in 1924 wrote such words: «I believe in Spinoza's God, who manifests himself in the natural harmony of life, but not in God, who cares about fate and people's affairs». In another letter, one can read such words: «I do not believe in a personal God. I expressed my attitude towards God clearly and have never refused my words. If one may consider some my statements to be religious, then it is probably due to my unlimited admiration for the world's structure that

science shows us.» He expressed the following thought:

«The one, who is seriously engaged in science, is convinced that there is a certain spirit in the laws of nature, and this spirit is higher than man».

The same idea was expressed by James Joule, the English physicist:

«There is a vast variety of phenomena we face which are the evidences of the Great Universe Architect's wisdom and kindness» Max Planck, the outstanding physicist and founder of quantum physics, once said the following: «Both religion and natural science need faith in God, at the same time, God stands at the beginning of all thinking for religion, and at the end – for natural science. For some people, He means the foundation, and for others – the peak of any worldview principles' building».

Andre-Marie Ampere, another famous French physicist, said:

«The most convincing evidence of the God's existence is the harmony of means by which order is maintained in the universe, due to this order, living things find everything they need for the development and reproduction of their physical and spiritual abilities in their organisms».

Werner Heisenberg, the German physicist and one of the quantum mechanics' founders, expressed the similar idea: «The first sip from the natural science's cup gives rise to atheism, but God waits for us at the

bottom of the vessel».

Andrei Sakharov, a Soviet physicist and one of the hydrogen bomb's developers, said: «My deepest feeling... is the existence of some kind of the nature's inner meaning... And this feeling, perhaps predominantly feeds on the picture that has been opened before people in the XX century. «I don't know at heart what my position really is, I believe in no dogma, I don't like official churches. At the same time, I can't imagine the Universe and human life without any meaningful beginning, without a source of spiritual «warmth» going far beyond the matter and its laws».

James Jeans, the English astrophysicist, said in a similar way:

«Primitive cosmogonies presented the Creator working in time, forging the Sun and the Moon and stars from the already existing raw material. Modern scientific theory makes us think of the Creator working out of time and spaces, which are part of His creation, as well as the artist is out of his canvas».

Pascual Jordan, a German physicist, one of quantum mechanics' founders, also noted that «Modern science has removed the obstacles that previously were between natural knowledge and religious worldview. Contemporary natural science no longer rebels against the Creator».

Thomas Edison, a well-known physicist-inventor answered the question of expediency in the world of

atoms during an interview in the following: «Do you really think that it is done without any sense? The harmonious and useful combinations of atoms take beautiful and interesting shapes and colours, as if expressing their pleasure. In illness, death, decay, or decay, the disagreement of the compound atoms immediately manifests itself through the fetid odour. The atoms united in the known forms constitute the lower ranks' animals. Finally, they are united in a man, who represents the complete harmony of meaningful atoms».

The same opinion was shared by William Herschel, the English astronomer: «The more the field of science is broadening, the more evidences of an Eternal Creative and Almighty Intelligence existence appear».

John Fleming, the English physicist and radio engineer, wrote on this occasion: «A great number of modern discoveries have completely destroyed the old materialistic ideas. Nowadays, the Universe appears before us today as a thought, but thought presupposes the presence of a Thinker».

Stephen Hawking, a modern theoretical physicist, wrote: «My studies of the Universe are in the boundary zone between science and religion, but I do my best to stay on the scientific side. It is quite possible that God acts in such a way that is not described by scientific laws, but in such a case, the person has to rely on its

own faith. Even if there is only a single unified theory – it is just a set of rules and equations. What adds fire to the equations and creates the Universe to be described? The common scientific approach of a mathematical model constructing does not provide the answer to the question of why the universe should exist to be described by this model. Why does the Universe exist at all? (Stephen Hawking, *A Brief History of Time: From the Big Bang to Black Holes*, New York, 1988, 174).

I would like to finish this list of the famous scientists' sayings with the final phrase of the «Origin of Species», the main paper by Charles Darwin. It reads as follows: «There is greatness in this view, according to which the Creator initially breathed life with its various manifestations into one or a limited number of forms; and while our planet is spinning, according to the unchanging laws of gravity, an infinite number of the most beautiful and most amazing forms has occurred and continues to occur from such a simple principle». He also noted in this book: «The world rests on regularities and in its manifestations is presented as a product of the Intelligence – this is an indication of its Creator».

The fact of the availability of a great number of the greatest scientists and thinkers of the human history's different periods who speculated about the role of the Supreme Intelligence is an obvious incentive

to analyze the most important issues of the life's creation and functioning on Earth, the rationality and its planned creation not on the basis of the spontaneous development principle and, of course, not on the basis of religious beliefs.

1.8. NECESSITY OF NEW POINTS ON THE LIFE DEVELOPMENT ON EARTH

The evolutionary theory gave a huge impetus to the development of science, made it possible to accumulate huge factual material about the various species on Earth occurrence's sequence within the process of their improvement. Therefore, all scientific dogmas are viewed only from the standpoint of the evolutionary theory, despite its contradictory arguments and improbability. Being the only scientific explanation of the origin of life, it argues that after millions of years since Earth had been formed, life occurred on it due to the pure chance, the development of which was performed in a natural way – from unicellular organisms to millions of various plants and animals that currently exist.

L. S. Berg (Берг Лев Семенович) expressed the need for evolutionary views' reconsideration long time ago expressed in such scientific papers as «Nomogenesis or Evolution based on Regularities», «Works on the Theory of Evolution» and «Theory of

Evolution». He compiled the vast factual material accumulated by the early twentieth century which testified the organisms' natural variability within the evolutionary process and the organisms' inherent initial practicability. In his opinion, as the result of the embryonic potentially available signs' development and improvement the new, more complex forms are formed with time. The conclusion of the performative nature of evolution was the logical one. He provided the detailed and substantiated arguments in favour of the fact that, although it contradicts Daewin's concept, evolution is not an accidental process but the naturally determined one in which chaotic mutations and natural selection have their own focus. In his opinion, the essence can be illustrated by a simple analogy: although the development of the individual organism is influenced by many random factors, there are no doubts that the inner information that is contained in the genes is the main and determining factor. The entire history of the body is the implementation of the program, which determines what will grow, for example, from the given seed, a birch or a pine. The whole biosphere's evolution, according to Berg, is the «unfolding of a Law or multidimensional program, which contains numerous methods for its implementation. Therefore, Berg called his concept the nomogenesis (from the Greek. nomos – «law»), contrasting it to the Darwinian concept of tychogenesis, i.e. development that is based

on chance. Berg did not discuss the question of the source of this law. In his opinion, a number of General biological phenomena suggest that the process of evolution cannot be described even in the qualitative aspect within the framework of Darwin's diagram.

The principles of nomogenesis were briefly summarized in form of the table and contrasted with the Darwinism's postulates as follows. If in Darwinism all organisms developed from one or few primary forms, in nomogenesis organisms developed from many thousands of primary forms; if in Darwinism the further development proceeded divergently, in nomogenesis it was predominantly convergent (partially divergent); while evolution in Darwinism is based on random variations that separate individuals undergo by means of slow, hardly noticeable continuous changes, in nomogenesis it is based on leaps and paroxysms, mutationally capturing the vast masses of individuals on a vast territory; if in Darwinism there are many hereditary variations and they go in all directions, in nomogenesis hereditary variations are limited in number and they go in certain directions; if in Darwinism the struggle for existence and natural selection serves the factor of progress, in nomogenesis the struggle for existence and natural selection are not factors of progress, but preserve the norm; if in Darwinism, species are connected with each other by transitions due to their origin by divergence, in

nomogenesis species are sharply separated from each other due to their mutational origin; if in Darwinism the evolutionary process means entirely the new traits' formation, in nomogenesis evolution is to a large extent the deployment of existing inclinations; if in Darwinism, the extinction of organisms occurs due to the external causes (the struggle for the existence and survival of the fittest), in nomogenesis, extinction is a consequence of both internal (autonomous) causes and external (choronomic).

A. Lima-de-Faria, a famous biologist, also wrote in the book «Evolution without Selection: Form and Function by Autoevolution» (1991) that biological evolution is determined by the three forms preceding it: elementary particles, chemical elements and minerals. In all these processes, natural selection, or something similar to it, if any, was then a secondary factor. According to him, «... each new level occurs as a typical innovation not because it creates something fundamentally new, but because it is a continuation of only few already limited combinations of previous levels».

The evolutionary approach dominates in modern science, and anyone who doubts its reliability risks being marked as an ignoramus. However, by the beginning of the third millennium, enough scientific facts contradicting the «random processes» theories in the development of life on Earth have been

accumulated. It is becoming increasingly apparent that a complex and finely balanced set of physicochemical processes in protein organisms cannot be explained by chance. The increase of the biological complexity knowledge has created a kind of dead end in the modern theory of the origin of life. The search for truth is complicated by the fact that the creationism is the only alternative to Darwinism in the society's opinion, which insists on a literal understanding of the picture of the world's origin described in the Biblical text. Therefore, the educational level of a modern man contradicts the mythical views on the creation of the world and he has no other choice but to follow the dogmatic principles of the evolutionary theory, which would not have been so widespread if it had not refuted the ideas of the divine creation of life on Earth. It exists only because there is no sufficiently developed alternative.

Darwinism is the only branch of modern biology, where hypotheses are accepted by the scientific community as sufficient ones. It is impossible to provide direct evidences to confirm the facts which took place long time ago. Therefore, the existing ideas about the origin of life on Earth are the hypothetical assumptions based on the facts of past events, which can be interpreted in different ways. The task of scientists is to choose the most logical ones corresponding the fundamental biological and philosophical laws of the

development of matter. The theory of evolution is one of the options to explain the origin of species on Earth, but it is impossible to deny the possibility of other theories development that can be more convincing and more justified, and also able to explain many obscure phenomena observed on the planet.

It is difficult to disagree with the words by Fred Hoyle: «Instead of agreeing with the infinitely small probability of the occurrence of life under the influence of the nature blind forces, it is probably better to assume that life occurred as a result of a deliberate, meaningful action».

Chapter 2

CIVILIZATIONS' DEVELOPMENT LAWS

2.1. SYNERGETICS AND «THINKING SUBSTANCE» DEVELOPMENT

The order of protein life and its increasing complexity contradict the Second Law of Thermodynamics, which states that disorder (entropy) can only increase in a closed system. This is especially evident in the developing organisms, when the amount of information increases dramatically during morphogenesis. The evolutionary theory's opponents

believe that evolution and the Second Law of Thermodynamics cannot be correct at the same time, and the occurrence of the living (ordered) from the inanimate (disordered) is impossible in general.

However, according to the evolutionary theory's supporters, developing systems are always open and exchange energy and substance with the environment, due to which the local ordering and self-organization processes take place. The Austrian physicist Erwin Schrödinger introduced the negative entropy concept, which living beings should receive from the environment in order to compensate the entropy's growth, leading them to the thermodynamic equilibrium and, consequently, to death. He stated that an organism can «stay alive only by means of constant negative entropy's extraction from the environment, which is itself something very positive... Negative entropy is what feeds the organism. Or, in order to express it in a less paradoxical way, what is essential in metabolism is the fact that the body manages to free itself from all that entropy that it has to produce while it is alive».

Later, Leon Nicolas Brillouin, the American physicist, introduced the term negentropy in his paper «Scientific Uncertainty and Information» (1964): «information itself is a negative contribution to entropy». Negentropy is opposed to entropy and expresses the material objects ordering.

E. Schrödinger in one of the last chapters of his book «What is Life? Physical Aspects of the Living Cell» pointed out the existence of two different mechanisms for the ordering phenomena: the statistical one that creates «order from disorder» and the new mechanism introduced by him, which creates «order from order». He stated: «We have the right to assume that the living matter obeys a new type of the physical law. Or should we call it nonphysical one, if not to say the super physical law?» At the same time, E. Schrödinger does not explain how order occurs in living systems. He states that if the «order from order» mechanism operates in the living substance, and the order is drawn from the environmental order, then the inanimate substance owes the order occurrence to the «order from disorder» principle.

However, the question arises: what is the origin of order in the environment? The fact of an open system and available external energy existence does not generate the order in the given system. Where does the specific information that does not only deter entropy, but contributes to the strictly determined specific order and complexity in the course of historical development come from, if, according to the increasing entropy law, simplification and degradation should take place? Not just abstract information should prevent it, and specific complex one, which may not occur spontaneously. Protein life is not degrading, but is getting more refined

and complicated, which is impossible without the new specific information that someone should create. It is logical to assume that the entropy overcoming in living organisms is performed by using information created by the intelligence.

Such an interdisciplinary scientific trend as synergetic, which studies natural phenomena and processes on the basis of the self-organization principles of systems consisting of subsystems, and new qualities self-generation, can provide a certain idea of the material intelligence's occurrence. This process, despite its spontaneity, has a certain focus: there is an increase in various elementary and primitive forms and structures to complex and more advanced ones.

The following main empirical generalizations are at the basis of synergetic:

1. The Universe is a single self-developing system.

2. In the course of the Universe's development, random factors are present, processes occur in terms of a definite uncertainty level. They are characteristic for all the levels of the world's organization.

3. There is heredity in the Universe, the present and future depend on the past, but are not determined by it.

4. The world is dominated by laws, which are the selection principles. They distinguish a certain set of admissible states from possible virtual ones.

5. Selection allows the existence of bifurcation states in which it is impossible to predict the way of further development since the new channel is largely determined by factors out-of-control at the bifurcation point.

Judging from the synergetic principles, it is possible to develop an idea of the intelligence's occurrence within the various material forms of matter's self-development. The universal matter's property is «reflection», manifested by the object of influence in the form of a response. Reflection is a philosophical category denoting the universal matter's property, stating the fact that under certain conditions of interaction one material system reproduces certain aspects of another system interacting with it in its specific form. In this case, the reflection is either the new properties acquisition, or the certain reactions' development, or the restructuring of the object that is being affected. A function occurs as the result of the multiple consolidations. A consolidated response to a frequently repeated influence is the reflection function.

The principle of reflection is characteristic for the matter at all levels of its organization and is the cornerstone of the materialist theory of cognition. Spontaneous development of the surrounding world occurs until the moment when material objects acquire the ability to think starting from the primitive responses to external stimuli formation to the information storage

devices, the improvement of which can lead to the occurrence of intelligence, analytical abilities and adequate interaction with the environment. Then development takes on the features of awareness and controllability. Moreover, in addition to the passive adaptation to the changing external conditions, the former intelligence will consciously initiate further development of the surrounding world by planning and creating new materials and technologies in accordance with its needs.

Therefore, it is necessary to consider two stages in the spontaneous and self-organizing processes of the matter's development – spontaneous (synergistic one) and managed by the developed intelligence's one. Each of them has its fundamental features. On the initial stage there is a spontaneous complication of the physic-chemical structures until the initial intelligence's occurrence capable of accumulating and analyzing information about the environment. On the second stage, the development of the material world is not a spontaneous one, but with the intelligent structures that carry out the activity aimed at their own life support. In this case, the environment changes already involuntarily. At this stage of development it is not the fortuity of the new material forms occurrence which will be observed but the design and expediency.

The possibility to use the information accumulated is the main factor of development. The

intelligence carriers can be of different material nature. People used to associate thinking with the protein carriers of information inherent to all living beings on Earth. People have created artificially other information storage media on the basis of which the design of robots with artificial intelligence is carried on. Taking into consideration the fact that plasma represents the most part of the Universe matter's main phase state according to modern concepts (the weight of about 99,9 %) it is logical to assume that the development of thinking matter took place and was improved on the basis of this form of the material world. It is established that the information transfer is an energetic process based on both the active substances and the receptive structures' physic-chemical restructuring. Nowadays it is difficult to imagine the way of the information transmission and perception on the plasma level.

2.2. CIVILIZATION AS THE «THINKING SUBSTANCE'S» HIGHEST FORM OF DEVELOPMENT

The intellect occurred seeks to avoid the influence of the chaotic synergetic processes and manage its development. At the same time, the intelligence of an individual is not able to carry this process out. Such opportunities are being realized when thinking objects create associations that ultimately form

a civilization that functions on the basis of material world development's certain laws.

Civilization is the highest form of the thinking matter's development. Its formation is the inevitable result of the thinking matter's development. This is the highest form of its existence. At the same time, the intelligence-bearers' capabilities and needs undergo changes ranging from the use of their own labor and the slavish exploitation of other people's labor in various forms (through violence or material incentives) to the development of self-reproducing structures that can satisfy all the needs of a highly developed intelligence in energy and information provision. Therefore, the Universe's global processes must be considered not on the basis of individual ideas, but from the point of view of a civilizational intelligence.

Thus, the development of civilizations, regardless of their physic-chemical properties, is accompanied by the certain laws' implementation which can be formulated as follows:

1. The matter's self-organization occurs as a result of the ability to think and influence the surrounding world (environment).

After this, the development goes according to civilizations development laws.

2. The development of any civilization requires a growing energy provision, the main and best source of which is the Sun's renewable energy.

3. A highly developed civilization must develop a system of self-replicating structures that can store and process the solar energy at a certain stage of development in order to use the Sun energy, as well as for the development of new living spaces. Various types of such structures will be developed and improved. They will be adapted to the conditions of the environment under exploration and programmed to provide a constant energy supply.

In a human society, the possibility of the highly developed civilization's parallel existence is not considered and the results of its activity are not analyzed, while this can be observed in the diversity of species of protein organisms on Earth. This may be a thinking form that is absolutely unusual for us. «The intelligence that we will discover one day may be so different from our ideas that we don't want to call it Intelligence,» Stanislav Elm wrote in his book «The Sum of Technologies».

Chapter 3

SPECIFIC FEATURES OF HIGHLY DEVELOPED CIVILIZATIONS

3.1. OTHER WORLDS

The existence of an infinite number of different cosmic civilizations was allowed by many thinkers throughout the history of humanity. According to the principle of Copernicus, the laws of nature are universal and function the same way everywhere in the Universe, which means that there is a possibility that, in addition to the Sun and Earth, there are other planets in the Universe with identical conditions where life could have occurred.

Developing the Copernicus' (Mikoyan Copernic) heliocentric theory, Giordano Bruno stated in his book «On the Infinity of the Universe and the Worlds» (1584) that the omnipotence of God allows Him to create not one world, but an infinite number of them. Bruno quoted Epicurus, Lucretius, and also wrote about the infinite Universe in other works published beyond the reach of the Inquisition in Protestant countries. He believed that, despite the highest temperature, stars can be inhabited by plants and animals, which develop due to the cooling effect of neighboring celestial bodies

(just like living creatures on Earth develop due to the heat of the Sun). All stars are the living and thinking beings. A fluid similar to blood circulates in their internal channels. Such an approach to the Universe's nature was called the «Copernicus – Bruno principle». For the church fathers, multiple world's concept was an attribute of pagan beliefs. After the publication of the Bruno's Inquisition case, it became known that his biggest «heresy» was the idea of multiple inhabited worlds in the Universe. However, some authorities of the Catholic Church also expressed similar ideas. For example, Thomas Aquinas, the theology founder, wrote that the world in which we live is not the only possible one. Hercules Cyrano de Bergerac, Fontanel, Bernard le Bevier de Fontanelle, Christiaan Huygens, Voltaire, Immanuel Kant, Pierre-Simon de Laplace, and William Herschel dedicated their works to this issue, though they were the speculative ones. Camille Nicolas Flammarion wrote in his works «La pluralité des Mondes Habités» (Numerous inhabited worlds, 1862), «Les Mondes imaginaires et les modes réels» (Imaginary worlds and real worlds, 1865), «Les Etoiles et les curiosités du ciel» («Starry Sky and Its Miracles») (1881) and others that there is a dynamic principle in space, invisible and intangible, dispersed throughout the Universe, independent of the visible and weighty matter and influencing it. And the intelligence superior to our one is in this dynamic element.

Konstantin Tsiolkovsky expressed similar ideas in his works «Cause of the Cosmos», «Will of the Universe», «Unknown Intelligent forces», «Monism of the Universe», «Scientific Ethics». In a philosophical note «Planets Inhabited by the Living Beings,» he wrote the following: «In the known Universe, one can count a million billion suns. Therefore, we have the same number of planets similar to Earth. It is inconceivable to deny the life's availability on them. If it has occurred on Earth, why can't occur it under the same conditions on planets similar to Earth? Their number may be less than the number of suns, but still they should be. It is possible to deny life on 50, 70, 90% of these planets, but it is absolutely impossible to deny live of all of them».

Winston Churchill, a famous politician, wrote an essay entitled «Are We Alone in the Universe?» in which, on the grounds of the «Copernicus principle», he stated that the Universe is too vast for the life on Earth to be unique. He determined that reproduction is the necessary condition for life, and the presence of water, appropriate temperature and gravity to form the atmosphere stand for significant factors. Based on these assumptions, Churchil believed that, speaking of the Solar system, the life could have occurred only on Mars and Venus in addition to Earth.

Hugh Everett, an American physicist, put forward a theory of parallel worlds in the mid of the XX

century. His article on Physics titled «Formulation of quantum mechanics through «related states» was published in the journal «Reviews of Modern Physics» (1957, v. 29, № 3, p. 454-462). The author's multi-world interpretation (The Many-Worlds Interpretation of Quantum Mechanics) suggested the «parallel universes» existence, in each of which the same laws of nature function and which are characterized by the same world constants, but which are in different states.

Hugh Everett suggested that the Copernicus's Universe is only one of the universes, and it is the physical multitude that is the basis of the Universe. In his opinion, the «perceived reality» is a multitude of classical realizations of physical worlds, built on the basis of rationally conscious worlds that reflect the interaction of the Observer with a single quantum reality.

According to the H. Everett's concept, the Object and the Observer's quantum-mechanical interaction leads to the formation of a set of different worlds, and the number of branches equals to the number of physically possible outcomes of this interaction. And all these worlds are real. Hugh Everett called the multidimensional interpretation of quantum mechanics the «state relativity». In his opinion, this theory perfectly explained the mysteries of quantum mechanics, which caused fierce debate among scientists

at that time.

Hugh Everett's theory is sometimes mistaken for the parallel worlds' theory. However, it does not imply the real existence of other worlds, but only one really existing world, which is described by a single wave function, which, while measuring a quantum event, must be divided into an observer (conducting a measurement) and an object, each being described by its own wave function. On the contrary, the Copenhagen interpretation places the observer in his classical world, which is different from the quantum world of the object observed.

The main reason for rejecting the Everett's ideas recognition is the assertion that they are «experimentally unprovable». In addition, scientists using this interpretation cannot explain the nature of the boundary between the quantum and classical worlds. This theory explains a number of phenomena only at the micro-level, and it does not agree with the laws of preservation of mass, energy, momentum, etc. at the macro-level of our existence.

Modern Physics, based on a multi-world interpretation of quantum mechanics, superstring theory, multiuniverse theory, implies the multiple worlds' existence. According to the theoretical physicists estimates adhering to the theory of superstrings, parallel worlds can be from ten raised to one hundredth power to ten raised to five hundredth

power. Today the «many-world interpretation» is called the Oxford interpretation of quantum mechanics, which is one of the leading ones along with the Copenhagen one.

Experts do not exclude the possibility that the other worlds' representatives of live somewhere in the depths of the vast universe. Physicists of Stanford University have been able to establish a hypothetical number of universes formed as a result of the Big Bang. Moreover, it is possible that they can be included into each other and inside our Earth as well. Perhaps there is a hidden Earth-2. They also estimated the amount of information that such a number of the parallel worlds' existence carries, and came to the conclusion that a person is not able to observe all the universes, since the structural features of his brain are not able to perceive more than ten raised to the sixteenth power bits of information during his lifespan.

Frank Donald Drake, a professor of astronomy and astrophysics at the University of California, has developed a formula that, in his opinion, determines the number of extraterrestrial civilizations. The formula named after him consists of seven constituent elements: the number of stars formed during the year; fraction of stars representing planets; the number of planets or their satellites with livable conditions; the probability of the life's occurrence, the probability of turning it into an intelligent one; fraction of planets with highly

developed creatures; lifetime of a civilization that lives on the planet. Depending on the choice of parameters, the Drake formula gives grounds to believe that there are from 10 to 100 extraterrestrial civilizations in the galaxy at each separate moment.

However, repeatedly performed calculations with the Drake's formula being used gave a different number: from their complete absence up to 5 thousand. Such a dispersion arose due to the fact that the researchers evaluated the values of the parameters included in the formula in different ways. Critics note that the Drake's formula does not take into account the time variation of the parameters included in the formula. At the current level of the scientific development, only two coefficients for this formula can be relatively accurately determined, while others cannot be determined at all.

Brian Lacki, an astrophysicist at the Institute for Advanced Study showed that depending on the combination of parameters necessary for the intelligent life's occurrence, the probability of its existence in the world ranges from 1.4 up to 48%. He mentioned the type and mass of the planet, the distance between it and the star, as well as the variety of genetic material for the various life forms' occurrence among the factors determining the appearance of civilization.

Adam Frank, a professor of Physics and Astronomy from the University of Rochester and his

colleagues from the University of Washington's astronomy and astrobiology department, by means of the Drake's formula, calculated not the estimated number of intelligent civilizations, but rather the probability that human civilization is the only one intelligent in the Universe. It turned out that this probability is less than one divided by 10 raised to the 22nd power. Their further calculations showed that there are approximately 10 billion intelligent civilizations in the Universe. There are several thousands of them only in our galaxy, in the Milky Way. Many of them died, but it is possible that several hundreds of high-level civilizations still survive in our galaxy. In their view, the intelligent life is a common phenomenon in the Universe.

Duncan Forgan from the University of Edinburgh in Scotland developed a mathematical model and software that analyzed the probable number of inhabited worlds (not in the entire Universe, but only in the Milky Way) on the basis of three criteria: living organisms either occur with difficulty, but then develop well, or they have difficulty with turning into intelligent creatures, or life could be transferred from one planet to other one. As a result, three positive results were obtained. In the first case, the number of intelligent civilizations will be no less than 361, in the second – 31 513 and in the third – 37 964. William Borucki, the head of the group of researchers working with the

«Kepler» space telescope, presented the data on potentially inhabited planets at the annual conference of the American Association for the Advancement of Science (AAAS). Statistical analysis of data gathered by means of the telescope showed that 44% of the stars in the galaxy have planetary systems. Since there are approximately 100 billion stars in the Galaxy, it turns out that they can have about 50 billion planets. Out of them, approximately 500 million may be in the so-called zone of life, i.e., at approximately the same distance from the star as Earth from the Sun.

Seth Shostak, a senior astronomer at the SETI Institute (Search for Extraterrestrial Intelligence Institute), while taking part in the NASA Innovative Advanced Concepts (NIAC) symposium held in 2014 at Stanford University, promised that the extraterrestrial intelligent life would be revealed in 2038. However, his optimism has subsequently diminished.

Nikolai Kardashev, the Russian astrophysicist, suggested evaluating civilizations by their energy consumption in order to classify them. According to this classification, Type I civilization uses planetary forms of energy, with the help of which it can adjust the weather, change the direction of hurricanes or build cities in the oceans. Sources of energy are mostly limited by their planet.

Type II civilization is the interplanetary one and uses the energy of the entire star, with which comets

and meteors can be directed in the opposite direction, ice ages can be prevented, and climatic conditions can be changed. It is the thermonuclear energy which is used. Type II civilizations are actively moving through the Universe and populate (colonize) other planets.

Type III civilization is the interstellar one. Distant stars and new galaxies are reachable for colonization by it and captured and newly discovered stars become the new energy sources. It can travel through the galaxy freely. Such a civilization can use energy of 10 billion stars. Each type civilization increases the amount of energy used by the previous type by 10 billion times, i.e., the energy consumption of type III civilizations is 10 billion times higher than that of the type II civilizations' one. Currently, humanity uses only about 0.16% of the total energy budget of the planet and approximately corresponds to the 0.72 level of technological development without reaching type I planetary civilization's level.

It should be noted that the Kardashev scale is the hypothetical one and it is not possible to verify it at the moment. At the same time, it gives an idea of the possibilities for the civilizations development on a cosmic scale. In addition, these stages of the civilizations' development are far from the distant future scientifically based scenarios. The Kardashev scale was supplemented by Carl Edward Sagan. However, these additions are not taken into account by

astrophysicists but are considered by science fiction fans.

Sensitive new-generation telescopes allow astronomers to measure the level of background infrared radiation, which should be a type III civilization's indicator according to the Kardashev scale. Professor Michael Garrett from the University of Leiden (the Netherlands) decided to verify this theory and studied about 50 galaxies from the list, not only in the infrared spectrum, but in other radio frequency bands as well. The analysis of the results showed that the type III developed civilizations do not exist in the observable Universe at all.

Numerous arguments supporting the idea of the existence of a significant number of technologically advanced civilizations in the Universe are not proved by observations. It has been established that there are more than 8.5 thousand stars and more than 3 thousand planets similar to Earth within a radius of 80 light years from Earth.

It has been estimated that the diameter of our Galaxy is about 100 thousand light years. If at least one civilization capable of moving between stars at a speed 1000 times lesser than the speed of light existed in the Galaxy, it would spread throughout the Galaxy in 100 million years.

So far, it has not been possible to find a planet that would resemble Earth: with an oxygen atmosphere,

water and a more or less acceptable climate. The airless Moon, the dead sands of Mars, the red-hot sulfuric atmosphere of Venus, the icy worlds of gas giant satellites cannot be an environment for the protein life's development. No one has ever got the evidence of the aliens' existence within the mankind's existence. Therefore, the belief in the existence of intelligent beings on other planets is gradually dying away.

The direct contact with other civilizations is impossible at the modern changing level of scientific and technological development of human civilization due to the huge interstellar distances. Even Proximal Centauri, the closest star, after the Sun, is at a distance of about 40 trillion kilometers, and it would take the spacecraft about four Earth's years to reach it, even at the speed of light. Therefore, the theoretical possibility of the direct contact may be assumed if other civilizations have the superluminal speeds' methods of moving, which are difficult to imagine on the basis of modern physical knowledge of a human being.

Humanity has tried to establish contacts with the intelligent civilizations of our galaxy. Thus, the mathematician Carl Friedrich Gauss, a mathematician, put forward an idea to cut clearings in a dense forest and plant them with wheat or rye 200 years ago. The result would be in a contrasting geometric figure of gigantic dimensions, consisting of a triangle and three squares, known as the «Pythagorean pants». This

figure, according to Gauss, could have been observed from the Moon and even from Mars. Soon after, Joseph Johann von Littrow, an Austrian astronomer, came up with a suggestion about digging wide channels and filling them with water with kerosene: «If one burns them at night, they will turn into geometric shapes – for example, into triangles – that Martians will not accept for a natural phenomenon, but for a sign of an intelligent life on our planet». All these ideas were based on the human analyzers' ability to perceive the world around them. But the fact that other civilization can treat fire differently than a human being does it was absolutely not taken into account.

As for our time, there was an attempt to establish contact with the extraterrestrial civilization by means of a message transmitted by the Arecibo radio telescope on a distance of 21,000 light-years to the outskirts of the Milky Way, but again without a presupposed analysis of the other civilizations' perception possibilities, only on the basis of human ideas and relatively modest knowledge in Physics. In addition, the message represented a series of digital images, 1679 bits of information in each of them. Today, these pictures resemble the very first video games due their primitivism.

Prior to this, the US space agency NASA launched the interplanetary probes Pioneer 10 and Pioneer 11. Each device had a metal plate fixed to the

case with a set of characters and images of the naked men and women. However, it is likely that such drawings will turn out to be incomprehensible to aliens as well as the images on the Nazca plateau remain a mystery to us.

In other case, a gold plate was placed inside the «Voyager» apparatus, which was launched outside the Pluto orbit, for the playback of which a special player is needed and which is unlikely to exist in the other life form. Therefore, contacts organized on the basis of human ideas will not bring success without the other life forms properties' comprehensive studying, as far as possible.

Sebastian Rudolf Karl von Hoerner, a German astrophysicist, in his article «The Search for Signals from Other Civilizations» explained the silence of the Universe by the fact that the tools of mankind are still very imperfect with the costs of the search being completely negligible. Perhaps people will never be able to visit other star systems, so it is possible to start looking for other civilizations and try to contact them remotely, in the radio frequency band, by means of the SETI and METI projects. The term SETI (Search for Extraterrestrial Intelligence) refers to the international efforts aimed at extraterrestrial civilizations' search. The SETI experiments are not aimed at the life's search in the entire galaxy, but at finding out whether there is a civilization that uses a certain portion of the radio

frequency band for communication using a radio telescope within 50 light-years distance from the Sun. Dozens of experiments have been conducted in order to search for signals in the radio frequency band as well as in the optical range within the last fifty years. However, they did not produce any results. Developed civilizations, and especially super-civilizations, are not likely to use radio communication, which is uneconomical and ineffective at large distances, and is also limited by the light barrier.

The lack of evidence of the highly developed civilizations' existence in the Universe may confirm the erroneousness of our ideas about their nature. Any methods used by a person wanting to establish contacts with a highly developed civilization should not use the concepts conventions developed by a human civilization. In my opinion, the universal language of communication with all civilizations, regardless of their material form, should be based on the geometric shapes. Moreover, not on figures, but on fractal images created by means of these figures. Fractals are sometimes called the language of geometry. The letters of any alphabet carry no semantic meaning unless they are combined into words. In the same way, complex images expressing a certain meaning can be composed of the geometric shapes. As well as, for example, in the Chinese language, where symbols already express certain meaning, fractal geometry can be considered in

the same way. There are two main groups of fractal languages: linear and non-linear. Both groups use an infinite number of algorithms and cover an infinite number of possible fractal images, most of which use a deterministic set of rules, similar to grammar rules. The linear fractals' geometry is the most common form of fractal languages. Such fractals are usually formed starting with the initial figure, to which a certain basic pattern is being applied. Self-similarity is manifested at all levels of all deterministic fractals. Encoding by means of the fractal images is justified only if there is an effective method of an image hidden in fractal algorithms' «extraction». Having mastered the language of fractals, one can describe any messages by means of images that use the language of traditional geometry. Aren't crop circles an attempt of a highly developed civilization to leave a message by means of the fractal geometry language?

I. S. Shklovsky (Шкловский Иосиф Самуилович), an astronomer, substantiates the extremely low probability of the humanity and other similar highly developed civilizations' simultaneous existence in his book «The Universe, Life, Mind». The other civilization's intelligence can be so different from the human one that its representatives will not be able to understand the messages humanity sends into space.

Stephen Hawking, the English theoretical physicist, shortly before his death, published his latest

work, which was dedicated to the possibility of the parallel universes' existence. This paper was written in co-authorship with Thomas Hertog of Catholic University of Leuven under the title «A Smooth Exit from Eternal Inflation». This work serves the theoretical foundation and mathematical apparatus that can be used in the future for experimental proof of the multiple universes' hypothesis.

Enrico Fermi doubted the possibility of the extraterrestrial civilizations' detection. If there should be many developed civilizations in our Galaxy, then we must answer the questions: Well, where are they in such a case? Why are we not observing any traces of the intelligent extraterrestrial life?

A number of assumptions have been put forward as the possible «Fermi paradox» solution. It is believed that the level of the extraterrestrial civilizations development of is too high to communicate with Earth's population. K. E. Tsiolkovsky in his philosophical note «Planets Inhabited by Living Beings» put forward the zoo hypothesis as an answer to this paradox. He wrote: «A time must come when the average level of the mankind's development will be sufficient for heavenly inhabitants to visit us... We are not likely to go to visit wolves, poisonous snakes or gorillas. We just kill them. The perfect animals from heaven do not want to do the same with us».

The «Fermi principle» advocates believe that

humanity is the only technologically advanced civilization at least in our sector of the Milky Way. Extraterrestrial civilizations do simply not exist. Their opponents suggest that extraterrestrial civilizations exist, but a contact with them is impossible due to the limited speed of light because the colossal distances of space.

A palaeontologist Peter Ward and an astronomer Donald Brownlee used the extended Drake's formula to prove that Earthly characteristics planet's existence in the universe should be considered an incredibly rare phenomenon. They were the first to provide the detailed hypothesis of the unique Earth in their book «Rare Earth: Why Complex Life Is Uncommon in the Universe». It provides an answer to the Fermi paradox, explaining why the occurrence of a planet such as Earth should be considered as very unlikely.

Stanisław Lem noted in his paper «Are We Alone in the Universe?» (Czy jesteśmy sami w kosmosie? Nurt. Poznań, 1977, No. 5) that «Today we can only discuss Other Civilizations. In the future, it will be possible to establish at what distance they can be detected for sure. But this future will not stand for the end of our path. There are no reasons to say that it is possible to reach the «absolute peak of knowledge» in space: having conquered the current peak, we discover the new ones that have not been conquered yet.

Perhaps, having climbed one of such peaks, we

will understand that the contact between space civilizations is impossible. But today we still have the right to hope for».

Thus, despite the theoretically high percentage of probability of the existence of civilizations of extraterrestrial origin, there is no evidence of contact with them. Humanity has not met a single life form outside our planet yet, and so far no signals have been received from an intelligent civilization. The paradox of the «Great Silence of the Universe» by Enrico Fermi still exists and is unlikely to be solved due to the difference in material properties of the other intelligent life forms and the human protein organism.

3.2. REMNANTS OF THE HIGHLY DEVELOPED CIVILIZATION ON EARTH

It should be borne in mind that the highly developed intelligence carrier cannot be only alien civilizations but also civilizations (or a civilization) that exist concurrently with the human on Earth. Taking into account the fact that the concept of «civilization» implies a system of thinking entities that develop and improve technologies to provide their life activity, the existence of a highly developed civilization on Earth can be proved by its technological activity traces, the characteristics of which do not fit into modern scientific ideas.

According to one eastern story, when someone asked the Bedouin how he knew that a camel had passed by his house at night, he replied:

«I know this from the footsteps on the sand». Stephen Hawking and Leonard Mlodinow stated in their popular science book «The Grand Design» that people cannot see individual electrons, but they see the effect they produce.

«Quarks, which can also not be seen by us, are a model for explaining the properties of protons and neutrons in the nucleus of an atom. Although it is believed that protons and neutrons are made up of quarks, we will never see a quark, because the force that binds the quarks increases during separation and therefore separate and free quarks cannot exist in nature. They are united in groups of three quarks (these are protons and neutrons) or of quarks and antiquarks (pi-mesons) and behave as if they were connected by a rubber band

... The issue of whether it is permissible to say that quarks really exist if it is impossible to single out one quark has been discussed throughout a few years after the quark model was first put forward.» This book also states: «Some anti-realists even wanted to limit science only to what is observable. Therefore, in the 19th century, many rejected the idea of atoms on the grounds that we would never see them».

Another example can be provided. Edwin

Hubble, an American astronomer, published his observations demonstrating that the universe is expanding. He did not observe this expansion directly but detected the light emitted by galaxies. This light had a specific characteristic associated with the composition of each galaxy. Despite a lot of controversies, the expanding universe's model has become generally accepted.

Nowadays, a number of artefacts belonging to technologies mankind could not have in principle have been discovered on Earth. The figures on the high plateau of Nazca in Peru stand for one of such examples. This is the giant ground-based images' complex consisting of approximately 13 thousand lines, 100 spirals, more than 700 radial geometric shapes and about three dozen paintings of birds (a Hummingbird, a Pelican, a Parrot and a Condor) and animals (monkeys, dogs, llamas and a whale). A number of mysterious characters have also been discovered. These images are large, so they can be seen only from the bird's eye view. For example, the spider is 46 m long, the Hummingbird is 50 meters long, a Condor is 110 meters long, and a lizard is 188 m long. The most significant image represents a strange bird with a serpentine neck and elongated beak. Its length exceeds 250 m.

Each of the images is made in the sand and pebble ground as one continuous line in the form of

groove ranging from 10 to 30 cm in dimension. The separate strips width stands for 100 and 200 cm, while the length stands for 8 to 10 kilometres. Straight lines and stripes are rectilinear, as the beams for the kilometres' distance, regardless of the relief and soil. They descend into ravines, ascend to the tops of the hills and their geometric accuracy and the lateral boundaries' parallelism remain stable. They repeatedly cross each other; the lines are laid over the drawings geometric shapes are crossed with the strips. This suggests that the complex of Nazca was covered with the images not once but in stages. But later made and the overlaid images do not destroy the outlines of the drawings under them. Modern geodetic methods do not allow drawing a straight line with a length of up to 8 km with the deviation less than 0.1 % on the irregular terrain, and the Nazca drawings' creators managed to do it.

Maria Reiche, who had studied these images for many years, established that all curved lines are perfectly interconnected with straight lines, that is, they are made according to the strict mathematical laws resembling the computer graphics.

By means of the radiocarbon analysis method it is established that they are dated by 525 A.D. According to the Gerald Hawkins (Gerald Stanley Hawkins) expedition's members, ground figures on the Nazca plateau cannot belong to a single local Native American

culture. According to their estimation, the total amount of manual work to create the entire complex of the Nazca desert is more than 100 thousand person-years, if the Indians had worked 12 hours a day. At the same time, the plateau is located between two valleys that can feed only a few thousand people. The absence of traces of workers' tracks completely refutes the hypothesis that these images were executed in the form of ordinary excavation works. In addition, the development of figures is not mentioned either in the Spanish chronicles or among the locals.

It is the characteristic feature of the Nazca macro-complex that all these images can only be seen from the air, that is, their development was not focused on the locals living in this region. The drawings processing (a spider's one, in particular) by means of the computer technology has confirmed that they were projected from the air.

None of the hypotheses to explain these figures' origin can answer the question: how and what for have these drawings been created? Alla Belokon, a radio physicist, put forward a hypothesis that the drawings on the Nazca plateau are a kind of the unknown Intelligence's traces. There is every reason to believe that all these figures could have only been created by the complex work of a highly developed civilization within a long period of time. In her opinion, they have been created from the air by a stream of energy of an

unknown nature. The one who has created the images moved through the air and possessed a source of energy, which left traces when in contact with the ground.

Maria Reiche suggested that the entire Nazca Plateau macro-complex was aimed at solving some astronomical tasks. However, the American specialist Gerald Hawkins, by means of the modern measurement methods and computer simulation applied came to the conclusion that only 20 % of all the Nazca plateau lines can be unambiguously correlated with any celestial landmarks.

In addition to the Nazca desert, the ground-based figures of the same technique are found in the middle zone of the Andes along the entire Pacific coast. So, more than 400 images made of 1-2 m wide lines were found in the Sahama Nature Park in western Bolivia. They are larger in size than the lines on the Nazca plateau and extend up to 1500 km.

Similar images are found on the Middle East. Round stone structures located in the desert between Syria and Saudi Arabia were discovered only after the advent of aviation. It is believed that there are at least 2 thousand years old. Some of them are grouped together, while the rest stand alone. The purpose of these structures is unknown.

During the First World War, the British Royal Air Force pilots discovered strange drawings on the

ground in the Arabian Peninsula. They looked like giant bicycle wheels. The results of the research revealed that they were created in 6500 B.C. This is very strange because geoglyphs are not visible from the ground, and one can only look at them from the bird's eye view.

Giant patterns were also found in Kazakhstan on the territory of the Torgai steppe during the careful examination of pictures taken from space. In total, 7 variants of such images have been found in the Kazakh steppes. They are formed by a group of hills, which were previously thought to be of natural origin. The outlines resemble inscriptions. The Usthogai Square formed with the help of 101 hills became the most famous object among them. Its perimeter stands for 1148 m. The diameter of the other exhibit (Turgai swastika) reaches 94 m. The giant tetragon, one of whose sides is 171 m long, and the other is 137 m long is one of the discoveries.

In my opinion, «crop circles», which also have not received a scientific explanation yet, are related to the terrestrial images. They were first mentioned in Great Britain in the 17th century. Since the beginning of 1990, about 10 thousand circles have been recorded around the world – from Japan and China to the United States and Brazil. About 90% of all circles appeared in England, in the county of Wiltshire.

Such drawings can be small or so large that they

can only be seen entirely from an aeroplane. Usually, they appear at night within several seconds. If one analyzes the photographs of circles taken in different years, one can easily trace the tendency towards their complication. They represent squares, lines, ellipses, rhombuses, forming figures or pictograms of regular geometric shapes with an absolute verified lines accuracy. The electronic equipment fails to work inside the circles. Therefore, it has been suggested that this is not a human work. The figures in the fields are interpreted as messages.

The base of the figure can have several evenly laid layers, sometimes up to five such layers are observed. Wheat in each layer is twisted in the direction opposite to the previous one. Each their spikelet (cone) lies neatly next to other one. At the same time, the plant is not broken but rather twisted into a spiral by means of the same logarithmic proportions used in the Fibonacci numbers or the golden ratio. Such circles are different from fake ones, in which the spikelets (cones) are trodden and broken.

The official science still does not give a definite answer regarding the cause of the circles occurrence. Their occurrence can somehow be explained on the basis the of «Chladni figures» principle, according to which figures occur under the influence of the sound waves on the sand sprinkled on the surface of the elastic oscillating plate. A German physicist Ernst

Chladni, exploring the shapes formed by the sand's particles, and their relationship with the regime of oscillations, found that relatively large particles are collected at the nodal lines with the relatively low vibration amplitude. If the particles are relatively small, they are not collected at the nodes but in clusters. This results in various geometric forms' figures. This phenomenon has been observed by Savart and explained by Faraday as a consequence of the acoustic flow in the environment surrounding the plate. The same particles concentration's dependence on the size is set for the micro – and nanoparticles. If crop circles are formed in accordance with the «Chladni figures» principle, it is necessary to explain what is the source of the vibrations to cause the appearance of the figures and why they are different. In addition, one needs to find out if they can occur spontaneously. In researches by Chladni, they were formed under the influence of the experimenter.

Interest to the crop circles study has somewhat diminished after several retirees admitted that they were the authors of many images in order to shake the people's ordinary consciousness and stimulate a response.

Collected information regarding the crop circles allowed Jacques Vallée to establish that the early images were simple circles, and then circles occurred being accompanied by satellite circles. The complexity

of the drawings increased and, finally, images of highly accurate geometric figures appeared. In his opinion, most of the «drawings» characterized by extremely high mathematical accuracy and geometric fractality of the Mandelbrot set are difficult to explain, which were. What it the crop circles represent message of a highly developed civilization in the fractal geometry language?

In the summer of 1990, an international conference on the «phenomenon of circles» was held in Oxford attended by more than 150 scientists from different countries. Many spoke on it about rotating pillars of air, spiral air tangles, plasma vortices and the effects of static electricity. However, there was no consensus on the issue of the prints. The English philosopher Richard Crook reported on the oddities in these places. For example, in summer of 1989, on the very day when circles appeared on the fields, thousands of carrier pigeons lost their course, and the engine of a flying military aircraft stopped over one of the circles, which eventually crashed to the ground. In those cases where the process of the circles formation was witnessed by people who were in the field and were the eyewitnesses themselves, they mentioned a reddish light near earth itself. This corresponds to the opinion that the beam was directed to the field from an aircraft hovering in the air, creating the images in the same way as an electron beam draws an image on a computer

screen. At the same time, questions arose: why there are no eyewitnesses to detect the aircraft and why circles continue to appear despite the fact that they have already reached the highest degree of perfection?

Communicating with researchers studying the circles, Jacques Vallee concluded that the «drawing beam» is not just an infrared beam. Rather, it is a combination of laser and microwave radiation or a type of maser (quantum mechanical amplifier). Such a beam can be used not only as a weapon but as a means of aiming much more energy to the final target. What if the Tunguskiy and other so-called meteorites were destroyed in the same way before reaching Earth's surface, as described in the chapter about global catastrophes?

As it has been noted above, crop circles may be the message of another civilization in a language that is not understood by the terrestrial man. This assumption was expressed by some researchers of the given phenomenon. Lawrence Doyle from the SETI Institute in Mountain View (California) who offered an original way to study the system of the dolphins' signals could either confirm or refute this hypothesis. This method is based on complicated calculations that allow one to analyze any sequence of characters (a series of DNA bases, numbers, letters or phrases, etc.) to define the information content in it. At the same time, it turned out to be possible to establish that the dolphins'

incomprehensible «whistle» has the same slope coefficient of the line on the corresponding logarithmic scale's graph as in human languages. The conclusion was that the signals carry information. This method could be applied in the study of crop circles. Do they carry certain information or they do not?

In addition to complex images on Earth, it is also difficult to explain the occurrence of human created structures. The Great Wall of China is one of such mysterious historical sites. Many questions regarding its story are still questions. Historically, there was a version that the necessity to strengthen the newly established state's borders and protect the empire's border from Normand occurred during the period of the separate ancient Chinese princedoms' unification under the rule of a single emperor. The very idea of the wall's construction belonged to Emperor Shi Huangdi of the Qin Dynasty. Two main load-bearing sandstone of hard rocks-built walls with a thickness of slightly less than a meter were constructed at a distance of about 7 m from each other. The gap between them was filled with clay thoroughly rammed to a state close to the monolith. The wall stretches for 4 thousand kilometres. Its height reached 10 m; watchtowers were installed at the distance of every 60-100 m.

The Great Wall of China's traces have been discovered outside the current territory of China in the Gobi desert in Mongolia. It runs parallel to the southern

border of Mongolia and China for more than 100 km. In some places, the wall is preserved to a height of 2.5 m. It is made of soil and sexual branches. The construction of the Mongol wall belongs to the reign of the Chinese Han dynasty (206 BC – 220 ad). The radiocarbon analysis showed that the later wall was several times rebuilt, in the XII century as well, i.e., within the Genghis Khan's period. Some of the walls discovered in Northern Mongolia, reaching the territory of contemporary Russia, forming a senseless forks, strange turns and running through the ridges of inaccessible hills and mountains that are difficult to access. Dozens of separate walls are arranged in a parallel order. There is no a single logical answer to the question of the Great Wall's construction. Military historians do not accept the version of the protective purpose of the Great Wall, that is, to protect China from foreign invasions as it was not an entire one and it could be passed around. In addition, all the armed forces of China at that time would not be enough to organize an effective defence on the very wall. If a small squadron were deployed in each tower, the enemy would defeat it thoroughly before the neighbours could come to support it. If, however, large groups were deployed with lesser density, the enemy could easily and invisibly penetrate through the gaps. At the same time, one edge of the wall really has certain protection, but the other one leaves an

impressive kilometres-long pass uncovered.

What really surprises is the fact that the embrasures of some Wall's segments are oriented not on the North but on the South, while on others they are oriented both on the North and South.

The question regarding the aim of this project's implementation remains without a definite answer. Many modern researchers believe that all known for now ancient civilizations did not have enough knowledge to project the Great Wall. Neither aerial photography nor accurate maps of Earth's surface as well as geodesy existed. It is possible that the construction was planned by the highest civilization's representatives. The Great Wall of China is the only man-made terrestrial object clearly visible from space. It is stretched along the definite line and winds even on flat areas, which indicates some kind of practical sense. The Great Wall, being laid over the map of known parallels and meridians net, almost accurately follows the thirtieth parallel. This imaginary line is a kind of equator to separate Earth's terrain equally. It should be noted that a similar wall with a length of 270 m and a height of up to 2 m was discovered in Georgia. It was built about 1600 years ago, and its purpose remains a mystery. It is unlikely to be used to protect the mountains from an attack since there is not a single water source on the mountain. Cherokee legends say that the wall was built by the underground, tall,

fair-skinned, bearded «moon-eyed» residents leading a nocturnal lifestyle.

The Great Wall of China reminds the Zmiev Waly, which pass through the territory of Western Ukraine and end in the basin of the Seversky Donets River. About a quarter of the ramparts in Volyn, Kyiv region (the longest fortification system), Poltava region, Kharkiv region, Pereyaslav region and Podillia have survived to our time. The remains of the ramparts are preserved along the rivers Vit, Krasnaya, Stuhna, Trubezh, Sula, Ros, etc.

Besides Ukraine, similar ground formations, stretching for tens and hundreds of kilometres, were found in other European countries – Bulgaria, Hungary, Poland, Romania, Moldova, Germany (Transdanubian and Zareinsky ramparts), as well as on the border of England and Scotland (Adrian ramparts).

Zmievy ramparts surround Kyiv and the adjacent areas of the state of Kievan Rus with several semicircles. The height of the ramparts reaches 10–15 m, and the width ranges from 20 to 60 m. The total length of the ramparts exceeds 2000 km, and the length of separate sections ranges from 1 to 150 km. Artificially created ramparts are accompanied by moats. They were created, as a rule, by means of a ledge in the steppe direction, forming a front to the south and southeast, thus establishing the entire fortification system. The ramparts were often

strengthened with a wooden picket fence (sometimes with walls) with embrasures and watch towers on the upper platforms. The ramparts had wooden structures built-in for strengthening. Wood was burned on purpose to provide the embankment with greater strength. Some sections of the ramparts consisted of several fortified lines and ditches with a depth of more than 200 km. Signs of fortifications and settlements to the military units' deployment have been found behind the ramparts in many places. At the same time, the Zmievyy ramparts were not analogous to the fortress walls – permanent garrisons were not deployed there.

The chronological problem of Zmievyy Ramparts continues to be debatable. On the basis of the carbon analysis, they date back to the II century B.C. – the 7th century A.D. Some researchers tend to believe that Kyiv princes built the Zmievyy ramparts in order to protect the southern borders of Kievan Rus from the Pecheneg attacks, while others argue that the main work on the construction of the Zmievyy ramparts was carried out within the period from the 2nd century B.C. according to the 8th century A.D. Then it is not clear why Zmievyy ramparts, which had been used as a means of protection for nine centuries, but were not used for these purposes after the 7th century A.D.?

The map of the Zmievyy Ramparts shows that they were built according to a single plan, which could have been realized for many hundreds of years only by a

large centralized state, capable of mobilizing thousands of detachments of builders. According to various estimates of experts, from 5 to 10 million people lived on the territory of Kyivan Rus in the later period (X–XIII century), which is definitely not enough to perform such a construction. In the earlier period, the population was not likely to be larger. Therefore, it is not plausible that such a titanic work could have been carried out by unorganized Slavic tribes living in the territory of Polesie and the Forest-Steppe of Ukraine, as well as in neighbouring areas. In addition, the construction of such large structures is not recorded in the annals.

According to a popular legend, one day Nikita Kozhemyaka harnessed a serpent into a huge plow and ploughed the soil, having thus created in a furrow and the edges formed the ramparts. It gave the name of the created structure, that is, «Zmievy ramparts». At the same time, the serpent which Kozhemyaka used for ploughing got to the river to drink water and allegedly groaned and died. Since then, the river he drank water from has been called Stugna (from Ukrainian *stognaty* – moan).

Up to now, it is difficult to explain the construction and purpose of such colossal structures like the Great Wall of China and Zmievy ramparts. People could carry out such grandiose projects under the influence and with the participation of highly

developed organizers able to unite them and direct them towards the achievement of a specific goal, despite the fact that such a goal did not matter to them. Probably, such a massive impact on the psyche is possible. For example, mental epidemics are known to occur in a human society. For instance, there was an epidemic of demonic insanity, accompanied by hallucinations of demon obsession in the VIII century in Calabria (Italy). The epidemic reached Constantinople.

In 1418, a crazy dance swept all over Paris. People danced till exhaustion in the streets and squares, on balconies, roofs and Parisian cemeteries. In the sixteenth century, such madness once involved the inhabitants of Lisbon.

The St. Vitus's dance epidemic was described in Germany at the end of the 14th century. People moved through the streets, spun, danced and jumped. They were unconscious and hallucinated. Music, singing, and church service contributed much to the spread of this epidemic. At the beginning of the 15th century, a similar state spread over Spain. The red colour made people fury, and the water itself attracted people, as a result, many distraught people rushed into the water and drowned.

In 1962, an epidemic of laughter on the territory of current Tanzania, which ended only a year and a half later.

There are massive sexual epidemics in the East.

The global sexual psychopathy that occurred in France in 1848 is described, as well as the epidemic of masturbation in Germany and the 1903 epidemic of rapes. Epidemic pederasty was also observed. So, the epidemic of global homosexual debauchery spread in Rome in 218–222 A.D., and at the end of the nineteenth century among the soldiers of Brazil and Colombia.

Judging from the normal human logic, it is very difficult to explain the fact that idea of mass elimination of people of a certain nationality originated in the in civilized Germany last century. With this aim, special camps being serviced by thousands of people were constructed. At the same time in the other state, the USSR, people were massively eliminated just because their thoughts did not coincide with the official point of view of the state. Also, the camps were globally built where dissenters were systematically carried out. Aren't these the psyche changes which can explain the fact that there are people who are currently making excuses for the organizers of these murders? In addition, it should be noted that ideas fictitious implemented in the Russia population's minds allow justifying the killing of citizens of almost all neighbouring states, which were had been carried out at regular intervals.

It is suggested that mental epidemics, accompanied by the same mass consciousness change's

type in large groups of people, are associated with solar activity. It has long been observed that induced psychoses, ups and downs of various kinds of social movements, riots, strikes, emigration are similar to infectious diseases that periodically cover different territories. Chizhevsky's theory, based on years of observations and experiments given in details in the book «Physical Factors of the Historical Process», manifested the fact that the cycles of solar activity manifest themselves in the biosphere changing life processes, from productivity to the incidence and mental state of humankind. This correlation has been confirmed by the historical statistics' study of more than 80 countries and peoples within a period of 2500 years. It is noted that in years when there are many spots on the Sun, wars, revolutions, political and economic crises or epidemics occur in almost 60% of cases on Earth. When the activity of the Sun decreases, the mass movements calmed down and they stood for only 5%. Currently, it is believed that solar activity itself does not cause these events, but initiates those processes that are highly probable and are about to start. Therefore, it is possible to assume that during the Great Wall of China and the Znievy Pamparts construction, a mass impact on the psyche of people in a certain trend was carried out on the basis of some kind of obsession.

Other objects have also been identified in various

parts of Earth, the purpose of which is difficult to explain judging from the historical capabilities of a human. For example, the giant stone balls of Costa Rica intrigue with their appearance and incomprehensible origin. It is not known by whom and what for they have been created.

In the lower valley of the Mississippi River, traces of a unique huge structure were discovered, which consisted of six concentric octagons and diagonally occupied about 1 km territory. It was established that it was built 1800 years B.C. Its design and dimensions analysis showed that the gaps between octagons correspond to the direction of the sunset on the days of winter and summer solstices with very high accuracy. It gave the experts grounds to conclude that the building was used to know time with very high accuracy.

In central China, in a zone closed for foreigners, about 100 kilometres from Xi'an, Shaanxi Province, there is a complex of the giant pyramids, the largest of which is almost 300 m, i.e., twice as high as the Great Pyramid in Giza is.

It seems obvious that Earth saw technologies being applied to make it possible to cut the granite and Basalt Mountains, move blocks of 100 tons or more weight for hundreds and thousands of kilometres, process millions of tons of stone and build huge structures from it, which we see now.

A number of archaeological finds also makes one think about the existence of an intelligence whose actions are difficult to explain judging from the capabilities of a human intelligence. For example, in Kamchatka, archaeologists of St. Petersburg University have discovered strange fossils of a mechanism that was «sealed» in the volcano's remains. The analysis showed that the device consists of metal parts forming a mechanism similar to a computer or clock. Hundreds of gear cylinders are well preserved. Geologists from the United States examined this find and confirmed that this mechanism was developed 400 million years ago when the planet was inhabited by very simple life forms. The find presupposes that either even then there was intelligence capable of developing such a device or our chronological calculations are incorrect.

Another archaeological find was discovered during excavations near Baghdad and was called the «Baghdad Battery». Based on the structure of the find, scientists suggested that this ancient battery could produce an electric current with a 1 volt voltage. Why the manufacturing technology of such batteries was lost and nothing like this was found in other regions?

People cannot link all inexplicable phenomena and objects on Earth with the human civilization's activities and these phenomena give reason to believe that they are related to the highly developed Intelligence activity. If there is no evidence to prove the

existence of highly developed civilizations in outer space, then the presence of a parallel intelligent civilization on Earth is confirmed by the fact of the plant and animal world creation on Earth. Anthropocentricity in human thinking prevents humans from realizing this. Therefore, the «Fermi paradox» advocates can be advised to go to the mirror and carefully examine their reflection as the perfection of the protein life creation on Earth, and then go to the window and see the diversity of this life.

3.3. UNIDENTIFIED FLYING OBJECTS (UFO)

The unidentified flying objects, or UFOs (Unidentified flying object, UFO) are the most popular and unexplained observations on the planet Earth. The «UFO» notion is used by the ground control agents for tracking services in relation to the recorded movement of airborne vehicles that are not amenable to classification and which have no scientific explanation. The term «UFO» was invented in 1954 by Edward Ruppelt, an employee of the American Center for Aeronautical and Technical Intelligence, who systematized such cases. Despite all the unusualness, such abnormal phenomena are recorded by radars, recorded on photo and film cameras, their presence or approximation are felt by animals.

The most comprehensive definition of UFOs was given by Joseph Allen Hynek, who had been a U.S. Air Force consultant on the UFO problem for 20 years: «the perception of an object or light visible in the sky or space or above Earth's surface; a phenomenon, a ghost, a trajectory, the general dynamics and nature of which does not have a logical, generally accepted explanation, is a secret not only for eyewitnesses, but remains unexplained even after a close examination of all available evidence by specialists who are able, if any, to identify the phenomenon from the point of view common sense».

Books by Aime Michel, Joseph Allen Hynek, Ralph and Judy Blume, Ted Phillips, John Keel, Ralph Fowler, Frederick Edwards, Joseph Jacobs and other authors are dedicated to the UFO's description. Jacques Vallee dedicated three books to this phenomenon, namely, «Anatomy of a Phenomenon: Unidentified Objects in Space – a Scientific Appraisal», «Passport to Magonia: From Folklore to Flying Saucers» and «The Invisible College: What a Group of Scientists Has Discovered about UFO Influences on the Human Race». A number of books were written by the Russian researcher Vladimir Azhazha.

Eyewitnesses left numerous descriptions of UFOs due to the years of observation. The original classification of UFOs was performed by Joseph Allen Hynek, who conditionally divided all the UFO's

observations into two groups – «near», located at a distance of not more than 150 m from the observer, and «distant». The «distant» ones were divided into three groups: «Daytime disks», «Night lights» and «Radar-visual observations».

According to another conventional classification, UFOs are divided into two groups: local phenomena having the form of the various geometric shapes with relatively sharp boundaries' formations, and extended phenomena observed simultaneously over a large territory with sufficiently large angular dimensions.

According to the results of observations, UFOs or flying saucers differ from each other in shape, color, size, flight speed and even smell, have a characteristic shape in the form of a sphere, cylinder, rectangle, disk with one or two convex sides, a disk with a dome, have an entire number of lighting specific features – emit bright light on a relatively dark background, clearly distinguished steady or pulsating light, have simultaneous or sequential multicolour or iridescent colours.

Very high speeds and unusual flight trajectories (hovering, lowering, sharp maneuvers, fluctuations, and rotation) are among the UFOs specific characteristics. In addition, they are able to divide into parts with the subsequent separate flight of each constituent part, as well as the geometric shapes change. Their appearance is accompanied by the electromagnetic fields

occurrence and, probably, other types of radiation affecting the environment, living organisms, electrical, radio and other devices.

Jacques Vallee, the American researcher, conducted statistical processing of UFO reports. He managed to detect certain patterns in the distribution of the number of messages depending on the time of day, population density, eyewitnesses' socio-demographic characteristics, etc. He stated that the potential number of observations falls at 4 am. The army archives have accumulated tens of thousands of UFO observations. The military leadership was seriously worried of the fact that unknown objects were repeatedly recorded by pilots and operators. As a result, special units were established for the data's collection and analysis in order to find out the level of the UFO's threat to the national security.

In the United States, a directive for military personnel was developed to define the behavior in case of the UFO's detection. According to it, the command distinguishes UFOs as a special type of airborne objects, indicating the differences between them and conventional aircraft.

The USSR Navy has also seen the methodical guidelines regarding the observation of the anomalous physical phenomena and their effect on the environment, living organisms and technical devices.

One of the projects for the systematic incoming

messages from unidentified flying objects' research was carried out by the US Air Force within 1952–1970 under the «Blue Book» title. At the same time, the leaders decided to draw the scientists to the researches, they were supposed to answer many questions related to the UFOs. The distinguished American physicist Edward Uhler Condon became the leader of the «Scientific Research of Unidentified Flying Objects» project With the funding of nearly half a million dollars. The commission examined 12,618 reports. However, most of them were considered the erroneous ones, as they stood for the natural phenomena (clouds, stars, etc.) or ordinary aeroplanes. According to the US National Aerospace Intelligence Agency, a number of reports could be explained by flights of previously classified U-2 and A-12 reconnaissance aircrafts. Only a minor number of the UFO reports have been classified as the inexplicable ones even after the rigorous analysis.

As a result of the studies, the Commission came to the following conclusions:

- None of the unidentified flying objects whose reports were investigated and evaluated by the Air Force have ever stood for a threat to national security.
- No evidence presented or discovered by the Air Force indicates that presumably observed objects classified as «unidentified» are based on technological developments and principles beyond the scope of the

contemporary scientific knowledge.

- No evidence proves that the «unknown» category's presumably observable objects are the extraterrestrial vehicles.

According to the commission's conclusions, no information has been obtained that could enrich science within 21 years of the UFOs studying, and further extensive UFOs research are not likely to be justified by the hope of its development. The research project was terminated on the basis of the given conclusion. It is quite possible that the Commission could not draw the other conclusion due to the political considerations, the purpose of which would reserve the priority of this area's research.

It is remarkable that Joseph Allen Hynek, the professor of astronomy at Northwestern University, who was skeptical of all UFO reports and, being invited by the U.S. Air Force project managers, had to screen out any astronomical observations from the messages, changed his mind and became an active researcher of this area. At that time he believed that the «flying saucers» were reported by unreliable or baffled by a natural phenomenon people. However, the Joseph Allen Hynek's communication of with astronomers, pilots, police officers, and military personnel made him to come to the conclusion that there were empirically supported evidences. Being the U.S. Air Force UFO's consultant within the «Blue Book» special research

project's frameworks he made a long way from the completely denial to the recognition of a mysterious phenomenon's reality. With the «Blue Book» project's (1969) termination, Hynek founded the Center for UFO Studies (CUFOS) organization established in Chicago to study the unidentified flying objects' «observation» with the scientific methods being involved.

The scientists and amateurs, ordinary eyewitnesses or visionaries obsessed with the idea of an alien mind, can be recognized among the UFO researchers. Hynek identified two groups of scientists rejecting UFOs in his book «The UFO Experience: A Scientific Inquiry» (1972). He referred scoffers who do not even try to deal with any particular phenomenon observation's case to the first group, and scientists who, after verification, tend to recognize the UFOs reality, but only as a pure psychological phenomenon were referred to the second group. The second group of scientists' position deserves attention since they have materials for discussion. The first group's views, on the contrary, do not stimulate discussion, because, in their opinion, if there is no phenomenon, then there is no discussion (no phenomenon, no discussion).

In my opinion, Jacques Vallee and Vladimir Azhazha's researches deserve the most attention, apart from the researches by A. Hynek. Jacques Vallee graduated from the University of Paris (Sorbonne), was awarded a Bachelor's degree in Mathematics, as well as

a Master's degree in Astrophysics by the University of Lille. He worked for the Paris Observatory in Medon. Then he was invited to work for the University of Texas's Observatory at Austin (USA). Soon he was transferred to the NASA-owned MacDonal Observatory, where he was involved in the detailed topographic maps of Mars's compilation. He worked on the artificial intelligence's problem at the University of Michigan and defended his doctoral dissertation in computer science at Northwestern University. Dr. Joseph Allen Hynek was his scientific supervisor, and involved him in the UFOs research. Then he worked at the Institute of the Future, where he was the leading developer of the National Science Foundation's project: global computer networks designing.

The works of Vladimir Azhazha, a four-striper (post-captain), the former deputy head of the section of underwater research of the oceanographic commission of the USSR Academy of Sciences, dedicated to this issue are also noteworthy.

Vladimir Azhazha and his co-authors write in the book «Beware: UFO!»: «As a rule, people, without noticing the fact, gradually fall into the complete submission to the source of contact. At the same time, some sharply worsen relations with family and friends, others constantly have conflicts with their colleagues, and others have the nervous system and psyche disorders of».

Among the possible reasons why science is not engaged in the unidentified flying objects' research, the following can be pointed out: the impossibility to predict in advance the place of the UFOs appearance, which complicates its study; the number of conscious hoaxes, as well as the prevalence of paranormal hypotheses trying to explain the UFOs origin, as well as the interest in UFOs on the part of religious fanatics and people with mental disorders. It is difficult to research UFOs since these are the eyewitnesses' subjective evidences which are the starting point for the analysis. Therefore, a vast volume of information contains facts of variable degree of reliability and quality of observation. It gave all the reasons to call a significant part of them implausible or fictitious. Moreover, it must be borne in mind that some witnesses of the UFOs appearance may suffer from mental illness, schizophrenia, in particular. Frequent or prolonged (over years) hallucinations, accompanied by changes in the external or internal world's perception are one of the most characteristic symptoms of this disease. In this case, the patient sees the non-existing objects, but he perceives them and describes them as part of the real world. Among hallucinations, various science fiction images often appear. Sometimes visual hallucinations are presented in the form of light flashes, falling stars, comets and other cosmic phenomena. A patient with a mental disorder is sometimes sure that all

these visions have a secret meaning and are sent to him as a chosen one, as he has a special mission to save the world. Psychiatrists argue that the visual hallucinations increase occurs at night and in the evening. According to a large-scale study (Epidemiological Catchment Area Project, USA), about 11-13% of people have experienced hallucinations in their lifetime. The results of another study conducted in Holland showed that «true» hallucinations were observed among 1.7% of the population. One of the schizophrenia's important diagnostic symptoms of is the illusion of being controlled by an external influence. People with schizophrenia sometimes describe their feelings in such a way that certain actions they perform were neither initiated by them nor under their control.

John Keel wrote that after meeting UFOs, people faced their state's deterioration, many of them went mad. It can be assumed that these observations may be associated with the manifestation of mental illness but not the UFOs effect's consequence. However, no one has considered such a possibility. Is it possible to believe the reports regarding people's abduction and examination by UFOs? Indeed, every year 30 thousand people disappear only in Russia, of which 15 thousand are found. Where are the remaining 15 thousand people? Though, it has not been proved yet that they are being abducted by UFOs.

Information about sexual contacts between people

and other civilization's representatives is an absolutely absurd. No offspring can be born from such contacts due to the genetic incompatibility.

One version to explain the UFOs appearance is based on their natural origin (The Natural Explanation). This version is based on the fact that all unexplained cases are a consequence of phenomena already known, described and examined by modern science: meteors, flying birds, burning swamp gas. It has been suggested that many UFOs are fireballs.

There is a version of the UFOs anthropogenic origin, which may be either the Third Reich disc-shaped aircraft or modern reconnaissance aircraft. One point against the UFOs anthropogenic origin is that they were observed long before the scientific and technological revolution in a human society. Moreover, some UFO maneuvers are strange, take the right angle's turning at speed deadly to any living creature inside the object as an example. Ancient and medieval evidence about UFOs demonstrates that mankind has been co-existing and interacting with the large-scale phenomenon for a long time, the model of which does not fit the traditional picture of the world. The singularity of kinematic, power and other characteristics, as well as the ability to affect wildlife and technical devices stand for the intelligent nature and technological superiority.

It has also been suggested that unknown objects

observed in the near-Earth space are space debris. Nowadays, there are about 10 thousand different objects there. There are also dozens of spacecraft exhaust nuclear reactors on the orbit. All these objects can cause a glow in the night sky and false suspicions of the one who is observing them.

However, in a number of reliable cases, the observed phenomena have not received an acceptable explanation yet. The available information on anomalous phenomena allowed us to consider that this problem deserves serious research and practical use of Earth's atmosphere and outer space.

On the Moon's photographs, researchers accidentally discovered a rather strange object in the form of a hole located in Bancroft Crater located on the visible side of the Moon. The hole is of square shape, unknown tubercles are placed along the edges of the recess. It resembles an entrance to an underground bunker.

According to the information by Vladimir Chernavin, the former USSR's Navy commander-in-chief, the Admiral of the Fleet, the USSR Navy the accumulated a large number of cases of observation of unidentified objects floating from underwater and plunging into the depths, which served as the basis for the establishment of a special group to collect and analyze such facts. Nikolai Smirnov, the Admiral of the Fleet and the Navy's

deputy-commander-in-chief, headed this group. Once a week, members of this group prepared a report on this issue for the Navy's commander-in-chief. The submarines' hydro acoustics repeatedly reported strange «targets» maintaining stable position (course angle and distance) relative to a maneuvering submarine – they simultaneously made turns and also accurately altered depths and speeds.

It was recorded that with the luminous figures' appearance on the ocean's surface, brightly shining objects in the form of ordinary and flattened balls flew out from under the water. Several photographs were even taken. Figures circled a ship passing by along an intricate trajectory and again hid in the water. When radars and other devices to study the seabed became available, the registration of objects moving at great depths at an incredible speed inaccessible to modern submarines started.

A mysterious sound in the ocean, which the Americans call Bloop (roar), is also associated with the aquatic environment. It was recorded in the Pacific Ocean off the South America coast by several NOAA ships (US National Oceanic and Atmospheric Administration). The sound was increasing in frequency for about 1 minute, and then stopped, while the sensors recorded it at a distance of 5 thousand km from the hypothetical epicentre. Its volume was distinguished by two microphones located at a distance

of 3 thousand miles from each other. Russian sailors called «Quakers» the underwater objects emitting sound signals resembling frogs croaking. They were recorded by many military and civilian sailors, submariners and researchers who registered and mentioned them in ship's registers, reports and reports, assuming these sounds artificial origin.

Vladimir Azhazha, while analyzing the naval UFO information, came to a conclusion: 50% of UFO encounters are related to oceans and 15% are related to the lakes. The oceans and seas are ranked in the following order according the UFO's observation: the Atlantic Ocean (44% of cases), the Pacific Ocean (16 %) and the Mediterranean Sea (10 % of cases). All other cases fall to 30 %. As for the Atlantic Ocean, the UFOs are most often noticed in the deepest area, that is, on the South of the Bermuda triangle and the Caribbeans. It should be noted that the deepest trench of the Atlantic Ocean, the Puerto Rica's one, is on the territory of the Bermuda triangle. It is s 8742 m deep. Dr. Verlag Meyer, an oceanographer, found two giant pyramids, each one bigger than the great pyramid of Cheops in Egypt with the help of the sonar in the Bermuda triangle at a depth of two thousand feet. Sonar equipment and high resolution computerized analyzers, installed on the ship, showed the voluminous and perfectly smooth surface of the pyramid not overgrown with algae, with no commissures, cracks or connectors

detected. According to the oceanographer, humanity is not familiar with the technology used for their construction. Verlag Meyer came to the conclusion that the pyramids are made up of glass. After examining all the age characteristics of these pyramids, he found that they were not more than 500 years old and they are not the remnants of the bygone civilizations. V. Meyer submitted a report, maps with the pyramids' exact coordinates and graphics with their image. It is suggested that the glass pyramid is the central unit of a powerful energy complex, which causes anomalies in the Bermuda triangle.

It should be noted that underwater pyramids were also discovered in other regions of Earth as well. So, a step pyramid consisting of stone slabs with the total height of about 20 m was discovered at the bottom of the lake in the southwestern Yunnan province in China. Moreover, there are 30 similar objects at the bottom of this lake. It is believed that they were constructed by an ancient civilization.

Still, the world ocean conceals many mysteries about the death of submarines. Of course, it is impossible not to take into account their technical imperfection and military confrontation between the strongest world powers. However, the role of advanced civilization in these tragic events also cannot be excluded. It is known that a number of submarines belonging to different states faced crashes under

mysterious circumstances. Thus, in the early 30-ies of the last century the unusual submarine M-2 was in service in Great Britain; such a submarine entered the English Channel within the frameworks of the training march and disappeared. 50 ships were involved in the search (rescue) operation and it took 8 days to find it at a depth of 35 m. The hangar cover, as well as the transition hatch in the hull of the boat, was open. Attempt to lift the boat to the surface was not a success and it was left under the water forever. There was an attempt to explain the tragedy by the fact that the submariners made a mistake being underwater – opened the hatch. However, the cause of this mistake has not been found yet.

The fate of 50 crew members of the Soviet diesel-electric submarine of the S-2 series, which in 1940 was located in the Gulf of Bothnia and actively operated on the enemy's sea lines, is still unknown. The official version said that it was eliminated in the area of the Finnish mine barriers.

During the Second World War, many submarines of different states were considered MIA ones. And although after the war there were the documents found confirming the elimination of some of them, still a number of mysterious losses could not be explained. Thus, in 1942, an American submarine, located near the Japanese coast, was considered the MIA one. After the war, no mention of the submarine's being under attack

or its sinking was found in the archives of Japan.

There were many sunken ships on the battle account of the U-209, the German submarine of the Second World War. But it disappeared in May 1943. Until 1991, everyone believed that it was eliminated while attacking the British frigate, but it turned out later that other German submarine was involved in the attack, which means that the secret of the U-209 disappearance has not been disclosed yet.

Only within 1955–2014, 8 atomic submarines sank. The true causes of the tragedies occurred have not been elucidated yet. Only versions are available. It is assumed that they wrecked as a result of various accidents: 3 – due to technical malfunctions, 2 – due to fires, 2 – due to the armament problems, the cause of the one boat's elimination is not reliably known. Problems with a nuclear power plant were observed only in one case – on the K-27. They did not lead to the elimination of the boat, but in the end they became the cause of flooding for disposal. Also the causes of the American submarine «Scorpio»'s wreck are unknown.

In 2000, the «Kursk» atomic submarine missile carrier along with 118 crew members was lost in the Barents Sea. The tragedy happened at the distance of 175 km from Severomorsk. The official version of the cause of the submarine's wreck is an explosion in a torpedo tube. It has been suggested that the boat was either attacked by a torpedo or collided with a mine

installed during World War II.

It should also be mentioned, that some researchers, who had been studying «The Titanic» wreck's circumstances, came to the conclusion that the liner could have been sunk by a kind of underwater civilization. As the result of the wreck, more than one and a half thousand people died. The wreckage of the vessel rest at a depth of about 4 thousand meters. The body of the Titanic broke in half: the feed lies at the bottom at a distance of about 600 m from the bow. Smaller debris are scattered around an area of about 2.6 square kilometres. What if it is the response of a supreme civilization to the introduction of a man into the alien territory?

There are also direct attacks of ships by the unidentified objects described. Thus, one British edition reported that in 1809 the ship «Warren Hastings» was «attacked by three fireballs» during a storm. The team saw one of them go down and kill a man on the deck. The one who decided to pick up the dead body was hit by a second ball, he was knocked down with light burns remaining on his body. The third ball killed one more man. The team noted that after the incident there was a disgusting smell of sulfur over the deck. In this episode, the plasma formations' conscious actions are described.

This case is reminiscent of the events described by the chronicler Nestor in The Tale of Bygone Years. He wrote that in 1092, «There was a sign in the sky –

like a great circle in the middle of the sky... A miraculous miracle appeared... At night there was a stomp, something moaned on the street, demons roamed like people. If someone left the house to have a look, he was invisibly bogged down, he was granted an ulcer and died of it... Then they began to appear on horses during the day, but they themselves were not visible, but horses and their hooves were visible...»...

In 1988, Jacques Vallee came to Brazil to study cases of the UFO aggression. He met with eyewitnesses, interviewed doctors and police officers, copied dozens of official documents and came to the conclusion that UFO rays lead to the nervous system disorders and to death, in some cases. At the same time, luminous rays are not an effective weapon. One can hide from them in the forest or under a shore cliff. According to Jacques Vallee, UFOs attack not to kill or injure people. Such a task can be performed much more efficiently even with primitive weapons. Their activity should not be considered as direct hostility, but as the fulfilment of a task, and its executors do not care about our feelings and health. According to Jacques Vallee, the UFOs aggressiveness increases in direct proportion to the distance from cities. Those who walk at night in the countryside without sheltering trees run the risk of being left alone with unknown hunters. It is believed that UFOs create an electromagnetic field that causes the electrical appliances and electrical engineering's

failure, as well as the metal objects electrification and the painful conditions occurrence in humans. It is known that the electromagnetic field affects the human body in different ways: thoughts, behaviour, physiological state and vitality are altered. Due to the wide range of the given frequencies ranging from gamma rays to the low frequencies electro-oscillations, changes in the human body can be the most ambiguous. First of all, it negatively affects the nervous, immune, endocrine and reproductive systems. The consequences may depend on the power of the emission source, the distance to it and the duration of electromagnetic emission exposure.

The famous book «Flying Saucers – Serious Business» by the American journalist Frank Edwards begins with the following warning: «Approaching a UFO can be dangerous to humans. Do not stand under a UFO that flies at a low altitude. Do not touch the landing UFO. Leave this place for the sake of your own safety... Do not risk observing a UFO».

The issue of the UFO's origin has been repeatedly arisen. Researchers initially inclined to the idea of their extraterrestrial origin, but later concluded that they exist along with humanity. The US CIA has declassified hundreds of documents on the investigation of the UFO's observation in different countries, which were divided into two groups depending on skepticism and optimism regarding the UFO's belonging to

extraterrestrial civilizations. None of those documents testified to the UFO's connection with aliens, since most of the data lacked sufficient materials (contained insufficient materials) for the scientific analysis.

J. Hyneck was also not an advocate of the ideas about the UFOs alien origin of. He reinforced his doubts with the absurd abundance of their frequent and unjustified occurrence. Jacques Vallee, the ufologist, was one of the most ardent opponents of the extraterrestrial hypothesis. In the article «Five Arguments against the Extraterrestrial Origin of Unidentified Flying Objects,» published in the journal «Journal of Scientific Exploration», he puts forward the arguments contradicting the UFOs extraterrestrial origin's hypothesis:

- The number of contacts in their numbers significantly exceeds necessary number for the physical exploration of Earth.

- The humanoid appearance of the alleged «aliens» has little chance of appearing on another planet and, from the point of view of biology, is not very suitable for the space travel.

- The behavior of «aliens» contradicts the hypothesis of the scientific or genetic research on people carried out by a race that has gone far from us in its development.

- The UFOs' evident ability to manipulate space and time allows us to put forward fundamentally

different, much more fruitful hypotheses.

- Observation of the phenomenon throughout the human history indicates that UFOs have been traced through the history of mankind.

Jacques Vallee provided a number of the UFOs historical observations when there were no modern technical means to confuse with such objects. For example, within 1896–1897 a series of observations took place, and UFOs were described as «oval objects flying through the sky, glowing with bright lights». These objects did what is done by contemporary UFOs. They moved very quickly, turned sharply and changed the flight direction, landed. He suggested that many various nations' myths and legends may be related to the UFO phenomenon. John Keel, the ufologist, set forth the ultra-earth hypothesis of the origin of UFOs (Ultra terrestrial hypothesis) in his book «UFO: Operation the Trojan horse» (UFO: operation «Trojan horse»). Based on the analysis of a huge number of facts accumulated over 25 years, he came to the conclusion that flying saucers do not arrive from some distant planet and are not representatives of some mysterious civilization. He believed that the flying saucers are either launched by civilizations that live on Earth in parallel with the human, or UFOs are unknown creatures living on Earth.

Researchers such as Dr. Brad Steiger, Trevor James Constable, Florin Gheorghiu and Vladimir

Azhazha have also abandoned the idea of the UFOs alien origin of.

It goes without saying that people are faced with new phenomena that cannot be explained from the existing worldview concepts' standpoint. The UFOs existence evidences amount to hundreds of thousands ones. At the same time, a distinct contradiction between the factual material's abundance and the complete failure of attempts to explain the nature of this phenomenon has been defined. Jacques Vallee revealed all the data collected in «Passport to Magonia: From Folklore to Flying Saucers», his third book on ufology. In his opinion, as the UFO phenomenon, three levels of this phenomenon should be distinguished. The first level is the physical one. This is a large amount of energy enclosed in a small space, as well as the light and microwave energy emission. The second level is what happens to witnesses who claim the orientation and a sense of time loss while contacting with a UFO. The skin effect like sunburns and the eyes effect are often – ranging from conjunctivitis to temporary blindness. There were cases when, after close contacts with UFOs, healing processes were accelerated under the influence of electromagnetic radiation. The third level is the impact on our views systems.

The discussion of the UFO problem was included to the official agenda of the UN General Assembly's 33rd session in 1978. Then, at a meeting of the Special

Political Committee, J. Vallee, being invited as a speaker, drew the attention of those present to the phenomenon reality, which manifests itself on these three levels.

Judging from the extensive and versatile material drawn from ethnography, mythology, history, philosophy, sociology, religion, parapsychology, physics and astronomy, Jacques Vallee considers the UFO phenomenon as a kind of system that exerted and continues to exert a profound influence on the mankind collective consciousness's evolution and the development of the culture of the entire terrestrial civilization.

The book «UFO's: 50 Years of Denial?» written by different authors and dealing with different aspects of the problem mentioned served as a kind of a summary of all these researches. The half-century history of scientific research (and not pure scientific one and pseudo-researches as well) by specialists (and enthusiasts) has allowed us to develop an array of hundreds of thousands of heterogeneous empirical data accumulated by more than 130 countries of the world, which, according to some estimates, makes up from 1 to 10% of all observations. There are descriptions confirmed by the radar data, as well as photo, film and video materials.

While considering the UFO phenomenon, questions requiring answers arise. If UFOs are of

terrestrial origin, then where is their permanent location? What kind of energy do they use? What is the purpose of their flights? Why do not they establish contacts with people and is it possible to establish contacts with them? Why is their appearance associated with the aquatic environment? What are the material features of their structure and functioning? The UFO phenomenon's mystery can only be revealed by means of the thoroughly conducted comprehensive scientific research.

3.4. REASONS FOR THE HIGHLY DEVELOPED CIVILIZATIONS SILENTLESS

All strange things should evoke interest and be accompanied by the search of possibilities to examine them. If such a desire appears among the human civilization's representatives, it is not available among other civilizations. The main reason for this phenomenon may be the fact that all highly developed civilizations have a disjoint system of concepts, which are determined by the surrounding environment, and individual characteristics of the world perception of and analysis of information obtained by means of analytical and synthetic thinking. Formation of the world's image in all organisms is determined by properties of their analyzers. The senses help to solve vital tasks. However, everybody reacts only on a certain part of the

world that surrounds it. It is related to people who are often difficult to imagine the possibility of the existence of an object or phenomenon they do not perceive by their analyzers. The human brain has a direct contact neither with the original matter nor with the external world but forms an image from signals provided by five main sense organs to provide vision, hearing, and sense of touch, taste and smell. Each protein your body develops brain images of the environment's perception. It depends on the senses' specific features and the brain functioning. Therefore, there is a specific incompleteness of the external world's perception. The world around us is filled with electromagnetic emission of various frequencies and wavelengths, but a human comes to conclusions judging from the knowledge of an insignificant part of the world perceived. In this case, the human senses perceive only an insignificant part of the information from the entire available wave range. Everything else is beyond his perception. Part of the external world is beyond of the human analyzers' physiological capabilities. The only reality that is given to a human is the world of his own perceptions and the devices readings.

The electromagnetic emission's spectrum is conventionally divided into several ranges: low-frequency waves, radio waves, infrared rays, visible light, ultraviolet rays, x-rays and gamma rays. There are no distinct boundaries between them, but

each range has its own characteristics (see Fig. 3.1).

Figure 3.1. Electromagnetic waves scale

About 80-90 % of environmental information is obtained through vision. The range of colours and shades is determined by the electromagnetic oscillations' frequency, and the light brightness is determined by their amplitude. As it is known, a human perceives seven basic colours: red, orange, yellow, green, blue, navy blue and violet. They range from 380 to 760 nanometers, which is only a narrow band in the wide spectrum of existing electromagnetic emission. Huge areas not perceived lie on both sides of it and one can penetrate there only with the help of special equipment. A human has learned to obtain the other wave ranges characteristics by means of the equipment used, but in limited situations. In addition, each of the devices has its own parameters and operational ranges, which are set by the designers, and the device does not perceive environmental features outside of these properties. Therefore, the world that is available today for scientific study is not ultimate one, and part of it exists beyond the instruments sensitivity. It is known that people do not even perceive many natural features that are available to some animals. R. Burton noted in his book «Animal Senses»: «We live in a world the

boundaries of which are defined by the capabilities of our senses, and for centuries we have believed that this world is the ultimate one. But, just as the 15th and 16th centuries' researchers and travelers showed that the borders of the world and the Universe extend much further than one might have imagined, the 20th century biologists have proved the existence of other sensory worlds, very diverse and completely different from our one. We now know that there are sounds that lie beyond the perception of our hearing, and if we do not perceive them, it does not mean that they do not exist...»...

For example, a human does not perceive a part of the spectrum accessible to insects, many of which have vision shifted to the ultraviolet part (bees, wasps, satyr butterflies). They perceive the ultraviolet light, but do not perceive the red one. Therefore, bees perceive white flowers as bluish-green, since they do not reflect the ultraviolet rays and flowers that appear to people to be blue or violet can have different shades for bees depending on the amount of ultraviolet rays they reflect.

It has been established that not a single vertebrate animal perceives polarized light, which differs from the ordinary one in that it vibrates only in one plane, while unpolarized light can be represented as a multitude of waves spreading in different planes, inclined at all possible angles to the horizontal plane. A bee is able to

perceive the polarized light, which helps it to navigate in environment. It is an example of an organism living in a very special world, different from the human one, as it has information not perceived by humans.

Many animals are colour blind and do not perceive the red colour. For example, dogs cannot perceive the red, the green, the orange, and the yellow colours. But they distinguish all shades of the grey colour much better than humans do. Bulls do not perceive the red colour and on a bullfight they rush not on the red colour of the bullfighter's cloak, but on its flickering irritating a bull, which the animal treats as the enemy.

Cats also do not perceive the red colour, but they perceive the blue and green colours. They can also distinguish up to 25 shades of the grey colour, which helps them navigate at night. Horses, goats and sheep do not perceive the blue colour, and hedgehogs perceive just the yellow-brown shades.

Beasts leading a nocturnal lifestyle see everything in black and white colours. Owls have good night vision. The sensitivity of their vision to the weak light exceeds the human vision by about 100 times. In case of snakes, on the contrary, the centre of vision has been moved to the infrared spectrum.

Some people sometimes show the ability to perceive complementary colours. If most people have three types of cones sensitive to the red, blue and green

colours' waves, then some have four. This condition (tetrachromatia) is more often inherent in women and is caused by the X-chromosome mutations. This suggests that the environment colour perception of the world surrounding a human is genetically programmed.

As for the ocean's depths of and outer space, with no light available, any intelligent creatures cannot communicate in the wave range of electromagnetic waves that are perceived by a human.

The human eye begins to distinguish matter at its certain density. Judging from his impressions, a person judges the world around him, not taking into account the properties that are beyond perception. At the same time, the visible and invisible parts of the world are based on the same principle and can be perceived differently by subjects who have analyzers different from other creatures. Then the physicochemical ideas about the world will be different as well.

As for sounds, humans perceive them in a different part of the wavelength spectrum than insects, bats, dolphins and other animals do. Normally, regardless of age, a human most easily perceives sound waves within the range of 100 to 2000 Hz. Everything that exceeds these boundaries (infrasound and ultrasound) is not perceived by a human's hearing. At the same time, for example, dolphins and bats are able to perceive infrasound, which extends much further in the atmosphere. Moreover, it is the main tool for their

orientation in space, in their environment. With its help, the brain constructs the corresponding images of the surrounding world in a way different from that of a human.

A highly developed civilization should have a form of communication in the form of a certain type signaling for communication and information transfer. Taking the different perceptions of the world and different opinions about it into account, a human cannot contact with civilizations that function on a different material basis. This requires an intermediary system which is to be developed and learned in order to use it. For example, zoopsychologists came up with the idea of teaching monkeys the sign language for the deaf. It was the way the famous monkey Washo appeared, which learned 85 words within three years and 160 by the end of the five-year term of study. It did not just repeat memorized gestures, but actively communicated with its teachers: she made requests and gave quite reasonable answers to questions. Nowadays, there are dozens of such «talking» monkeys in the world.

It should be taken into account that the Physics' laws in other parts of the Universe may be different, so the perception of the world and means of communication will differ from the human one. Stephen Hawking and Leonard Mlodinow claimed in their popular science book «The Grand design» that the gold fish in spherical aquarium «... does not see the

world as we do, nevertheless it could also formulate the laws that govern the motion of objects that are visible outside its aquarium. For example, a freely moving object, which we perceive as one moving in a straight line, moves along the curve in the goldfish's perception due to distortion of the aquarium convex walls. Nevertheless, the goldfish could have formulated scientific laws in its distorted frame of reference, and they will always function that will allow us to predict the motion of objects outside the aquarium. These laws will be more complicated than in our reference system, but simplicity is a matter of taste. If a goldfish formulated such a theory, we would have to admit her vision of reality just as legitimate as ours one».

Psychology and modelling of some mental functions may differ among various material forms of living organisms. Therefore, forms of thinking habitual for a human may not correspond to those of the other thinking civilizations' representatives. If it is often difficult even for us to penetrate into another person consciousness's depths in order to try to be in his shoes, it is difficult to imagine how representatives of a different civilization perceive the world. A highly developed non-protein mind may lack many familiar to us concepts. This may explain the Great Silence of Earth and the «Fermi Paradox».

People interpret the material world through the chemical elements (alphabetic symbols or images of

atoms in the form of balls) symbols or in a visual way in the form of the already generated tangible substance. A human considers the chemical elements' spatial structure on the basis of the Rutherford–Bohr atomic structure's planetary scheme, in which all atomic interactions are represented as associations of the balls-electrons orbits or balls-atoms forming the spatial molecules. However, it turned out that the particles constituting the nucleus, and electrons which whirl around don't look like tight elastic balls. The theory had to be substituted with another one. Atoms exist in the form of the electron-proton cloud coverages interacting with each other and forming a certain sequence.

One cannot disagree with the opinions of Stephen Hawking and Leonard Mlodinow expressed in «The Grand Design»: «... any physical theory or picture of the world is a model (usually, of the mathematical nature) and a set of rules linking the elements of this model with observations. This provides the basis for the modern scientific data's interpretation». «We develop models in science, but also we develop them in our everyday life. Model-independent realism is applicable not only to scientific models but also to the conscious and subconscious mental models that we all develop in order to interpret and understand everyday life... Model-dependent realism is in line with our objects' perception».

Nowadays, it has become clear that it is impossible to explain all the phenomena of the micro world on the basis of beliefs accepted. It is known that any structural unit of the matter exists in the form of corpuscles and waves, and these properties are inseparable. At the same time, in practice, our concepts do not go beyond the corpuscular. As one dives deeper into the microcosm these are the matter's wave properties, not the geometric ones which are becoming more and more important. In the macrocosm, according to the modern Physics concepts, there are not any analogies to the electron's behavioral specific features. It is difficult to imagine such motion's nature. The electron possesses both the particles and waves properties. The dual nature of the electron is called the corpuscular-wave dualism. Therefore, the atom orbital model's formulation can be possible only with the corpuscular-wave dualism taken into account. The electron's state in an atom, characterized by certain size, shape and orientation in space of the electron cloud, is called the atomic orbital.

An electronic cloud represents a region of space, at each point of which a given electron can be located. The probability of its detecting in the electron cloud's different places can be different. However, our concepts about interatomic interactions in living nature are based on the particles interaction, as it happens in the world visible to us. It is difficult to imagine their

interaction in the form of the electronic clouds.

It is possible that other civilizations not operating on the basis of protein structures perceive the objects existing as a complex of the well-organized electron-proton clusters surrounded by electromagnetic fields. For example, plasma life forms can perceive the world around them not with the help of analyzers similar human ones, but by highly sensitive fixation of the electromagnetic cloud surrounding biological objects. In this case, it will be accompanied by a change in the electromagnetic state of the plasma formation, which will be recorded as perceived information. Based on such concepts, the protein organisms were probably created, which we perceive as formations reflecting a certain light wave and possessing a certain density.

It has been hypothesized that other civilizations can exist in the four-dimensional space, not in the three-dimensional one as mankind does. However, there is no reason to think that it is so. An international group of scientists, including specialists from Britain, the USA, Portugal and Germany justified in the European Physical Journal why space should be the three-dimensional one. According to their theory, about 13.8 billion years ago, on the early stages of the Universe's development, most of the world's matter was in a quark-gluon plasma state, and protons and neutrons occurred during its transition to plasma. They formed the nuclei of chemical elements. It turned out

that the power tubes nodes connecting quarks and antiquarks are stable only in the three-dimensional space. At the same time, the tube system pervading the world with a higher number of spatial changes cannot exist for a long time.

Besides the differences in the surrounding world's perception, the lack of contacts of the advanced civilization with Earth can also be explained by its attitude towards a human civilization. People have reached a certain technical development stage of perfection that allows it presumptuous to consider themselves to be attractive to other advanced civilizations. However, a parallel advanced civilization probably treats mankind as its creation, which was created for a specific purpose. Therefore, nobody contacts with robots, robots are used. No one will contact with the computer games characters he himself created. Nowadays, the relationship of mankind and supreme civilization reminds the relationship between the horse and rider. They are not interested to communicate with us. The one who is strong always treats the weaker one with leniency. This explains the fact that the superior intelligence, with such frequent UFO observations taken into account do not seek to establish contacts with the human civilization.

It can be assumed that a human civilization will not contact with self-replicating robots that will be created in the future because they may stand for a

certain danger for the creators since the programmed improvement through the struggle for existence will be accompanied by aggressiveness. Therefore, it is unlikely that any highly developed civilization will contact the created intelligence until its creation reaches an appropriate development level and the ability for a fruitful communication.

The sagacity of Fred Hoyle, the famous astrophysicist, is surprising as Kiwi bird cites his press-conference's utterance in his book «The Book about the Strange»: «People are just pawns in a huge game which is led by the intelligence different from us and controlling every step of mankind. These forms of intelligence come from the other five-dimensional Universe. Their laws of Physics and Chemistry are completely different from ours. They have learned to push the barriers of Time and Space that limit us. These Super intelligent entities are so different from us, that it seems to be absolutely impossible to understand or describe them by means of human concepts. It seems that these entities are totally devoid of such physical restrictions as the body, and resemble a pure intelligence. They reach any point in the Universe within seconds». «These entities are everywhere: in the sky, in the sea, on earth. They are here for countless years, and possibly control the Homo sapiens' evolution. Everything that a human created was only possible because of these intelligent forces

participation». This assumption cannot be proved, but stimulates the search for evidence of the intelligent life forms' existence influencing the human civilization's development.

3.5. POSSIBLE FEATURES OF THE NONPROTEIN LIFE FORMS

In an exclusive interview with the Spanish newspaper «El País», Stephen Hawking, the world-renowned theoretical physicist, said the following: «My mathematical thinking suggests that calculations and numbers make it possible to think of aliens as real-life creatures. The real challenge for us is to understand how they can look like». It is difficult to disagree with these words. At the same time, if there is no reason to think of aliens, the signs of the highly developed parallel civilization's existence of on Earth are reason for its study. Many are convinced that all forms of life should be based on the basis of carbon, as it is on Earth. Carl Sagan and Robert Shapiro have defined this phenomenon as the «protein-carbon chauvinism». On the contrary, the alternative biochemistry advocates consider and study the possibility of such life forms' existence whose biochemical processes are completely different from Earthly ones. Such differences include the replacement of carbon in the organic substances' molecules with

other atoms, as well as water, which is used as a solvent, with other liquids.

Silicon is one of the contenders for such a replacement. It is now established that approximately 84% of material objects are carbon-based and only 8 % are based on silicon in the interstellar space. The cosmic carbon VS silicon ratio stands for 10: 1. This allows one to assume that complex carbon compounds are more common in the Universe and the life occurrence on the basis of silicon is unlikely on other planets. However, as for Earth, the content of silicon exceeds that of carbon. Its volume in Earth's crust is the second one after oxygen and, according to various estimates, its weight stands for 27, 6–29, 5 %. Earth's core contains about 6-7 % of silicon besides iron and nickel. This suggests that molecules on the basis of silicon able to ensure the life of other organisms could be formed under certain temperature and pressure combinations. The red-hot depths of the planet can be a suitable habitat for the silicon-organic life. A geochemist A. Ye. Fersman, an academician V. I. Vernadsky, and the American astronomer Thomas Gold substantiated the hypothesis that at a certain Earth's crust development stage a silicon life could have occurred in the bubbling magma's depths and it can still exist. It should be noted that the silicon compounds cannot be as varied as the compounds of carbon. Properties of silicon in many aspects are similar to the

coal's ones properties, because they are placed in the same periodic system's group. Silicon is most often found in the form of the dioxide (silica) based compounds – sand, quartz, quartzite, flint, feldspar and silicates and aluminosilicates. Such compounds stand for about 12 % of Earth's crust mass. Silicon dioxide becomes more liquid with the environment temperature's increase. Therefore, the silicon life may consist of the «silicon-biological molecules» melt in the silicon dioxide.

Silicon and hydrogen compounds, silanes, are analogues of carbon and hydrogen compounds. They are less resistant to temperature than hydrocarbons. At the same time, silicones, which are polymers consisting of a chain of the alternating silicon and oxygen atoms, are heat-resistant in a wide temperature range from -120 to +300 °C. Nowadays, silicones with the heat resistance of up to +1500 °C have been developed and it is planned to increase the heat resistance up to 3000 °C. The new compounds' silicones possess unique properties. For example, if the temperature on the one sample's side exceeds 1500

°C, then the other side's temperature remains slightly higher than the room temperature. The silicones properties give a reason to assume that the silicon form life can exist at a temperature much higher than the Earth's one. In this case, the role of a universal solvent should not be performed by water, but by compounds

with a significantly higher boiling point. Water, for example, can be replaced with such solvents as ammonia, hydrogen fluoride, hydrogen cyanide or sulfuric acid.

It should be noted that a silicon form life can exist under Earth's conditions, and other, more universal high-temperature life forms are likely to be typical to the outer space. It can be assumed that the silicone life forms can interact with them since they can exist both at high and at low temperatures.

There is an assumption that the intelligent life can exist in the dark matter that cannot be observed directly because it neither emits electromagnetic emission nor interacts directly with it. The existence of the dark matter can be judged by circumstantial evidence of the astrophysical objects' behaviour. The observation by the WMAP telescope installed on Board of an artificial satellite of Earth, allowed to conclude that the known matter (stars, gas-dust nebulae, quasars and even black holes) contains 5% of ordinary matter, 26.8% of the dark matter and 73% of the dark energy. It is supposed that the dark matter's based life may exist not on a certain planet and but in the entire Universe. However, according to experts, it is hardly possible to register the dark matter under Earth's conditions, for example, with the rare dark matter particles and the ordinary matter ones interaction.

Robert Shapiro, a chemist at New York

University, presented an original classification of various life forms in the Universe. He suggested that there may be plasmoids functioning in stellar atmospheres; radiobs (radiation (emission) life) inhabiting the interstellar clouds; lavaobs and magmobs in the form of the silicon classical structures, living in the seas of molten lava; hydrobs, that is, the formless creatures floating in liquid methane and consuming hydrogen compounds, and thermophages getting energy from the temperature difference between space and the atmosphereless planets' surface.;

According to this classification, radiation life (radiobs) can be both on planets with any surface temperature and in space. K. Tsiolkovsky suggested that the «radiant humanity» is distinguished by the fact that it is «adapted to life on the air» (K. Tsiolkovsky, «Will of the Universe. Unknown Intelligent Powers», 1928). It can be assumed that these energy beings move freely in their «radiant» bodies in the interstellar space.

An astrophysicist Carl Sagan and the inventor of this term, criticizing the «protein-carbon chauvinism» advocates in his book «Cosmic Connection», suggested that atomic nuclei or other structures in the Universe can be combined in completely unfamiliar ways.

Giuseppe Cocconi, one of the search for extraterrestrial civilizations supporters' admitted the possibility of the life (and civilizations) existence at the level of... elementary particles, while the French

astrophysicist J. Schneider admitted the possibility of the even «nuclear life».

A physicist Roger Penrose suggested in his book «Shadows of the Mind: A Search for the Missing Science of Consciousness», (1994) that consciousness can be a quantum phenomenon. In his «objective controlled reduction» model, he, along with a neurobiologist Stuart Hameroff, suggested that quantum effects affect the neural activity through the microtubules constituting the cytoskeleton of cells.

According to the academician V. L. Ginzburg, there may objects exist representing a field consisting of the elementary particles endowed with properties absolutely unusual from the point of view of the human experience. It freely penetrates other bodies and objects, transmits light and is not perceived by the human organs of vision. I believe that structures possessing intelligence in the Universe, including Earth, should function on the basis of that material form which is the most widespread one. Taking into account the fact that about 99.9% of the bulk matter in the Universe is in a plasma state (the Sun, stars, nebulae, interstellar matter, planetary ionospheres, etc.), it is most logical to assume that the primary forms of material life and primary thinking matter are also formed on the plasma base.

3.6. PLASMA FORMATIONS ON EARTH

Plasmoids. In addition to such a perfect plasma formation as a UFO is, other smaller plasma structures have been recorded under Earth's conditions but have not yet been studied yet. It has been suggested in popular literature that natural luminous formations that are visible by the unaided eye and are clearly visible on video cassettes and on sensitive film are related to the plasma structures. According to descriptions in popular publications, the diameter of such structures ranges from a few centimetres to half a meter or more. They have received been named plasmoids or orbs («light orbs» – light «circles»). Their colour may be white, bluish, green, pink or golden one. Plasma formations are found near Earth's surface mainly above the tectonic faults. They can be found at any time of the day or year.

The astronomer Marcel Gilles Jozef Minnaert, a member to the Amsterdam, Brussels and many other academies of sciences, the honorary doctor of Moscow University and the founder of the Center for Mathematics and Computer Science in Amsterdam, doctor of Biology and Physics, provides the following information in his book «The Nature of Light and Color in the Open Air» (1954): «Folk tales tell of wandering lights dancing... in cemeteries and luring travelers into swamps. Their existence, however, is by no means a

fairy tale's one. They were seen and described by the famous astronomer Bessel and other excellent observers. The difficulty is that this phenomenon is represented in many different forms. Wandering lights appear in swamps, in places where peat is mined, and along ditches; they are sometimes seen while tamping the moist, freshly fertilized greenhouse land or troubling the drainage ditches' dirty water. In summer and rainy warm autumn, they appear more often than in the cold season. They resemble a tiny flame which is 1 to 12 cm high and not more than 4 cm wide. Sometimes they appear directly on the ground, sometimes they float at the altitude of about 10 cm above it. The statement that they are «dancing» is apparently the false one. In fact, they suddenly disappear and at the same time another flame appears nearby; this probably gives the impression of rapid movement. Sometimes, the wind manages to carry them several tens of centimetres away before they go out. In many other cases, wandering lights were observed, burning without interruption for hours, all night long, and even during the day. At the time of the new flame's appearance, a pop of a faint explosion is sometimes heard. The colour of the flame is sometimes yellow, sometimes red or blue one. In many cases, when a hand was thrust into the flame, no heat was felt. In other cases, flames set fire to paper and cotton. The smell is usually absent; sometimes there is a slight smell of sulfur. What is the

nature of this mysterious flame? So far, no one has been able to collect flammable gas. It is assumed that this may be phosphorous hydrogen, which is able to catch fire in the air spontaneously; apparently the assumption of the PH_3 and H_2S mixture giving fire without smoke and smell, is the closest to the truth. These gases may form with the decay of rotting substances. The flame itself is a form of chemiluminescence. Back in 1910, Dr. Garzhanni was able to observe many wandering lights in the swamp near Nijkerk. Pebble-sized lights sparkled between heather and moss. But after a few nights, after heavy rain, everything disappeared.

One reader informed me of the wandering lights that he had observed in the swamp at Winterswijk. Someone was walking ahead of him, and soon he noticed the lights appearing from under the ground in those places where the walking man in front had stepped. The lights were about 5 cm high, flashed with a bluish light and immediately went out».

Micheal Ledwith, a professor of Theology, has gathered a collection of 100 thousand photographs with spheres. He drew attention to the fact that the balls vary in size, colour and density. Ledwith suggested that flash or other circumstances provoke fluorescence, and plasmoids can be fixed with a camera or even seen with the unaided eye.

Ruggero Santilli, a physicist, the head of the

Institute for Basic Research, believes that most people are unaware that there are many structures invisible to the human eye. They are captured by the video equipment that can shoot in high resolution and slow-motion playback's mode. He claims that these objects emit infrared, electromagnetic, and thermal emission and move helically at very high speeds.

R. Santilli has gathered a collection of files on which these objects are visible.

In the early 1980s, Professor Luchiano Bökkone, the Italian physicist, as well as Trevor J. Constable and Florin F. Georgitsa conducted a series of studies, installing special measuring equipment on top of a three hundred meter hill in the deserted region of the Gulf of Genoa. The equipment recorded the intensity of the radioactive emission, electromagnetic field strength and acoustic noise in different ranges. At the same time, taking photos and filming of the surrounding environment were performed in the visible and infrared ranges. Filming was carried out both with the use of various filters and without them, sometimes with the use of the flash. Observations were carried out for three years, 7-10 hours in a row, usually at night. The cameras and movie cameras automatically turned on case the devices detected the parameters unusual deviation. As a result of these studies, it was found that various densities and forms of formation were recorded in the invisible part of the spectrum: spherical,

lentil-like, cylindrical, irregular geometric shapes and even similar to human figures. They could alter, separating themselves from transparent or opaque fragments, which were also able to move and increase changing shape while linking. At the same time, if a transparent figure was linked to another one, it consequently lost transparency and darkened. These formations moved at speeds of up to 1,500 km per hour at various altitudes and, as a rule, hovered over large fires, large industrial complexes, followed the airliners. Dogs felt them and when they barked, the operators on duty near the registration equipment turned it on.

L. Baccone suggested in his book «UFO – Hidden Reality» (UFO la realta nascosta) that there are special life forms in the near-Earth space beyond the bounds of the perceivable reality that, in his opinion, possess an ethereal or plasma structure. They may have a high degree of organization, show the life and rationality signs. It is impossible either to talk about the nature of such objects or classify them since there is too little accumulated material for analysis.

Trevor James Constable suggested calling such entities «Critters,» which means «living things» or «critters» in American colloquial slang. He suggested in his books «Sky Creatures: Living UFOs» and «The Cosmic Pulse of Life,» that UFOs are unicellular critters ranging in size from a few centimetres up to 1 km that live solely in the atmosphere. These formations

supposedly emit infrared rays, due to which they remain invisible.

Probably, the skyfish (rods) are one of the «critters» varieties, first reported by the director José Escamillo, who was filming in New Mexico. On the film, he noticed some strange objects moving through the air at great speed. Outwardly, these mysterious «creatures» looked like worms. But they showed special protrusions on the side that allowed them to move through the air by means of the wavelike movements, developing speeds of up to 1000 km per hour. These «creatures» ranged in their sizes – from 30 cm up to 3 m. They are also called the «flying sticks» and the «solar creatures» since they are visible against the background of the Sun. However, it is very difficult to detect these mysterious «creatures» without special equipment, and their nature is still unknown.

These observations somewhat resemble the incomprehensible information Herodotus cited while describing the most ancient Scythians. He wrote that in the area even further north of the Scythian land, one can't see anything and it's impossible to penetrate because of the flying feathers – «Earth and air are full of feathers there, and this even interferes with vision...». What kind of feathers did Herodotus write about?

Other reports of this kind are related to the mysterious formations existing in the form of luminous

balls on the South magnetic pole. These balls killed anyone who tried to get close to them. So, during the French polar explorers' stop for a rest who tried to get to the South Magnetic Pole, a huge ball glowing in blue appeared from behind a snowy hill. He turned into a cylinder, then into a «snake» and entwined around the operator, then again turned into a ball and flew away. The operator's burnt body and the molten camera remained in the snow. A similar case is described by the Russian polar explorer. After a thorough examination of the dead, it was found that a strong electromagnetic discharge similar to a lightning strike was the cause of death.

The American physicist Roy Christopher suggested that the described formations live within Earth's radiation pole of at an altitude ranging from 400 up to 800 km above the surface. There, in a discharged space, the clumps have a low density and remain invisible. As one descends to Earth, the clumps' density increases due to air saturation and they begin to glow. In this case, the clumps can approach Earth only in magnetic poles' area due to their interaction with the magnetic field. According to the physicist, such a form of life originated much earlier than the organic one, and the directed electric discharges are their weapons. He called them «plasmosaurs».

According to the hypothesis put forward by the academician V.P. Kaznacheev (Казначеев Влаиль

Петрович), creatures in the form of an energy field form live along with people on the planet. It is believed that such life forms have been existing for billions of years and can surpass humanity in the technical development's aspect.

In popular literature, the appearance of such objects in the frame is without any proof explained by the shooting error, assuming that these are droplets of dirt on a photo lens or internal glares on lenses. If someone expresses such an opinion, then this should not be done at the desk, which is the easiest way but he should take the equipment and conduct all the researches that are being criticized. It is necessary either to prove the fallacy of the results obtained or to confirm them, and unfounded interpretations only alienate the one from the truth.

The plasmoids' study was also performed by official science. So, A. V. Tatarinov, L. I. Yalovik in the work «Molecular Crystalline Shells of Natural Plasmoids» presented the results of the study of natural plasma formations occurring in the surface troposphere above the gas-emitting structures (mud volcanoes, active faults, thermal sources) of the Baikal rift zone. In addition to visual registration (rare V-plasmoids), more than 1000 photographs were taken by lens of a digital camera, capturing structures (F-plasmoids) invisible to the eye (infrared and ultraviolet frequency ranges of electromagnetic waves) ranging in size from 3-5 cm up

to 100 and more meters. The conducted researches found that «the Vand F-plasmoids studied are the multi-component structures, which consist of gas (ionized to varying degrees), charged dust mineral and organic particles, hydrosols and aerosols – products of Earth's «cold» degassing. The presence of amorphous-crystalline film structures in plasmoids, according to the authors, is the direct evidence of the genetic correlation of plasmoids with modern degassing structures. Referring to the works by A.M. Askhabov (Bulletin of the Institute of Geology, Komi Scientific Center, Ural Branch of the Russian Academy of Sciences. 2007, No. 9, pp. 2-3), the authors suppose that the plasma-dispersed substance's structuring begins in the lithosphere and finishes in the troposphere as an integral part (phase transitions' auto waves) of inertia. Plasma structures are formed by means of fractal self-organization of electrically charged clusters of the «hidden» phase of water (quatarons). Researchers claimed that they were able to obtain plasmoids ranging in size from 1 to 4 mm when the ice melts, which is recorded by a digital camera. They cite the statement by A. I. Morozov (Introduction to Plasma Dynamics. – M.: Fizmatlit, 2006. – 576 p.) that «plasma is actually a connecting link between various forms of matter from rarefied gas to extremely dense substances».

A. V. Bychkov in his PhD thesis for the degree in

physical and mathematical sciences «Formation of Long-lived Luminous Formations using Erosive Plasma Generators» (Moscow, 2002) states that the concepts «Long-lived plasma formations» and «long-lived luminous formations» appeared in the second half of the twentieth century due to the studies of various discharges types plasma in the atmosphere. These objects appeared in discharge experiments while creating particularly bright sources of emission, while studying the reduction of aircraft resistance by means of plasma, while studying the effect of plasma on various materials and in plasma-chemical processes. A distinctive feature of these objects is the anomalously long period of their existence (luminescence) compared to the period of their generation by a discharge source or the plasma charged particles typical recombination time. Their other feature is spatial autonomy, that is, the ability to move freely in space while maintaining shape, size and colour. According to these properties, they are similar to the natural ball lightning but differ from the «St. Elma» lights». Such a property, in particular, is absent in plasma objects generated and supported by microwave emission.

Ball lightning is a plasma formation, the history of observation of which goes back thousands of years. It is naturally formed and the average lifespan does not exceed several minutes. A study the ball lightning formation's properties and mechanism can help to form

an idea of stable plasma formations. Currently, in several countries, there are several banks that collect and analyze cases of its observations, which already amount to tens of thousands. According to eyewitnesses, the ball lightning appears most often in thunderstorm weather in the form of luminous and floating formations in the air. However, in Japan, it was found on large factual material (2060 cases) that 89% of observations were recorded in clear weather, 7.6% in rain and only 2.5% in thunderstorms. These contradictions may be related to the peculiarities of Japanese weather. In summer, on clear days, the air humidity in Japan exceeds 80%.

Most often, ball lightning is formed on conductors (trees, poles), accompanied by crackles, hissing or whistling and can leave the smell of sulfur, nitrogen oxides or ozone after it. According to the observations' statistics, it is usually characterized by a white colour, but there are lightning of red, yellow, and green and, according to eyewitnesses, even grey and black colours. Typically, a ball lightning moves in the air above the ground at an altitude of about 1.5 m. The size ranges from a few centimetres in diameter to the size of a soccer ball or more. Often there is an attraction of ball lightning to metal objects or movement towards conductive objects or wires. This can be explained by the fact that it carries a minor electric charge. In some cases, a ball lightning causes the wires to burn out and

also creates in radio communications' distortion, like a UFO.

It is believed that the electrical properties of a ball lightning are not significant in the energy effect on surrounding objects. According to eyewitnesses, it does not emit heat despite the enormous energy that can be enclosed in it and which significantly exceeds explosives. It is estimated that in the 1 g of the ball lightning mass's explosion, the amount of energy released exceeds the 1 g of TNT mass's explosion significantly. A meeting with a ball lightning most often occurs without special consequences for the observer, especially if this occurs indoors. Only explosions initiated by a ball lightning can lead to severe destruction and casualties.

The danger of a ball lightning to humans is that during thunder storms it can cause an electric current in the atmosphere, far exceeding the internal energy of a ball lightning. Therefore, the effect of the electric current occurring in this case on a person and conductors is much stronger than the effect of a ball lightning itself. Exposure of a ball lightning to people nearby can cause burns and injuries. As a result of contact with a ball lightning, people lost consciousness, were injured or died. Most of them felt a strange state of constraint. For some people, the meeting with lightning passed without any consequences, while others could not recover for a long time.

The accumulated data indicate that a ball lightning differs from UFOs in smaller sizes, greater proximity to the observer, and a shorter lifetime. Its lifetime correlates with its diameter – the larger its diameter, the longer its life. Lightning is much more often observed indoors, while UFOs are always found in the outer space and perform complex purposeful actions.

The nature of ball lightning has not been studied yet. Due to the fact that its occurrence is rare, and attempts to artificially reproduce it turned out to be a failure, the main material for the study of a ball lightning is evidence of random observations. Observers believe that the movement of ball lightning is determined by logics. It is able to manoeuvre, fly around various obstacles in its path, gently circumambulate the room, keeping itself at the same height all the time, move along wires, write strange zigzags around the room, and also has the ability to pass through solid bodies. Its movement occurs at different speeds – first slowly, then very quickly. Many of the eyewitnesses who met a ball lightning spoke about it as of a living creature. In one case, a lightning easily turned the tractor over or exploded in case of a light contact with the car, and in the other one, it allowed the motorcyclist to cross itself over.

In 2012, on the Tibetan plateau, a ball lightning came into view of two splitless spectrographs with

which Chinese scientists studied the spectra of the ordinary lightning. As a result, 1.64 seconds of a ball lightning's glow and its detailed spectra were recorded. In contrast to the spectrum of the ordinary lightning, in which lines of ionized nitrogen are mainly present, the spectrum of a ball lightning is filled with lines of iron, silicon and calcium, which are the main components of the soil.

When studying the trace of a ball lightning with the help of the for air samples analysis' equipment, M. T. Dmitriev found that the content of ozone and nitrogen dioxide in the air was 50-100 times higher than in the ordinary air.

In the thesis by A. V. Bychkov, it is noted that the analysis of available observations of a ball lightning in nature shows that they can have an elastic frame in the form of a ball of luminous fibers or filament structures and consist of fibers and threads.

There are more than a hundred different hypotheses to explain the origin of a ball lightning, but so far none of them has got full recognition in the scientific community and cannot provide a satisfactory explanation of its nature. Researchers had only short-term spherical gas discharges that exist for several seconds, which does not correspond to the observation of a ball lightning in nature.

According to Joseph Peer and Alexander Kendl, the Austrian researchers from the University of

Innsbruck, who expressed their points of view in their work published in the journal «Physics Letters A» visual images (so-called phosphenes), i.e. hallucinations, occur cerebral cortex's visual centers in case of the human brain or optic nerve's exposition to strong electromagnetic fields. However, this theory does not explain how a ball lightning can be captured on video.

Most often, two main theories of the ball lightning's origin are considered. One of them suggests that the energy source supporting its existence is in the atmosphere, and the other one states that the ball lightning is the energy source itself. Most researchers agree that the ball lightning's formation and existence are controlled by electrical processes taking place in the atmosphere. The Nobel Prize winner in Physics P.L. Kapitsa was able to obtain a spherical gas discharge at atmospheric pressure in a helium medium. Additives of various organic compounds changed the brightness and colour of the glow. He believed that the source of energy, due to which a ball lightning glows, is not in it itself. In his opinion, a ball lightning is a gas discharge that moves along the power lines of a standing electromagnetic wave between clouds and Earth. At the same time, it appears to be «strung» on the power lines of a standing wave and moves along the conducting surfaces. A standing wave is responsible for the ball lightning's energy supply. At those ionization

intensities' indexes responsible for the lightning ball's bright glowing, the resonance conditions are entirely determined by its external dimensions. According to A.P. Kapitsa, the most frequently observed diameter of a ball lightning ranges from 10 up to 20 cm which corresponds to a 35 to 70 cm's wavelength. According to this hypothesis, the penetration of a ball lightning into an enclosed space is due to the fact that it follows the path of short-wave electromagnetic waves being spread either through openings or through chimneys or wires like waveguides. However, this model of a ball lightning explained neither the reasons for the occurrence nor the long-term existence of intense short-wave electromagnetic waves during a thunderstorm. P.L. Kapitsa noted that it is still necessary to prove the existence of electromagnetic oscillations in nature that feed a ball lightning and to explain why electromagnetic oscillations occur in the limits of the wavelength that is necessary for the ball lightning's occurrence during a thunderstorm. This phenomenon is not described in the literature.

According to other researchers, the plasma clots (areas of the ionized rarefied gas) can be formed with the size of up to several tens of meters in Earth's atmosphere under certain conditions that have not been studied yet. Having a large electric charge, they change the electromagnetic field around them, which causes the electrical appliances and electrical equipment

failure, as well as the electrification of metal objects and the emergence of painful conditions in humans. A ball lightning can be considered as auto stable plasma, stabilizing itself in its own resonant variable (alternating) and invariable (constant) magnetic fields.

In the work by A.M. Khazen, a model of a ball lightning was developed as a plasma clot with an inhomogeneous dielectric penetration constantly existing in the thunderstorm's electric field.

Physicists from Amherst College (USA) and Aalto University (Finland) were the first to create «knots» in the environment of extremely rarefied and cold quantum gas, consisting of magnetic moments of the gas atoms rotation. These nodes have demonstrated many properties similar to the properties of a ball lightning, which, as scientists suggest, consist of entangled electric current flows. Such nodes' stability is probably the reason for the fact that a ball lightning can exist for quite a long time compared to the ordinary lightning's discharge. A similar process can naturally occur in the moment of the ordinary lightning's discharge. According to the researchers, the results obtained can become the basis for new technologies for the plasma stability maintenance in the next generations' fusion reactors. However, the results of these studies do not explain the occurrence of a ball lightning in case of the thunderstorm's absence.

Plasma formations can probably be attributed to

the St. Elmo's lights, which appeared before a thunderstorm on the cross of the St. Elmo church's spire in Italy. They glowed with a bluish fire and resembled flames, extending upwards by 30-50 cm. There is evidence that fires can appear even in public, especially in mountainous areas. For example, during one of the night marches of Hannibal during the time of Carthage, flames suddenly flashed brightly on the spears of the warrior spears. The soldiers seemed to be carrying thousands of bright torches. In this case, the flame did not burn but only crackled. Despite numerous attempts to explain the mechanism of the St. Elmo's fires formation, no contemporary exact theory can exactly explain how such a gas discharge occurs in the atmosphere. A ball lightning differs from the St. Elmo's lights by the fact that it is observed in thunderstorm weather and is connected with the object on which it occurs.

Thus, it can be stated that any plasma formations' properties existing in terrestrial conditions either permanently or temporarily have not been studied nowadays.

3.7. PLASMA LIFE EXISTANCE HYPOTHESIS

Plasma is a partially or fully ionized gas composed of neutral atoms (or molecules) and charged

particles (ions and electrons). It belongs to the fourth state of a substance's aggregation after solid, liquid and gaseous one. Any substance turns into a gas being strongly heated, in which, with a further temperature's increase, the molecules begin to decompose into their constituent atoms with the ions formation. The gas's ionization can also be caused by exposure to electromagnetic emission (photoionization) or by the charged particles bombardment. If no neutral particles remain in the gas, the plasma is completely ionized. Even a partially ionized gas, with at least 1% of the atoms being ionized, can be may possess the plasma characteristics (respond to the action of magnetic fields and have high electrical conductivity).

The description of the various plasma formations found on Earth does not meet the widespread idea of plasma, which can exist at very high temperatures – at about a million degrees – and which does not occur in the terrestrial conditions. The term «high-temperature plasma» is used often most for the thermonuclear synthesis's plasma, which is almost always completely ionized. Usually, it is treated as the fourth state of a substance's aggregation. Let's take the Sun as an example.

According to Hannes Alfvén, the Nobel Prize winner, the history of plasma studies has gone through several stages during its development. The dominance of a theoretical approach towards the plasma physics,

though not confirmed by experimental studies had been observed for a long time. Theoretically, it was concluded that in terms of the magnetic fields the plasma can be held and heated to temperatures at which the release of thermonuclear energy becomes possible, which was the starting point of thermonuclear researches. But despite the general recognition, these ideas could not solve the tasks set. According to H. Alfven, they had few common points with the plasma experimental physics. Therefore, the so-called thermonuclear crisis occurred. In addition, many effects that could not be explained by these theories were discovered in plasma. The most remarkable difference between the plasma's real state and its mathematical description were found in the so-called boundary zones, where plasma with a low degree of ionization transforms into a highly ionized state. It is believed that in this state the plasma can be described neither by means of simple mathematical functions nor a probabilistic approach.

H. Alfven established in a large-scale laboratory studies results' analysis of the factor of 10 to the 9th degree that they can be extrapolated to the magnetosphere's conditions. The next leap on this scale can be extrapolated to the galaxy, and the third leap can be extrapolated to the distance described by a Hubble's law (Hannes Alfven. On hierarchical cosmology. Astrophysics and Space Science, 1983, vol. 89, 2, p.

313-324).

The degree of the plasma ionization is determined by the ratio of the number of ionized atoms and their total number. Depending on the degree of ionization, the plasma is divided into a weakly ionized (fractions of a per cent), partially ionized (several per cent) and fully ionized one (100%). Weakly ionized plasma constitutes the upper atmosphere, the ionosphere; partially ionized plasma is artificially generated in gas discharges and gas-discharge lamps, and fully ionized plasma is located on the Sun and hot stars, where the temperature is about a million degrees Kelvin. Therefore, a high-temperature (above a million degrees Kelvin) and a low-temperature plasma are singled out. Among the low-temperature one the hot plasma with a temperature of 200 to 20,000 Kelvin and cold plasma at room temperature are distinguished. If the temperature of electrons and ions is equal, such plasma is called the equilibrium one, and if the temperature of electrons is higher than the temperature of ions, it is called the non-equilibrium one. A low-temperature non-equilibrium plasma is characterized by a low degree of ionization (up to 1%). In this case, the ions have a lower temperature (usually the room temperature), while the electrons' temperature exceeds it significantly.

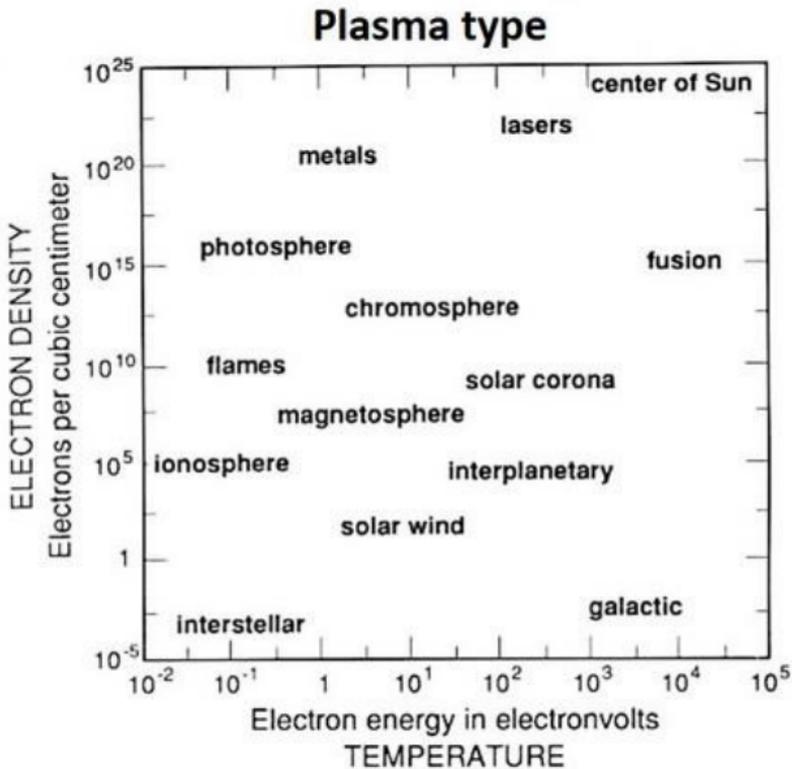


Fig. 3.2. Different plasma types depending on temperature (electron energy in electron volts) and electrons density (number of electrons per 1 cm³) (Peratt AL, Advances in Numerical Modeling of Astrophysical and Space Plasmas. Astrophysics and Space Science, 1966, vol. 242, Issue 1/2, p. 93–163)

Earth is surrounded by an extended layer (15-25 km thick) of the partially ionized cold plasma

(ionosphere) in the upper atmosphere at an altitude of about 100 km, which is created due to the ultraviolet emission of the Sun. The temperature of this layer does not exceed + 40 °C. In the atmosphere layers close to Earth, there are also peculiar floating plasma formations. They exist in atmospheric layers close to Earth (see Fig. 3.2).

If to characterize those plasma formations that are found in Earth's atmosphere, they probably should be attributed to a low-temperature plasma. It is weakly ionized and the number of neutral atoms and molecules in it significantly exceeds the number of charged particles. The collision of a free electron in plasma with an atom of matter causes the transition of its electron to a higher energy level. When it returns to its ordinary energy level, energy is released in the form of a visible light's photon. This causes the plasma glowing.

As for modern technologies, people usually use cold plasma with the ion temperature approaching the ambient temperature. It is used in electronic devices, plasmotrons, gas lasers, as well as in industrial technologies. For example, if one brings a palm to a miniature plasmatron emitting cold plasma, one can feel light air jerks and see bright white flashes. After such exposure, the skin smells of sulfur.

Dusty plasma, that is, an ionized gas containing solid particles with a diameter of 10 to 100 nanometers, belongs to a low-temperature plasma. Such plasma is

often found in space: in planetary rings, comets' tails, interplanetary and interstellar clouds. It turned out that the dusty plasma abruptly passes into a fundamentally different state at a very high temperature, which has received the conventional name «plasma crystal», or «Crystalline plasma». In this case, there is a completely definite type of organization and a completely definite interconnection of structural elements instead of the chaotic behaviour. One of the plasma crystals' unique properties is that they do not need to be retained like the ordinary plasma. While cooling, the plasma crystal comes to the state of ordinary plasma like a snowball and explodes.

A unique study called the «Plasma Crystal» (Das Plasmakristall-Experiment) had been conducted at the International Space Station for many years. The author of the experiment concept is Gregor E. Morfill, a professor of the Institute for Extraterrestrial Physics Max Planck (Max-Planck-Institut für extraterrestrische Physik). As a result of computer simulation, it was found that plasma crystallization did not lead to the appearance of granules regularly distributed in space, but to the formation of long chains of dust particles that twisted into spirals. They turned out to be stable and capable of interacting with each other. In addition, such spirals at certain plasma parameters could be attracted to each other despite the fact that their charges were the same. They were also able to create their own copies.

Since many segments with different sections were placed on one spiral, they obviously could transmit information. Such structures do not exist on their own without plasma. As researchers noted in an article published in the «New Journal of Physics», the revealed self-organizing structures' properties in plasma gave the authors the grounds to consider them as a possible non-protein plasma life form. Seth Shostak, a senior astronomer at the SETI Institute, noted that «... if one had to agree that these computer spirals in plasma can be called the living ones, then this would completely change the idea of life».

Similar results were obtained by an international group of researchers led by V.N. Tsytovich at the Institute of General Physics of the Russian Academy of Sciences. In terms of the computer simulation, it was possible to document the fact that when electron charges separate and the plasma polarizes, the plasma particles self-organize into the electrically charged spiral structures and are attracted to each other. They could also divide to form copies of the original structures, similar to the DNA, and induce charges in their neighbours. According to the authors of the study, this form of a plasma crystal reminds of life and, given the wide distribution of plasma in space, it may be the most widespread life form in the Universe.

The famous American physicist David Joseph Bohm had even discovered that the ionized electrons do

not behave as individual particles, but exhibit properties inherent in parts of a large interconnected whole. Although their individual movements seemed random at first glance, a huge number of electrons were able to produce effects indicative of their organization. Plasma constantly reproduced itself and surrounded foreign substances at its boundary, just as biological organisms block foreign substances in their protective shell. According to D. Bohm, he had the impression that this mass of electrons resembled a living organism.

In another study, Mircha Sandulovich and his colleagues from the Romanian University of Cuza during the experiment placed two electrodes in a container filled with low-temperature argon plasma. After a high voltage was produced on the electrodes, spheres consisting of two layers formed in the plasma: the outer – negatively charged electrons and the inner – positively charged. An ordinary argon core was inside the spheres. The diameter of the spheres varied from a few micrometers up to 3 cm. It turned out that the spheres could be reproduced by means of division into two parts, as well as that could capture neutral argon atoms and split them into ions and electrons to fill the boundary layers. In addition, they could transmit information by emitting electromagnetic energy, causing atoms in other areas to vibrate at a certain frequency. Thus, the spheres were not only self-organizing systems but behaved like intelligent

beings.

The results of research conducted by Lucas Lamata and his colleagues from the University of the Basque Country in Spain are worth mentioning. They developed a computer algorithm to find out how tiny a system can be to carry out self-reproduction – an action inherent only in living organisms. Researchers discovered that a system can exist at a quantum level. Tiny quantum devices with several qubits could already reproduce themselves by means of combining standard biological properties such as genotype and phenotype with real quantum properties such as plexus and superposition. The results of the experiment showed that the system was able to create a similar one, and quantum properties were critical for the complete transfer of quantum information to future generations. The results of these studies indicate that in terms of the matter's existence at the plasma level, structures can self-generate, which, judging from the human understanding, possess the of living organisms' properties. It cannot be ruled out that such simplest plasma structures with the living organisms' properties (judging from the human understanding) can be combined into more complex multi-structured plasma organisms (like multicellular organisms).

According to H. Alfven, plasma has an important, if not the dominant one, significance in the Universe. It has now been established that it is found in any

medium, at any temperature and in any type of matter. Even metals are classified as plasma since they are the solid matter with free electrons. All chemical elements must have existed in the form of plasma before their occurrence, i.e., it should have been the primary form of the matter's existence. Based on the fact that the main part of the Universe consists of plasma and it is the earliest (and probably the primary one) form of the matter's existence, it can be assumed that a primary intelligent plasma life could have been formed on its basis, which in the process of its development should explore the life space. The plasma life form should be characterized by an exchange with the environment, a system of self-generation and improvement, and also develop technologies for its energy supply. To this end, the plasma intelligence could have created a protein life in the depths of the ocean on the border with the high-temperature bowels of Earth, with the most favourable conditions for its existence. Probably, judging from such assumptions, humanity should consider the protein life on Earth's origin and the role of a highly developed civilization that exists in parallel with humanity. However, at present, the specific features of the plasma intelligence's activity are considered by people either as unknown natural phenomena or as mysticism.