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THE PERSPECTIVES FOR THE DEVELOPMENT OF SCIENCE IN THE SOCIETY

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Abstract. The world has never been so open to scientific research and technological development as it is today, nor has human competence evolved so rapidly in directions not previously appreciated. The pace of discoveries is faster, although there are scientific fields in which goals are achieved more slowly and with considerable collective effort. However, we find that the successes achieved in the field of science have had an enormous impact on people's mentality and as a consequence have formed the belief that reflects science as a dominant factor in contemporary society. A philosophical reflection on the process of scientific development reveals that for a long time, the physical sciences have been dominant, and in recent years we are witnessing a fulminating development of biology (genetics), which has not only economic implications but also the ethical implications of a major importance. At the same time, the contemporary society of information and knowledge attests to obvious factors of a unique phenomenon called integrative science. It is projected at the integrative frontier of the astrophysics field that combines the processes of the universe constitution as a quantum system (processes that go beyond the theory of quantum mechanics, but also the theory of super lathes) and the processes of life, mind and consciousness. Integrative science proposes a new understanding of reality, even the one considered today purely structural. We hope that integrative science theories will reflect the reality that includes Consciousness as a fundamental factor of Existence.

Keywords: *quantum mechanics, biology, development, integrative science, consciousness.*

Rezumat. Lumea nu a fost niciodată atât de deschisă pentru cercetarea științifică și dezvoltarea tehnologică ca în prezent și nici competența umană nu a mai evoluat atât de rapid spre direcții care nu erau apreciate anterior. Ritmul descoperirilor este mai accelerat, deși, există domenii științifice în cadrul cărora obiectivele se realizează mai lent și cu eforturi colective considerabile. Cu toate acestea, constatăm că succesele obținute în domeniul științei au avut un impact enorm asupra mentalității oamenilor și ca consecință au format convingerea care reflectă știința ca factor dominant în societatea contemporană. O reflecție filosofică asupra procesului de dezvoltare a științei ne relevă faptul că timp îndelungat științele fizice au fost dominante, iar în ultimii ani asistăm la o dezvoltare fulminantă a biologiei (geneticii), care are nu numai implicații economice, dar și implicații etice de o importanță majoră. Totodată, societatea contemporană a informației și cunoașterii atestă factori indicativi a unui fenomen inedit numit știința integrativă. Aceasta se proiectează la frontiera integratoare a domeniului astrofizic care îmbină procese de constituire a universului ca sistem cuantic (procese ce se plasează dincolo de teoria mecanicii cuantice, dar și de teoria superstrungurilor) și a proceselor vieții, minții și conștiinței. Știința integratoare propune o nouă înțelegere a realității, chiar și a aceleia considerată astăzi pur structurală. Sperăm că teoriile științei integrative vor reflecta asupra realității care include Conștiința ca factor fundamental al Existenței.

Cuvinte-cheie: *mecanică cuantică, biologie, dezvoltare, știință integrativă, conștiință.*

1. Introduction

The twentieth century embodies the essential elements like science and technology as integral parts of human activity. Their nature is determined by the social goals pursued, by the degree of organization of the society, and by the specifics of the promoted policy. The social climate, the complex issues in science and the requirements for the establishment of the digital society require that in the process of evolution, we focus on the development of creative activities, as well as on capitalizing on the results of this activity.

In the first decades of the 21st century, scientific research has proven to be a fundamental component of the knowledge-based economy and society. More than ever, science has become one of the fundamental driving forces behind economic and social progress, and it is a key factor in improving the quality of life. In the last decade, science accentuated its systemic character and raised the degree of the interdisciplinary approach, and assimilation of intrepid behaviour to research teams in research institutions and universities. In this context, the relations of research with education and production in the form of partnerships and collaboration projects have been intensified. This Research-Development and Innovation environment can be improved if measures are taken at the government level, which means intensifying and economically implementing intellectual property rights, as well as developing quality standards. In the 21st century, there is a belief that Western economies will thrive only through the effective commercialization of ideas, intellectual creations and innovations.

Achieving this goal involves placing scientific research at the centre of society's attention, creating among people the belief that society is the basis for solving all problems, including economic and social ones. Society's understanding of science as an essential factor of society involves not only the "popularization of science", but also the presentation of scientific achievements in an accessible form for those outside the community of scientists, their understanding of the concept, and the scientific model about our world.

The development of science has led to the expansion of the fields in which man enters through knowledge and dominates through his actions. Science is the foundation of culture, which aims to study the laws governing phenomena, based on which scientific predictions can be released. Science differs from the simple accumulation of facts in that its principles must be based on general principles and laws. For example, ”Science among the ancient Egyptians and Babylonians presented a collection of practical observations and recommendations, but this was not a science because it was not aimed at identifying the general laws”[1]. The dominance in the cultures of these societies of canonized styles of thinking and traditions oriented towards the reproduction of the existing forms and methods of activity, imposed serious limitations on the predictive possibilities of knowledge, preventing the stereotypes of social experience already formed. The knowledge in oriental cultures was exposed in the form of prescriptions for practices and did not acquire the status of knowledge about the processes of nature, which occur according to objective laws.

2. The specifics of the development of science in antiquity and in the Renaissance

The transition to scientific knowledge imposed the need for a new type of civilization and culture. One such civilization, which created the premises for the first steps towards science, was the democracy of ancient Greece. ”The traditional culture took place in Greece and the social life embodied the spirit of competitiveness in which everyone competed with each other, manifesting activism and initiative” [2]. In the Greek state, the priority of an opinion was imposed by demonstration, which was later transferred to mathematical science. Mathematics occupied an important place in Greek culture, being the concern of many philosophers such as Thales, Anaximander, Pythagoras, Plato, and Aristotle. This science was "based on reasoning - a scientific activity over which the Greeks had a special predilection" [2., p. 53]. Mathematical reasoning reached its peak of development with Alexandrian Euclid (3rd century BC), who wrote 13 books known as the "Elements" in which all the mathematical knowledge accumulated in Greece in the last three centuries was summed up in one system. The oldest treatise on algebra "Arithmetic" was written by Diophanes (b. 210 BC), who is considered the "father of algebra." It is also known the Aristotle's "Physics" (390-321 BC), which argued that the movement is induced by the attempt of each object to reach its natural state of equilibrium. Archimedes of Syracuse (287-212 BC) established the mathematical laws of lever motion and the laws of hydrostatics. He was the author of numerous inventions: field irrigation machines, lever systems and pulleys for lifting weights and weight-throwing machines used in Syracuse’s war of defence.

All these can be appreciated as incipient theoretical models obtained by applying mathematical proof. However, until the formation of the natural sciences as a distinct field of knowledge remained a step: the fusion of mathematical description with empirical research. The ancient science was not able to accomplish this last step. The cause, as most researchers claim, was slavery - the cheap labour of slaves that did not create the necessary incentives for the development of technology and scientific knowledge [3, p. 29]. Another condition for the establishment of science is related to the specificity of the meaning of the basic category - "nature". In ancient Greece, the universal "nature" was expressed by the categories of "physis" and " outer space ". "Physis" meant the special qualitative specificity of each thing and each essence, involved in the work. Knowledge was aimed at revealing the qualitative essence of things that have meaning, purpose and function. The outer space was a perfect finality, and "its eternal motion presented itself as an eternal reproduction of harmony" [4, p. 71]. That is why the knowledge that implies empirical research, i.e. the placement of work in artificial, unnatural conditions was conceived by the Greeks as a violation of harmony.

Thus, the knowledge of outer space can be reached only through mental contemplation, appreciated as the main way of searching for the truth. The ancient Greeks opposed the knowledge of the nature of "physis" to the knowledge of "techne" (artificial). Mechanics in antiquity was not considered a knowledge of nature but was attributed to the artificial, created by human hands. If Archimedes’s experiences and mechanics are appreciated as knowledge of the laws of nature, then in the ancient world they were attributed to "techne", and the experience was not conceived as a way of knowing nature.

The natural sciences, which are based on the experimental method, appeared at the same time as technogenic civilization. The foundation of this culture was formed in the Renaissance when a new understanding of man and human activity was established [5]. During this period, the traditional Christian teaching regarding the divine creation acquired a new meaning. The man himself became a creator on a smaller scale compared to God, and the man's activity was oriented towards the recognition of its rational origins (laws) and the confirmation of the conscious harmony of nature in the human arts. It was during the Renaissance that the old meanings of the notions of “space” - as a qualitative system of places and “time” - were replaced by a succession of qualitatively distinct moments with qualitatively homogeneous “time” and “space”.

The fact that the new representations about space and time developed during the Renaissance in the most diverse fields is significant: in philosophy (N. Cuzanus and G. Bruno’s conception about the infinity of the Universe); in science (N. Copernic’s heliocentric system that erases the boundary between the earthly and the heavenly realm); in the representative art, where the conception of painting appeared in the dominant form of spatial organization, from the linear perspective of the homogeneous Euclidean space. All these created premises for the affirmation of the empirical method and the fusion of the theoretical (mathematical) description of nature with its experimental research. In many respects, the researchers of this period prepared the radical turning point in science, later made by G. Galilei and I. Newton, crowned with the creation of mechanics as the first scientific theory of nature.

3. The development of modern and contemporary science

G. Galilei was the first researcher who, against the peripatetics, dogmatically supported the supremacy of Aristotle's physics and against the Christian tradition, did not comment on the Bible, but with the help of a telescope he tracked the motion of celestial bodies and confirmed N. Copernic's "heliocentric" theory. Starting with G. Galilei, science lost its speculative character, influencing and subsequently determining technical and technological progress.

Fr. Bacon - the English philosopher is considered the first theorist of science who in his work "New Atlantis" claimed that "Science means power". In this way, he expressed his confidence in the limitless possibilities of science. In such conditions, when the scientific factor is considered decisive for all forms of human activity, I. Newton mathematically founded the explanation of the natural phenomena in his work "Mathematical Principles of the Philosophy of Nature". He used the analogies between mental experiences and the models of mechanical constructions to represent the forces of interaction between celestial bodies. Thus, the law of universal gravitation was obtained, by comparing J. Kepler's laws and the mathematical expressions gained through the mental experience on the mechanical analogue model, which characterized the motion of a ball under the influence of centrifugal force.

The theoretical sciences of nature, which were established in the Modern Age became an undoubted value of civilization. At the end of the eighteenth century and the beginning of the nineteenth century science increasingly participated in the formation of the conception of the world, claiming to achieve true knowledge about the world. It is in this historical period that the intensive process of the interaction of science and technology began, the permanent and systemic introduction of the results of science in production, thus revealing its pragmatic value.

In the eighteenth century, the Marquis de Condorcet (1743-1794) in his work "History of the Progress of the Human Spirit" argued that "the rationalist progress should infallibly lead mankind to happiness" [6, p. 48]. Later, the French physicist Andre Marie Ampere presented a classification of scientific disciplines, including cybernetics as a new science, which deals with "the study of the methods of command and management of society" [7, p. 68]. He considered that this science would contribute to the formation of a society in which the citizens would be carefree and enjoy themselves in peace. Later this brilliant prediction was confirmed by the evolution of cybernetics in the twentieth century, by its strong gnoseological and praxiological value.

In the current conditions, when we have an informational "explosion", man can no longer aspire to many sides, as it was during the Renaissance or even the Modern age. The age of personalities who "knew everything and something above" [8, p. 67] was in the past. The contemporary man can no longer comprehend even the knowledge accumulated over a century.

The development of science-based on previous achievements and the challenge of scientific knowledge of the nineteenth century took place in the twentieth century. The second law of thermodynamics, the increase of entropy and the idea that the fundamental laws of nature include the "arrow of time" were discovered by R. Clausius in the first half of the nineteenth century. Also, during this time, Ch. Darwin supported by convincing evidence the evolutionary conception of biological species, and J. C. Maxwell demonstrated mathematically (M. Faradey's idea) the propagation of the electromagnetic field in the form of waves. Later, in the second half of the nineteenth century, H. A. Lorentz formulated the law of the contraction of objects moving at a speed close to that of light, H. Becquerel discovered the natural radioactivity, and J. J. Thomson introduced the atomic model (plum pudding), followed by E. Rutherford's planetary atomic model and N. Bohr's quantum atomic model.

The twentieth century began with some scientific discoveries that have called into question a series of previously developed knowledge: the indivisibility of the atom, the reality of the ether, phlogiston, and caloric, but also the recognition of some new sciences such as genetics and cybernetics. At the same time, in this century, theories were established that produced profound changes and scientific debates.

The theory of special relativity developed by A. Einstein in 1905 states that the speed of light is constant, but the absolute time and space (independent of the reference system) in Newtonian theory are replaced by the global time and space depending on the reference system (the law of transformation of Lorentz). An even more striking thing in this theory is that the inert mass, which is an invariant in Newtonian dynamics, is completely converted into energy. In the second theory - general relativity published in 1915, A. Einstein argued that the inertial-gravitational structure is determined by the matter-energy content of space-time. This theory incorporated the legitimacy of mechanical, electromagnetic, and gravitational processes, leaving out atomic and nuclear processes, "outlining the problem of unitary laws of the field, which would explain both micro and macro physical processes" [9].

Quantum theory, in turn, caused another scientific "explosion". This theory formulated by M. Planck in 1900 argued that energy is transferred from a hot object to the environment only in finite quantities called quanta. Subsequently, through the efforts of researchers such as N. Bohr, W. Heisenberg, E. Schrodinger and P. Dirac, the quantum theory will become the foundation of the new mechanics, as comprehensive as Newtonian theory, in the sense that it can be applied to the problems related to phenomena and processes of the microcosm. With M. Planck's quantum theory, contemporary science moved to a new stage of development, which requires a deeper way of research and a special understanding of reality [10].

At present, many researchers claim that quantum mechanics includes a large number of paradoxes. [11, p. 102]. In this context, quantum mechanics is difficult to understand because it refers to a microcosmic reality, space and time being on a very small scale. At the same time, our senses have evolved through natural selection and provide us with knowledge about the microcosmic world, and this has allowed the species to survive. The dominant laws of quantum mechanics are probabilistic, in the sense that they cannot accurately predict the behaviour of the particle, but it can be argued with a higher or lower probability that it is at a certain time in a certain place.

Today, scientists describe the universe using two fundamental theories - the theory of general relativity and quantum mechanics, which are the great achievements of the first half of the twentieth century. Unfortunately, "these two theories are incompatible" [3, p. 116]. Much of the efforts of physicists are geared towards developing a theory that includes both gravity and quantum theory. With the help of the four fundamental forces (electric, magnetic, strong, weak), physicists can describe the full range of known physical processes. Gravitational and electromagnetic forces are long-range forces because their effect is felt at great distances, while the weak and strong forces act at very short distances. These fundamental forces seem to act independently of each other, and physicists are trying to formulate a single theory that encompasses them all. The theories that would succeed in achieving this goal would be called unification theory. A. Einstein was convinced that the gravitational and electromagnetic forces could be unified. It is known that the scientist dedicated his last years to this unsuccessful research, which aimed to unify the theory of fields, the general theory of relativity with Maxwell's theory of electromagnetism. Some current models managed to unify strong interactions with weak and electromagnetic keys but failed to incorporate the gravitational force, and this limits the possibilities of explaining reality [5]. The twentieth-century science would be "incomplete" without specifying another feature, which relates to the technical approach of scientific discoveries, by reducing the period of their implementation in industry. The intense interaction between industry and science has generated an accelerated evolution in the field of basic scientific research and has imposed a rapid pace of technical progress. In this sense, we would mention those that had a decisive impact on existence: new motion systems (car, naval, aerial), space exploration, radio and television (today digital and three-dimensional television), modern means of global communication, calculation systems (from J. Napier, B. Pascal, G. Leibnitz, A. Turing and B. Gates). Information and communication technologies (ICT) have become an integral part of our economic, everyday, and social life. The development of computers and communications has led to the explosion of information on a global scale.

The discovery of vaccines and antibiotics has brought a higher degree of comfort and health. However, the consequences of the Chornobyl catastrophe, genetic manipulation and cloning have tarnished the image of science. This has contributed to the secrecy of research results related to the remote propagation of energy through radio waves; the possibility of capturing and retransmitting high-intensity energy by psychotronic means; the discovery of radiation in the living molecule and its representation as a miniature emission and reception station, whose emissions are beyond the five senses and appear to be outside the measurable electromagnetic spectrum. In this situation, M. Berthelot's arguments that "science today demands, simultaneously, the material, the intellectual and the moral direction of society" became even more relevant [12, p. 34].

The validity and importance of these ideas became important in terms of the impact of new technologies on society. Even if there was a long optimistic period, today it has been understood that the problems of science, thinking and psyche cannot be satisfactorily explained by the current science. The sceptical element about the value of scientific truth manifests itself in an increasingly visible form today, arguing that science has reached its limits. Under these conditions, several developed countries are making considerable efforts to further develop scientific research.

The problem related to the unitary character of science remains unresolved even at the beginning of the third millennium. The reflections of the philosophy of science on the evolution of science show that it went through a complex path from the paradigm that supported the primacy of matter to the primacy of energy and then to the one of information-knowledge, and most recently to the paradigm of digital technologies. For a long time in science, the emphasis was on the quantitative, measurable aspect. Subsequently, it turned out that the use of only structural information deduced directly from measurements, observations, and experiments is insufficient.

At present it has been understood that the great problems of contemporary science are tangent to the problems of consciousness: a) of physics, to explain the transition from deep existence to space, time and matter in the universe; b) of biology, to explain life; c) of information science, regarding the relationship between intelligent robots and consciousness, in general, between intelligence and consciousness; d) of cosmology, to clarify the dependence of the universe on a fundamental consciousness, but also on the nature of the last layer of reality.

These problems have had a structural (synergetic) approach, which involves the description through the mathematical models. However, for deeper knowledge, it is necessary to capture the phenomenological meaning, which at the contemporary stage was considered a fundamental process of nature, irreducible to physical, measurable phenomena, and this phenomenological meaning being a phenomenon outside the structural science. Structural science has already reached the frontier that requires its transformation into an integrative science, i.e. a science that combines the structural and the phenomenological into a whole.

The concept of integrative science was developed by M. Kafatos, who would have methods and a mathematical language appropriate to the structural-phenomenological processes of reality. According to Kafatos, the integrative science "will have an integrative mathematics, which through the theory of categories extended from the structural field to the phenomenological structural categories and the structural-phenomenological phenomenological functions could represent the theories of physical and informational reality" [13, p. 84]. J. G. Taylor, another British researcher, proposed a way to build a link between the phenomenal experience and the neurobiological structure of the brain. The study of mental processes and consciousness today leads to quantum phenomena and experimental phenomena [5]. The transition from structural science to integrative science represents the frontier of contemporary science, and the latter supports the thesis that "structural science is insufficient to explain all existence including life, mind and consciousness". Integrative science involves a mixture of physics and information science connected to other areas of reality. This is because life itself is an integrative process and the brain is a complex system, a device with integrative functions.

4. Perspectives on the development of science at the current stage

From the comparative analysis of predictions on the future of science, we highlight the following areas that will play an important role in the evolution of science and technology in the XXI century: science and information technology, genetic technology, materials technology, environmental science, and brain science.

Information science and technology is the fastest evolving field with the most obvious involvement in the social and economic field. Some factors allow us to conclude that today we are only at the beginning of the evolutionary process of this field. The development of information science and technology is determined by the intensification of communication due to the opening to the general public of the global network – the internet, based on personal computers that facilitate real-time connection between people and allow access to information of any kind. Replacing copper with fibre optics has led to the transformation of every phone into a video phone.

The effects of the development of science and information technology are spectacular, and in the conditions of the global pandemic with SARS-CoV-2, when a large volume of work is done from home, the use of these technological innovations has been accelerated. At the same time, the effects of the development of information science and technology have had a considerable impact on education. They have optimized and created conditions for the development of the educational and instructive process in the online form.

Another direction of development of science and information technology is related to artificial intelligence. Currently, two levels of Artificial Intelligence have been highlighted: a) the lower level (weak) - ensures the development of non-biological processes that involve the management of production processes, understanding and synthesis of natural language; b) the higher level (strong) - offers the possibility to have intelligent reactions similar to humans. The trends in developing artificial intelligence software that provides similar reactions to humans have achieved some success. This is because there is enough research and scanning of the human brain, and there are real-time observations of human neural networks. Mathematical models have been devised that simulate dozens of regions of the brain, including the cerebellum, in which the largest number of neurons are concentrated. However, there are differences between the human brain and the computer (robots) in the sense that the human brain is prone to make mistakes, it forgets and makes errors. The process of human thinking is non-algorithmic and operates mainly with images, while the computer (robot) is an algorithmic machine, and if the software is correct then it does not make mistakes and does not forget. The processes of thinking have the form of reasoning, which is subject to logical rules, while human emotions and feelings are not governed by logical rules and cannot be simulated by the computer (robot).

At the present stage, there is important research in the study of the process of thinking, but it cannot be stated that the mechanism of human thinking is fully known, moreover, it cannot be stated that the mechanism of thinking generating new knowledge is known. Research for collective intelligence and environmental management activities is intensified. These do not aim at "mastering nature", but the integration of man in the environment through interaction with the technical environment.

Genetic technology is another field of research that determines the specificity of the evolution of science and technology at the current stage. At the end of the twentieth century, the human genome was deciphered and the relationship between genes and their effects was elucidated, which facilitated the knowledge of the biological basis of man. The successful effects of this research have made possible genetic changes for medical purposes related to the cure of hereditary diseases. Other directions of application of genetic research are related to plant changes, which aim to cultivate plants resistant to harmful factors and increase their production. Even if progress and beneficial effects have been made, not only ethical but also existential dangers persist in this field, determined by the possible human cloning, which will cause dangerous consequences for the entire human species.

Material technology is another direction of scientific research. For millennia, the materials have been active factors in the development of human civilizations. Research in the field of materials technology has opened up perspectives whose results are unpredictable. They can favour and help man to fit into the environment, as well as his exclusion from nature. At the present stage, the progress in this field is presented by the production of the so-called aerogels-elastic, reliable, hydrophobic materials, with a conductivity close to zero. Airgels are remarkably remarkable thermal insulators and are used in various fields as cosmonautics and as absorbers in ecological catastrophes. The nanoparticles, which allow the programming of material properties, are another success in the field of materials technologies. Due to the structure of nanoparticles when introduced into other materials, they change their characteristics: some metals can be transformed into semiconductors and optical materials. One direction in the nano field is the creation of nanostructural materials, which are used in the electronics industry. Materials technology also includes research in the direction of producing biological materials, obtained by imitating natural processes. This is how silks are obtained with a resistance comparable to the spider's web, cotton with exceptional elasticity and resistance.

Regarding the field of research and development of energy technology, it has a priority direction oriented towards the replacement of standard resources, which use the burning of fossil fuels, with alternative, recoverable energies, nuclear energy, photovoltaic energy, and wind energy. Regarding nuclear energy, there are currently two known ways of production: by fission and by cold nuclear fusion (non-polluting and inexhaustible source). The latest research has stated that energy will not be able to be produced by nuclear fusion in the next 50 years. The use of nuclear technology by fission is followed by a series of problems related to the insufficiency of the uranium source, the safety of the operation of nuclear power plants, and the storage of waste that remains radioactive for many years to come.

One solution to a problem in this direction would be the fast-neutron regenerative nuclear reactors. In this case, the problem of world peace arises, because when most countries have such regenerative nuclear reactors, they could at any time become sources of fuel for nuclear bombs. Wind technology does not present prospects for solving the energy problem on the globe, because there are not so many windy areas to cover the energy needs. An analogous situation also relates to the conversion of solar energy into electricity. There are currently no economically efficient technologies for providing the energy needed in the 21st century. Research on the conversion of solar energy claims that this direction can only be developed through nanotechnologies. This will allow people to provide cheaper, smarter, cleaner and easier materials, which ensure conversion. In this way, not only a cheaper energy source will be obtained, but it will also be possible to create an ecosystem.

The scientific studies and conclusions drawn in the field of ecology have led to the establishment of ecological movements, which have voiced the dangers that can cause the inappropriate exploitation of the natural environment: the spread of cancer and uncontrollable genetic mutations, the reduced immune capacity of the human body, the greenhouse effects which lead to thinning of the ozone layer, the negative effects of the environment on brain function. The only solution to overcome the situation is to use resources without harming nature and future generations. This involves processes related to the use of green technologies with zero waste. Greater attention needs to be paid to recycling and remanufacturing processes.

Many scientists believe that the last frontier of science today is to explain how the brain, mind and consciousness act [14]. Recently, research has been conducted and knowledge about the brain has been accumulated, which has established connections between human performance not only with brain biochemistry but also with the genetic factors. It is claimed that 60% of mental functions are genetically determined. However, it is incomplete to understand how the brain works, because today it is not known what the decision-making mechanism is. It is difficult to identify the types of behaviour of neurons and establish their connection with decision-making or a certain cognitive activity is, for now, impossible. The complications are determined by the fact that the adoption of a decision is preceded by the analysis of several alternatives of neural correlations. At the present stage, the science of mind and consciousness has reached a common frontier with quantum physics. The mind and consciousness cannot be explained without the involvement of quantum physics, and the latter will not be able to move forward without considering the necessity of explaining what consciousness is. The phenomenological information and the active information generating the quantum world unite these sciences.

Research in the field of brain science will evaluate brain functions in the direction of monitoring [15]. The functions of the brain are both specific-individual and general-universal. This assumes that certain locations in the brain are involved that perform certain things that then integrate into complex functions such as memory and logical analysis. It will be sufficient to identify the location where a potential disaggregation could occur, and the source of that disaggregation, to correct it. Mental simulation technology has been developed based on brain imaging that highlights the correlation between active brain areas and the experimental finding that neural networks evolve throughout life. This allows the brain to reshape its activity and improve its cognitive capacity. It was found that the human brain has a remarkable intellectual plasticity, which is manifested by the ability to reshape the neural networks, to reprogram their activity. At present, the limits of action of mental simulation technology are not known.

It is argued that it will be possible to create the possibility of a complete remodelling of brain circuits so that an existing brain function can be improved or a lost brain function can be restored. In this way, it will be possible to treat several diseases related to neuronal degeneration, ageing, and memory loss.

5. Conclusions

The analysis of the evolution of scientific research will allow the highlighting of other potential achievements soon: the development of digital technologies, the production of new superconducting materials, the developments in biocybernetics and genetic engineering to combat interdisciplinary diseases such as psycho-neurological, cardiovascular and cancer. All these allow us to argue that after two millennia of science, the adventure of knowledge, in search of the truth, has a chance to continue. G. Galilei stated that "all truths are easy to understand as soon as they have been discovered, but the problem is to discover them". The only way to discover is through research. W. von Braun defined "research as what I do when

I don't know what I'm doing" Research is a search followed by a set of pertinent questions for which answers are to be formulated and the most creative quality of a researcher is the ability to ask appropriate questions.

Current advances in science and technology are happening too fast compared to our ability to understand. If a few centuries ago science had an insignificant influence, today, science and technology are present everywhere. Even if they are not well understood, their importance is recognized. Especially when they are so obvious, such as the media, computers, transportation, and medicine. Deciphering the human genome at the end of the twentieth century will undoubtedly have many economic, social and ethical consequences. This discovery will give impetus to the development of scientific multiple fields.

The use of scientific and technological discoveries allows the prediction of radical changes in human nature, redefining it not only psychologically, biophysically and biochemically, but also improving the human being by prolonging his life and quality. In this context, the question of the ethical aspect of science becomes extraordinarily important. If science is defined as pure and selfless research, which aims to obtain objective knowledge, then the final verdict is that science is good for humanity. Its value can be challenged only by the technical-scientific "applications", which raise major problems such as weapons, nuclear waste, genetic manipulation, and excessive automation. Some researchers argue that the path of science is undoubtedly an advantage for humanity. However, questions about evaluating the effects that science can have on the way we feel, think, or behave with our fellow human beings arise.

The problems we face could go beyond the economic logic of scientific efficiency. It is less important if we have faster cars or more sophisticated electronic utilities. It would be essential to know what kind of society and what way of life we tend to, to understand the specifics of global evolution in which science has a major role.

The dangers to which humanity is exposed start from the fact that day by day, a weak correlation between human creativity and moral precepts is sketched. The more correctly the future effects of science and technology will be understood, the more important will be the active role of man in their evolution. It will be necessary to place the results of their development in an ethical and social context. This could even involve redefining what is human and what is humanism. Man as a human being has not only instincts and intelligence but must also manifest a conscience, personal censorship, being able to understand and become aware of the consequences of certain actions, being responsible and controlling their instincts, and actions according to their moral actions.

The man can give all his actions a moral and constructive meaning for himself and his fellows. He was endowed with consciousness not to be destructive to the world around him, but to contribute to the improvement of the way of life. He should do good. Our belief is that man must establish a purpose in life by which to give a moral, constructive meaning to his actions. It is unfortunate that, in the current conditions, it seems that this sense has been somewhat lost. It is found that as science and technology develop, the immorality and the sleep of reason become more and more overwhelming. If reason and morality generate harmony, then the sunset of the light of reason gives rise to chaos. Therefore, we must be aware of our purpose, that is, to use our intelligence for our great, noble purposes, that is, to use morally the reason we possess, and for this, we should be aware of our lives.

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