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## NANOPSYCHOLOGY IN THE EXTREME FUTURE

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**Argument :** *The end of the 19<sup>th</sup> century and the whole of the 20<sup>th</sup> can be characterized as a time of affirmation, self-definition, the time when psychology manifested and asserted itself as a science. Even if in its evolution psychology went through a drama, as one of the architects of the Iasi psychology school, Vasile Pavelcu, characterized it in his work “The Drama of Psychology” (1965), its destiny rose to the triumph of psychology, as we might call its evolution in the 21<sup>st</sup> century. There is no field of practical activity (economics, education, culture etc.) that does not resort to the latest knowledge and information of theoretical and applicative psychology. It is known that if the first use of the term psychology by Philipp Schwarzerd (also known as Melanchton) and then by Rudolf Godenius is dated 1590, the beginning of the assertion of psychology as a science is considered to be the year 1879, when the first laboratory of experimental psychology was founded by W. Wundt in Leipzig. From the beginning the studies and treaties of the history of psychology (c.f. M. Ralea, C. Botez 1958, P.T. Petroman 2001, M. Bejat 1972, I. Mânzat 2003 etc.) recognize the role of the discoveries in physics, psychology and medicine in stimulating research in the field of psychology and medicine, these disciplines being considered roots of psychology. This is what Ion Mânzat, author of “History of Universal Psychology” (2007, p. 477) asserts “Going beyond the two millenniums of philosophical existence of psychology and after the knowledge about nature acquired the prestige of a science, the experimental method used in physics began to be used in the research on man, too. The separation of psychology from philosophy and its becoming an autonomous science is due not to psychological analysis, per se, but to the research into the connected fields, especially the general physiology of the nervous system and the psychophysiology of the sense organs. Physics also had a crucial role, demonstrating the possibility of the experimentation and objective measurement, indirect of course, of what was considered «pure subjective experience».” In the society of knowledge dominated by IT and high technology, the impact of inventions and discoveries in physics, medicine and neurosciences open new horizons and new fields of research in psychology. The emergence of a new field of psychology – nanopsychology – is connected to this new dimension.*

*Key words: nanotechnology, nanopsychology, extreme future*

## 1. NANOPSYCHOLOGY – FORCE OF THE EXTREME FUTURE

### WHAT IS THE EXTREME FUTURE

In the 1970s, Alvin Toffler, famous futurologist, drew the scientific world's attention by announcing the impact that the development of technologies was going to have upon mankind, using the term the shock of the future, while J. Naisbitt marked the main megatendencies that would determine the evolution of mankind in the future.

The mapping of the future became a preoccupation of futurologists, but also of economists, businessmen and politicians more and more frequently convinced by the syntagm “The future of the past is in the future, the future of the present is in the past, the future of the future is in the present” (J. Naisbitt, 1989, p.2).

To fill in the puzzle of the future, in 2006 James Canton, Alvin Toffler's disciple and collaborator, launches and defines the term “extreme future”, dedicating it the work “Challenges of the future. Main trends that will reshape the world in the next 5, 10, 20 years.”

“Welcome to the extreme future”, James Canton said. “Everybody must change their attitude to the future, a future marked by changes, challenges and risks. It is a new type of future, different from moving from one stage to another on an evolution marked by the brief flashes of the innovations characterizing the greatest part of history. The future we live in depends on the way we understand the stunning changes in store for us.” Major changes are in store for us, changes the quoted author calls *the extreme future*, describing it as extremely dynamic, turbulent and pluridimensional. In J. Canton's opinion (2010, p. 18) the extreme future will be defined by five factors: speed, complexity, risk, change and the unpredictable and by ten main tendencies (2010, p. 15), of which mention should be made of the following:

One tendency refers to the energy of the future – the energy crisis, the post petrol future and the future of alternative energy, like hydrogen and nanoenergy (2010, p. 49)

The second dimension is the innovation-based economy – transforming global economy relying on the convergence of free trade, technology and democracy, thus leading to the appearance of new jobs, new markets, globalization, competition, peace and security. The four instruments of force of the innovation-based economy are nanotechnology, biotechnology, IT and neurotechnology.

A third dimension shows the reasons why the future work force must embrace innovations in order to become competitive at a global level.

The medicine ensuring longevity is considered among the key-forces that will radically change medicine, like nanotechnology, neurotechnology and genomics, so that people will enjoy a longer, healthier life.

Another tendency characterizing the future is the way in which the science of the future will change every aspect of our existence, culture and economy from nanobiology to multiple universes.

A tendency that is already manifest in the future present is ensuring security – the major threats at people's freedom and defining the risks specific to the 21<sup>st</sup> century.

The future of globalization: the clash of cultures – the new realities of global commerce and competition; the rise of China and India; the confrontation between cultures and values; the ideological fight for dominating the future - a challenge and a direction in the map of the future.

To the tendencies presented here, that are a reason for concern, to the changes of the climate and to what the future may bring in the context of their manifestation at the level of the individual are added questions regarding the necessary changes and the way people must act so that they can sail among the threats coming from technology, governments and ideologies in their fight for human rights, freedom and individual independence. These are the questions that theoreticians and practitioners are trying to find solutions to and all eyes are directed to the power of education to prepare, form and support the individual in the dynamics of an extreme future.



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As emphasized above, among the instruments of force of the emerging innovation-based economy in the extreme future, J. Cauton includes nanotechnology and neurotechnology. These are extremely valuable technologies that will ensure the individual's adjustment to the extreme future.

The society of knowledge in which we live is the result of the manifestation of people's creativity at a performing level. The extreme future requires a high level of creativity in individuals endorsed with megaskills and inventive competence in order to discover, develop, understand and solve the challenges and problems of the future. Maybe one of the most necessary skills to develop in all members of society is the ability to change the hardships, obstacles and challenges of life into golden opportunities.

This capability based on the creative ability called sensitivity to problems and opportunities becomes an essential dimension in the process of personal development and the management of a successful career.

#### FROM NANOTECHNOLOGY TO NANOPSYCHOLOGY

Born in the society of knowledge, nanotechnology is a field of research of high technology, the first to create products whose value is to be found more than 8% from results in research and development. Nanotechnology is a fascinating science for many scientists who consider that it offers unexpected opportunities in fields with major implications in mankind's survival and progress: nanomedicine, nanofarmacology, nanoenergy and nanorobotics.

An eloquent example is the building and use of nanorobots in increasing the immune system, in detecting & treating cancer, in the diagnostics & treatment of diabetes, etc (Freites, Jr. R.A., 1999).

The concept of nanotechnology is defined as a collective term for technological developments on a nanometric scale. In a large

sense, nanotechnology represents any technology that has nanometric results: fine particles, chemical synthesis, microlithograph, etc. In a restricted sense, nanotechnology represents any technology based on the ability of building complex structures, respecting specifications at an atomic level, using mechanical synthesis. Not only are nanometrical structures very small, relying even on an atomic scale, but they also possess totally different, unexpected properties compared to the same substance at a macroscopic level (ro.wikipedia.org).

Nanotechnology represents a radical solution requiring the exploitation of quantum, the manipulations of atoms (James Canton, 2010, p-49). It is a fantastic science, "an innovative theory of the possible. It can help discover new solutions to the energy crises, new techniques for treating illnesses considered incurable, it is considered a reservoir of opportunities and innovations steadily demanded by the extreme future that is beginning to manifest itself in the present." Intelligent medications for neuroregeneration and medication required for the medicine of longevity are some of these innovations.

For the question how nanotechnology will help man, scientists answer that "nanites will be used in medicine, being programmed to replace sick cells. Mankind's problem will be whose hands we will be in".

Other questions refer to the effects and impact of nanotechnology at the individual's level. We consider that the answer will be given by psychology through the new fields – nanopsychology, nanocreatology and nanoinventics, etc.

#### NANOPSYCHOLOGY – A NEW FIELD OF PSYCHOLOGY

The beginning of this paper emphasizes the perceptiveness of psychology, the discoveries and progresses in physics and medicine.

In an informational society like the society of knowledge, the latest information in high technology has implications at the individual level, constituting its “rebirth”. Psychology has the task of studying the impact that the phenomena and forces of the extreme future has on the human psyche. The use of the concept of nanotechnology has recently led to that of nanopsychology.

The concept of nanopsychology was first used in 2008 by Ramil Garifullina, who was on a doctoral program in psychology, at an international conference organized by the Academy of Science of Tatarstan in Kazan. He is considered a promoter of the concept of nanotechnology, starting from the era of nanotechnology that has just begun.

The future is nano, many specialists think Nanotechnology- “the microscopic angels of the future”.

Nanopsychology can be defined as the science studying the correlations between nanostructures and mental transformations in the science of creating artificial neuronal networks that simulate the real ones, the quoted author affirms.

We define nanopsychology as the science dealing with the study of the effects of nanotechnologies at the level of psychic life and their impact upon the individual and communities.

Among the problems of interest for nanopsychology Ramil Garifullina mentions:

The problem of the influence of nanoparticles upon mental processes and the way relations between nanochips and various nanoenergetic structures and mental processes can be managed;

The problem of the manner of research into the structures of the brain and nerves by means of nanostructures in global networks, like the internet;

Another problem is the study of the global governing of persons with mental processes implanted in the brain through nanochips, by means of radio networks or the internet;

The study of the use of artificial nanostructures as instruments to create new

techniques and methodologies of investigating mental processes;

The investigation of the subjective mental stimulation of reality through artificial nanostructures;

Another problem might be the prognosis and design of psychic reality by means of the conversion of information from nanostructures;

The study of the way in which the brain codes and creates value by introducing artificial nanoprostheses that will create imitators of coding the brain processes and observing the way in which mental processes change.

R. Garifullina asserts that nanopsychology may become a science of creating artificial neuronal networks.

To map the field of study of nanopsychology it is necessary, in our opinion, to enlarge the sphere of the psychic processes considered not to be limited solely to mental processes. The developments in nanotechnology in various fields that are already in practical use have effects at the level of affective, motivational, volitional processes, of creative, inventive processes etc.

Nanocreatology will be a subfield of nanopsychology, aiming at the way in which the nanocreation is produced and the way it influences the life of the individual. Training specialists in psychology in accordance with the tendencies and characteristics of the extreme future involves instructing and endowing them with the abilities necessary to study and develop nanopsychology in the 21<sup>st</sup> century.

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