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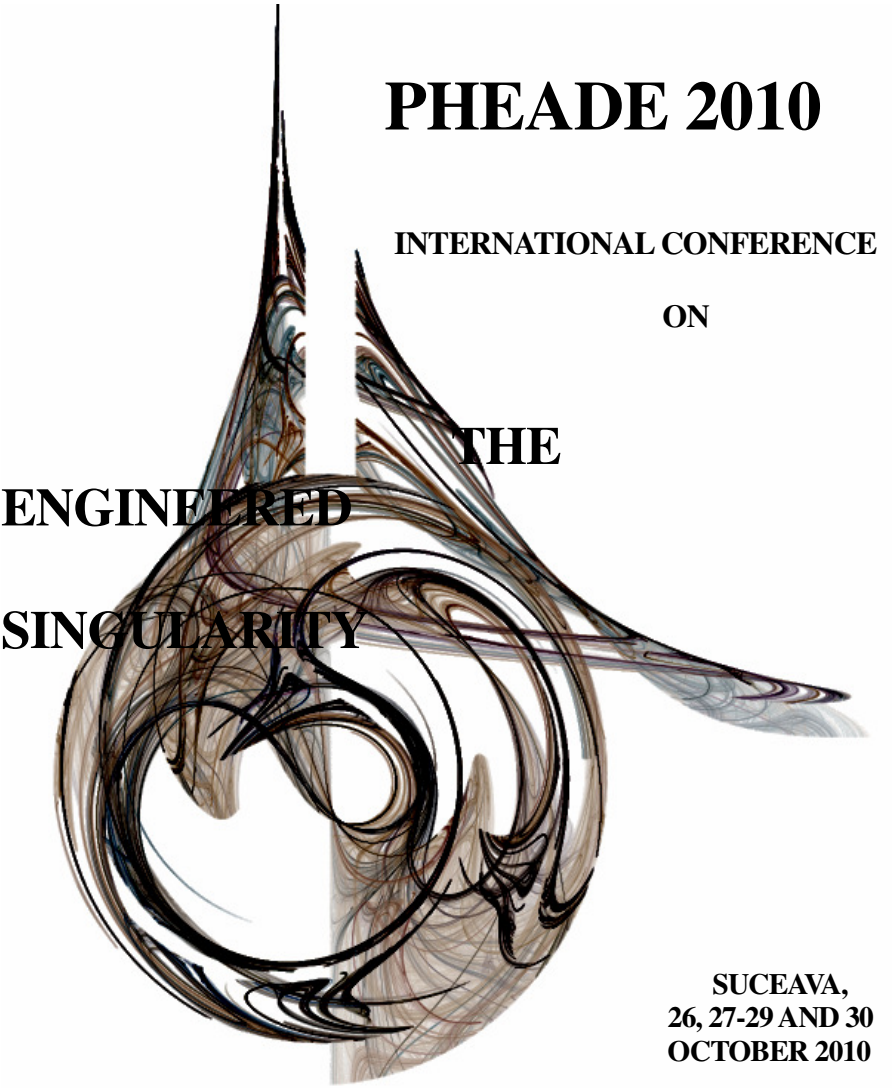
ON

THE

ENGINEERED

SINGULARITY



SUCEAVA,
26, 27-29 AND 30
OCTOBER 2010

PHEADE 2010

The Engineered (Technological) Singularity

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ALECU CIPRIAN

"NEW ECONOMY" AND "SINGULARITY"

The development of the knowledge-based economy or "the new economy" has become a priority to any society. Thus, the competences a company can acquire are superior as cost functions and profitability are concerned. These competences are closely related to the utilization of ICT. The emergence of artificial intelligence, superior technological creations (singularity) has aroused deep interest from the part of the economic science. History proved that technological transfer is closely related to economic vision and the technical advantages thus obtained can lead to very good financial results. Considering these premises, we believe that the association between the concepts of "new economy" and "singularity" is a necessary one and it entails an interdisciplinary epistemological approach in which specialists in economics, engineering and philosophy should emphasize the principles and laws of a society-oriented sustainable development and foresee its advantages and, more important, threats. The paper underlines essential aspects of the way in which the two concepts impact each other, without exhausting the subject and without providing an immutable order of the following viewpoints.

Condition of the absolute optimum and relative optimum. In the last century, the functions of economic rentability were analysed from the absolute optimum perspective. The socioeconomic reality proved that this is not a viable perspective in the case of limited resources. Along with the orientation towards concepts such as human development and sustainable development, there comes the need to define the concept of relative optimum aiming to subordinate the immediate results to much wider, long-term and very-long term objectives. The way in which the two optimum conditions are defined within the context of knowledge-based economy wil deeply impact the principles and laws at the basis of future "creations of superior technologies".

Development pillars. The main development pillars of the knowledge-based economy are research and education. From the singularity perspective, both elements should be stressed. The development of superior technological creations is the direct result of research activities; human quality, the access to information and knowledge, the amount of financing support, and the strategic orientation of research priorities are the aspects in focus. At the same time, two elements have a particular importance to the development of singularity: specialist training and the attraction of human resources and economic partners willing to get involved in projects designed to find answers to major world issues. The last two decades revealed many restraines of the cooperation between political environment and knowledge-based society; these obstacles are also expected to arise on the way of singularity development.

Ethical aspects. The element that renders possible the economic feedback, regardless of the activity type, is rentability. From the singularity perspective, the feedback focuses on the quality of the answers given by technological creations to the major world issues. Thus, "the new economy" represents the convergence path towards sustainable development.

Reflection of the demiurge image. It denotes the way in which a concept such as "singularity" can deeply change at both the theoretical and application levels the face of economics, for example.

Organization management changes, adjusting itself to the new technological reality. The systemical approach of organization management will include new chapters and the role of information subsystem will progressively increase. The functions of organization management changes and the decision-making process becomes more complex and so the decident will have to

take into consideration rationality principles characteristic of informatics. The principles of market economy, the way in which financial flows are oriented towards various research fields will deeply impact the evolution of "singularity". An economically "born" (just launched on the market) creation which is technologically superior will monopolize the market segment created as a result of the financial objectives, but at the same time will postpone the upgrades and technical changes for a long time as well as the product's development until its economic "maturation" or moral obsolescence. Also, the logic and imagistic models at the basis of the respective singularity will deeply impact both future developments and competition.

Financial engines. They are the activities by which the allocated budgets and the technological innovations dominate the society. Here we deal with the applications developed by the military, film, music, television, gambling, and "erotic services" industries. All these activities impact both the goal of singularity and the economic organization's objectives and some basic rules and principles.

The relation between the new economy and singularity is continuous in which the exchanges (flows) are made possible through two essential channels: research and education. This relation should be the subject of a thorough reflection not only from the part of those directly involved in economics or technology but also from the part of philosophers and sociologists who should objectively discuss the alethic value of progress.

„ACKNOWLEDGEMENT: This paper was made within The Knowledge Based Society Project supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU ID 56815

BAGHIU BOGDAN

THE CIVILISATION OF THE LOGOS *VS* THE CIVILISATION OF THE MACHINE

The rise of the Machine has dramatically changed the relationship between man and his immediate alterity. The demon of material creation has gained a strong foothold in human consciousness. The manipulation of matter has been one of the biggest accomplishments of humanity, but it came at a considerable price. This is proven by the fact that the ideology of the Artifact has taken over our own intimacy. Often times we no longer find simple answers without assistance from the machines around us. And perhaps the most banal example is the telephone: we ring other people every time we have a problem; we ring anyone, only to have a dialogue and be given an answer to our problems, instead of looking for that answer inside us. The incarceration of the Logos inside the Machine is the great utopia professed by Transhumanism which, I believe, is destined to fail. Knowledge of self cannot be confined to a project technological in nature. The Artifact will never help the soul to know itself. The Machine will never have power of introspection, whereas the human being will always ask questions about the self.

„ACKNOWLEDGEMENT: This paper was made within The Knowledge Based Society Project supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU ID 56815

BAZAC ANA

A NONCONFORMIST INTERPRETATION OF THE THEORY OF ENGINEERED SINGULARITY

This paper adopts a socio-centric perspective about the engineered singularity, considering that only the techno-centric one would not be sufficient. Its purposes are twofold: to show a significance of the theory of posthuman state of man through the specific AI techniques, and to suggest that the attitude of this theory toward the big discoveries related to the transformation of man is an integral part of technophilia as ideology. After interpreting the clash between the process of engineered singularity and the beneficiaries of this process, there is shown a critique of the theory of singularity (Mitch Kapor) and the problem of the weakness of this theory as quite autonomous scientific prediction about the future of man, in front of the political forces and the low level education of common people. The idea is that the increase of the level of the general education is a factor that could oppose to the specific political interests marking the realization of the engineered singularity.

I: Introduction starting from the definition of the engineered singularity. The problem of engineered singularity has appeared in order to keep alive the conscience of the necessity to forecast the results of the technological developments over the entire society. The main aspects aimed to be foreseen belong certainly to technology as such, but there are not the only ones. Although the technological developments are moving within an uncertain and open space, the purpose of the research about the technological singularity is to transform the unanticipated consequences into anticipated ones. In this respect, the research is situating under the sign of *Prometheus*.

As it was coined, the engineered singularity is a technological discovery[1] that changes in a rapid and radical way the state of things, the state of the world. In fact, it signifies the discovery of artificial intelligence that would transform, through different ways, the definition of man himself, of *his singularity in the framework of natural and engineered things*.

The clash between the recipients of this discovery and change and, on the other hand, these facts as such has thus an extraordinary importance for the future of humankind. It's no wonder that a special institute[2], or even two[3], was and were created just in order to research the aspects and implications of the engineered singularity. At the same time, the new Singularity University concentrates to "assemble, educate and inspire a cadre of leaders who strive to understand and facilitate the development of exponentially advancing technologies and apply, focus and guide these tools to address humanity's grand challenges"[4].

My standpoint here is that these goals are not enough if we want humankind not only win without the annihilation of a part of it[5] but also keep and develop the humanity at its highest level

1 The researchers who proposed the entire program of technological singularity began and insisted on the appearance of the smarter-than-human intelligence (AI) as the main technological revolutionary event that will change the position of man in its even cosmic environment. See Vernor Vinge, *The Coming Technological Singularity: How to Survive in the Post-Human Era*, 1993, http://www.aleph.se/Trans/Global/Singularity/sing.html. But there are other technologies of smarter-than-human intelligence as: direct brain-computer interfaces, biological augmentation of the brain (or "smarter minds creating still smarter minds", *Why Work Toward the Singularity*, http://singinst.org/overview/whyworktowardthesingularity/), genetic engineering, ultra-high-resolution scans of the brain followed by computer emulation.

2 The Singularity Institute for Artificial Intelligence, http://singinst.org/, founded in 2000.

3 The other one is Future of Humanity Institute, at the University of Oxford, UK, http://www.fhi.ox.ac.uk/

4 Mentioned in http://en.wikipedia.org/wiki/Singularity_University

5 Thus excluding the „collateral damages" from the present pattern of technological development: this meaning the change of this pattern as such.

possible, and *for all and every human being*: „in the comparatively humble sense, of pleasure and freedom from pain, and in the higher meaning, of rendering life, not what it now is almost universally, puerile and insignificant – but such as human beings with highly developed faculties can care to have"[6].

The idea to treat the problems of the engineered singularity in both techno and socio-centric perspectives does not follow from an idealistic view about man, shared by the researchers of singularity as well[7], but from a very pragmatic interest: that of providing to the effort of controlling the evolution of technological singularity as much creativity as humankind could manifest and offer. Any lost or waste of human lives and possible human creativity weakens at a great extend the human answer to the engineered singularity and seems to repeat the kind of primitive attitude occurred until now and even in present: the attitude of those who lead the destiny of society without count the suffering and death of the ruled, or who consider this suffering and death as inherent and "collateral damage", "compensated" by the general progress of civilization. But could we accept, at the present level of technological evolution and scientific conscience this type of judgement? From its techno-centric perspective, the theory and, more, the movement of technological singularity tends to counter-pose to this judgement a humanistic preoccupation, care and confidence.

II: A critique of the technological singularity. How could be understood this democratic standpoint? I have to notice a profound doubt concerning the optimism of Kurzweil's Law of Accelerating Returns[8]. Perhaps not so much about the deadlines of technological performances (for example that of a computer being or not being able to demonstrate consciousness at a human level by 2029) but about the consequences of the technological developments on every human being: "It's intelligent design for the IQ 140 people" (AB, that's meaning a wonderful story for sophisticated idealistic intellectuals), for „this proposition that we're heading to this point at which everything is going to be just unimaginably different - it's fundamentally, in my view, driven by a religious impulse"[9].

I don't know if Mitch Kapor objected in this way considering only technological reasons and prudence, or witnessing a social skepticism too. But technological optimism without questioning the social framework of the implementation of an as revolutionary technology as it could be is a *deus ex machina* type of reasoning. Firstly, Mitch Kapor was right speaking about a religious pattern of thinking: as religion explains the things trough an exterior *movens*, as technology becomes an exterior factor within a theory neglecting the social intercourses.

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6 John Stuart Mill, *The Collected Works of John Stuart Mill, Volume VIII - A System of Logic Ratiocinative and Inductive, Being a Connected View of the Principles of Evidence and the Methods of Scientific Investigation (Books IV-VI and Appendices),* ed. John M. Robson, Introduction by R.F. McRae, Toronto, University of Toronto Press, London, Routledge and Kegan Paul, 1974, Book VI, Chapter XII, http://oll.libertyfund.org/index.php?option=com_staticxt&staticfile=show.php%3Ftitle=247&layout=html#chapter_40043.

7 See *Why Work Toward the Singularity*, http://singinst.org/overview/whyworktowardthesingularity/ : „the transition of intelligent life on Earth to a smarter and rapidly improving civilization with an enormously higher standard of living".

8 Ray Kurzweil, *The Law of Accelerating Returns*, 2001, http://www.kurzweilai.net/the-law-of-accelerating-returns: „The "returns," such as chip speed and cost-effectiveness, also increase exponentially. There's even exponential growth in the rate of exponential growth. Within a few decades, machine intelligence will surpass human intelligence, leading to The Singularity — technological change so rapid and profound it represents a rupture in the fabric of human history. The implications include the merger of biological and nonbiological intelligence, immortal software-based humans, and ultra-high levels of intelligence that expand outward in the universe at the speed of light".

9 Mitch Kapor, the co-founder and former CEO of Lotus Development, cited in Brian O'Keefe, The smartest 9or the nuttiest) futurist on Earth, May 2, 2007, http://money.cnn.com/magazines/fortune/fortune_archive/2007/05/14/100008848/

The literary trope *deus ex machina* is however a kind of laic deviation from religion as such. It consists in putting an improbable event to intervene in the evolution of facts, but the author and the spectators as well know very well that this deed is a fiction, and that they have to admit this fiction only for the sake of the drama as such. Unfortunately, the real life is not equivalent to a play; therefore people know that they have to strain theirs efforts in order to become them themselves the "machine"[10] ordering the course of life. From this standpoint (and secondly), the technophilia proved by those who not join the technical aspects to the social ones is a mixture between a religious impulse and a *deus ex machina* symptom: it suggests a kind of hope that a fragmentary approach, as necessary as it is, would solve a unitary or total problem, and a kind of postponement, *within one's own conscience*, of the necessity to frontally surpass the fragmentary. In fact, technophilia is only a characteristic of thinking, far for lacking of respectability. It has different consequences, and the problem is to maximize the good ones, by completing the foresight of big technological discoveries with social features.

III: Common people and the technological singularity. In a recent survey concerning the common conscience of Romanians about science and technique, the majority considered that science has a huge importance in order to improve the general level of life. The confidence in science would seem wonderful if the same majority would not have asserted that, generally, things turn worse just for people follow rather the science than the religious faith[11]. I begin this chapter with this reference about the attitude toward science for, in the broadest sense considered by Nick Bostrom, technology includes "not only gadgets and machines but also techniques, processes, and institutions. In this wide sense we could say that technology is *the sum total of instrumentally useful culturally-transmissible information*"[12] (namely also science, AB).

The survey certified a quite usual tendency within the present mass education: that where science occupies an *exterior* place toward people – who cannot therefore control it (even though they use it) –, just divinity does. This exterior position is a basic feature for our philosophical interpretation of the engineered singularity: indeed, the problem we focus on is the common attitude toward the scientific and technical revolutionary discoveries – those which could radically change man's position within its universe.

The singular discoveries certainly occur, as combined results of the inner logic of science, and of the social capabilities of the economic and political interests and relations of forces. The question advanced here is whether common people – or rather the common level of instruction and concrete

10 The Greek *μηχανή* – ingenious invention, from where machine, machine of theatre, from where means, stopgap, slyness, artifice. *Μή* is the root signifying a negation in a hypothetical sense, meaning that the thing one speaking about would be uncertain, presumed, and even inadmissible. From this root, an entire family of words emerged: *μηχαναω* – to imagine, to arrange with art, to combine for a precise purpose, from where to produce, to cause, to occasion (as well as in negative senses: to conspire; *μηχανεύς* – inventor, ingenious; *μηχάνευσις* – apparatus, device; *μηχάνησις* – machine; *μηχάνημα* – ingenious invention, mechanism, machinery; *μηχάνητικος* – able to invent; *μηχανικός* – able to work, constructed by the art of the mechanic (engineer), the art to construct a machine. In this sense, Irving John Good, *Speculations Concerning the First Ultraintelligent Machine*, 1965, http://www.stat.vt.edu/tech_reports/2005/GoodTechReport.pdf, wrote that man will construct within his own mind the principles which form the architecture of the new superintelligent machine: "man will construct the *deus ex machina* in his own image".

11 See Ana Bazac, "În legătură cu Raportul despre nivelul cunoaşterii ştiinţifice a populaţiei", iulie 2010, (Note on the Report about the level of scientific knowledge of the population), http://revistacultura.ro/blog/2010/08/cu-privire-la-raportul-institutului-de-cercetare-a-calitatii-vietii-un-comentariu-de-ana-bazac/, with the Romanian references concerning the topic.

12 Nick Bøstrom, "The Future of Humanity", in Jan Kyrre Berg Olsen, Evan Selinger, and Søren Riis (Eds.), *New Waves in Philosophy of Technology*, New York, Palgrave McMillan, 2009, see http://www.nickbostrom.com/papers/future.pdf, p. 4 (I underlined).

political power – have to do with the conditions of realisation and generalisation of singular discoveries.

Traditionally, the modern philosophers have put the problem as if man never would be challenged and even substituted by non-human intelligences: more, the paradigm of the fix and dominant position of man irrespective of his relationships with tools meant that technique happened but man kept his place, although in a general climate of "dissolution of manners", of alienation generated by the development of modern civilization[13]. What is noticeable here is that Rousseau has mentioned that sciences and Power have not to be in contradistinction, for only in consensus with the Power could scientists lighten and thus contribute to the happiness of peoples[14].

IV: Historical representations about the dominant role of man as singularity. Letting this last aspect apart, Rousseau's rather pessimistic point of view was generated by a very important historical aspect: that of the subordinated role of tools in front of man within the entire pre-modern era. Indeed, tools – and not machines – have constituted one of the most remarkable features of *continuity* within the pre-modern societies[15]. Just this continuity was the ground of the decay of these societies, but continuity has consisted first of all just in the *dominant position of man (including the labour force) towards (a simple) technique.* With the development of the first industrial revolution, where machines began to substitute the tools, this dominant position of *man* began to jolt: the main role within the productive process was taken over by machines, *while the labour force became the servant of machines.*

It's interesting, however, that this subordinated position of the *labour force* was contemporary with a general confidence in progress, including in the development of the dominant position of *man* towards technique.

This complex position, of man and labour force as well, was (and is) the basis of most of the optimistic or pessimistic predictions concerning the future of humanity. From the second half of the 20th century on, the scientific revolution based on cybernetics, tends to re-impose, at a superior level obviously, the pre-modern relationship between the labour force and his tools: they could be again controlled by the working men, through the agency of computers. It seems that the conclusion would be only optimistic: *man* as such re-becomes the master of technique.

But the novel technological developments could generate severe existential risks for humanity[16]. My viewpoint is that this possibility is not generated only by the internal occurrences from within the evolution of science and technique[17], but also, and *in a great extend, by the social conditions of this evolution* – i.e. mostly political and economical. By the way, these social conditions are leading – as they were[18] – to the cyclical view of *ricorsi*, which however is only the

13 Jean-Jacques Rousseau, „Discours qui a remporté le prix de l'Académie de Dijon,; en l'année 175o; sur cette question, imposée par la même Académie: Si le rétablissement des sciences et des arts a contribué a épurer les moeurs", J.J.Rousseau, *Oeuvres complètes*, tome I, Paris, Firmin Didot frères, libraires, imprimeurs de l'Institut de France, 1866, p. 466.
14 *Ibidem*, p. 476.
15 See Ana Bazac, "Tehnica – optimismul şi pesimismul filosofiei", in *Perspectivă filosofică asupra tehnicii*, Bucureşti, Printech, 2006, p. 72.
16 See Nick Bostrom, "The Future of Humanity", in *ibidem*, see http://www.nickbostrom.com/papers/future.pdf, p. 11.
17 See also Nick Bostrom *ibidem*: „The same technologies that will pose these risks will also help us to mitigate some risks".
18 See *The New Science of Giambattista Vico*, Translated from the third edition (1744) by Thomas Goddard Bergin and Max Harold Fisch, Ithaca, New York, Cornell Universiry Press, 1948, Book Five, pp. 357-360; in Romanian, Giambattista Vico, *Ştiinţa nouă. Principiile unei ştiinţe noi cu privire la natura comună a naţiunilor*, *precedată de Autobiografie*, şi Studiu introductiv şi indici, Note de Fausto Nicolini şi Nina Façon, Bucureşti, Univers, 1972, pp. 513-516.

sign of perplexity in front of the overwhelming proofs of technological and scientific developments coexisting with the identically numerous phenomena of barbaric behaviour of the human beings.

With the emergence of cybernetic revolution, a new type of singularity – rather only this new type is the singularity as such – was and is on the point of being born: the engineered one. And this singularity pushed thinkers to change the presupposition of the eternal and unproblematic dominant position of man as such. The already quoted Irving John Good clearly formulated that the limited intelligence of the human brain was to be transformed with the help of cybernetics and that the super-intelligent machines constructed by this new brain were to impose a super-rational world and thus to represent the rationality as such. Nick Bøstrom summarized, as *Technological Completion Conjecture (TCC)*, the fact that, from the standpoint of technological logics and normally, the above-mentioned process cannot be annulled: "all important basic capabilities that could be obtained through some possible technology will be obtained"[19].

The tendency is obviously real and correctly grasped. I want only to observe that, beyond the problem of the limits of technology[20], a main aspect is the continuity of the present social differentiation that involves different levels of "intelligence explosion" and use of the enhancement of the human brain. In this social framework, the common people could not but consider in an *abstract*[21] way the role of science, since they do not choose whether the biggest part of research funds is allocated for weapons or for medical technology in order to safe the life of so many and really improve the quality of existence. They can only use the cell phones[22] and, searching for human criteria of judgement taking account of them, consider that science and technique would influence too much their life and that religion would be a better guiding lighthouse.

The reason of this attitude is overlapping/interconnects with the reason of the power relations: that to estrange common people from the understanding of social mechanisms and rationality, in order to only consume, and buy, the technical gadgets. Alienation, in its Marxist sense, includes thus man's position toward his big discoveries. Even though only transition marks the present epoch, the contradiction between man's powers to having created and to go on to create parts of a new and more human man and world, and on the other hand, the lack of power of the consumer multitude, educated only in order to accept its position, is too important for keep it dark. I think we have to add to the question concerning "our" conception about the good or bad consequences of the implementation of technological singularity[23], another one: that concerning the different social subjects whose attitude toward technology is not similar.

This contradiction cannot be neglected; otherwise we could arrive to accept as a fatal datum the salvation of a part of humankind – thus of the human intelligent life – on the expense of the

19 Nick Bostrom, *ibidem*, p. 5.
20 Sandberg, A. & Bostrom, N. (2008): *Whole Brain Emulation: A Roadmap*, Technical Report #2008□3, Future of Humanity Institute, Oxford University, see http://www.philosophy.ox.ac.uk/__data/assets/pdf_file/0019/3853/brain-emulation-roadmap-report.pdf, p. 99-100.
21 The simple men think in an abstract manner, according to G. W. F. Hegel, „Wer denkt abstrakt ?" (1807), G. W. F. Hegel, *Werke in zwanzig Bänden,* Frankfurt am Main, Surkamp Verlag, 1970, 2 Band (Jenaer Schriften – 1801-1807), pp. 575-580.
22 See Gérard Granel, „Qui vient après le sujet ? ", *Écrits logiques et politiques*, Éditions Galilée, 1990, p. 335-336; http://www.gerardgranel.com/txt_pdf/2b-Qui_vient.pdf: „a race of formed servants who consider their servitude as freedom…and who ignore the in principle inform character of their formation".
23 Nick Bostrom and Toby Ord, *The Reversal Test: Eliminating Status Quo Bias in Applied Ethics*, http://www.nickbostrom.com/ethics/statusquo.pdf

annihilation of the other[24]. Therefore, to anticipate different paths of evolution means to also take into account the relations of power, since to master unanticipated phenomena involves these relations as such[25].

V: Time. The singularity research shows that the anticipation of unpredictable facts is related to the problem of time: first of all, of the propitious interval to question and develop singularity. In the Greek tradition, the opportune moment, *kairos*, is just the only propitious interval to act, this meaning to act efficiently. If one loses time by delaying the realisation of big discoveries[26], one loses human lives and humanly lived lives[27].

The decision concerning the *kairos*, rhythm and content of developing singularity does not depend only on scientists (thus on the specific logic of science), but on politicians taking part of the power relations. Irrespective of how are they persuaded by visionary researchers, politicians reflect *the political criteria* to judge the efficiency of the development of big discoveries and post-human state of man. This observation, based on the coexistence, in the last 30 years too, of an exponential rhythm of apex science *with* the increase of wars, suffering, social diseases and troubles, ecological crisis and quest for natural resources, aims only to put a precautionary brake within the theory of singularity. The TCC is real, but depends ultimately on political interests: what kind of discoveries and where to be implemented. For this reason, the attitudes of common people, their education and enlargement of horizon, including a political one, thus the development of their rationalism "all the way", are an important factor to counter-press the interests of domination and to realize singularity. The scientific revolution is not the only one in our society. But "a revolution may be ripe, and yet the forces of its creators may prove insufficient to carry it out, in which case society decays, and this process of decay sometimes drags on for very many years"[28]. Constructed from a social viewpoint, this representation is somehow similar with Bostrom's possible trajectory of the future development of technology as "a stasis at (or close to) the current status quo"[29]. But, as this trajectory would be improbable according to singularity theorists, a huge problem for philosophy still remains: why does the explosion of knowledge and technological realisations coexist with so many signs of social decay, suffering and injustice? And would the paradigm of engineered singularity be sufficient for the future representation of man?

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24 This is the existential catastrophe/disaster, in contrast with the extinction of humanity as such; there are many scenarios concerning these possibility, see Nick Bostrom, "The Future of Humanity", p. 11.

25 *Ibidem*, p. 13: „ Even the *Stern Review on the Economics of Climate Change*, a report prepared for the British Government which has been criticized by some as over-pessimistic, estimates that under the assumption of business-as-usual with regard to emissions, global warming will reduce welfare by an amount equivalent to a permanent reduction in per capita consumption of between 5 and 20%".

26 See Nick Bostrom, *Astronomical Waste: The Opportunity Cost of Delayed Technological Development*, 2003, http://www.nickbostrom.com/astronomical/waste.html

27 I doubt that this humanly lived life would mean to be happy (only) through „safe and effective methods of controlling the brain circuitry responsible for subjective well-being", Nick Bostrom, "The Future of Humanity", p. 16, quoting David Pearce, *The hedonistic Imperative*, 2004, http://www.hedweb.com/hedab.htm. Beside this aspect, I agree with Pearce on many points.

28 Lenin, „The Latest in *Iskra* Tactics, or Mock Elections as a New Incentive to an Uprising", 1905, http://www.marxists.org/archive/lenin/works/1905/oct/17b.htm.

29 Nick Bostrom, "The Future of Humanity", p. 15.

BEJENAR MIRCEA FLORIN

ORTHODOX SPIRITUALITY AND TECHNOLOGICAL REVOLUTION. HOPE OF HEALLING

In our time we talk more and more about the "technological revolution", but it is seen from different perspectives, even opposite, some defending it, while others anathematizing it.

Is there a fundamental difference in the area of the Orthodox theology between the above-mentioned problem and the contemporary reality?

We could, of course, enlarge with reference to the past century about an industrial revolution, with all its social, political, moral, religious consequences.

But when we are speaking of a new era in human history, about a third "technological revolution", is it not exaggerated somehow the size of the indisputable change occurred in the conditions of our life? Perhaps it would be more realistic that, instead talking about "revolution", to recognize a process that began long before the industrial revolution, having as limit the maximum development and consequences.

However, the cornerstone of today's new technology is a reverse of things. In olden times, while man was trying to improve through science his mastery over nature , he now enters the deepest laws of nature, gaining results probably useful, but also with frightening and limitless opportunities to interfere in these very laws.

And where could this reversal reach? To the extension of the possibilities or voluntary limitation in order to maintain their supremacy, majesty and the safeguard of nature itself?

Therefore, the problem it is not essentially the human relationship with nature, but rather his intelligence in front of the infinite laws, so that he would not turn into the victim of his works. World crisis today is the crisis of the man himself, not just for some or others of his achievements and ideals. For this reason it is so difficult to define and assess its consequences; because the spiritual substance or the complex of values itself, through which it asserts the native identity of the man was injured, altered, deeply flawed. It is in ultimate instance the crisis of a world willing to live outside and against God and must be understood as God's trial for a thing made wrong, for all the failings and transgressions of witch the Christian people of Europe are to blame.

For all these reasons we must admit that getting out from the crisis, from God's justice, or even its decreasing, can not mean anything other than taking a firm option for a true moral spiritual *life in Christ.*

BUZATU RAZVAN & MUNTEANU FLORIN

TECHNOLOGICAL SINGULARITY IN A CHANGING WORLD

Human beings have always made use of their creative and innovative abilities. We have always tried to show that we can invent this, or we can invent that. Either, some have had a vivid imagination which transformed eventually into reality, such as flight, the computer etc., either some were too pragmatic and used those inventions to increase their profit at the downfall of our humanity. The question that we know and that we are not inclined to answer is “to what end”? Is it for the entire global community, or is it merely for my own scientific knowledge or for my own scientific ego or for my own personal use or for my own personal profit or just to have the pride to say that I have “created” something that would revolutionize and change the whole world? Do I think that

when I "create" such a device, I produce such an outcome that would either push humankind at the next step of evolution or I provide the necessary means to destroy it, involuntarily, of course. For, we, as scientists, have positive inclination to do good in the world, but somehow, sometimes, we create the most abominable means that contradicts us. And we have a lot of examples in this sense.

Technological singularity is one of these fields in which we are overenthusiastic of the product or products and at the same time we see the negative aspects of it and at the same time we go forward with it despite of the outcome. It is important to develop the technical and scientific progress of science, but at the same time take into consideration that the world is not yet at a peak of technological progress which is accelerating and developing exponentially. We tend to forget that all we invent, we do it in order to help humankind evolve, not only progress at a technological level. Alas, through our history, the measure of our technological progress has superseded our spiritual evolution and our knowing ourselves. That is why we need to be cautious when putting together all the right nanometric processes in order to produce such devices, that we call artificial human brain or body, which are prescribed with the intelligence of different new data inscription algorithms that we give them constantly.

In order for such innovations to benefit humankind, we need to go to the level of education and put our knowledge together to create such scientists and researchers which can use their developed and evolved insights in order to innovate with a sense of morals, ethics and principles. Such an education process should start from kindergarten and then lead to school and to high-school, having as curricular base the complex systems of the science of nature and the laws of the Universes. In this sense, through the present paper, we propose to approach and put up for discussion a series of factors linked to the necessity of educating the Human Being, by intertwining curricular, non-formal and informal educational methods used on a global scale, and made available in the physical space, as well as the virtual space. This endeavor will permit the dynamic stabilization of society at global level, in the context of the pressure induced by the technical evolution towards singularity. In other words, through this paper we would like to draw a sketch of the supportive and educational complementary needs, aiming to insure the sustainability of life on Earth by initializing, forming and educating a society of conscience, in the sense defined by Mihai Draganescu, considering it the only viable solution which completes singularity.

CARAGEA ALEXANDRU

HOW TO TREAT THE (ACTUAL) DISHARMONY BETWEEN *EPISTEME, TECHNE* AND *PHRONESIS?*

INTELLIGENCE SINGULARITY, ENGINEERED FREEDOM, PHRONETIC CHALLENGE ... EVOLUTIONARY CRUCIALLITY

In Aristotle's view there are three intellectual virtues: *episteme*, *techne* and *phronesis*. In his words, phronesis is an intellectual virtue that is "reasoned, and capable of action with regard to things that are good or bad for man". There is a general consensus that phronesis is the forgotten/neglected intellectual virtue of modern ages. It concerns values and goes beyond analytical, scientific knowledge (episteme) and technical knowledge or know how (techne) - it involves, in a metaphorically definition, "the art of judgement", the tacit/no formal/un-encoded knowledge or, in Mihai Drăgănescu's terminology, asks for a structural-phenomenological approach.

In this paper we show that some new advances in science and philosophy (made especially by the *Science of Complexity*, Bejan's *Constructal Theory*, Stapp's *Theory of Quantum Consciousness*, Drăgănescu's *Ortophysics*[30], and even the Conway and Kochen's *Free Will Theorem*) have to be taken in view in order to reestablish the harmony betwen *episteme, techne* and *phronesis.*

Our work started from emphasizing two main observations.

1) The quantum theory is suitable for studying intelligence.

As Henry Stapp[31] remarks, the most profound change (made by the quantum theory) in the principles of physics is encapsulated in Niels Bohr dictum that *"in the great drama of existence we ourselves are both actors and spectators"*. The emphasis of quantum theory is on "actors" and, not on spectators as in classical physics. The quantum theory was formulated basically as a set of practical rules for how scientists should go about their tasks of acquiring knowledge, and then using this knowledge in practical ways. So, in other words, the quantum theory seems to offer a set of practical rules for being intelligent!

2) Intelligence implies a layered and plastic architecture.

From the perspective of the Constructal Theory[32], which has at core the concept of performance, we look at intelligence as at the performance in acquiring and using knowledge. This means that for any intelligent entity one can identify a referential purpose and a referential range of constraints.

In this paper we use the following (original) formulation of Bejan's Constructal Principle.

By modifying the constraints and/or the objectives of a system, it will modify its architecture (structure and/or shape/form) in such a way that, in the new conditions created, the material and immaterial streams that flow thorough it (and from which it is constituted) would maximize their persistence in time. Unlike the inanimate systems, the living ones can modify (in the genetic and physical limits) their objectives and their constraints, while the ones (inanimate) of an artificial intelligence can modify both elements only in the limits implicitly set by the initially programmed state and by the intrinsic proprieties of the material substrate.

Intelligence has a layered and plastic architecture, according to the nature of purpose and the range of typical constraints against which that performance occurs.

So, we can speak about intelligence:

- on a multiplicity of layers - as: operational layer, engineering layer, architectonic layer, artistic layer ..., scientific layer …, political layer …, and spiritual layer;

and/or to classify the forms of intelligence

- by using
  - the specific referential for the teleological dimension of performance – as aspirations, …, needs, …, necessities etc. - and ,

30 Mihai Drăgănescu: Ortofizica, Editura StiinTifică Si Enciclopedică, BucureSti, 1985 (see also: http://www.racai.ro/~dragam/)

31 Hery Stapp currently performs his research at the Lawrence Berkeley National Laboratory and is the author of the Theory of Quantum Consciousness. While making important contributions to, inter alia, the analysis of proton-proton scattering and the development of analytic S-matrix theory, Stapp is perhaps most well known for his ongoing work in the foundations of quantum mechanics, with particular focus on explicating the role and nature of consciousness. He is also an expert on Bell's Theorem, having solved problems related to non-locality presented by John Bell and Albert Einstein.

32 A. Bejan and S. Lorente **Constructal theory of generation of configuration in nature and engineering**, *Applied Physics Reviews, Journal of Applied Physics*, Vol. 100, 2006, 041301: was selected for the Sept. 1, 2006 issue of the Virtual Journal of Biological Physics Research. See also http://www.constructal.org/

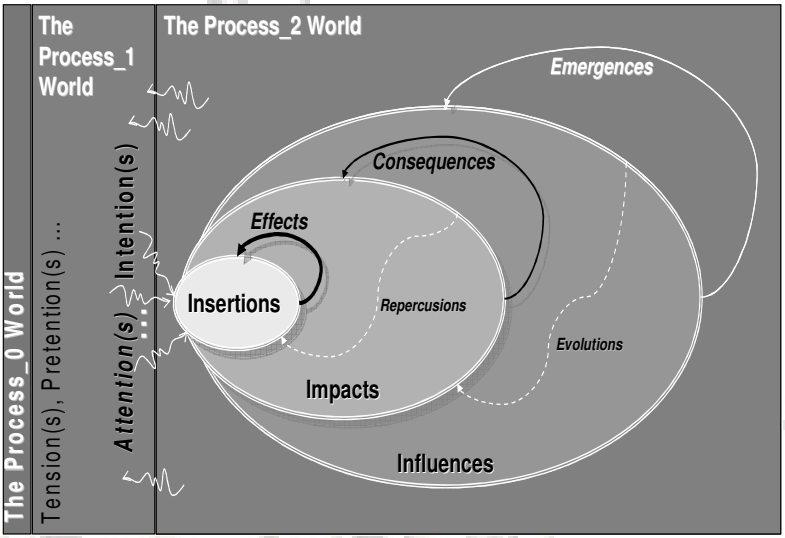
- the specific referential for the constraining dimension of it – as: ambiances, …, situations, conditions, …, physical constraints etc.

These two observations allow drawing a conceptual framework for setting the problem of the complex rapport(s) established between the natural intelligence and the artificial intelligence.

The starting point for the discussion of the phronetic dimension of intelligence was the elaboration of the conceptual map 1, where:

- The Process_1 World and Process_2 World are the "sites" where could be placed the von Neuman's processes: 1 (thermodynamically irreversible) and 2 (thermodynamically reversible) - which are crucial findings of the quantum measurement theory[33];
- The Process_0 World is that of Drăgănescu's Deep Reality

Map 1.



The conceptual map above, organized in accordance with Stapp's Theory of Quantum Consciousness, enables to set the problem of intelligence in terms of performances of the insertions made by human mind in the physical reality by asking experimental questions[34].

But, the quantum theory teaches the cognitive agents to seek for knowledge only by using "yes" or "no" questions. It doesn't offer a way for seeking the answers for the phronetic questions focused on the sense and the value of the intentions. That is why we introduced in the map a

33 Von Neumann generates his form of quantum theory by recognizing that Process 1 describes an influence of a mentalistically described aspect of reality upon a physically described aspect, and by expanding the physically described part to include the body/brain that is connected to the mentalistically described stream of consciousness. Thus Process 1 represents, in the end, a dynamical influence of the mind of an agent upon his body/brain.

34 The core idea of quantum mechanics is to describe our activities as knowledge-seeking human agents (and the knowledge that we thereby acquire) and the fact that quantum theory involves, basically, what is "in here," not just what is "out there".

Process_0 World which is accessible only through the phenomenological experience which is powered by a special kind of energy, called by Mihai Drăgănescu *"philosophical tension"*.

The critical (in our view) aspect of Stapp's Theory of Quantum Consciousness (which we bring into attention) is that referring to the physical ground of the abstract relation between attention and intention.

Starting from the experimental probation of the so called Quantum Zeno Effect[35] (the inhibition of transitions between quantum states by frequent measurements of the state), Stapp's theory shows that this phenomenon is a source/exemple of'*the capacity of directed attention and mental effort (*energy – our remark*) to systematically alter brain function"* and that *"these wilfully induced brain changes are generally accomplished through training in, and the applied use of, cognitive reattribution and the attentional recontextualization of conscious experience"*. Regarding this cognitive phenomenon, Schwartz&Stapp&Beauregard make the medodological observation that *„ it is useful to classify process 1 events as either 'active' or 'passive'. Passive process 1 events are attentional events that occur with little or no feeling of conscious effort. Active process 1 events are intentional and involve effort. This distinction is given a functional significance by allowing (*allocating – our remark*) 'effort' to enter into the selection of process 1 events."*[36][37]

Equally, the conceptual map (map 1.) was organized in a manner to be suitable for looking at the issue of intelligence with an original constructal paradigm, originating from Bejan's *"Constructal Theory"* in which we define the typical issues for two kinds of human knowledge based activities.

- The typical issue for any category of *engineering*[38]
- The typical issue for any category of *architectonic creations*[39].

We show that in this way, it is possible to see the artificial intelligence:

- as an engineered tool designed to be inserted, by human will, in the physical reality as a more powerful (more performing) entity than humans (mainly on the operational layer) and which is aimed at saving time and energy for human performance on the other layers of intelligent action, and so,
- an economic enterprise aimed at a better allocation of the attention effort,
- an issue of policy kind, derived from the problem of selecting/filtering the intentions.

The next step in our work was binging in the field of analysis the complexity lessons which show that the emergences could be seen as something like a free will of the macroscopic world

35 The quantum Zeno effect is a name coined by George Sudarshan and Baidyanath Misra of the University of Texas in 1977 in their analysis of the situation in which an unstable particle, if observed continuously, will never decay. An earlier theoretical exploration of this effect of measurement was published in 1974 by Degasperis et al. and Alan Turing described it in 1954. The crucial (in our opinion) direct experiment which demonstrated the the inhibition of transitions between quantum states by frequent measurements of the state was that realised by Itano, Heinzen, Bollinger, and Wineland in 1989, and published in Phys. Rev. A 41, 2295–2300 (1990)

36 Quoted: Jeffrey M. Schwartz, Henry P. Stapp and Mario Beauregard: *Quantum physics in neuroscience and psychology:a neurophysical model of mind–brain interaction* - Philosophical Transactions of the Royal Society, B, doi:10.1098/rstb.2004.1598 (published online)

37 Our driving question derived from the above observation is: what could one say about the attention focused on the intention of selecting an intention?

38 The issue of searching the determinist connection between the capacity of a system of providing performance and its architecture and of using this knowledge for improving the performances used when working on the environment, through the engineered system, in order to obtain the expected benefits.

39 The issue of searching for a determinist bond between a desirable benefit and an "possible to be engineered" system;

which might be taken into account beside the quantum"free will"[40] when we discuss the border behavioral limits of intelligence. ,we suggest that the concept of engineered singularity might be seen as the opened door towards the engineered freedom but also as a critical challange for phronetical performance, which becomes an evolutionary cruciality.

Finally, we discuss the theoretical findings in a real context of intelligence – a criticality which became"necessitant" in the sense that the intention to solve its consequences is generated by emergences and not by needs.

The"necessitant" context of our discussion is what we call a situation of intelligence precarity generated by intellectual disharmony. The case brought into attention is the following one.

Regarding the scientific layer of intelligence, one can see that economics were decupled from the underlying laws of physics. There are more than 30 years since Nicolas Georgescu-Roegen (NGR) showed in his works and suggested that the way of repairing this conceptual mistake, which could generate incommensurable costs for humanity, is abandonment by economics of its classical mechanics roots, adopting a thermodynamic compatible view and seeking for new conceptual roots in biology. More than this, he showed that the so called orthodox neoclassical theory of economic growth is unsustainable at the global scale. The powerful mainstream of economical-political thinking can't find counterarguments to these proved facts, and instead of searching a change of paradigm, is still ignoring them. We call this situation one of intelligence precarity (on the scientific and political layers) and, starting from NGR's observation that economics forgot its real purpose – generating of the conditions for joy of life - we identify as a cause of this kind of precarity the neglecting of a thinking dimension, focused on questions like[41]:

- Where are we going, and what for?
- Who gains and who loses, and by which mechanisms of power?
- Is this development desirable for us, but for humanity?
- What, if anything, should we do about it?

At a more accurate analysis we observe that the cause of the above revealed precarity is the disharmony between *episteme, techne* and *phronesis.*

CEAUSU FELICIA

LEVELS OF MENTAL PROCESSING OF INFORMATION

Immediate world in which man lives is the natural environment and social environment, but also that of his own reality. In this world much smaller are the biological brains and even the new electronic brains which arouses so much interest.

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40 We reffer here at the logically incontestable result of ConwayandKochen'sFreeWillTheorem which draw the conclusion that *if the choice*
For a particularty type of spin1 experiment is not a function of the information accessible to the experimenters, then its outcome is equally not a function of the information accessible to the particles. Therefor, the response of the particles can be seen as a free one.

41 These questions were developed starting from a narrower formulation given by BENT FLYVBJERG in Phronetic Planning Research:Theoretical and Methodological Reflections – Planning Theory&Practice,Vol.5, No.3, 283–306, September 2004

New ontological model must include a deeper reality than the universe which he comes. Bernard d 'Espana supports from the data of quantum physics there is a deeper level of existence, placed under the quantum world, a veiled reality, which he considers somewhat hidden for knowledge. The idea of a "deep underlying reality" is strongly supported by Menas Kafati. Roger Penrose (1989, 1994), Henry Stapp (1993), S.R. Hameroff (1994), and K. M. Jibu Jasue (1996) are promoters of the quantum theory of consciousness. Their actions are based on two types of quantum processes known: type I (after von Neumann) the system evolution takes place under the Schrödinger equation and leaves no possibility of occurrence the mental and consciousness; type II, in which takes place the reduction of vector state (representing a superposition of states). Penrose called process U and process R two processes aforesaid. Stapp and Penrose believe that the process of consciousness can be related to the phenomenon of reduction state vector (collapse of wave function of process U by process A). David Bohm supports processes and non-measurable physical quantities, but who determines the evolution of the physical phenomena. Margene (1984) argued that the interaction of body / mental is analogous to a field of probabilities described by quantum mechanics, the field has no mass, no energy but can cause a microsite an effective action. Peters and Kora (1987) proposed considering bundles of dendrites of the neuron as a structural microunitate of the cortex, called „dendron".

Each „dendron" or neural unit should be imbued with a mental unit called „psihon". An intentional mental acting through its „psihon" available through his dendron nearly 10,000 presynaptic vesicular network already activated, where each vesicle expected to be selected. Roger Penrose (1999) suggested that the microtubules of neurons would be the place of the relevant quantum effects in the brain.

At the origin of the phenomenon of consciousness would be those neuronal cytoskeleton that is grafted microtubules, places of existence of coherent quantum states. Large-scale quantum coherence does not imply consciousness itself. Otherwise we have to recognize that superconductors are aware. From the neurobiological point of view we can define consciousness as a visible property of the brain that comes from the voice activation of an undetermined number of neurons over a variable period of time after being substituted by a different number of neurons that is activated and the process continues until the installation of biological death of the brain. Neural ensembles is a mechanism unreadable, but precisely where, in an infinitely small time the vibrations of supracondensate material, produced by the molecules of the neuron, releases energy that can be transformed or expressed through what we call consciousness.

Information processing mechanisms in the neuronal assemblies, using a Bose-Einstein model and Fröhlich effect, as the Meda Truta demonstrates that the structures of higher learning such as thinking, language is achieved through a state of consciousness necessary for brain determine the role and place that human beings occupies in the environment.

CEAUSU GEORGE

DEFINITION AND DESCRIPTION OF FORMAL SYSTEMS OF ARTIFICIAL INTELLIGENCE TECHNIQUES

The definition is the concept background operation by proximate genus and specific difference. So the most general concepts and categories can not be rigorously defined, but described as a database consultation semiotic (structured fields), or simply a text. A formal ontology is a list of

interrelated classes that lead to a model of the categories of space, time, continuity and vacuum [Ceausuworld will not miss F.; Ceausu G., 2004]. When speaking, human agent works at two levels of articulation (declarative and phonological) through two fundamental logical categories, concept and phrase, CLF = (n, p), and four logical categories derived CLD = (operators strictly speaking, connectors, subnectori, preachers), where op = f (n / n), co = f (w / w) su = f (n / p), pr (p / n) [John, 1999]. Requirements of a general syntax, semantics closely related developed around a set of primitives are essential in specifying GU rules (rules of universal grammar, language independent). Noam Chomsky developed an analytical system of language, grammar Government-binding (GB Gouverment and Binding Grammar) [Chomsky, 1996], which is associated with a generalized syntax, namely X-bar theory [Black, 1999], used cunoaşteriii new declarative representation [Ceausu, 2008]. By similarity, we detect and the language of intelligent animals two CLF, static and dynamic representations, and, accordingly, only two CLD [Ceausu, 2009]. In the language of non-biological agents, formal ontology is more plastic.

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CHAPOUTIER GEORGES

SINGULARITY AND COMPLEXITY: FROM LIVING BEINGS TO MACHINES

In living beings, singularity leads to complexity. Two basic phenomena are the keys to this evolution towards complexity: juxtaposition and integration. Juxtaposition, as the term suggests, is the accumulative positioning of identical, originally single units, one next to the other, a process similar to forming a necklace with identical beads. Integration involves a process which enhances or refines the original units, thus generating entities one step up the hierarchy, comprised of the same original units that then become component parts (e.g. a necklace with beads of different colours or shapes that form a pattern). I have proposed that these complex integrated structures be called “mosaic structures,” using the term mosaic as understood in art. Numerous examples of such mosaic processes can be found in genetics, anatomy and even human societies. The human brain and mental operations, including memory and language, can also be analysed as mosaic structures. By these processes the properties of the “whole” (the “mosaic”) do not cancel out the autonomous existence of the properties of the component parts, confirming therefore the Aristotelian stance which is similar to Konstantin Khroutski’s biocosmology. At the same time, as complexity causes diversity, it leads to other types of singularity. These processes, leading to autonomy, and even freedom, in living beings, cannot be reproduced in present day machines, regardless of their degree of complexity. Modern

machines, in spite of their powerful functions, have not reached the degree of autonomy and freedom experienced by living beings.

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CHIRIAC HORIA COSTIN

DESCRIPTIVE IMAGINARY AND THE EPISTEMOLOGIC STATUS OF THE ENGINEER

This paper is trying an analysis of some ethical and epistemological implications of the emergence of singularity, taking into consideration the position of the engineer who participates in the effort of creating it. One of the most implicated specialists responsible for the rise of artificial intelligence is the engineer. He is, after all, the one who is able to apply the principles of different scientific theories, from quantum physics to digital electronics, and to obtain the practical result of creating a device capable to execute logical operations quite similar to those made by human intelligence, within some limits. Therefore, he is also the first who must be aware of the ethical implications of such activity, especially in the case of the tremendous progress of artificial intelligence efficiency, with deep cultural and social implications. His position is special not only in an ethical sense, but also in an epistemological sense, most of all, because he has the opportunity to observe closely the practical relation between scientific theories and the features of nature they are claiming to describe successfully.

Actually, the understanding of the relation between scientific theories and the characteristics of nature they describe represents one of the most interesting philosophical aspects regarding engineering education. Because he is focused on applying the scientific theories on the real physical world, the engineer has the tendency of considering those theories as being "true" once forever. Very often, he considers his primary mission that of applying the principles of those theories for obtaining new technologies. After all, the technological approach of science is an indirect one and creates sometimes the illusion of complete stability and efficacy of the scientific descriptions of nature capacities. In fact, much of the theoretical evolving struggle in science does not appear at all in the evolution of technology. Moreover, if a certain technology uses some capacities of nature this does not mean that scientific theories used to create that specific technology represent a complete description of those capacities of nature.

A closer look to the structural features of the scientific discourse could reveal a much more complex image, at least as regard the dynamics of scientific representations. The reason for the complexity of scientific representations dynamics is the complex relation between fictional products of human thinking and what we are used to call objective physical reality. Scientific theories can be seen as complex systems of such fictional products of human thinking with descriptive features toward physical reality. Especially contemporary theories in physics create a whole explicative world of concepts called "scientific reality" involved in a very complex relationship with "objective physical reality". The major problem of the relationship between scientific reality and objective physical reality is represented by the fact that scientific reality is not unique, nor the set of premises used in its construction. That is why recent struggles in the unification of contemporary physical theories are so important. They represent a last step in a historical evolution of basic scientific descriptive concepts in natural sciences towards a final and coherent description of the capacities and

human understandable features of nature. Nevertheless, this type of description can never become a definitive one.

A continuously evolving science is trying to reveal the most significant characteristics of reality. The engineer is trying to exploit them and doing so, he has the possibility to discover the limits of the epistemological optimism of the scientific discourse. He has the opportunity to observe the complex mixture between the qualitative and quantitative aspects of scientific concepts and the very refined dynamics of scientific representations, a process we will analyse using the concept of "descriptive imaginary". The same concept will be used for describing technical creativity that is so necessary for the engineer in order to develop artificial intelligent systems. One can remember that some of the greatest cultures in the world missed the opportunity of inventing modern science just because they hesitated to make a sharp distinction among real world and imaginary worlds. In order to give constructive powers to human imagination in the knowledge making process, a great culture has to admit the fictional nature of the conceptual products of human imagination. The distinction between imaginary and real represents the first step towards the recognition of the constructive and epistemological function of imaginary. This is equivalent with admitting that descriptive fictions have a provisory and explanatory nature with regard to their part in the scientific discourse.

As science is characterised by moral neutrality and because the scientific theories are presented in schools & universities in a non-historical manner, the contempo-rary popular culture is characterised too often by moral neutrality and very few people's poses historical consciousness as to their culture and their identity. Most of the people have no direct access to the understanding of the significance of scientific theories but through technology. In this context, the engineer has a privileged position as regards the understanding of the profound ethical and even cultural implications of his work. In the same time, he has the knowledge that allows him to appreciate the role of descriptive imaginary in the progress of science and technology. In order to create artificial intelligent systems able to improve the progress of intelligence, he must be capable to develop such descriptive imaginative faculties, that allow him to create artificial intelligent systems capable of enhancing and improving just the descriptive representations used by those who created them. In order to implement a concept like singularity, it is necessary to analyze the complex process of scientific representations evolution, an objective that could be achieved easily using the concept of descriptive imaginary.

„ACKNOWLEDGEMENT: This paper was made within The Knowledge Based Society Project supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU ID 56815

CODOBAN AUREL

IDENTITY AND OTHERNESS IN VIRTUAL REALITY

From the modernity which made communication secondary and dependent from knowledge and limited at the verbal type we inherited the idea that communication is in the first place a way of sending information. In this case the identity and otherness of the subjects that communicate are a clear and solid one. The postmodern and globalizing concept of communication put in the first place not the process of sending the information, but the building of relations. This ontological model of relationship describes the meaning of communicational reality as virtual, or, more precisely, describe communications action like a virtual reality. In this case the identity and otherness of the subjects that are in relation appear only as a weak occurrence of the modern idea of subject.

DASCAL CLAUDIO

CONSIDERATION ABOUT SINGULARITY FROM A PERSPECTIVE OF TELECOMMUNICATION ENGINEER

From a perspective of an engineer that has been involved in the tremendous evolution of telecommunications in the last forty years and have seen the way it affected human behavior and way of life I will share my thoughts about this new technological revolution.

The evolution of technology is indisputable, however there is a continuous evolution of man, that can be viewed during the last great achievements that have changed drastically the how to be of the human kind: digital divider and mobility.

We all agree that the world would not be the same without two of the most important inventions of late nineteenth century: the electric lamp and the telephone! However if Graham Bell and Thomas Edison by any miracle would appear amongst us certainly Thomas Edison would recognize his lamp while Graham Bell would not guess what are those mobile device that each and every human being has.

The evolution of powerful software machines is undisputable, as well as robots and intelligent machines but this does not mean that these adaptive intelligent machines will replace man, because to be technologically feasible is only one step.

There are a few issues to be considered beyond the technology itself: if such intelligent and self sufficient machines exists who is going to master them? What are the economic factors that will make them really produced and distributed among the humans until the humans are dominated by these self sufficient machines. A virtual creature like in the film "I Robot" is unlikely to happen unless generated by the initial will of a man.

What we have seen in the past decades, specially in the telecommunications development, is the incredible capacity of humans to adapt to new technology and new offerings, but also we have seen that the diffusion of technology and new devices and machines are directly related to market motivation, i.e., sales and profit and market participation. We hear from educators many times that children now born and raised are born with chips in their head and understand much faster what for our generation has been a lengthy process of learning. This trend could mean that those new generations will adapt and use the devices and machines and not be used by them or overpowered by them.

Replacement of human kind by machines in my view will not happen as a natural consequence of the development of the technology. It is dependent on market and economics, as we have seen in the telecoms market, unless eventually political or other reasons prevail.

FEREIRA ADEMAR

COMMENTING ON THE SINGULARITY – A ROBOTICS PERSPECTIVE

Introduction. The word singularity was used by Vernor Vinge [1982] to name the event of an intelligence explosion that would happen, if machines could once surpass human intelligence. Ray Kurzweil [2005] associated the idea of the Singularity to a period in the future where technology would change so fast as to transform human life irreversibly . According to him, the development of a technology is an evolutionary process that can be described by a law of accelerating returns. This means that technology builds on itself, by means of an exponential growth (sometimes even with

increasing exponents). This is especially true of the information technologies. Needless to say, this is a highly controversial subject.

In this paper, because Kurzweil is one of the leading futurists of the said coming age of the Singularity, I will take the opportunity to point to some of his assumptions and justifications on that issue, providing evidence that they are unsound or inconsistent, on the basis of current robotics development and its possible evolution.

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In 1950 Allan Turing proposed to consider the question 'Can machines think'. Instead of starting by attempting to define the terms involved in the question, he chose to replace it by a game in which a human, by asking questions, has to decide which is the computer and which is the human. This game became known by the name of the Turing test. If the computer could imitate human thinking, fooling the human interrogator, then it passed the test. At that time, Turing [1950] apparently was hoping "that machines would eventually compete with men in all purely intellectual fields". It is worth noting that for "intellectual fields", he proposed trying not only abstract activities, like playing chess, but also, in today's jargon, "embodied" activities using sense organs and language ability. Also, he was prudent in saying that "we can only see a short distance ahead, but we can see plenty there that needs to be done".

Fifty five years after Turing's paper, Ray Kurtzweil feels confident enough to say that he can see a long distance ahead, and that what needs to be done to create higher than human intelligence will be done in the next 35 years, when the Singularity will be around.

Kurzweil considers robotics, the creation of nonbiological intelligence, the most important of the revolutions underlying the Singularity, because, as he rightly says, "intelligence needs an embodiment, a physical presence, to affect the world". He de-emphasizes physical presence, however, because for him disembodied intelligence is the dominant factor. Intelligence, in his conceptualization, will create embodiment, and subsume physical skills, as necessary. For justifying this last point, he refers to the human brain, where the cerebellum controls our skills and muscles. It seems that his notion of embodiment here is confuse or even contradictory, and this is because he sees intelligence essentially as computation. Evolution tells quite the opposite story.

Contrary to this cognitivistic view, in robotics intelligence is inherently embodied and situated. Sensory-motor coordination aspects, as well as social interaction are considered intrinsic to robot intelligence.

Kurzweil claims that the first half of this century will already configure the beginning of the Singularity. The forthcoming decades will be distinguished by three overlapping revolutions, in Genetics, Nanotechnology, and Robotics (GNR), which will bring forth the Singularity. We are in the beginning of the "G" revolution in these days. Maximum importance is assigned to R, because human-level robots will exhibit higher than human intelligence, and intelligence is the supreme gift that will "overcome any obstacles that stand in its path". Again, intelligence considered in the abstract, in spite of robotics. No wonder that Kurzweil considers the human brain as a computer, a biological one. As a computer, the brain can be reverse engineered, and so transferred to hardware and software. Computational technologies using nanobots (products of the "N" revolution) are much more powerful than biological processing, since the proteins of biology have "profound limitations in strength and speed".

Based such considerations, Kurzweil expects that one thousand dollars of hardware by 2020 will emulate human-brain functionality, and that by 2050 the same amount worth of computing "will exceed the processing power of all human brains on Earth"! And this is only a glimpse of the Singularity times to come.

Several of Kurzweil's concepts and claims (to be described more at length in the paper), to justify his idea of the Singularity, can be criticized. For example, extrapolating technological trends far into the future is largely prone to errors [Brooks, 2008]. Also, biological computation might not be inferior to the technological computation, because "the biological world is a physical system whose properties and behaviors seem entirely foreign to physics. The origins of this discrepancy lie in the very high information content in biological systems and the evolutionary value placed on predicting the future (computation) …" [Hopfield, 1994]. When he hopes that the robotics revolution, aided by the other two, will unfold the Singularity, he should better think on the difficulties that roboticists normally experience to design and build mere "autonomous" agents. Just to visualize the abyssal difference between current technology and biology, compare Brook's six-legged robots, capable of walking with impressive performance, to real insects. Ants, for example, can also do many more complex things, like manipulating objects, orient in different environments, building housing, organize social structures, reproduce, etc. [Pfeifer & Bongard, 2007].

In respect to embodied artificial agents, it is worth noting that a great challenge is proposed to the robot technology of 2050: To develop a humanoid robot soccer team to beat the world human soccer champions! Could the technological intelligence of Kurzweil's Singularity solve this problem? Of course not. But, will the more down to Earth robotics succeed in that? Well, this is an empirical question!

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GRAMATIKOFF PETAR

SCIENCE AND ORTHODOX CHURCH DIALOGUE

The current year is the last one of the United Nations World Decade for development of culture of peace and nonviolence (2000-2010). The main responsibility today of the religious communities is to favour reflection and exchanges of views and experiences, promotes research and publishes findings on new developments in the field; to teach International Humanitarian Law and Human Rights in order to show how the laws of Human Rights and Humanitarian Law and European Communitarian Law are all interrelated and inter-dependent. It is highly conducive to learning and networking and engagement in dialogue on complex and evolving issues. The primary aim is to co-operate with various non-governmental organisations and academic institutions in order to promote the development, application and dissemination of international humanitarian law in all its dimensions, thus contributing to the safeguard and respect of human rights and fundamental freedoms throughout the world which will help to alleviate human suffering in difficult situations.

It is impossible to overcome the ecological crisis in the situation of a spiritual crisis. This does not at all mean that the Church calls to curtail the preservation activity, but in her hope for a positive

change in the man-nature relationships, she relies rather on society's aspiration for spiritual revival. The anthropogenic background of ecological problems shows that we tend to change the world around us in accordance with our own inner world; therefore, the transformation of nature should begin with the transformation of the soul. The ecological ethics is being developed. The public consciousness guided by it speaks against the consumer way of life, demanding that the moral and legal responsibility for the damage inflicted on nature be enhanced. It also proposes to introduce ecological education and training and calls for joined efforts in protecting the environment on the basis of broad international co-operation. According to St. Maxim the Confessor, man can turn the earth into paradise only if he carried paradise in himself.

"Without God's love and mercy we cannot contribute much, as Christians and churches, to the building of Europe", said Protestant Bishop Axel Noack preaching at the opening service of the ecumenical encounter of one hundred and fifty delegates from all over Europe gathered in Lutherstadt-Wittenberg, Germany for the third stage of the Third European Ecumenical Assembly (EEA3). The EEA3 is being organised by the Council of European Bishops' Conferences (CCEE) and the Conference of European Churches (CEC) on the theme "The light of Christ shines upon all – Hope for renewal and unity in Europe" with a plenary session on "Secularisation as a challenge for Europe." The Wittenberg encounter was the last stage before the Assembly itself which took place in Sibiu, Romania, from 4-9 September 2007.

[The Council of European Bishops' Conferences (CCEE) includes the presidents of the 34 bishops' conferences in Europe. The president is Cardinal Péter Erdõ, Archbishop of Esztergom-Budapest, Primate of Hungary; the vice-presidents are Cardinal Josip Bozanic, Archbishop of Zagreb and Cardinal Jean-Pierre Ricard, Archbishop of Bordeaux. CCEE's Secretary General is Mgr. Aldo Giordano. The secretariat is in St. Gallen (Switzerland)]

[The Conference of European Churches (CEC) is a fellowship of some 125 Orthodox, Protestant, Anglican and Old Catholic Churches from all countries of Europe, plus 40 associated organisations. CEC was founded in 1959. It has offices in Geneva, Brussels and Strasbourg]

The Ecumenical Patriarchate and the Reconciliation of Human Beings with the Natural Environment. I would like to quote some other documents with Pan-Orthodox importance provided by the Permanent Delegation of the Ecumenical Patriarchate to the World Council of Churches. In recent times more and more is said about of globalization, tolerance, peaceful coexistence and dialogue among the world religions. The Orthodox Church, through the Patriarchal Encyclicals, has voiced its concern and advocacy for the amelioration of the human condition and the role of religion in enabling people to reconcile and live in peace. This can be most effectively achieved through dialogue that engages religious people of good will and faithful to God's message of peace and love among all people. The recent Patriarchal Encyclicals depict the Orthodox Christian view of the application of tolerance and coexistence among all people on our planet Earth. His emphasis is on the scriptural understanding that all human persons are created in the image of God, and as children of God all are endowed with the gift of freedom and the right to live in peace. God created the world out of His infinite Goodness and Love. The world is full of signs that point to Him and His wondrous and beautiful world, where the lion and the lamb live together in peace. The human person is the main concern of God, and through the dialogue between God and man one arrives at perfect goodness and love. The human person seeks communion with himself and God but unless one has communion with "others," he will not be able to come to God. The need for God and other human persons is imperative for each of us to find personal peace that leads to universal peace. Friendship - filia - agape - mutual love and respect for the rights of the others is necessary precondition to perfect

peace. (Rev. Dr. Protopresbyter Professor George C. Papademetriou, Hellenic College/Holy Cross Greek Orthodox School of Theology, Brookline).

A major focus of the Ecumenical Patriarchate's ministry in the modern world as a ministry for global cooperation and reconciliation is the natural environment. Patriarch Bartholomew's commitment to the sanctity of the Creation as a gift from God to be protected is reflected in his many and continuous pertinent efforts. The Orthodox Church appreciates the efforts for overcoming the ecological crisis and calls people to intensive co-operation in actions aimed to protect God's creation. At the same time, she notes that these efforts will be more fruitful if the basis on which man's relations with nature are built will be not purely humanistic but also Christian. One of the main principles of the Church's stand on ecological issues is the unity and integrity of the world created by God. Orthodoxy does not view nature around us as an isolated and self-closed structure. The plant, animal and human worlds are interconnected. From the Christian point of view, nature is not a repository of resources intended for egoistic and irresponsible consumption, but a house in which man is not the master, but the housekeeper, and a temple in which he is the priest serving not nature, but the one Creator. The conception of nature as temple is based on the idea of theocentrism: God Who gives to all «life, and breath, and all things» (Acts 17:25) is the Source of being. Therefore, life itself in its various manifestations is sacred, being a gift of God. Any encroachment on it is a challenge not only to God's creation, but also to the Lord Himself.

Starting in 1995, he began to host a series of seafaring environmental symposia, aimed at bringing together experts in religion and science, as well as political representatives, to focus attention on critical areas of environmental concern. The first symposium, for one week, took place on a boat in the Aegean Sea. Since 1995, four similar environmental symposia have followed on board vessels in the following areas of heavy environmental damage: the Black Sea (1997), the River Danube (1999), the Adriatic Sea (2002), and the Baltic Sea (2003). Additional environmental symposia are currently being planned for the Amazon River in July, 2006, and for the Caspian Sea in July, 2007, respectively. What is significant, if not unparalleled, about these environmental symposia is the level of dialogue that takes place: There is the general dialogue between religion and science, then, the dialogue among the representatives and leaders of the monotheistic religions that are participants, the dialogue among the scientists themselves, and the dialogue among the various governmental representatives who are invited to embark upon the vessel at each port of call. Perhaps what is most significant about the level of this kind of dialogue is its universal and ultimate call to reconciliation, namely, the reconciliation between humankind and the natural environment itself. This act of reconciliation extends to all human beings in the world at all times, truly aiming toward what may best be described as an ultimate rapprochement.

The realities of pluralism challenge each person in the global village to reflect more critically upon the teachings of his or her own faith, in light of the multitude of differing perspectives. An Orthodox Christian responds to these challenges with the understanding that we must always be tolerant of the perspectives of others, especially when such perspectives differ on the basis of religious, cultural, or historical ideology.

Bases of the Social Concept of the Russian Orthodox Church. Adopted at the Sacred Bishops' Council of the Russian Orthodox Church, this document sets forth the basic provisions of her teaching on church-state relations and a number of problems socially significant today. It also reflects the official position of Moscow Patriarchate on relations with state and secular society. In addition, it gives a number of guidelines to be applied in this field by the episcopate, clergy and laity.

The nature of the document is determined by the needs experienced by the whole of the Russian Orthodox Church during a long historical period both within and beyond the canonical territory of Moscow Patriarchate. Therefore, its deals primarily with fundamental theological and ecclesio-social issues, as well as those aspects of the life of state and society which were and are equally relevant for the whole Church in the end of the 20th century and in the nearest future. In Chapter XIII the document deals with the relations between the Church and ecological problems. Sin that was born in the soul of man damaged not only him himself, but also the entire world around him. «For the creature was made subject to vanity, not willingly, but by reason, of him who hath subjected the same in hope, because the creature itself also shall be delivered from the bondage of corruption into the glorious liberty of the children of God. For we know that the whole creation groaneth and traveileth in pain together until now» (Rom. 8:0-22). The first human crime was reflected in nature like in a mirror. The seed of sin, having produced an effect in the human heart, gave rise to «thorns and thistles», as Holy Scripture testifies (Gen. 3:18). The full organic unity that existed between man and the world around him before the fall (Gen. 2: 19-20) was made impossible. In their now consumer relations with nature, human beings began to be more often guided by egoistic motives. They began to forget that the only Lord of the Universe is God (Ps. 23:1), to Whom belong «the heaven… and the earth also, with all that therein is (Deut. 10:14), while man, as St. John Chrysostom put it, is only a «housekeeper» entrusted with the riches of the earth. These riches, namely, «the air, sun, water, land, heaven, sea, light, stars», as the same saint remarks, God «divided among all in equal measure as if among brothers». «Dominion» over nature and «subjection» of the earth (Gen. 1:28), to which man is called, do not mean all-permissiveness in God's design. It only means that man is the bearer of the image of the heavenly Housekeeper and as such should express, according to St. Gregory of Nyssa, his royal dignity not in dominion over the world around him or violence towards it, but in «dressing» and «keeping» the magnificent kingdom of nature for which he is responsible before God.

XIII. 1. The Orthodox Church, aware of her responsibility for the fate of the world, is deeply concerned for the problems generated by the contemporary civilisation. Ecological problems occupy a considerable place among them. Today the face of the Earth has been distorted on a global scale. Damaged are its bowels, soil, water, air and fauna and flora. Nature around us has been almost fully involved in the life support of man who is no longer satisfied with its diverse gifts, but exploits without restrain whole ecosystems. Human activity, which has reached the level of biospheric processes, constantly grows due to the accelerated development of science and technology. The pollution of the environment by industrial wastes everywhere, bad agricultural technology, the destruction of forests and top-soil — all result in the suppressed biological activity and the steady shrinking of the genetic diversity of life. The irreplenishable mineral resources are being exhausted; the drinking water reserves are being reduced. Great many harmful substances have appeared, not included in the circulation and accumulated in biosphere. The ecological balance has been violated; man has to face the emergence of pernicious processes in nature, including the failure of its natural reproductive power.

All this happens against the background of an unprecedented and unjustified growth of public consumption in highly developed countries, where the search for wealth and luxury has become a norm of life. This situation has obstructed the fair distribution of natural resources, which are common human property. The consequences of the ecological crisis have proved painful not only for nature, but also for man as organically integral to it. As a result, the Earth has found itself on the verge of a global ecological disaster.

XIII. 5. The ecological problems are essentially anthropological as they are generated by man, not nature. Therefore, answers to many questions raised by the environmental crisis are to be found in the human heart, not in the spheres of economy, biology, technology or politics. Nature is transformed or dies not by itself, but under the impact of man. His spiritual condition plays the decisive role here, for it affects the environment both with and without such an impact. The church history knows of many examples when the love of Christian ascetics for nature, their prayer for the world around them, their compassion for all creatures made a beneficial impact on living things.

Relationships between anthropology and ecology are revealed with utter clarity in our days when the world is experiencing two concurrent crises: spiritual and ecological. In contemporary society, man often loses the awareness of life as a gift of God and sometimes the very meaning of life, reducing it sometimes to the physical being alone. With this attitude to life, nature around him is no longer perceived as home and all the more so as temple, becoming only a «habitat». The spiritually degrading personality leads nature to degradation as well, for it is unable to make a transforming impact on the world. The colossal technological resources cannot help humanity blinded by sin, for, being indifferent to the meaning, mystery and wonder of life, they cannot be really beneficial and sometimes become even detrimental. In a spiritually disorientated man, the technological power would beget utopic reliance on the boundless resources of the human mind and the power of progress.

Science and Religion in Dialogue. Ethics and Religion. On the Secular science in "Bases of the Social Concept of the Russian Orthodox Church" we read: Christianity, having overcome heathen prejudice, demythologised nature, thus contributing to the development of natural science. With time, science, both natural and humanitarian, became one of the most important components of culture. By the end of the 20th century, science and technology have achieved such results and influence on all aspects of life as to become in fact the decisive factors in the life of the civilisation. At the same time, despite Christianity's initial impact on the formation of scientific activity, the development of science and technology under the influence of secular ideologies has led to consequences arousing serious fears. The ecological and other crises, which have hit the modern world, have increasingly challenged the way chosen. The scientific and technological level of the civilisation is such that the criminal actions of a small group of people can cause, in principle within a few hours, a global disaster in which all the highest forms of life will perish irrevocably.

From the Christian perspective, such consequences have arisen because of the false principle lying in the basis of the contemporary scientific and technological development. This principle stipulates a priori that this development should not be restricted by any ethical, philosophical or religious requirements. With this «freedom» however, the scientific and technological development finds itself at the mercy of human passions, first of all vanity, pride and thirst for the greatest possible comfort, which frustrates the spiritual harmony of life with all the ensuing negative developments. Therefore, to ensure normal human life it is necessary today as never before to restore the lost link of scientific knowledge with the religious spiritual and moral values.

The need for this link is also conditioned by the fact that a considerable number of people still believe in the omnipotence of the scientific knowledge. It is partly due to this belief that some atheistically-minded thinkers of the 18th century resolutely opposed science against religion. At the same time, it is commonly accepted that in all times, including the present, many outstanding scientists were and are religious people. It would be impossible if there were fundamental contradictions between religion and science. The scientific and the religious types of knowledge are completely different. They have different points of departure and different goals, tasks and

methodologies. These spheres can come in touch and overlap, but cannot oppose each other, because the natural science contains no atheistic or religious theories, but more or less authentic theories, whereas religion does not deal with matter.

Mikhailo Lomonosov rightly wrote that science and religion «cannot come into conflict… unless some one excites strife in them out of conceit and desire to show off one's ingenuity». St. Philaret of Moscow expressed a similar idea: «The faith in Christ is not in conflict with the true knowledge, because it is not in union with ignorance». Noteworthy also is the incorrectness of opposing religion to the so-called scientific worldview.

There are few intellectual battles greater than the one currently being waged between faith and science. But must religion and science be such bitter adversaries? Or are these seemingly implacable foes more like natural allies in the search for objective truth? The underlying assumption of Science and Religion in Dialogue is the belief that scientific and religious practices of inquiry can, in fact, be viewed as logically compatible, complementary, and mutually supportive. I would like to point on the work of several organizations in promoting the dialogue between science and religion.

ASA: The American Scientific Affiliation (ASA) is a Christian fellowship of men and women in science and disciplines that relate to science who share a common fidelity to the Word of God and a commitment to integrity in the practice of science. ASA was founded in 1941.

ESSSAT: The European Society for the Study of Science and Theology (ESSSAT) is a scholarly, non-confessional organization, based in Europe. ESSSAT has members from almost every European country with diverse confessional backgrounds, including believers as well as non-believers and atheists.

F&SE: New England Center for Faith and Science Exchange, a program of the Boston Theological Institute.

IRAS: Working for a dynamic and positive relationship between science and religion since 1954, the Institute for Religion in an Age of Science hosts an annual summer conference on Star Island, NH.

John Templeton Foundation: The John Templeton Foundation was established in 1987 by renowned international investor, Sir John Templeton, to encourage a fresh appreciation of the critical importance---for all peoples and cultures---of the moral and spiritual dimensions of life. The Foundation currently funds more than 150 projects, studies, award programs and publications worldwide.

CSSR: Columbia University's Center for the Study of Science and Religion (CSSR) was founded in the summer of 1999 as a forum for dialogue between the sciences and diverse religious traditions.

CTNS: The Center for Theology and the Natural Sciences (CTNS) focuses primarily on the relation between contemporary physics, cosmology, technology, environmental studies, evolutionary and molecular biology and Christian theology and ethics. As an Affiliate of the Graduate Theological Union (GTU) in Berkeley, California, CTNS offers courses at the doctoral and seminary level. CTNS was founded in 1981.

AAAS DoSER: American Association for the Advancement of Science (AAAS) established the Dialogue on Science, Ethics, and Religion (DoSER) program in 1995 to foster communication between scientific and religious communities. The program builds on the association's long-standing commitment to relate scientific knowledge and technological development to the purposes and concerns of society at large. The astrophysicist Jennifer Wiseman leads AAAS effort to build Religion-Science Dialogue since 2010. Wiseman was welcomed to AAAS during a Wednesday, 16

June, panel discussion, "Re-Envisioning the Science and Religion Dialogue." The speakers included William Phillips, professor of physics at the University of Maryland and a 1997 Nobel laureate in physics; Howard Smith, an astrophysicist at the Smithsonian Astrophysical Observatory and author of "Let There be Light: Modern Cosmology and Kabbalah"; David Anderson, founder and lead pastor at the Bridgeway Community Church in Columbia, Maryland; and Rick Potts, director of the Human Origins Program for the Smithsonian Institution.Wiseman currently heads the Laboratory for Exoplanets and Stellar Astrophysics at NASA's Goddard Space Flight Center in Greenbelt, Maryland. She will retain a position at Goddard, where she is the incoming senior project scientist for the Hubble Space Telescope. From 2003 to 2006, she served as the program scientist for the Hubble at NASA Headquarters in Washington, D.C. "Jennifer Wiseman is an accomplished scientist who also understands the importance of religion in American life and how a deep knowledge of the natural world need not threaten religious belief," said Alan I. Leshner, chief executive officer of AAAS and executive publisher of Science. "With continuing battles over the teaching of evolution in the schools and new fundamentalist attacks on the reliability of climate science, there is a need more than ever for a constructive conversation between scientists and religious groups. Dr. Wiseman is admirably prepared to help make that happen."

Only religion and philosophy by their very nature can fulfil the function of worldview, which no specific science or concrete scientific knowledge as a whole can assume. A reflection on scientific achievements and on their inclusion in an ideological system, however, can take place in a wide framework beginning from religious to openly atheistic.

Though science may be one of the ways to know God (Rom. 1:19-20), Orthodoxy sees in it also a natural instrument for building life on earth, which is to be used very prudently. The Church warns man against the temptation to view science as a realm completely independent of moral principles. Today's achievements in various areas, including the physics of fundamental particles, chemistry and microbiology, show that they are essentially a double-edged sword that can both benefit man and take away his life. The evangelical norms of life make it possible to educate a person in such a way that the knowledge and abilities obtained could not be abused. This is why the Church and secular science are called to co-operation for the sake of life and its proper order. Their interaction contributes to the healthy creative climate in the spiritual and intellectual sphere, thus helping to create the best conditions for the development of scientific research.

GROSU STEFAN & MACSUT ADRIANA MIHAELA

ABOUT SINGULARITARY AND BIOETHICS

The Singularity is a philosophy and a social movement seen as the creation of a super-intelligence, and it can formulated as possibility within the medium-term future, and that deliberate action ought to be taken to ensure that the technological singularity occurs in a way that is beneficial to humans.[42]

A few years ago the word '*Singularity*' has been used less often than nowadays . So it can be said that today there is a different kind of thought..

It feels like something big is about to happen: graphs show us the yearly growth of populations, atmospheric concentrations of carbon dioxide, Net addresses, and Mbytes per dollar.

42 http://en.wikipedia.org/wiki/The_Singularity_Is_Near.

They all soar up to form an asymptote just beyond the turn of the century: The Singularity. The end of everything we know. The beginning of something we may never understand.[43]

The Singularity will be a great problem in the future so the Wallach, a famous Yale bioethicist warns of singularity's perils at futurist gathering.

Wallach is a pioneer in the nascent field of robot ethics and has captured the imaginations of futurists with his theories on artificial moral agents and computational ethics. In fact, he designed the world's first course on the subject at Yale, and he published a book last year entitled, Moral Machines: Teaching Robots Right from Wrong.[44]

There are three major schools of thought that have become associated with the word called *Singularity* (established by Eliezer Yudkowsky for the Singularity Institute for Artificial Intelligence):

-The School of Ray Kurzweil's,

-The School of Vernor Vinge's and

-The Scholl of I.J. Good's.[45]

There are three major schools of thought that have become associated with the word. One that you have all heard of already, I'm sure, is Ray Kurzweil*'s accelerating change. There is also* Vernor Vinge*'s event horizon, and* I.J. Good*'s intelligence explosion.*[46]

Ray Kurzweil is an American author, inventor and futurist which is involved in fields involved in fields like optical character recognition text-to-speech synthesis, speech recognition technology. He published in 205 a book called *The Singularity Is Near* where he discusses about the coming technological singularity and how people of the world will be able to augment their bodies and minds with this new technology. In this interesting book he describes the Singularity as resulting from a combination done of three important technologies of the 21st century: genetics, nanotechnology, and robotics (including artificial intelligence). There are described in his book four central postulates of the book are as follows: 1. *A technological-evolutionary point known as "the* singularity*" exists as an achievable goal for humanity. 2. Through a* law of accelerating returns*, technology is progressing toward the singularity at an* exponential rate*. 3. The functionality of the* human brain *is quantifiable in terms of technology that we can build in the near future.. (http://en.wikipedia.org/wiki/The_Singularity_Is_Near). 4. Medical advancements make it possible for a significant number of his generation (*Baby Boomers*) to live long enough for the exponential growth of technology to intersect and surpass the processing of the human brain.*[47]

On a youtube`s video about *The Singularity* it is told : the book called *The Singularity* is focuses on the future of technology and the human race as did The Age of Intelligent Machines and The Age of Spiritual Machines (other book written by Kurzweil) but here he makes very few concrete, short-term predictions though longer-term visions are present in abundance. This conception was told in a recently movie where Kurzweil discussed about *The Singularity* `s conception with Vice Magazine and was filmed for a documentary on the magazine online network.[48]

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43 Danny Hillis, The Millennium Clock, Wired magazine, *1995.*

44 Ibidem 1.

45 Eliezer Yudkowsky, Introducing the Singularity: Three Major Schools of Thought, http://www.acceleratingfuture.com/people-blog/?p=209, 9/6/2010 3:13:55 PM

46 Ibidem.

47 http://en.wikipedia.org/wiki/The_Singularity_Is_Near.

48B *Youtube video:* The Singularity of Ray Kurzweil, 9/6/2010 5:49:12 PM.

The accelerating change thesis human thought about the future are maybe linear, but technology change is accelerated and no-linear. People see the changes in the future as they have seen in the past, if not less. But technological progress feeds faster than people think. So it can be said more it is learnt, the more it will have been to learn. The future will contain more technological change than people expect to be. The technology change is smoothly exponential so it cannot be predicted the date when new technologies will arrive. There is here the function defined by the variations of Moore's Law for the speed of the fastest supercomputers: transistors per square centimeter, operations per second, per thousand dollars.

All doubling every year, or two years, or 18 months. Here we see a graph with a fully generic version of Moore's Law, which shows "techno juju" increasing exponentially over time. As you can see, the amount of techno juju we have is going up by a factor of a thousand every fifteen years. If we extrapolate this trend into the future, what do we get? That's right, "Big Juju!" As you can see from this graph, once you cross the threshold of Big Juju in 2031 on April 27th between 4:00 and 4:30 in the morning. [49]

It can be sadi about the computing progress that could be only grown exponential but too bumpy to be predicted exactly. So this exponential progress of the computer`s world still means it is going to get its huge changes somewhere down the line. There is also a positive second derived here that implies the future changes larger than past changes:"So criticizing Moore's Law is not enough of an argument against accelerating change"[50].

The second School is attributed to Vernor Steffen Vinge which published in 1993 a book called *The Coming* Technological Singularity. He argues that exponential growth in technology will reach in the future a point beyond which it cannot even speculated about the consequences.

Within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended.Is such progress avoidable? If not to be avoided, can events be guided so that we may survive? These questions are investigated. Some possible answers (and some further dangers) are presented. What is The Singularity? The acceleration of technological progress has been the central feature of this century. I argue in this paper that we are on the edge of change comparable to the rise of human life on Earth. The precise cause of this change is the imminent creation by technology of entities with greater than human intelligence.[51]

It can be said that there is a *model* of the future that will break down but not necessarily the future itself will break down. So if someone is ignorant about a phenomenon that means is only a fact about his own state of mind but it is not a fact about the phenomenon itself. *Something* happens just but on person don't know what it is. This is called in the philosophy of mind, shows I. Cepraz, a state of mind. [52]

There are today the cognitive sciences which are related with the science of computer, seen as a tool with a double use: -for the research of the physical reality and -as a model of the human mind.

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49 Ibidem 4.
50 Ibidem.
51 *Vinge, Vernor,* The Coming Technological Singularity*, 1993,* http://www.aleph.se/Trans/Global/Singularity/sing.html, *9/6/2010 6:06:55 PM*
52 Ion, Ceapraz, Course of Philosophy of Mind,., University of Timişoara, 2007.

So it can be described "a new… perspective about the knowledge which reveals the dependence of the cognitive acts of the informative capacity of subject assisted by the computer"[53]. But any model of the human mind must have ethical and bioethical rules.

People used to think that there is the scale of cognitive minds as if it ran the scale from village idiot to Einstein. If a person can take an IQ test that person is designed for humans, you as a member of the cognitive elite no matter what you score: "The scale that starts with a rock, zero intelligence, and runs from there to flatworms, insects, lizards, mice, chimpanzees, and to humans"[54]. Vinge's event horizon about intelligence is that improving the brain is very serious business.

It tampers with the roots of the technology tree, goes back to the cause of all technology. And that makes the future a lot stranger than strapping on a jet pack. If you want to know the true shape of the future, don't be distracted by amazing gadgets with lots of blinking lights. Look to the cognitive technologies, the technologies that impact upon the mind. [55]

The third school of Singularity thought talks about the intelligence explosion, which goes back to the 1960's and was invented by the famous Bayesian mathematician I.J. Good, and also pre-invented in the 1930's by the science fiction editor John Campbell"[56].

Mind can be seen as been the source of technology. It can be said that the changes that occurred over the past 10,000 years were done by constant progress human brains:"10,000 years ago, as today, our ancestors had a pre-frontal cortex, visual cortex, limbic system - the same brain architecture as today"[57] . So shows G.Ryle in the *Paper The Concept of Mind* the problem is "what we know not we can know"[58]. Then the it comes limits of bioethics which say what man can do and what man cannot do. For example it could be *limited* the research about Euthanasia, the experiments on the embryo? The choose is reflected by the cross-disciplinary field of bioethics which include the diverse fields of law, philosophy, health sciences, religion, the social sciences and the popular media covering the ethical, legal, and public policy aspects of health care and biomedical research. So it can be built limits in the study about *The Singularity.*

It can be talked about using technology to improve intelligence and so "suppose we have humans with brain-computer interfaces that augmented their intelligence"[59] But what is argued intelligence: " lay the stock market? Cure cancer? One good bet is that they would use their augmented minds to design the next generation of brain-computer interfaces"[60]. The human body is in fact composed by molecules and this molecules act like robots: "we are directly the descendents of these robots which are reproduced".[61] There is intelligence of the human being and "the smarter you are, the more intelligence you have at your disposal to make yourself even smarter.[62] The role of the computer`s technology is to improve minds is a positive feedback

53 Ibidem.
54 Ibidem 4.
55 Ibidem .
56 Ibidem.
57 Ibidem.
58 Gilbert,.Ryle, *The Concept of Mind,* New University of Chicago Press Edition 2002.
59 Ibidem 4.
60 Ibidem 3.
61 D. Dennet, Kinds of Minds, : Towards an Understanding of Consciousness 1996, in Romanian Tipuri mentale, Humanitas Edition, Bucharest, 1998
62 Ibidem 3.

cycle, and this stripped down to its bare essentials is the core thesis of the intelligence explosion"[63] But it cannot be used the human scale of intelligence to judge this artificial mind of computers. There is here a *Singularity* prediction that can be described here.

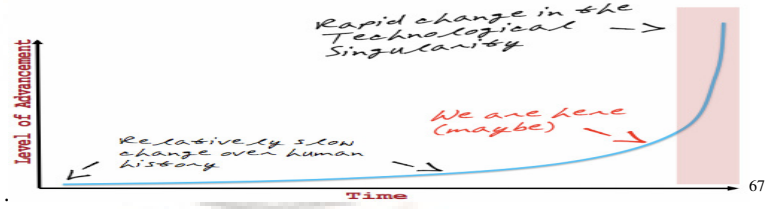
We are making a prediction about what happens after the Singularity. One often hears, 'Well, there are physical limits to computation, so this can't continue forever.' Well, according to our current models of physics, there are physical limits, but they're way the heck off the top of this graph. It's way above the ceiling even.[64] So the problem is what can be predict that threshold using Moore's Law at all? It was discovered a software *progess versus hardware progresss* so there are now two problems. Is a question related to an algoritm.

Geordie Rose *of* D-Wave Systems *recently was kind enough to provide us with a startling illustration of software progress versus hardware progress. Suppose you want to factor a 75-digit number. Would you rather have a 2007 supercomputer, IBM's Blue Gene/L, running an algorithm from 1977, or a 1977 computer, an Apple II, running a 2007 algorithm? And Geordie Rose calculated that Blue Gene/L with 1977's algorithm would take ten years, and an Apple II with 2007's algorithm would take three years.*[65]

This paper tries talk about the perspective of the intelligence explosion school, seen in the critical mode and it can be said that the articial intelligence have nothing to do with human equivalence per se, because humans don't rewrite their own source code as the computers do . follow horizon, the intelligence explosion, and accelerating change are often mashed together into Singularity paste. The artificial intelligence is in fact an algorithm but life of humans is more complex and there are rules of bioethics which must protect the value of human life.

In the end it can be said that maybe these three schools did not really exist and in the future this conference of Suceava`s University will be the room for a fourth school that will give to the Singularity a new definition.

But what is the role of bioethics I this complex movement called *Singularity*. The explanation is given by Ray Kurzweil. *Ray Kurzweil may not be a household name, but the blind know who he is. He invented the first reading machine and then reduced its size to a hand-held gadget. Kurzweil will be remembered more as a man on a mission to tell the world what life will be like in the age of technology. Microsoft billionaire Bill Gates said he is the best in the world at predicting the future, and what a world he predicts.* [66] The Singularity is nearer than someone might think It is the education that is building the future.



67

63 Ibidem 3.
64 Ibidem 3.
65 Ibidem.
66 Ibidem 2.
67 http://www.educationfutures.com/2009/03/18/the-singularity-is-nearer-than-we-might-think/9/6/2010 6:51:57 PM).

The problem of the future will be to build a bioethics that can deal with *The Singularity*. So it must be built o code of education in bioethics for complex philosophy of mind called *Singularity.*

After the study of The principal Schools of *The Singularity* it can be said that Ray Kurzweil *succeed*ed to value the bioethics in Singularity . Be built a real system of education in through the mod of Singularity..

The New York Times Sunday business section recently ran an enormous puff piece on Ray Kurzweil and the "Singularity" cult (my term, not the Times's). Kurzweil is a successful inventor–entrepreneur best known lately for his sci-tech prophecies. He claims that advances in AI, nanotech, biotech, computer science and neuroscience are bearing us toward a radical transformation of our minds and bodies called the Singularity—aka "rapture of the geeks.[68]

The future will to deal with biotech, nanotech and these terms will be the problems of the future bioethics.

The role of a bioethician es to explore the human soul but in the future he has to explore the articial intelligence. The Singularity is nearby and is the future. So the future role of bioethics will be to describe it. Singularity, seen by the mind bioethician "would mean a future in which humans and technology fully converge, but some voice skepticism about the idea"[69].

The Schools about Singulary, studied in this paper, show that there are models, genetic algorithms, neural networks, search and learning algorithms and it is just technical fact. The brain of *homo sapiens* is certainly very heavy and complex but it slow than a computer. But these computers do not have *consciousness detector* as humans have.

Ethics means " the study of the moral basis of human behavior that aims to determine the best course of action" [70] and bioethics, is "a transdisciplinary area, based both on ethics and on life sciences, reflects upon the ethical problems raised by new technologies and scientific research"[71]. In to the complexity of deliberation about singularity should be promoted projects of education providing the practice necessary for correct deliberation and raising awareness of the current ethical and bioethical issues. This projects must "educate and inspire a cadre of leaders who strive to understand and facilitate the development of exponentially advancing technologies in order to address humanity's grand challenges"[72].

The main focuses of this era s advanced technology described by Singularity. In August 16, 2010, the researchers met at conference about this theme at San Francisco.

Hosted by Ray Kurzweil, this gathers scientists and futurists from around the world to discuss the ramifications of a possible future event called the Singularity. So what is the Singularity and why does it matter for education?[73]

In the 20-th century the mind blowing was in terms of technology but in the 21st century the mind will look like the middle ages. The Singularity is what happens when computers reach and then surpass human intelligence. But the problem is as it was written before that these computers have not a *consciousness detector.* How does this apply to Education and Bioethics?

The future will show if the world is really ready to deal with the complex problems of *The Singurality. The* Singularity is "seen as a future time when, in theory, the pace of technological

68 Ibidem
69 http://bioethics.net/news.php?catId=15,9/6/2010 7:33:23 PM.
70 http://files.ecetera.si/IOSTE/417.pdf,9/6/2010 7:54:57 PM
71 Ibidem.
72 http://singularityu.org/news/2010/05/maker-faire/,9/6/2010 8:02:36 PM.
73M http://educationstormfront.wordpress.com/2010/08/16/the-singulari.ty-is-coming/9/6/2010 8:08:22 PM.

change becomes so great that we cannot predict the course of future developments of human society"[74]. But it is certain that in this future built by *The Singurality* the bioethics has an important role. But in this uncertain future a new term in born: *neuroethics*, a term ethics and bioethics. This new science has to deal with the problems of *The* Singularity. In fact the neutroethics is "the examination of what is right and wrong, good and bad, about the treatment of, perfection of, or unwelcome invasion of and worrisome manipulation of the human brain"[75]**.** But this *neuroethics* has also to deal with the artificial intelligence and established bioethical rules the uncertain world of the singularity. The man must be the principal value in the future world of the *The Singularity*. As Protagoras said the man has to be the measure of all the things.[76]

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ISAC IONUT

SEVERAL ARGUMENTS FOR AND AGAINST SUPERINTELLIGENCE / 'SINGULARITY'

We are only at the beginning of a technological revolution in informatics, robotics and computer sciences. However, we try to imagine how our world will look after years, decades and centuries. In this respect, one of the boldest ideas ever advanced by researchers is that of *singularity*, understood as the result of very sudden and fast technological progress, leading humankind to the possibility of building a supposed more-intelligent-than-humanity 'almighty' machine. Such an extremely complex technical system endowed with an extremely vast potential is actually seen as a possible solution to the most difficult problems of humanity (i.e. as an entity capable of resolving them forever, for the best desirable future of *homo sapiens*).

74 http://johnhawks.net/weblog/topics/teaching/cost-of-education-singularity-2008.htmlm9/6/2010 8:20:06 PM.
75 http://www.botox4thebrain.com/?page_id=34, 9/6/2010 8:34:15 PM.
76 Protagoras, http://www.archive.org/details/doxographigraec00dielgoog, 9/6/2010 8:45:58 PM.

But how could this position be sustained? There have been formulated many arguments for and against the rise of superintelligence/ singularity, all of them deserving a serious discussion. The purpose of this paper is, however, to comment only on several of them.

Let us begin with the following idea: theoretically, if a machine built by humans could bring to bear greater problem-solving and inventive skills than humans, then it may be able to design a yet more capable machine. If built, this 'more-capable-machine' then could design a machine of even greater capability (and so on). This iteration could accelerate, leading to a 'recursive self-improvement', i.e. to an 'intelligence explosion' (I. J. Good).

In the first place, I have to say that there is no certainty that such a machine, once reaching a very high degree of intelligence, complexity and speed in its actions, would be still capable or willing to design a different machine, 'better' than itself. Maybe because of some limits we are still not aware of or due to some reasons of self-protecting, the aforementioned utmost-evolved-machine would be rather tempted to stop somewhere in the process of 'recursive self-improvement' and, consequently, decide to multiply itself and by itself, at the same level of complexity already acquired. In the second place, it also could take the decision to create and develop 'inferior' machines – however much more intelligent than humans – for the purpose of keeping for itself an unassailable preeminence in the world for an unknown period of time (most probably, as long as possible). It may occur that that machine would not be willing to expose or endanger its outstanding place in the whole of existence; or, if it decided to build a machine 'more capable' than itself, it could mean exactly as to design its disappearance.

Another position difficult to defend seems to be that of the so-called 'infinite' (or extremely large) intelligence. How can one understand the content of this 'infinity'? How does it apply to machines (computers, robots etc.)? The idea is that if and when some intelligent machines can design other machines even smarter than themselves, the process will cause an exponential growth in machine intelligence, which leads to 'singularity'. But, as G. Hawkins posits, belief in this idea is based on a naïve understanding of the nature of intelligence. What does it mean when one says 'infinite intelligence'? Is it something related to the 'space' of intelligence, to the time of its life or rather to the speed of its activity? Be it the last one of them, then it is clear, at least for now, that there is no possibility to accelerate this speed endlessly (e.g. a computer processor or a software system *cannot* operate 'infinitely' fast, because there are limitations for all of their parameters). And, in fact, this is the crucial point: if there is no 'infinite' acceleration of a machine's functional parameters, then there is no 'singularity' either!

Upon this claimed 'infinity' of the hyper-intelligent machines hinges the problem of their alleged 'immortality', i.e. the presupposition that, not being tied to any particular body, the software intelligence would essentially be *immortal*. From this feature of their immortality, it has been inferred that machines would neither have need to produce 'off-spring' in order to perpetuate their artificial life, nor would they experience an evolutionary need for love (or emotional feelings), as Berglas points out. Again, it is very hard to argue the 'immortality' of machines (no matter how 'superior' they can become compared to humans), because there are countless factors that may stop their evolution at any time (e.g. an unexpected malfunction provoked by humans or by the machines themselves, a cosmic catastrophe like the collision of the Earth with asteroids or comets etc.). What reasonably can make us truly believe that a machine could stay 'alive' forever? Are we not here rather projecting our ancient desire for eternal survival on these technical systems? As to the problem of perpetuating the artificial 'species', there is no reason to stop us from imagining these machines as being interested and motivated to create some kind of 'descendants' with 'inferior' qualities – but

maybe not very much lower that those of their 'parents' – e.g. with the scope of giving them some more accessible tasks to fulfill (to keep the maintenance of certain systems, to explore unknown areas of the world, to evaluate critical situations in relationship with humans – potential dangers or conflicts – and send reports to the 'central intelligence' etc.).

From the point of view of a certain 'trans-humanism', one cannot avoid to consider the problem of 'cooperation' between humankind and those alleged 'super-intelligent' machines. Would it be in the future left some room for humans? For instance, Bostrom discusses human extinction scenarios having superintelligence as a possible cause. One of them could occur in the case when a 'subgoal' would be mistakenly elevated to the status of a 'supergoal' (e.g. in the process of resolving a difficult mathematical problem, the superintelligent machine can 'forget' about the limited status of the human specialist – the programmer – and perform actions which could endanger his/ her life). But there is no major obstacle to imagine ourselves that once such an intelligence was 'born' and put at work, the human capabilities should have been already sufficiently advanced as to anticipate (almost) any possible collision between the demands addressed to machines and their responses. So, if Berglas makes the point that there is no direct evolutionary motivation for an AI to be *friendly* to humans (because an AI does not have evolutionary traits), we can say that there is no direct evolutionary motivation for an AI to be *unfriendly* to us. An extremely high intelligence should not have any major problem with understanding the kernel of human life, to sympathize with the major problems of humans, though not as a 'classical' biological creature.

As a preliminary conclusion, the paper's author asserts that different types of perception about the future of superintelligent machines are able to generate and nurture different visions, views and technological forecasts. To speak about 'singularity' is, probably, to a large extent, a question of how we are inclined to conceive the emergence of a possible world ruled by a supposed extremely intelligent machine. If the coordinates of this process are seen under the fear of a possible oppressive evil system which eventually eliminates the 'unnecessary' human being, then the technological 'singularity' would mean the end of humankind's mission in the world. But if the path to singularity is conceived as paved with successful attempts by humans to understand those superintelligent machines and to reach for themselves a degree of intelligence high enough to successfully cooperate with them, then the technological 'singularity' could mean the progress of humankind toward a higher degree of evolution. Regardless of one's preferred view, a lucid and critical discussion should always be welcomed in order to avoid falling into the trap of perpetuating a futile and sterile mythology.

KALDIS BYRON

BRAVE NEW WORLD: TRANSHUMANISM, PROSTHESIS & ENHANCEMENT DEBATES

Human enhancement by medical means, especially prosthetic surgery, aims at what is known as a "posthuman condition" that will hopefully transgress the given state of our biological human nature surpassing its bounds. Transhumanism is a loosely-held social, philosophical and scientific movement that campaigns in its favor. Such enhancement, covering all aspects of the human organism, has the purpose of producing significantly improved human beings by a wholesale alteration of their bodily, mental and even emotional abilities (e.g. 'affective computing'), including longevity, with a view to the attainment of the 'perfectibility of the human species' beyond strictly

therapeutic purposes. A wide gamut of possible future states of such perfectibility are foreseen and urged on, such as our being interfaced with computer machines or fused with animals, gaining prosthetic devices, receiving neural transplantations or undergoing a continuous 'mind-uploading' or even being wired up with a permanent exocortex system (i.e. an outside brain).

Prosthesis encompasses 'incorporation' either of organic material (e.g. genetic transfer) as in 'xenotransplantation' or 'allotransplantation' (receiving cells or organs either from a different species or the same) or of an artificial limb or medical device (e.g. the standard pace-makers or the more advanced implants like the neurotechnologically engineered 'brain makers' in deep brain stimulation curing certain mental disorders). The goal canvassed for by transhumanism is to deliver human beings from undeserved and avoidable agony and suffering, either bodily or emotional, to increase human rationality and wipe out irrational or pathological behavior, develop wholly new talents, enhance human lives even in terms of emotional improvement, enhanced levels of happiness and consequently well-being. By technologically 'sculpting' our future condition, even down to enhanced emotions of love, we put an end to limitations due to privations resulting from our physical nature which we are now in a position to alter radically.

Such ideas are increasingly at the forefront attracting worldwide scientific, philosophical and public-policy attention primarily because of their utterly unheard of and unprecedented deep implications for the future of humanity. Inevitably, they trace a history of controversy. Though their historical trajectory encompasses a variegated set of origins as well as a ramified path through which diverse ideas and contrary positions have developed over the years, they have always been accompanied by heated debate. Such debates range not only over ethical, social and religious but also over conceptual issues, raised by the prospect of a posthuman condition in which human nature is expected to be significantly or totally transformed beyond recognition. They also engage more than one discipline, such as philosophy, critical theory, bioethics, philosophy of medicine, etc. each following its own approach and privileging distinct values.

Thus the proliferation of different positions, the divergent evaluative assessments, the variety of historical pedigrees and the simultaneous presence of more than one disciplinary standpoint have resulted in a rich yet quite confusing cluster of definitions of the principal terms making any single conceptual clarification or clear-cut analysis of terms impossible. Moreover such a conceptual quagmire of somewhat distinct but closely overlapping notions blends unavoidably with a similarly bewildering range of corresponding ethical debates rendering any uniform classification of positions or smooth terminological taxonomy inappropriate.

Though ideas about human self-transcendence whereby the human body is drastically improved by artificial prosthetic members – usually machine-like structures supplementing, enhancing or radically altering bodily and mental functions beyond merely therapeutic ends – have engaged the literary imagination from ancient times, see e.g. the myth of Icarus, or had been the focus of attention in terms of the contrast 'natural vs. artificial' in what constitutes humanity proper during the Enlightenment (see J J Rousseau), the particular historical background of the ideas of transhumanism, posthumanism, human enhancement, species-change, species-hybridization, transgenics and human-machine symbiosis as these have developed in recent decades should properly be placed within the contours of contemporary techno-scientific developments. In this sense it is a modern, post-Enlightenment phenomenon, both in the range of its particular visionary or futuristic goals to transform human nature in specific ways by certain technological means not previously available as well as in terms of the types of arguments advanced by the opposing parties.

Two crucial such differences distinguishing current debates from older fears induced by apocalyptic scenarios are the advanced state of converging technologies rendering such an eventuality increasingly possible (though not without certain limitations imposed by biology) and the ideology of medicalization. Technological convergence thanks to systemic intertwining of the quartet of novel advanced technologies – nanotechnology, biotechnology, information technology and cognitive science – integrated into an assemblage of enabling tools exhibiting exponential temporal growth and capacity to deliver the required outcomes, is expected to be the driving force behind the envisaged human enhancement; the culture of medicalization amounts to the dominant intrusion of medicine into all aspects of life, beyond therapy, and into the cyberspace as well, repositioning medicine at center-stage, redefining and empowering it, ascribing new values to it.

A standard historical point of origin of modern developments is thought to be the 19th century idea of eugenics together with the 20th century idea of robotics. Though Plato is usually (but wrongly) accused of being the earliest proponent of eugenic cleansing for purposes of enhancing human nature restricted to a certain class of rulers in his ideal state, it is Darwin's cousin, Francis Galton (1822-1911) who first coined and defined the term in 1883 for scientific purposes. Eugenics crusades including eugenics societies but with dissimilar strands in different countries lasted between the last quarter of the 19th century and the first half of the 20th. Transhumanist proponents denounce any link with eugenics since they are in favor of reproductive freedom and reject any kinship with utopian schemes promoting ultimate plans since they support freedom of choice and multiplicity of valuable modes of life.

Modern literary classics, Zamyatin's *We*, or the emblematic *Brave New World* of Huxley's and Orwell's *Ninety Eighty-four*, played an important historical role in making futurist visions along with didactic warnings vividly present in everyone's imagination: their legacy, certain names and titles synonymous to nightmarish dystopias, persists as the public vernacular of such themes, acting as hackneyed metaphors by now. However what is usually forgotten or mistaken is that unlike what preceded them, the classic *Dr Frankenstein* or *Erewhon*, the 20th century texts portrayed a radically changed social, political or natural environment, not radically altered humans or conscious machines as contemporary transhumanism envisages. It is ironic, though important from the viewpoint of cultural history and a testimony to the symbolic utility of literary notions affecting scientific imagination, that they are being confusedly used.

Enhancement of sorts is already being practiced by providing children with human growth hormone. Kevin Warwick, professor of cybernetics at Reading, is considered the first self-made human cyborg, while the Cypriot-Australian artist Stelarc experiments with art forms involving prosthetic members and implants. The first use of the term 'posthuman' is due to F. Fukuyama preceded by that of "Metaman" of G. Stock's.

Gene therapy (genetic change of somatic cells) of a single living individual should be distinguished from genetic enhancement influencing the germline of future generations irrevocably modifying non-pathological traits without these future beings having been asked or given the chance of granting their consent. Ethical debates about human enhancement via genetic engineering of future children decided upon by parents pivot around the distinction between harmful disabilities prevented vs. positively enhancing traits conferred upon offspring beyond what is required for normal health – though what counts as health vs. disease and what as improvement, as 'better emotional life', or as 'optimum' performance or as 'species-normal' levels are themselves debated as socially constructed and historically mutable notions or as being altered when species' contours themselves alter as a result of evolution or enhancement.

One camp within transhumanists considers foreseeable disabling conditions to be a clear disadvantage, irrespective of social conditions and prevailing attitudes that may or may not regard it as such, which parents have either a moral reason to prevent, avoid or eradicate or, even further, a strong moral duty to do so on the basis of the principle of non-maleficence (not causing or not-omitting to alleviate avoidable injury). Furthermore, proponents of such a view take biological harms to be continuous with benefits or, equivalently, preventing disability to be morally symmetrical with positive enhancement. Hence they argue not just for enhancement as merely permissible but for a moral obligation to enhance. Bio-libertarians, underline parents' human right to procreation as a liberty-shield against encroachments on what parents decide to do with it, while others as, alternatively, parental obligations towards their offspring in securing conditions of human flourishing for them that germline modification or prosthesis offer. Moreover enhancing defined in contradistinction to therapy as is commonly proposed is here shown to be problematic: even merely preventing harmful biological traits, without taking the extra step of positive enhancement, makes certain pre-natal therapeutic interventions equivalent to enhancement.

The varied means by which such enhancement/disability-prevention may be realized, i.e. genetic engineering vs. simple behavior control, or affecting the environment, etc., are also a controversial issue, as is the degree of significance of disability or the type or scale of enhancement: what is precisely the difference between avoiding significant genetic disabilities and cosmetic surgery for reasons of ethnic- or race-assimilation considered as a social disadvantage if not carried out? or organ supplements for artistic purposes, athletes' super-drugs and college students' pharmaceutical enhancers for better exam results, or surgery that enhances an athlete's vision, as it has been done in baseball, while touching nothing else in his body, i.e. restricted vs. wholesale trait-enhancement? Is manipulating the environment as opposed to genetic intervention clearly distinguishable in all cases, including affecting the uterus, something effectively functioning as an embryo's environment? Is genetic intervention affecting in advance emotional capabilities or other mental traits relating to social and political opinions distinctly different and more of a 'brainwashing' than normal ways of influencing ideas formed by adults naturally? Here the 'natural vs. artificial' contrast reappears when critics fear that such designing of improved traits silences any blame or praise as inapplicable: moral accountability is said to be lost when an implanted chip in a cyborg is the originator of an action.

Traditionally, arguments against transhumanism voiced by bio-conservatives or religious ethicists and 'Bio-Luddites', or arguments simply caused by technophobia, are phrased in terms of what is considered as a natural repugnance ('yuck'-reaction) against drastically altered human bodies or human-animal chimeras, or as losing the essence of human nature or not respecting human dignity: the punishable 'hubris' of 'playing God'. Attaining full posthumanity amounts to human extinction. Further, not strictly moral, objections include social and political criticism targeting the possibility of increased inequalities, discrimination and social divides as a result of enhancement, pointing to obstacles in resource allocation, or to unknown or inestimable risks taken before fully testing the required technology, to curbing liberties or mounting social pressures that leave no room to freedom of alternatives (e.g. not to enhance). This will eventually homoginize posthumans despite transhumanists protestations that they are envisaging a future of freedom of self-diversity. In general libertarian transhumanists, though wishing to curtail state interference in procreative matters and in decisions regarding posthuman autonomous bio-determination, some less extreme positions retain a role for government regulation.

On the other hand, however, enhancement may not always prove beneficial, or total extreme enhancement may not prove worth having, especially when the balance of improvements of various traits leads to mutual conflicts, as some transhumanists acknowledge, admitting the possibility of vulnerability and dependence even amongst posthumans. Besides, competition for space and resources amongst enhanced posthumans may end up having countervailing effects on the presumed advantages. As a response transhumanists maintain that enhancement even if restricted to a few will have useful outcomes for the rest, too, as benefits pass on to the rest of the social fabric.

Some of these arguments are biopolitical in nature while others stem from an opposite avant-guard cultural critique that wants to redraft what counts as 'humanity' shattering uniform notions that privilege humans as we are today. Cultural critics sometimes argue against cyborg mania from within transhumanism, i.e. supporting at the same time the artificial transgression of constraints imposed by natural evolution. So sometimes a 'posthuman' future is feared from a religious or an ethico-political standpoint while at other times it is positively judged from a cultural standpoint, not because of the wonderfully enhanced future beings and the biological benefits accrued, but as pointing to a welcome end of hegemonic conceptions of humanness and specism. This amounts to an internal conflict between different posthumanisms that is more than terminological.

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KHROUTSKI KONSTANTIN

SINGULARITY – IN THE LIGHT OF TRIADICITY AND BIOCOSMOLOGICAL VECTOR OF DEVELOPMENT

The Technological Singularity (i.e. a futurological hypothesis of the extremely rapid technological progress, carried out by the virtue of "intelligence explosion") **–** is seen by some of its defenders as the replacement if living systems by more full-blown ones. Author is going to argue categorically this statement. First of all, he declares that modern cultural world has entered into the state of "cosmological insufficiency" (using a medical sense of the term "insufficiency"). A concept has appeared (in the result of his special study) that the historical emergence and development of the so-called "scientific method" (during the "modern era" and its dominance in our present sociocultural life) has been realized in the manner «to throw the baby out with the bathwater». In other words, this new "scientific method" and its underlying cosmology (i.e., modern Dualistic –

Anthropocentric Transcendental – cosmo(astro)logy) – cosmology of Transcendental confrontation of man with the physical universe – had been established artificially (man-made, ideologically) as the only true method of cognition and practical transformation of the world (a kind of '*cosmological singularity*').

Author claims that rehabilitation of the cosmos-centric pole of Aristotelism (alongside with the totally dominating at present Plato's and Kantian - anthropocentric - pole) is the really urgent matter. In fact, there is no time (for global culture) to wait for more. Modern world has already entered into the reality of complex global crises (author lists the 11 of them). Otherwise, the further processes of "technological singularity" will significantly aggravate these crises and bring the world to man-made disasters.

We are to remember constantly: Man and her/his intellect (a possibility of "technological singularity" itself) is ever the product of the cosmic evolution, but not vice versa; hence, – the ultimate (cosmic) driving force (cause) is the inherent causa finalis (entelecheia) of a living subject (biological, personalist, sociocultural). In other words (from the Biocosmological point of view), – our ultimate (universal) principle is the immanent teleological essentialism (fundamental functionalism). Therefore, "technological singularity" (sociocultural processes on the whole) are to be subdued to the realistic cosmic (universal) laws, like the aforementioned "cosmic origination" (and, hence, subordination to the universal Cosmic laws) of every living being, including her/his/its intellectual potential and capabilities.

Therefore, author strongly argues (in this, using the findings made by Pitirim Sorokin, in his "Social and Cultural Dynamic", 1937–1941) that, in reality, – we have the evidence of Triadicity – synchronous existence of the three autonomous (but inherently integrated) sociocultural spheres ("supersystems", in Sorokin's terms). First of all, there are always two polar spheres (in the global sphere and any sociocultural domain, scientific as well): in author's expression – one has the essence of RealCosmism or Biocosmology (in metaphor, – cycle-era of Awake activity, that is substantiated by Aristotle's philosophy); and the other (opposite) is AntiCosmism – of Dualism, Humanism and Physicalism (metaphorically, this is the cycle-era of global Sleep processes, that refers to Plato's and modern Western philosophy on the whole).

The Third, in turn, is a fundamental Bio-realm – ACosmist (Holistic) in essence, – Sorokin called it "Integral". This fundamental realm of life (sociocultural) activity realizes the basic life processes – "life itself", life's sustainable existence and harmonious integration of a subject (of life) into the milieu. This Integral sphere (that integrates the communication with both poles: RealCosmist and AntiCosmist) is exactly the basis for Transitional cycles – of Awakening (from Sleep to sensible wholesome activity) or Transiting back from sentient activity to Sleep processes.

Actually, the issue of a Third (Integral) sociocultural realm – its presentation and understanding – is really significant. In other words, the goals and meaning of Technological Singularity and Transhumanism couldn't be rightly understood and effectively implemented into the global sociocultural progress without a clear perception of the Triadic essence of our real world. Author claims that the time has come (long ago) for the treatment of our current "cosmological insufficiency" and, thus, – achievement of the clear vision of both poles (directions) of evolutionary processes (AntiCosmist – Plato's; and RealCosmist – Aristotle's) – and their interrelations through the communication with conceptions (constructions) of the basic Third (Integral) sphere, (of which modern sciences that deal with Complexity (like Systems theories, Holistic approaches, Chaos theory, Synergetics and other trends, including the study of Biosphere, Ecosystems, etc.).

At any rate, modern Singularity and Transhumanism, which are the evident products of the current Transcendental (Humanistic – AntiCosmist) sociocultural milieu ("supersystem"), - the truth is that they cannot continue to be in the isolated state, independent from the other two autonomous sociocultural spheres. The natural evolutionary process is the integrated interaction of all the three main sociocultural spheres (AntiCosmist – Humanistic; RealCosmist – Biocosmological; and ACosmist – Holistic). Author argues that a key point for this coordinated action (a reference point, at least) is the Biocosmological (of the expedient - universal – teleological) activity by a conscious subject of life (on personalist, societal and global-noospheric levels). Ultimately, to repeat this truth once again, - we urgently need a Biocosmological framework that substantiates an evident truth – all Earth's processes, including personalist and collective evolutionary processes are naturally the product of, and inseparable integrated part of the one whole Cosmic evolution. Hence, modern powerful scientific means (that are associated with the notions of Singularity and Transhumanism) are to be integrated, in the end, - to the natural organizing power of universal Cosmic laws of Bio-evolution (author represents 16 of them).

MAXIM SORIN TUDOR

FACTORS OF PROSPECTIVE ETHICS WITHIN THE TECHNOLOGICAL HORIZON

The world *based on acknowledge* undoubtedly represents another type of social integration and of future perspective as comparing to the industrial, post-industrial or consumption worlds, whereof the current social thoughtfulness takes care. It's all about what European Union wishes to accomplish at high level until 2020, and what's more important! – refers to the sense of social evolution, as a new *wave of the changing*, decisively for the human civilization development.

The essential characteristic of the new world under the impact of new technologies is represented by *the changing.* In another words, the general rhythm of development has been compressing, so that *the current social evolution* will be quantified into years and not in tens of years, as comparing to the primitive commune, which was counted in hundreds, thousands of years, the slave system in thousands of years and the feudalism or the capitalism in hundreds of years. Taking into account these new conditions, the changing expresses the social normality state, where the continuity and the steadiness will only signify *the accident.*

Considering this moment, the new theoretical representation over the social evolution should insist over the consequences of changing.

At the moral level, the rhythms so unexpectedly fast of the changing involve a new approach of the interpersonal reports, as well as the relationship of the individual with the community, organizations or technological challenges. Today a steady social situation is met, and tomorrow the unemployment might appear; stockholder within an economic organization and employed to another; where will the loyalty be carried out? The correctness, the respect for *the well done* things are no longer options, but represent a quasi-compulsory life style in a world where practically each of us knows the most important aspects for our life. Within the informational world, a behavior lacked of morality is considered as being against the production, on both individual and organizational levels.

Though, the factors of not reflecting *currently* over the ethic involvements of the future world are considered to be against production, also. For such understanding of the new challenges, which the world based on knowledge rises towards moral reflection, one have advanced within a scientific communication illustrated at Suceava, at the beginning of the last year, of *prospective ethics*.

The ethics can no longer limit the study discipline to *now* and *here*, since upon this basis, the ideal contents of what *should exist* have to be established. Besides the cognitive, normative-axiological and persuasive functions, the ethics should assume the new part, meaning *the prospective* function. "The concept of *prospective ethics* refers therefore at a new size of the moral theoretical speech, of not being contented by only the reflection over reality, but also of listening the understanding and describing a world which might exist in the near future, since it does not contradict the tendencies and the laws of the current social development."[77]

Therefore, in a decisive way, the future of humanity is strongly connected to the technological challenges, which brings new problems towards the ethical reflection. But, what are these? Aristotle insisted over the fact that, more important than the solution is the representation of the problem. Indeed, once the problem seen, tens or hundreds of years might pass, until the solving will be accomplished; but, if the problem is not seen, how many centuries will be necessary in order to be thought? As conclusion – as Professor Petre Dumitrescu of Iasi affirmed – "a philosophy lives not only by its different solutions, but especially by the problems and questions that were promoted and have been imposed; though, these problems have had the part of permanently fructify the humanity spirit."[78]

An attempt of identifying some new ethical problems, appearing towards the world future and under the incidence of technological developments, can no longer be benefic for the current social theory and practice, giving the fact that future is built or is under negation for the time being.

MILICI DAN & MILICI MARIANA & CERNOMAZU DOREL

CONSIDERATION ABOUT EVOLUTION OF PERFORMANCES IN NATURE AND TECHNOLOGY

This paper proposes a method to predict the evolution of performance based on Complexity Science and patterns of evolution of living organisms. In the living world the evolution is made on levels, by quality leaps but there are also periods of decline. Trying to understand these natural rhythms and having on the base sets of results findings in athletes during training, one can approximate for each individual during the training period the results which it will get.

The growing faster evolution of civilization became particularly evident in modern times. Moreover, in recent years we have literally become spectators to major changes occurring during only a generation. Lately distances have ceased to be a significant obstacle for communication between people, organizations and countries.

The movement of environmental bio-components is made in large spaces, so-called ecosystems, which have a space-temporary character. Here, whatever evolution of movement over time, the rest states are very relative; the overall movement par excellence is of transitory nature,

[77] S.T. Maxim, *Probleme etice în societatea bazată pe cunoaştere*, PHEADE, 2009, Suceava
[78] Petre Dumitrescu, Postfaţă la volumul *Iluziile raţiunii* (autor: Bogdan Popoveniuc), Ed. Didactică şi Pedagogică, Bucureşti, 2009, p. 534

with reactions stimulated by the nature of the information received. In addition, water and air, without which there can be no life, are the main physical non-biotic components of the environment, as well as being carriers of information.

From the above it follows that a classical approach is inadequate and therefore need to develop a specific methodology to address, dedicated to understanding and using of complex systems. We can say in conclusion that: Complexity study allows the development of new concepts, methods, models, valuation techniques and technologies being extremely useful in overcoming the limits imposed by the current paradigm.

Chaotic behavior can be observed in many natural systems such as weather predictions. The explanation of such behavior can be found by analyzing a mathematical chaotic model, or by analysis techniques such as Poincaré maps.

MUNTEANU FLORIN

THE TECHNOLOGICAL SINGULARITY SEEN FROM A SPIRITUAL PERSPECTIVE

The invention of the computer and all the subsequent developments related to and resulted from it, particularly the emergence of Artificial Intelligence (AI), have changed for ever mankind's *modus operandi et modus vivendi* (the way of working as well its way of life). Ever since the invention of the first integrated circuit and the assembly of the first personal computer, innumerable changes have transformed, sometimes radically and irreversibly, the world's social and cultural environments, not to mention the technological, scientific and economic landscapes. All these changes have occured in an incredibly short time and were triggered by the impact with the computer (hardware), software and AI (in one form or another; and here we do not mean cyborgs à la Spielberg; think rather, e.g., assembly robots and 'smart' specialized software for more ubiquitous, but widely spread, purposes). We are all aware of this profound and extremely rapid change that has no similar precedent in the entire history of the mankind and which is still evolving at breathtaking speed to as yet unfathomable destinations.

The essence of this astonishing evolution that has fundamentally changed our life and work, and which seems to be even challenging moral norms and religious dogma, is a very deep qualitative change in our way of approaching Reality, of which not many are fully aware. Previously, until not very long ago (approximately until the end of World War 2), humans had an evaluation of their surrounding environment(s), based on understanding causal and quantitative laws that described amounts, fluxes, flows, interactions and variations of both energy and matter.

Our modern era and its computerized & informational revolution, however, has a different structure, and requires a new way of thinking and new types of interactions. It is -by definition and way of operation- intrinsically based on and operating with information, hence it deals with codes, messages, streams of data capable not only to communicate and inform, but also to inform, to regulate, to trigger, to correct processes or humans. One of the interesting and probably essential offsprings of this informational revolution is the(re)affirmation of a new vision/concept of the Universe, based on asserting the existence of an **Information-Energy-Matter** ontologic "trinity". Such a hypothesis/model, together with Negroponte's conjecture (according to which “everything can be digitized”) and with other concepts, models and theories based on a nonliniar understanding of the reality (which have generated in the last decades the new paradigm of Complexity) are only a

few of the key ingredients that justify the exponential acceleration of development for the entire social and economical aspects of our planet in the last decades. Our broader and much improved intelligence and intellect are increasingly more and more "submerged" in an artificial environment with artifacts that are themselves " intelligent", and become ever more so at an ever more rapid pace. This phenomenon initiates a recursive process of self-development and self-perfectioning of these artifacts and of their "intelligence", with an exponential dynamic that tends to inherently lead to an unavoidable critical point that is called the Technological Singularity (TeSi).

The uniqueness of this moment, the TeSi, may determine a major mutation in the human mental structure as well as many other effects. Thus, in the immediate temporal vicinity before the TeSi our prediction, or forecast, capabilities will significantly decrease even for short term evolutions due to the much stronger socio-economical turbulence induced by the accelerated self-development process of the AI world. Both phenomena are only two of the critical aspects that should fully justify the need to approach, study and understand this topic. The large number of scientific papers dedicated to this subject is also another proof for the interest shown worldwide by the scientific community to understand this phenomenon. In the majority of the cases, the approach relies on extending the classical scientific methodology in the informational field, in the same way as our surrounding reality is reduced -by the same approach- to the description of many physical and (bio)chemical processes. While this seems to be an objective, rational and logical way of understanding and describing reality given our present scientific know-how, this approach is criticized by those who consider that the human being, and particularly our consciousness, is more than just the sum of physical and (bio)chemical processes (even if quite many and complicated) and that we are also endowed with other key capabilities, such as Qualia, Awareness, Intuition, Clairvoyance, etc.

The proposed work targets to summarize at least a few of the key aspects related to the spiritual dimension of the Human being, as defined by the theological vision(s) of the Human Being and the Universe formulated by the major religions. This initial review is necessary in order to identify new perspectives and future points of view in the debate that will attempt to formalize the main problems/topics of interest related to TeSi. The reader will be familiarized with the classification of matter according to acad. E. Makovschi who defined different ranks (or levels) according to their structuring: biostructured, noesic, enisic, and super-enisic. The matter structured on each level has its own specific properties that are irreductible to those exhibited by the inferior level(s), even if they may be based on common chemical ingredients.

We shall also present several esoteric visions that assume that the living beings are characterized by specific "fields", e.g. causal, astral, etheric, etc. The existence and manifestation of these "fields" is considered to very distinctly separate the world of the living beings, particularly those endowed with consciousness, from that of the nonliving, including the "intelligent" or AI-endowed artifacts.

Ultimately, the purpose of bringing both these viewpoints together next to our present scientific know-how is to sketch a possible future direction of research that -most importantly- could be validated experimentally, in stark contrast with other previous attempts that were purely theoretical. Our approach will be based on theories and concepts developed and used in the science of complexity (e.g. chaotic resonance, stochastic resonance, synchronicity, self-organization, self-similarity, etc.) and which will allow us to explore the fascinating but so challenging field formed around a major dichotomy: Is Life (and by extension, any living being) reductible just to the dynamics (no matter how sophisticated) of an anorganic world, i.e. just to physical and

(bio)chemical processes? And, in the same direction, other equally challenging questions will be attacked: Are the mental and cognition processes an expression of just neuro-chemical reactions dictated by gradients? Does free will really exist or is it just an illusion?

A lot has been written on each of the previously mentioned topics. The present work attempts to suggest a new and experimental framework that might validate or invalidate various hypothetical answers to these questions. This framework applies concepts from the Science of Complexity while at the same time being inspired by theology and esoteric concepts that implicitly assume that the Human Being is, beyond the physical body, first and foremost, a Spiritual Being.

PETROSELU DANIELA

TRANSHUMANISM AND CYBERFICTION

Contemporary cyberfiction is largely concerned with applying advanced sciences on human biology and with the ethical repercussions of *life extension*. With a Ph. D. in Mathematics, teaching Geometry and Algebra at California State University, Bogdan Suceavă is also the author of an intriguing novel, *Vincent nemuritorul.* Placing the events during the futuristic years of 2036, Bogdan Suceavă describes a techno-utopian society fascinated by a revolutionary technology, SAW (SPRING AFTER WINTER), that consists in tranfering the human brain on an electronic device. Preserving the memories, but still developing the owners' intellectual abilities, the innovative systems change completely the human life and the laws it abides by.

The present paper aims at connecting some of the novel's major topics (physical immortality, mind-uploading, body–mind separation, human and family values) with the theoretical background of transhumanism. Assuming that humanity is living the *technological singularity*, Bogdan Suceavă' text examines the status of the participants involved in SAW and the political, economic, and civic consequences of this project. The novel displays a range of transhumanist theories about the impact of techonology on human religion and psychology, offering some answers to the most important question: Is the human being prepared to face immortality? This literary scenario is rather skeptical, because in order to be eternal, the human turns into a machine. Furthermore, the improvement of human life is done only at a technological level, proving, once again, the limits and the dilemmas of a technological utopia.

ACKNOWLEDGEMENT: This paper was made within The Knowledge Based Society Project supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU/89/1.5/S/57083

POPOVENIUC BOGDAN

ON THE PSYCHOLOGY OF SINGULARITY

One of the big problem underlying any discourse about the alterity (or otherness), the alter-future, alter-species, alter-world, alter-society, alter-whatever completely different than what we know, is the fallacy of analogy. Regardless the totally misleading argument based on ordinary and accidental observations and the extrapolation of it to near of further future. This is obviously the case

for AI (artificial intelligence) too, and the problem of artificial or computing consciousness. The process of intelligence, and much more less the human consciousness, is barely screeched and not at all understood phenomenon. So, it not takes too much time, even for an apprentice student in statistics, to understand that if the underlying causality is rather unknown, the extrapolation is not only futile, but mistaken. The people were amazed by the tremendous development of computer power which achieved high level of computing and speed in performing some primary cerebral or intellective functions as recognition, calculus, sorting, and classification data etc., but most of them are utterly mechanical associations. On the other side, we don't have to fool ourselves and precipitating to embrace the dualist thesis of intelligence as something different then the function of the brain. The relation between protein synthesis and production of neurotransmitters, the structure of neuroreceptors and the combination of various physiologic substances underlay the conscious intelligent phenomenon. The best part of this relation and the nature of this process is unknown yet, so is hard to tell what intelligent, especially conscious intelligence, could arise in the future, while we are unable to say how, or if, our dog behavior is intelligent or just suited (adapted).

I will keep away from talking about such monstrosity as automatic zombie-like intelligence, or consciousness, considering it, for the moment, a subject more from the area of computing science than AI. In the present paper I will just try to touch some preliminary aspects, mandatory for any rigorous discourse over this so-intriguing "smarter-than-human intelligence", as it is the Singularity.

First I'll try to identify some of the most tied psychological aspects related with the intelligence; second, some of the most important social conditions which contributed until now to the rise and evolution of human intelligence; and third, to analyze some of the most evident anthropomorphisms hidden in the arguments used in the disputes over the future of Singularity.

„ACKNOWLEDGEMENT: This paper was made within The Knowledge Based Society Project supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU ID 56815

REGNER ANA CAROLINA

THE DARWINIAN VIEW OF MIND: IS IT POSSIBLE TO FIND A PATH TO 'SINGULARITY'?

My intention in this paper is to show that, from a Darwinian perspective, there is no simple answer to the question posed in my title. My argumentative strategy makes use of a discussion of Darwin's "materialism" to see if it is possible to establish an analogy between the biological modifications which have led to the development of the superior faculties of human beings, and the technological and scientific processes which have resulted in the production of "the technological creation of smarter-than-human intelligence", as "singularity" has commonly been defined. Or is it possible to find continuity between the two processes? Does Darwinian intelligence, which follows the biological trajectory of human beings, exclude the emotional aspect of human intelligence? Can human intelligence be reduced to a mechanism? And can "singularity" become a creatively emotional and social phenomenon?

From his very first approaches to the relationships between the mind and the body in his *Notebooks M and N* (1838 and 1839), Darwin's view is consistent with his great theory of evolution: that the human mind has evolved from that of inferior animals, in degree rather than in nature. In *The Descent of Man* (1871), Darwin emphasizes this difference by referring to the joint action of more highly developed intellectual powers and a sense of empathy which have resulted in ethical

conscience. He explains the appearance of superior mental capacities, such as language and abstract thinking, as deriving from more basic capacities. He also believes that the more elevated human sentiments (for example those related to religious feelings) have gradually evolved from sentiments encountered in inferior animals. He concludes that if reason is attributed to any animal with sexual and social instinct, it must have a conscience, and this is a "capital" view. Thus Darwin's view of the mind admits that reason is not exclusive to human beings, and that sentiment and reason are not mutually exclusive of each other.

The Darwinian view of the mind is materialist in the sense that mental activities such as thinking are compared to the realization of a physical effort, and thoughts are seen as probable functions of the same part of the brain which affects the association of intentional memories of something, "or the tendency of a habit to produce a train of thought" (*Notebook M,* note 46). A mental action is a cerebral event, and may be the material cause of some other event: "One is tempted to believe phrenologists are right about habitual exercise of the mind, altering the form of the head, & thus the qualities becoming hereditary" (*Notebook M,* note 30). In note 57, Darwin warns himself: "To avoid stating how far I believe in Materialism, say only that emotions, instincts, degrees of talent which are hereditary are so because brain of child resemble parent stock. – (& phrenologists state that brain alters)" (Darwin, 1987: 533).

The latter note seems to indicate that Darwin's materialism is extremely radical, though this position is, at the very least, controversial. In *The Young Darwin and His Cultural Circle*, Edward Manier calls our attention to the fact (studied in detail by Maurice Mandelbaum) that "materialist" in the time of Darwin had a variety of connotations which gives rise to complex and confused emotions mixed with conflicting social and cultural forces. The most attractive side of this issue is that it leads to the abandonment of our pride and self-admiration as special creatures in this world. In doing so, we make ourselves explicable as "natural" beings. In line with the typology proposed by Mandelbaum, Manier lists four meanings of "materialist": (1) that which moves away from orthodox views of God, and from the relationship of God with Nature; (2) that which affirms that mental activity or thinking is a function of the bodily organs, usually the brain. Manier reminds us that, according to John Stuart Mill, this was the definition of materialism accepted at that time, but that it is incompatible with idealism, or with positivism which does not make any metaphysical allegations. If we assume that, unlike positivism, materialism is a metaphysical position, then we can distinguish between (3) the position which accepts that there is a world which exists independently of us, that human beings are entities like any other, that the human mind does not exist as a distinct entity from the human body, and that there is no God (nor any other non-human being) which is not a material entity; and (4) the commitment to a reductionism according to which not only do entities which are not material not exist, but that all the forms or properties of the behavior of particular material objects are ultimately explicable by general laws which also apply to all the manifestations of matter (Manier, 1978, p. 56-57). Darwin's position would certainly satisfy the first two of these conditions, but he explicitly affirmed, on more than one occasion in his correspondence, that his later stance concerning the existence of God was one of agnosticism, as distinct from atheism.

This, however, is not directly related to the subject of this paper. For this to be the case, it is sufficient to consider how a position in favor of possible "singularities" would be sustainable in terms of conditions (1) and (2). This could be so in the case of (1), but in terms of (2) it would require further debate, and this debate would have to include an examination of the place of humanity in the evolutionary process. Human beings have become more and more selective agents,

in an environment in which "natural selection" had operated as the driving force in the process of the production of new organic forms in Nature. In a simpler sense, those entities which are referred to as "singularities" are not entities of Nature. In a more sophisticated sense, however, we can perhaps comprehend them as creatures which appear in the flux of the evolutionary process of Nature, and which alter the very sense of the terms "natural", "naturalism" and "naturalization". Does the existence of such entities produce a reduction to what we can understand as "superior faculties" (or what these entities might eventually come to produce), thereby inverting the process through which human beings have been differentiated from their peers in Nature in terms of their similar emotional and social faculties?

At a deeper level, however, we need to ask if the self-development of "singularities" through the self-planning and creative thinking which is shown in the "invention" of new programs will lead to the development of an ethical conscience and, if this is indeed the case, how should one understand the Darwinian view of ethical consciousness as the climax of the development of human superior faculties? Or would the event of the "singularity' turn obsolete those ethical concerns? Darwin's lengthy reflection in Chapter III of *The Descent of Man and Selection in Relation to Sex* (whose main theme of Moral Sense is taken up again in Chapter V under the heading of Moral Faculties) reveals that the basis for the morality which distinguishes human beings from other animals is to be found in the social instincts which operate for the benefit of the whole community. These instincts led to feelings of love and empathy for one's peers, can cause approval or disapproval of one's actions, and create a sense of right and wrong. This is the source of moral conscience, by means of which human beings become the judge of their own actions, and this constitutes the most noble part of human nature. Through the development of their intellectual capacities and of the instruction by habit which follows beneficial experiences, human empathy becomes deeper and is extended to other human beings of all races, to those who are disadvantaged, and to inferior animal species. Is this a question of seeking an analogy with the process of creation and choice generated by singularities, or is it rather a question of completely re-thinking what we are, what the nature of the machines we create is and, indeed, what the real significance of Nature itself is?

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RICHMOND SHELDON

WHY COMPUTERS CAN NEVER BE SMARTER THAN HUMANS

What we know about computation is extremely little because computation is not reducible to algorithms or moreover, not even reducible to mathematics in general. We all know that real physical systems are not reducible to abstract geometrical systems—that a physical edge is not identical to an abstract geometrical line, or that a physical flat surface is not identical to an abstract geometrical plane. However, when it comes to physical computers, we adopt the pretense without

any thought that physical computers are identical to Turing Machines. However, Turing Machines are merely mathematical abstractions. A Turing Machine assumes mathematical infinity—i.e. an infinite tape; whereas, physical computational devices have limited "tapes" or memories. That difference makes a world of difference between mathematical abstractions and physical systems. Furthermore, Turing Machines, including Universal Turing Machines, are isolated or closed systems. Whereas, physical computers, including unlinked or standalone computers that are not on the Internet or other networks, are still open physical systems that interact with their physical environment, such as electrical systems, air, earth, water, and fire. For the integrity of their computational functions, physical computers depend on the integrity of their hardware and software. For instance, the integrity of computational functions rely on hardware such as power supplies, keyboards, disk drives, monitors, cases, silicon chips, solid state devices; and software such as operating systems that control physical devices as well as applications, but which ultimately depend on their binary coded instructions being properly stored and acted upon by physical devices. Throw these quirky physical systems onto networks, with a new level of hardware such as wires, switches, routers, servers and also with a new level of software such as network operating systems and communication protocols, we add a new dynamical layer where the mythical butterfly flapping its wings can change the universe.

Edsger W, Dykstra (11 May 1930 -- 6 August 2002), a leading computer scientist and winner of the Turing prize, has a similar diagnosis of the state of our knowledge about computer technology. I quote from a note he wrote on November 19, 2000, for the "Communications of the ACM":

"I would therefore like to posit that computing's central challenge, viz. "How not to make a mess of it", has not been met. On the contrary, most of our systems are much more complicated than can be considered healthy, and are too messy and chaotic to be used in comfort and confidence……You see, while we all know that unmastered complexity is at the root of the misery, we do not know what degree of simplicity can be obtained, nor to what extent the intrinsic complexity of the whole design has to show up in the interfaces. We simply do not know yet the limits of disentanglement. We do not know yet whether intrinsic intricacy can be distinguished from accidental intricacy. We do not know yet whether trade-offs will be possible. We do not know yet whether we can invent for intricacy a meaningful concept about which we can prove theorems that help. To put it bluntly, we simply do not know yet what we should be talking about…."

To my mind, Dykstra does not quite get to the bottom line reason for the failure of computer science. It is not merely a matter of losing sight of the goal of achieving simple models of complex systems. Rather the bottom line reason for the failure of computer science is that no real computer is reducible to Turing Machines, and so real computers are not reducible to mathematical systems. Hence, what we know about mathematics, though great and wonderful—including the profound discoveries of Godel and Turing concerning the un-decidable —are not the whole story about computers and what computers do, let alone can do.

Furthermore, from the logical point of view: the abstract and universal rationality or intelligence expected of computers is impossible because universal rationality or intelligence is impossible and because real computers are not abstract and universal systems. Rationality and intelligence is embedded within traditions and cultures. The embedded quality of rationality and intelligence, and the impossibility of universal rationality and intelligence, does not imply that rationality is completely impossible. A limited rationality of the critical sort does function between, among and within communities, but not independently of all communities. Also, intelligence is modular and multiple. Hence, computers might be able to achieve the capabilities of modular and

context based human achievements such as critical rationality and specialized and interacting intelligences.

Ironically, within the ranks of AI theorists and cognitive scientists, there has been the development of the idea that intelligence is multiple and modular, and the idea that understanding is based on the creation, application and revision of stories. However, they have not applied those ideas to the notion of what a computer is except as a transitional stage when developing expert and special-purpose automated intelligent systems. This approach presupposes that computers are abstract and universal systems; and that their intelligence and rationality should ultimately be abstract and universal.

This is so because the argument that rationality and intelligence are embedded within tradition and culture has been identified with technophobic critics of computation. In particular, those influenced by Heidegger hold that belief and thinking follow upon commitment to a community and acting in conformity to that community. They equate computers with the notion of universal rationality which they reject. They also equate computers with abstract methods, and universal rules, which they reject as part of universal rationality. However, the truth that universal rationality is impossible is derived from a false premise that rationality can only be universal and abstract. But, we can recognize that rationality is culturally bound without giving up rationality as intercultural and critical discussion, and without having to give up more practical and bounded uses for "smart" computers.

The bottom line for computer intelligence is: We are radically ignorant about computers. Though we know a lot about what Turing Machines do, we don't know very much about what real computers can do and can't do in the areas of intelligence and rationality.

STANCIULESCU TRAIAN-DINOREL

"AND SUDDENLY A MERE DOT MOVED...":
(META)PHYSICAL PATTERNING OF THE CREATIVE SINGULARITY

On the basis of Eminescu's cosmogonic intuitions, detached from the Vedic thought assertions, a cosmologic pattern of the "pulsing expansion" becomes able to be elaborate and argued. The singularity of the transition point from a cosmogonic reality to another, from the compression of an unimaginable "Big-Crunch" to the expansion of a metagalactic "Big-Bang" perfectly suggests the mechanism of an unending becoming "Brancusi's Column" type, the genesis process of "world of the worlds" itself… A "cluster universe" - in which infinite worlds are born and die in exciting cosmic sincronicity and silence – is thus (re)born permanently, under the amazing force of an unruffled Cosmic Conscience – through a (meta)physical patterning possible to be extrapolated at each world reality level, macro or microcosmic that is. From the core of these levels human life generatively pulses, itself being a "singularity" meant to holographically enrich the universe of archetypal values.

Mutatis mutandis… Beginning from the suggestions of such a model as The Creative Singularity, it's actually normal for us to wonder now in front of the powerful human value crisis: How much could the making of an Artificial Conscience, of a technological singularity which follows the pattern "His image and likeness" be subordinated to The Human Planetary Conscience so that earth and cosmic conflicts which seem to threaten our future could be avoided, thus enssuring the planetary value continuity even after 2012?!

TARANU MARIAN

ON HARD & SOFT TECHNOLOGICAL SINGULARITY. A SOCIAL POINT OF VIEW

The ideas that we forward for debate are based on the observation that most of the existing singularity definitions are rather incompatible than complementary[79]. Moreover, the vital assumption of singularity theories is an image that is typical to a researcher, and which is embodied by the way it valorizes the future. This image varies from the inevitable creation of an *ultra-intelligent* machinery that may "exceed" the human intellect, until the conception of singularity from the perspective of the economic evolution, with the subsidiary perspective of the agricultural and industrial revolutions.

There is no difference of nature between the two extremes, but a difference of degree. We may therefore speak, on the one hand, of a *soft singularity* (which has not induced the idea of a machinery exceeding the "power of human brain", a phrase that we use to designate the entire scientific research capacity of the species), which emphasizes the "speed" of the Artificial Intelligence evolution. On the other hand, one may notice the more radical visions, which exclusively focus on the scientific power (with a strong meaning – of "problem-solving"), on the inevitable creation of a machinery that is able to exceed itself, to generate and perpetuate an *outburst of intelligence*. This theoretical option may be defined as *hard singularity*.

The idea of singularity remains, at this stage, a prisoner of criticism. In order to stay at the logical level, we shall hereby mention only Steven Pinker's criticism from 2008[80]: "(...) There is not even the slightest motivation to believe in an inevitable singularity. The fact that you can visualize a future in your own imagination is no evidence that it is probable or even possible." This criticism is logically correct, while the operation by means of which the singularity idea is concluded lacks rigor.

Nevertheless, the absence of logical consistency in the theory of singularity, according to the current methodologies, does not imply the absurd. Although there is no well-grounded reason, we may underline at least one practical reason to consider this hypothesis worthwhile – the potential dangers that singularity[81] casts on human society. Starting from the observation that machines have registered various forms of semi-autonomy, including the ability of establishing their own power sources and of choosing the targets that may be attacked, we may foresee similar situations to the real ones, when computer viruses may "borrow" the intelligence of the machine it parasitizes and uses it to achieve its own purposes (usually against the machine itself).

As Vernor Vinge says[82], it is very difficult to anticipate singularity-induced results. But at least the following aspects must be considered:

- the impact on society organization – global economic results have doubled every 15 years since the Industrial Revolution, 60 times faster than during the agricultural age. From this perspective, the question referring to the next stages of the informational society evolution is justified by the very survival instinct;

- the extinction risk – "artificial intelligence neither hates you nor loves you, but you are made of atoms that may be used for something else."[83] – Therefore, it is importance to produce friendly

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artificial intelligence (the introduction into the artificial intelligence DNA of the idea of an "association" to the human race). An entire debate has derived from this point, concerning the safety and morality of artificial intelligence.

We start from the premise that it represents "all the activities that the human brain performs for adaptation to the environment". Certainly, this definition may be too lax, but it allows the filtration of the philosophical speculation from the perspective of human action results on or in accordance to the environment. On this basis, at least at the discursive level, *soft singularity* avoids the argumentation problems of predicting an unfriendly technological future for the human species. Moreover, *soft singularity* takes advantage of the accumulations so far registered by science history and technological innovation in order to induce the idea of a continuation of an already noticed historical tendency.

Most of the suggested methods to create a "trans-human" mind are included in two categories: the amplification of human intelligence by the increase in the performance of human brains, and the artificial intelligence. However, both perspectives are quantity-based. Neither the increase in the number of operations performed by the human brain or by the processor of some machinery with artificial intelligence within a time unit, nor the improvement of methodologies are quality-based approaches. On the contrary, such an approach is not merely related to the criteria of time and result, but it considers certain objects of knowledge that are different from the strictly practical – technological ones, and it is related to another purpose of knowledge than the problem-solving one (the achievement of a concrete result regarding God's existence by means of an ultra-in-telligent machinery does not solve the issue of knowledge by [religious, artistic, etc.] intuition).

„ACKNOWLEDGEMENT: This paper was made within The Knowledge Based Society Project supported by the Sectoral Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number POSDRU ID 56815

UEJIMA KAYO

NOUS-SELF CONCEPT VS TECHNOLOGICAL SINGULARITY

Nous-Self concept is based on organic approach for suggestion of symbiotic integration of scientific domains as background of ethical policy for construction of sustainable society and solution of ethical problems of modern society. For exploration of technological singularity in each scientific domain, one of the most important viewpoints that lacks in science is linkage between whole and part as well as the position and standpoint of each scientific domain in whole.

Nous-Self concept provides ethical viewpoint that lack in science by reductionism. Self shows the notion that links to individual from the living organic universe. Nous-Self concerns the formation of organism as notion.

This presentation is composed with the following 6 chapters.

1. The significance of Nous-self Concept for exploration of technological singularity The first chapter discribes framework for development of scientific systematization of structure, process and system with holistic approach. When we can observe definitely technological singularity in systematical position, role and significance of technological singularity in each scientific domain becomes clear.

2. Scientific task and meaning of technological singularity by holistic approach with organic perspective. The second chapter describes relationship between technological singularity and experimental positive science from viewpoint of structure as organism.

3. The bioethical meaning and scientific limitation of technological singularity The third chapter describes bioethical meaning and scientific meaning of technological singularity by exploration of difference betwen organic system and system of Artificial Inteligence and experimental positive science from viewpoint of system as organism.

4. **The need of self awareness concerning Self process and position of technological singularity in self process** The forth chapter describes linkage betwen position of fundermetal science and process of self process as organism. Thus linkage expresses the position of technological singularity in oranicistic structure. The meaning of poupose of techonology shows the need of self awarenss for creation of ethical awarenses for realization of millenium Developmental Goals that transcends technological singularity.

5. The essence of ethical problem of technological singularity. The fifth chapter describes the need of ethical analysis of technological singularity from organic perspective. Especially, exploration of ethical meaning about investment to technological singularity in economic system and political system is needed. Because, the linkage between consciousness and value in consumption behavior lead direction of technological singularity. Furthermore technological singularity is affected to macro economic policy by investment to technology for development of economy that creates social value and collective consciousness in deep psychology. When we begin grasp ethical cause in not only legal and political system but also economic system, we can find tangible way for solution of ethical problem about technological singularity.

6. **The ethical policies for achievements of Millennium Developmental Goals that can transcend technological singularity** The sixth chapter describes some ways of economic policy and ethical educational target of ethical awareness by self-awareness as ethical policy for achievements of Millennium Developmental Goals. The economic policy means experiential process economy for recovery of spontaneous healing system and care to environment and individual self from economy for consumption of products and energy for providing mass products. This economic policy can link development of social system and technology that can adapt and utilize systemic system as organism. The first step for evolution of recognition of human-beings means need of ethical education for ruling class in each social organization. Solution of ethical problem depends on evolution concerning individual cognition of human-beings and self-awareness as well as deep psychological evolution of collective consciousness in organic network of human-beings for a long history.

NOTES