ONTOLOGY OF INFORMATION, INFORMATION THEORY AND TECHNOLOGY

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ABSTRACT: Information as a philosophical object is treated here as both ontological brick and construct of information technology (IT).

The aim of this paper is, thus, twofold: first, to focus not on a discourse about ontology, but about the real roots of the essence of being. At the same time, the article does not belong to what is called philosophy of information[2] neither in the narrow/specific sense of researching what happens *within* the computer and interpreting the technical relations of transmission, storage, action, combination, simplification and transformation of information within and as a result of the Artificial Intelligence (AI), nor in the larger one theorising about the mind, but to an ordinary ontological questioning beyond this domain. Here ontology, science of being, is a part of philosophy as search for the *meanings* of life, while information is viewed as both founding element of existence and epistemological device.

Consequently, the treatment of information is considered in a non-fetishist way: simply as subordinated to the above-mentioned philosophical understanding of the reason of the human knowledge. Thus the second goal of my

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[2] Philosophy of information discusses the creation, dynamics, management, utilization of information, computational resources, the complexification of IT through the networked computer, and the far more influential role of ICT (digital Information and Communication Technologies) than "the mills in the Middle Ages, mechanical clocks in the seventeenth century, or the steam engine in the age of the industrial revolution"; therefore, discusses *concepts/processes* (algorithm, automatic control, complexity, computation, distributed network, dynamic system, implementation, information, feedback), *symbolic phenomena* and *representations* (HCI [human–computer interaction], CMC [computer-mediated communication], computer crimes, electronic communities, or *digital art*, *disciplines* (AI, Information Theory), *questions* (the nature of artificial agents, the definition of personal identity in a disembodied environment, and the nature of virtual realities), *models* (Turing Machines, artificial neural networks and artificial life systems), see Luciano Floridi, *What is the philosophy of information*, http://www.blackwellpublishing.com/pci/downloads/introduction.pdf.

paper – to highlight the ontological significances of IT – transcends what is already called computer ethics, by insisting on the necessity of sciences, and information theory as well, to overtake the objectivistic standpoint which supposes only or mainly the relentless determination of man by the natural laws emphasised by these sciences and his transformation into an object among many (subordinated only to a positivistic manipulation).
Therefore, by discussing information technology from the viewpoint of the ontology of the human, the paper belongs to the present trend of science-philosophy integration[3].
KEYWORDS: information, ontology, Mihai Drăgănescu, information theory, information technology, man, epistemology.

I

Preamble concerning ontology

Ontology is the core of philosophy, since it focuses on the roots and *essence* of things. And also: because this essence is conceived of as transcending the fragmented and varied constitution of reality. But soon enough man, or more precisely the philosopher, has discovered that he comes nearer to reality-as-it-is only through the agency of his understanding. From that moment on, philosophy could no longer ignore this mediation. And although the research began either from the metaphysical presuppositions imagined by philosophers who have put in brackets the problem of epistemological validation of these presuppositions, or just from the epistemological tenets, philosophy has always considered the world and man as indestructibly related: from the standpoint of the understanding of the ultimate principles of the "great chain of being"[4]. One of the most illustrative proofs of this consideration is the concept of *information*. In the

[3] This process of integration arouse in the moments when the second part 19th century fragmented sciences have arrived to some deep aspects of their research (see chemistry, biology and rather the 20th century physics). The science-philosophy integration has meant the surpassing of the former boundaries of disciplines, the birth of new ones in the interdisciplinary and multidisciplinary area and, later on, new epistemological assumptions as the trans-disciplinary ones. These assumptions constitute the methodological preamble of the process of integration. But the process as such supposes that, simply, the new physics etc. cannot be exposed and developed without the philosophical concepts related to the problems and without the philosophical interpretations of the scientific concepts and approaches.
IT based on information theory – a late development of science – illustrate the necessity of science-philosophy integration.

[4] The expression was borrowed from the well-known book of Arthur O. Lovejoy, *The Great Chain of Being: A Study of the History of an Idea* (1936), Cambridge Ma., Harvard University Press, 1964.

following, information is pointed out in a play that firstly seems to take off its human meanings. But obviously, just the development of the objective character of information pushes us to integrate these meanings in the cold universe.

The method of ontology: Heidegger

As we know including from Heidegger's insistence in *Being and Time*, the kernel of philosophy is ontology as the focus on and questioning of the *meanings* of Being. But the traditional Western metaphysics – which always questioned "what is Being" and not "which are its meanings" – would have suffocated ontology through circles made round about this questioning, thus by diverting attention to the conditions/ to less general domains or areas[5] of this process, and consequently forgetting the Being. And, since to draw it out from the state of oblivion – i.e. to discover the truth about it/its truth – means to understand it in a concrete way, so to come nearer to it (though never surprising it completely), just the analytics of *Dasein*[6], of the standpoint from which the meaning of Being is outlined, is the only correct point of departure of this enterprise. *Dasein* is, as we all know again, the human being who discovers what Being is, but he can not do this without understanding his own meanings in *Angst* (anxiety) and *Sorge* (care), and the understanding always involves the standpoint of his presence – *da*, here, there – as being the only way to open himself to the Being. In this respect, man means always *Da-sein* (Being-here), the fact to be here as place/point of openness to the Being.

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[5] Namely, the "outer circles" of philosophy, as Ted Honderich's (ed.) *The Oxford Companion to Philosophy*, Oxford New York, Oxford University Press, 1995, pp. 928–929, has mentioned.

[6] Heidegger understood the traditional Western metaphysics as inquiries concerning entities (*Seiende*) which, he thought, must be leaved aside just in order to start from the Nothing (*das Nichts*) in order, again, to come nearer to Being (Being and Nothing being tantamount but, pay attention, at the level of concepts). At first sight, Heidegger could be charged of a little fault: if the existence – always present – of man precedes the essence of things and Being, why would the inquiries concerning entities, reflecting always the real world, be a distancing from Being? In fact, it's not about a fault: entities were in the traditional metaphysics abstract concepts non-related to *Dasein*, i.e. seeming to have their own life allowing the understanding of "what is Being". The starting point of this metaphysics was the philosophical/scientific concepts of "origin" (spirit, matter etc.), but from them we never understand the *unconcealment* of Being. Therefore, it's a beautiful criticism on behalf of Heidegger, but in fact it's about different paradigms as research programmes, not at all contradictory. Rather each of them puts into brackets the concurrent tenets, if they are not intolerant (as Heidegger, let' say).

An interesting and apparently paradoxical situation appears: though ontology does not aim at focusing on man – but, on the contrary, on his external environment – it arrives to be constructed only with the human being, *from his side*.

Therefore, in Heidegger, not only the interdependence ontology-theory of knowledge is once more highlighted, but this is made in the manner of a phenomenological angle based on the (existentialist) presumption that only existence explains and precedes the essence. But existence as *ek-sistence*, thus transfigured as man's efforts to understand the meanings of Being. And I think that just for this manner of putting the ontological problem is Heidegger a great figure of philosophy.

But it is obvious that this manner is not the only one in ontology. Or, more correctly, it is *completed* by other views that direct toward other aspects related to the understanding of the meanings of Being. I do not consider that the ontological figure of the presence of man would lead to a type of "poetical ontology" for its offering of a "trajectory of proximity"[7]. It is never superfluous to underline this problem of "proximity" between the meanings of the objective world and the real human being. I simply think that the picture of philosophy and of our understanding of the world is illuminated only through *complementary* approaches[8]. For this reason, even though I obviously agree with the "definition" of philosophy as "the disposition for designating exactly where the joint questions of being and of what happens are at stake"[9], I do not think that by emphasizing that *Dasein* has no place in the world where he dwells if he does not consider critically his own creations, including the concepts and ideas – i.e. including the "big questions" as "what is Being" and "what is man" –, is a fault. (I think that a fault is only Heidegger's pessimism concerning man and philosophy, although it is not absolute: nevertheless, man can dwell in a poetical manner[10] and, concerning Heidegger, though his idea of poetics meant both impotence of philosophy and a path of alternative life of man[11], the harsh criticism of idiosyncrasies and

[7] Alain Badiou, *Being and Event* (1988), Translated by Oliver Feltham, London, New York, Continuum 2007, p. 9.

[8] Or: by approaches stopping each of them at different points/ moments of the analysis of the complex wholeness.

[9] Alain Badiou, p. 10.

[10] Martin Heidegger, "Poetically Man Dwells" (1951), Translated by Albert Hofstadte, in Martin Heidegger, *Philosophical and Political Writings*, Edited by Manfred Stassen, The Continuum International Publishing Group Inc., 2003.

[11] Or rather: not only a path of alternative life of man but also an impotence of philosophy and, in fact, of man's efforts.

forms that have opposed to this poetical dwelling on the earth was, certainly *sine qua non* (and valuable) but anyway, the philosopher's only approach and mode to contribute to).

Consequently, a different kind of ontology is remembered in the present issue (as a review of Badiou's ontology) in order to emphasise that ontology is "a presentation of the presentation"[12], not of entities/things/ones, but of discourses about them. These discourses constitute a structure of only "implicit count"[13].

Concluding remarks to the problem of ontology

As a discipline of philosophy, ontology has, from a common standpoint, the destiny of any science: that of being a focus on an objective, exterior domain of reality and, in this frame, an analysis of the problems of this domain from the point of view of the cold observer. But, since ontology is the questioning of reality at the level of *the most general principles*, these ones themselves appear as the result of human endeavour to deduce, to suppose, to think. So why would rather some principles, than other ones, be the last constituents of the ground? Consequently, the research emphasises that the concepts and knowledge concerning the "ground"[14] of existence are not simple information realised mostly through external observations or reflecting on reality, but a deep worry constituted within this reality and never surpassed by the historical development of man as a whole (of his mind, body, knowledge, sentiments, power and weakness). In short, ontology can no longer be as it was in its ancient naïve phase, an outward deduction of the last principles of the constitution of nature[15].

But, nevertheless, why would these principles of *nature*, or the understanding of nature at its most abstract level, be so important?

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12 Alain Badiou, p. 56.

13 *Ibidem*, p. 57. This aspect is crucial. At first glance, we could say that Heidegger's ontology privileges the quality, while Badiou's – the quantity. In fact, in the latter there is, rather, a beautiful dialectics of quantity and quality.

14 See Martin Heidegger, "On the Essence of Ground", in M. Heidegger, *Pathmarks* (1967), Edited and translated by William McNeill, Cambridge, Cambridge University Press, 1998, pp. 97–135.

15 This idea of compulsory integration of philosophy (metaphysics, said Kant) within science – or constitution of a new body of knowledge, that of science-philosophy – was demonstrated by Immanuel Kant, *Metaphysical Foundations of Natural Science* (1786), Translated and edited by Michael Friedman, Cambridge, Cambridge University Press, 2004, p. 4 (469): science "must derive the legitimacy...only from its pure part – namely, that which contains the a priori principles of all other natural explanations – and why only in virtue of this pure part is natural science to be proper science".

Because nature – as animals, vegetation, sea, land and sky, sun, wind, cold and hot, space and horizon – was and is the *exteriority* of man. It was and is also his environment which had to be known and calmed down in order to accept and help him. But the environment is exterior, equivalent to the "*existence*" itself.

And what is the most evident feature of reality? That it exists, that it lasts, that *there is* a lot of some-things forming the nature outside us. Heidegger reminded us that nature, φύσις, meant the constancy around us, the *stable* which remains irrespective of the countless changes[16].

To know why the existence is stable was the task assumed by philosophers. For this reason, the first domain of philosophy was ontology. After the Socratic turn, the wonder in front of the importance of man within reality was so huge, and the relativity resulted from the process of knowledge was so jolting, that the problem of truth seemed to drive away the priority of ontology. And truth means to discover the weakness of man, his deep dilemmatic inquiries about his own thoughts, dreams, actions, and inactions. Everything seemed to be mediated by man: *he* became the *stable*, the keystone, the headstone of reality. And this – because, *on the one hand*, the external nature seemed to be so eternal, so unproblematic, so able to remake itself, that it did no longer preoccupy the philosophers; the more so because, later on, when the natural sciences began to develop as special activity aiming at demonstrating laws and measured facts, philosophy seemed to lost the motivation to search for the last bricks of reality; *on the other hand*, the problems of man – of which is the most nearer to him and, at the same time, the most unknown – were so difficult (and especially the problem of *how to know* and *what is man*, *what could he hoped for* and *what could he do and act*), that philosophy has concentrated upon this difficulty.

In the 20th century, it seemed that the development of sciences – as if they would have brought off from the body of philosophy, of both the apparent and real insufficiency of philosophical discussions – have led to a kind of renaissance of the interest for ontology. As we know, Heidegger said that the post-Socratic Western philosophy has lost its first reason, the inquiry of Being.

But there are different ontologies, as there are different theories of knowledge and also regarding other philosophical domains. What is important is to critically approach all of them: not in order to give the "only right answers", but for putting the best always new questions.

[16] Martin Heidegger, "On the Essence and Concept of Φύσις in Aristotle's *Physics* B", I (1939), in M. Heidegger, *Pathmarks* (1967), Edited and translated by William McNeill, Cambridge, Cambridge University Press, 1998, pp. 183–230.

II

A model of an objectivist approach of being: Mihai Drăgănescu

To understand the "profoundness of the material world"[17]: the high difficulty, thus the historical evolution of the human understanding led to some phases of the relationships between philosophy and science:

– in the first, the philosophical intuitions have given *philosophical theories* full of coherent answers and suggestions concerning *the unity of the wholeness* and the symmetrical correspondence between *kosmos*[18] and *logos*[19];

– these theories have challenged the next efforts to *scientifically study slices of reality* by measuring within them, by experimenting the theses and by constituting consistent theories highlighting the laws of the interactions and functions within fragments or levels of reality; thus, this second phase has moved within a *structural (structural/functional) paradigm* aiming at knowing by sciences everything which could be possible in the framework of this paradigm;

– the third phase – we are on its threshold – is that of a *structural-phenomenological paradigm* which allows a new positioning of philosophy and science: from the standpoint of knowledge (and not only of conjectures and presumptions, irrespective of their logical character), neither philosophy may promote more cognisance on the first hand, nor the fragmented sciences, separated from philosophy, are enough, but new *structural-phenomenological sciences integrating philosophy*[20] are far more efficient.

Since information is related to our power to know, thus to a result of the interference between the human mind and its external

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[17] A beautiful expression of Mihai Drăgănescu (see his first book concerning ontology, *Profunzimile lumii materiale*, București, Editura Politică, 1979 [The Profoundness of the Material World].

[18] Κόσμος means order, from this – good order (κοσμέω – to put in order, to make order, to arrange, to prepare → to distribute, to make repartitions; that meaning – pay attention, though it's a question of social philosophy – to govern, to lead (and, obviously, to honour, to adorn and to praise (the leaders, who are supposed to behave in a well-ordered manner)) – discipline, organisation, construction, even the order of universe; only in Pythagoreans κόσμος have meant universe, world.

[19] See also Klaus Mainzer, *Symmetries of Nature: A Handbook for Philosophy of Nature and Science* (1988), transl. by Barbara H. Mohr and Thomas J. Clark, Berlin, Walter De Gruyter, 1996.

[20] Menas Kafatos, Mihai Drăgănescu, *Preliminaries to The Philosophy of Integrative Science*, Academy of Scientists-Romania, e-book, (MSReader), Academy of Scientists, Romania, 2001.

medium/ outer world, how could we connect it (information) to the fundamental principles of existence/ being? Information is obviously an ontological factor of man, consequently, a basic feature of the ontology of the human, but what is its place in the deep constituency of matter, or of existence?

Well, even this question denotes the structural perspective, or at least its reminiscence: that of the absolute difference and distance between subject and object. (By the way, in the same view – though already in the phase when philosophy was first and foremost indistinct from sciences – the *idea* of the objectivity of the world took place, as a victory of knowledge: the objective world was to be absolutely separated from man). But in a structural-phenomenological perspective, objectivity does not disappear, but is explained in a more profound way.

Therefore, the subject-object relationships *explain* the material world. First, this world itself exists for us through *concepts*, the articulated and logically coherent reflections and images about an infinite, indeterminate and even far away environment in macro and micro distances from our perception related to rather solid and familiar bodies. Second, after the period when sciences have developed just through the separation object-subject and at least[21] from Einstein's theory of relativity – that opened up the scientific 20th century – the objective material processes were proved as interfering with the observer and that the known object was only the result of this interference. The statistical laws related rather to ordinary bodies as objects of research have thus been not only completed with, but integrated in a picture of the functioning of the universe as *unity of individual events through their interrelationships*.

Nowadays scientists try to unify the "system of laws" from quantum mechanics to cosmology, as well as to unify the time

[21] „At least" refers to sciences/to their inherent "positivist" view in that time, because philosophy has grasped from the entire analysis of philosophical and scientific knowledge that "reason is misunderstood if reflection is excluded from the truth and it is not taken to be a positive moment of the absolute. Reflection is what makes truth into the result, but it is likewise what sublates the opposition between the result and its coming-to-be. This is so because this coming-to-be is equally simple and hence not different from the form of the true which itself proves itself to be *simple* in its result. Coming-to-be is to an even greater degree this return into simplicity", G.W.F. Hegel, *System of Science*, *First Part. The Phenomenology of Spirit*, Bamberg and Würzburg, Joseph Anton Goebhardt, 1807, Preface, 21., p. 18 (bilingual edition, 2008, http://ebookbrowse.com/hegel-phenomenology-of-spirit-bilingual-pdf-d294033134).

conditioning of dynamic systems of events. It is about a new level of understanding that: to (scientifically) know the deep unity of a dynamic existence does not mean at all to arrive to an abstract series of "fundamental" elements. Since "the truth is the whole", "the *whole* is only the essence completing itself through its own development"[22], thus being the *concrete* in its infinite richness. The whole is a concept relating to the always relatively final results of our (not only and no longer first and foremost philosophical, but) scientific researches. More: the whole itself could be taken at different levels of reality and has different degrees of profoundness. The concrete brick of the whole is the *event*[23], and the event manifests as *information*. The event – the taking place of information – generates the *objects* as we know them, since in fact they are put together multiple events[24], or information.

This doesn't mean that there would not be a material support of events as information. On the contrary, without this support, no information exists[25]. Matter is the bearer of information and informa-

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22 *Ibidem*, 20., p. 17.

23 Alain Badiou, *ibidem*.: the event is "that-which-is-not- being-qua-being" (p. 13), thus "on the basis of which the void of a situation is retroactively discernible" (p. 56), because the "event can always be localized. What does this mean? First, that no event immediately concerns a situation in its entirety" and it is "always in a point of a situation, which means that it 'concerns' a multiple presented in the situation" (p. 178).

It's interesting that, on the one hand, "the event ...belongs to conceptual construction, in the double sense that it can only be thought by anticipating its abstract form, and it can only be revealed in the retroaction of an interventional practice which is itself entirely thought through" (*ibidem*).

On the other hand, the event is attached to the concreteness of life: to a point, to a place, where the "historicity of the situation is concentrated" (*ibidem*). Therefore, the event is not equivalent to the situation, it lies within a situation, but it is more than that.

But this means that the event is the *re-presentation of a multiple of events* having the same belonging to a one presented with the help of the re-presentation which presents them.

24 See this type of interpretation in a view related not to physics but to archaeology, Christopher Witmore, *A brief manifesto for a symmetrical archaeology*, 2007, http://traumwerk.stanford.edu:3455/symmetry/817.

25 See Ana Bazac, „O provocare a lui Mihai Drăgănescu", *Noema*, X, 2011, pp. 41–62, http://www.noema.crifst.ro/nr10.php [A challenge of Mihai Drăgănescu]; and Ana Bazac, „Materia – observaţii epistemologice cu prilejul aniversării modelului atomului al lui Rutherford (I)", *Noema*, Vol. XI, 2012, pp. 133–158 [The Matter – epistemological remarks on the occasion of the anniversary of Rutherford's model of atom (I)], and „Materia – observaţii epistemologice cu prilejul aniversării modelului

tion is the manifestation of matter[26]. The problem is to understand the nature of information, what does it mean, since the ground of the real world is the *unity of matter and information*[27].

Therefore, the subject-object relationships explain even the material world: not only have the concepts as such illustrated this, but or even the concepts are *interactions* between the observation of the subject and the objective processes. By the way, as a consequence one would imprudently say that quantum physics would always show that singularities – the fundamental particles are called in this manner just because their experimented existence depends upon the observer – certify even a kind of *subject dependence* of the matter: since every measurement of the situations of particles gives a modified space and time of those particles; this meaning that what we know about the particles are *de-coherent* with the real state. Moreover, the particles are influenced by their interactions with the measurement devices. And au fond, this de-coherence theory is not at all a strange one, since until now all the experiences have legitimated it.

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atomului al lui Rutherford (II)", *Noema*, XII, 2013, pp. 83–114 [The Matter – epistemological remarks on the occasion of the anniversary of Rutherford's model of atom (II)]

And there always are new manifestations of the material support of the existence. See the *quantum spin liquid* ("a solid crystal, but its magnetic state is described as liquid: Unlike the other two kinds of magnetism, the magnetic orientations of the individual particles within it fluctuate constantly, resembling the constant motion of molecules within a true liquid") as *A new state of matter, and a third type of magnetism: The discovery that could revolutionise computer storage*, 2012, http://www.dailymail.co.uk/sciencetech/article–2251555/A-new-state-matter-MIT-researchers-new-type-magnetic-behaviour-revolutionise-computing.html.

[26] It's very interesting that the present cognisance of *informational molecules* – which are chemical bodies produced by a living cell in order to transmit a signal to another cell receiving this signal through a specific receptor – has its history in the 17th century bio-metaphysics of Maupertuis and Gassendi who spoke about the *living minima*, the smallest constituents of the organic life. See Charles T. Wolfe, "Endowed molecules and emergent organisation: the Maupertuis-Diderot debate", *Early Science and Medicine*, 15, 2010, pp. 38–65.

[27] Mihai Drăgănescu has expressed this unity in the concept of „informatter" and, because matter reacts and thus signals (informs), it has a "fundamental infra-conscience of the existence" (AB, since it reacts): see *Conștiința fundamentală a existenței*, http://www.racai.ro/~dragam/CONSTF_1.HTM [The fundamental conscience of the world]. This fundamental infra-consciousness would consist in the *first meaning* of every reaction, the *ortho-meaning* "to exist", as both "to exist in itself" and "to exist as in itself": meaning to us (and without us there are no meanings at all, at least those related to life and man would not exist at all) *and* to the material parts and particles of the existence.

But science develops. The 2012 Nobel Prize for physics was won by two researchers – Serge Haroche and David Wineland – who realised a quantum technology allowing the measurement of particles in their real time, namely attacked the de-coherence principle and allowed the direct observation of the quantum behaviours[28].

OK. But what's about the profoundness of the material world? Obviously, people discover this profoundness and this discovering means that people give *meanings* to the events they face. The meanings are the features of the world grasped by them: once more, these features, though objective, exist for man only in so far as he focuses on, names and researches them. And, by giving meanings, the entire adventure of human knowledge begins.

But this process of giving meanings would not exist *if the world as such would not allow its discovering by man* (and this is Mihai Drăgănescu's both standpoint and point of departure): and this "permission" is the result of the fact that each part of the world discovers the other ones by the fact that they interact. By interacting, each part of the world "discovers" not only the *significances* (the concrete contents, as gravity, light, attraction, rejection, convergence/addition and agglomeration, distribution and expansion, a certain quality, etc.) of the interactions – as we discover forces, elements, features, all of then taking part in systems of relations – but also something more profound than these significances, the *ortho-meanings*[29].

What do they mean? They are the *meanings or "interpretations"* of the *concrete significances*, meanings that were forgotten or are neglected by the ordinary *structural* sciences we are used to and which study the *structures*[30] – the logical ordering of phenomena and

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[28] See *Serge Haroche and David Wineland win Nobel prize in physics: as it happened*, 9 October 2012, http://www.guardian.co.uk/science/2012/oct/09/nobel-prize-physics–2012-live.

[29] Mihai Drăgănescu has kept attention on this aspect. *Orthos* in Greek = true.

[30] The phenomenological meanings and analysis do not "complete" the structural knowledge in order to "absolutely unveil" the existence, as if the known existence would annul the mystery of the unknown. On the contrary, they keep attention on the "greater" infinity of the unknown towards the known. The mystery which calls us to clear it up has the same power to challenge us as in the beginning of the human adventure of knowledge. Fifteen years before the writing of his original epistemology, Lucian Blaga wrote (1919) a beautiful poem where he said that man – as both a representative of humankind in front of the mystery of the world, and a unique individual, able to transcend the positivist clichés – does not transform, through his cognisance, the deep and infinite existence into a boring set

the modelling of features of the objects as these ones interact, through the images of our mind and giving to us just these more and more elaborated images of structures, superposed, intersected, opposed[31]. On the contrary, a better knowledge supposes – but we are only on the threshold toward this knowledge – a structural but at the same time *phenomenological* science: that which penetrates beyond the structures of knowledge toward the signals existent in and coming from the profoundness of the world.

There is nothing idealistic here: these signals have the same material support as the visible[32] phenomena (this last word in the meaning of Kant) grasped through the form of structures. More: they are grasped starting from the ground given by the structural sciences: the structure of matter. Just starting from this structure one grasps not only forces, energy, their movements, superposing, intersections and transformations related always to a material support, but also the more profound meanings of these structural data. And these meanings are the *ortho-meanings* which are grasped by both the material – but, rather, living – parts of the world and man. The *ortho-meanings* – 1) that of being/existence as such, 2) that of topology, 3) that of coupling-decoupling, 4) that of movement, 5) that of interaction, 6) that of integration in living organisms, 7) that of transmitting the

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of data: the world is wonderful, namely, for our eyes it is full of miracles, and just this infinity of wonders is so mysterious: "I do not crush the petal cup of magic of the world/ nor do I kill/ with reason the mystery I meet/ on my way/ in flowers, in eyes, on lips, in graves./ The light of others/ strangles the inexplicable spell hidden/ in the depth of darkness./But i/ who add with my own light to the magic of the world/ and as the moon's white rays/ not diminishing but trembling/ make even greater the mystery of night/ so I increase the shadowy horizon/ with wide shivers of holy mystery/ and everything not yet understood/ changes into things even less understood/before my eyes/ because I love/ flowers, eyes, lips and graves", "Eu nu strivesc corola de minuni a lumii", Translator: R. MacGregor-Hastie, "I do not crush the petal cup of magic of the world", in *Compendium of translated poetry*, Compiled by C. George Sandulescu and Lidia Vianu, Anthology, Contemporary Literature Press/Editura pentru Literatură Contemporană, 2011, pp. 439–440, http://editura.mttlc.ro/carti/compendium-of-translated-poetry.pdf.

31 Robert Rosen – quoted by Mihai Drăgănescu, *ibidem*, from Menas Kafatos, Robert Nadeau, *The Conscious Universe*, New York, Springer Verlag, 1990 – has called „a material system with computable models" a „simple system or mechanism. A system that is not simple in this sense is complex. A complex system should have non-computable models". But see also Robert Rosen, *Life Itself. A Comprehensive Inquiry into the Nature, Origin and Fabrication of Life*, New York, Columbia University Press, 1991.

32 Visible: through both the human senses and the scientific apparatuses.

information and 8) that of load – are *phenomenological information*, corresponding to the phenomenological experiences and being thus more profound than they appear in present, or even requiring a new concept since the one of information would not be sufficient[33]. But in this moment, just *information* – in its intertwining with matter and in its forms like energy etc. – is the means through which the correspondence between the scientific knowledge of the infinite structures of the real world and the infinite fulgurations of this world takes place.

Therefore, the ortho-meanings are more than concrete significances structurally conceived: they are the *phenomenological meanings* resulted from the interaction between the matter-information relationships and the mental processes coupled to this unity matter-information from the profoundness of the world. At the same time, they are information, like the concrete significances are, but at a more fundamental level. (However, I think that the phenomenological – the grasping of phenomenological information – may become structural, since it is understood and ordered, necessarily in structures). Further on, information is that which exteriorises and may become a world distinct from its initial physical support. But anyway it ought to have material support – directly or indirectly, as the virtual worlds or the concepts which exists only for man: his conscience cannot exist if its material support would not exist, even though it *transcends* this support and *generates* a world of structures, information, constructions that constitutes an autonomous entity/whole of entities.

The goal of Mihai Drăgănescu – but also of many others, including the old 17th century philosophy – was to understand how movement and transformation take place. This is the reason of the doubling of matter with information, or rather, of the double character of the bricks of reality, that of the *informational character of matter* and that of the *material substrate of information*. In fact, neither forces (as gravitation etc.) nor energy can be understood without the intermediate means of signalling to and thus pushing the material environment. In science, physics has already demonstrated that the possession of information has thermodynamic consequences (Leó Szilárd's thought experiment in 1929) and that the conversion of information to energy is possible, and vice versa, since this involves a process of increase of the thermodynamic entropy of systems which transmit/lose information and of decrease of the thermodynamic entropy of systems which receive information.

[33] Mihai Drăgănescu, *Profunzimile lumii materiale*, pp. 21, 19.

Therefore, we speak about an ontological model privileging the *continuity* of things – through their both structural and phenomenological approach –, opposed to the traditional scientific model where the discontinuity (given by particles and the specific differences between landings and strata) is the ground of structures. It's interesting, since the fundamental element of Drăgănescu's ontology is information – a basic representative of discontinuity[34].

A moment of the history of ideas: *peri* or instead of information

The profound substrate of the world exists through its movement. The movement means action and reaction, and these steps show that there are forces which explain the movement. Classical physics tended to reduce phenomena to movements and to reduce movements to their geometrical conditions (because these ones represent the movement with the least number of possible elements). The forces were the simple effect of the movements of masses, while these ones derived from movements occurred in a homogenous environment[35]. However, how and why took these forces and movements place? This was a big question, to which the logic of mechanics of macroscopic bodies could not answer. The question constituted the limit from which philosophical conjectures should sketch out theories.

There is an interesting unity, continuity and concatenation between the ancient philosophers' images and solutions and those from the 17th and 18th centuries' thinkers: and obviously, this relationship was the result of the insufficiency of scientific knowledge, thus giving room only to philosophical intuitions through analogies[36]. Consequently, all of them spoke about "innate" forces within matter, conscience and ideal objects (as ideas or numbers): forces consisting in the tendency of all the parts of reality – be they matter etc. – to exist, to last and to persist. Attraction, repulsion, unity, separation, combination, order of movements in a (pre-determinate) model – thus allowing the grasping of laws of these movements and relationships – or/ but also including the freedom of *clinamen*: all of them were the sign of the existential tendency of reality.

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[34] Discontinuity is also assumed by the theory of granular composition of matter.

[35] Abel Rey, *L'énergétique et le mécanisme au point de vue des conditions de la connaissance*, Paris, F. Alcan, 1908 (réimpr. 1923), p. 4.

[36] It's interesting that these intuitions have presented themselves as *episteme*, the knowledge resulted in a deductive process, mediated by proofs (analogy) offered by *theôria*, contemplation allowing an immediate knowledge.

And, since the sign of reality was the totality of so many signals from so many parts of the world and of so many forms and bodies, these signals as such were conceived of as the *will of existence* to exist. But what is this will, or rather, what it consists in? It is tantamount to the *creation* as such: since everything we see was created in a way or another, we cannot imagine that the existence as such would not have been created.

The evolution of the Greek mythology in connection with the Ionian pre-Socratic philosophers illustrates the role of this presupposition. Indeed, the first mythological figures were the parts and forces, as the earth (Gaia), the darkness in the space (Erebus), the space under the earth (Tartarus) and the sexual desire to reproduce (Eros). Where have these figures appeared from? Greek mythology spoke about Chaos, the primordial void (a gape-like void)[37] as origin[38] of things: something very exciting for us, isn't it?

But how did the figures appear from Chaos? It was no specific answer in the Greek mythology. We only may suppose that the figures themselves and chaos were imbued with something of, as one said related to the post-beginning moments, a spiritual nature. Or rather – and we may suppose with equal rightness – that chaos and the figures had in themselves a force/ they were at the same time both entities and force: that of creating and, concretely and after the moment of creation as such, multiplying. That is the reason the latter supreme God – but also other Gods – proved itself as such through the flash of lightening (see Zeus's thunderbolt). This flash was the sign of the intervention of God and meant the action of creation: an action of will, of inner force and tendency.

Therefore, the Greek mythology did not answer, but the Indian did. It's not here the place to discuss this problem. I only may suggest that there is a common logical pattern of thinking pertaining to both Greek mythology and Ionian pre-Socratic philosophy: if one cannot explain something, one surpasses it and tries to articulate that which is more fitted to analogies and intuitions[39]. No pre-Socratic philos-

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[37] As in the Indian (Hindu) *Matsya Purana*, http://www.bharatadesam.com/spiritual /matsya_purana.php: "in the beginning, there was nothing in the universe. There was only darkness and the divine essence (brahman). It is impossible to describe the brahman, it has no traits that can be described".

[38] Αρχή, beginning, first cause; only in Anaximander the significance of the world became that of *principle*: both from an ontological and epistemological standpoint.

[39] Diogenes Laertios, *Lives of Eminent Philosophers*, Translated by Robert Drew Hicks, Book X, 2, http://en.wikisource.org/wiki/Lives_of_the_Eminent_ Philosophers/

opher is interested about the primordial chaos: they begin with the moment things already are, or existence presents itself. And as in mythology, the first moment is that of concrete basic elements – water (Thales), air (Anaximenes).

But something is missing in order to explain the existence. And this is the principle which would connect and, at the same time, transcend the basic concrete elements of the existence: this is Anaximander's *apeiron* (ἄπειρον), the limitless and infinite origin of all things. This infinity in space and time, as basis of metaphysical monism, could be seen in both material and spiritual manner: since matter is the abstract concept unifying all the concrete forms of the existence – thus being characterised only by the fact that existence exists and is infinite – and since the divine is "that which has neither beginning nor end"[40], it results that, paradoxically, the limitless origin itself is only a temporary answer to the problem of creation as such. *Ex nihilo*? How?

That all of these are not enough was clear. Pythagoreans – with their inhalation by *apeiron* of the void, and with the abstract principle of number – and Anaxagoras who has inserted in *apeiron* the spirit/Reason/Mind, have showed us that if the interpretation of the principle of existence as either insufficient matter or un-understood spirit is unsatisfying, we need something new.

But this novelty was to be postponed for a while. Philosophers did not concern too much about it since they had to explain that which is nearer to us. And by focusing on this objective nearness, they called the force of things, manifesting in all forms and movement, *vis* or virtue, power to last and create consequences. Indeed, *vis*, or power, thus (pay attention) nature, essence of things, influence, meaning, was first of all revealed in living beings. In Plato's *Definitions*, in fact a latter apocryphal work, the force is characterised as "that which act from itself", the soul being "that which moves itself by itself and is the cause of the vital movement of living beings"[41].

However, the problem of the *impetus*[42] (Galilei) of things, though manifested through different physical forms and generating concrete

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Book_X. (In the note, the translator has mentioned that Sextus Empiricus, in *Adversos mathematicos*, X, 18, told very clearly the story).

40 Diogenes Laertios, *Ibidem*, Book I, 2. Thales, 36, http://en.wikisource.org/wiki/Lives_of_the_Eminent_Philosophers/Book_I#Thales.

41 Platon, « Définitions » (Notes, 239 specifying that it was taken from the German edition Bekker), in *Oeuvres de Platon*, Tome XIII, Traduites par Victor Cousin, Paris, P-J Rey Libraire, MDCCCXL, p. 195.

42 Or: attack, excitement, movement, passion, impulse, and – pay attention – crisis.

physical movements, mathematically knowable, was too important so as to limit the *trouvaille* of *vis* only to living beings.

The modern glorious trajectory of the concept of *force* is the proof[43]. It was used in relation with non-living beings and, leaving aside the scientific endeavour to measure concrete forces and their causes and consequences, it was understood as the inner power of material things to last: "Everything, in so far as it is in itself, endeavours to persist in its own being"[44]. Leibniz (influenced by Spinoza) wrote: "active force includes a sort of act or εντελέχειον, which is midway between the faculty of acting and the action itself and involves an effort, and thus of itself passes into operation; not does it need aid other than the removal of impediments", this force being "energy or virtue, called by the Germans *kraft*, and by the French *la force*"[45]. See also *The Monadology*, where he insisted: "11. The natural changes of the monads arise from an internal principle" and "15. The action of the internal principle which causes the change or the passage from... ("a transient state" to another, a transient state of reaction/*conatus*)[46].

Or see the concept of *energy*. Nevertheless, something missed. How is this force or energy showing itself?

The ontology of information

Force is revealing itself according as its consequences. And the first is the *form* itself through which it manifests. The form is seen like a *fulguration*[47] of the impetus, Zeus'[48] lightening meaning the "electric

[43] See John Wallis' (1670) law of conservation of momentum (*momentum* or *vis* = force), Newton's understanding (1687) of universal force (gravity), Coulomb's (1784) electrostatic force, Faraday's (1821–18620 and Maxwell's (1865) theory of electromagnetism (of electrical and magnetic forces), etc.

[44] Baruch Spinoza, *The Ethics*, III, Prop. VI, http://www.gutenberg.org/files/3800/3800-h/3800-h.htm#chap03.

[45] G.W. Leibniz, "On the Reform of Metaphysics and of the Notion of Substance" (1694), in *The Philosophical Works of Leibniz*, Translated from the original Latin and French, with notes of George Martin Duncan, New Haven, Tuttle, Morehouse & Taylor Publishers, 1890, http://archive.org/stream/philosophicalwor00leibuoft#page/n11/mode/1up, pp. 69–70.

[46] G.W. Leibniz, "The Monadology" (1714), in *The Philosophical Works of Leibniz*, pp. 219–220. At the level of living bodies, it is more understandable: as *instinct of self-preservation*.

[47] See Konrad Lorenz, *Behind the Mirror. A Search for a Natural History of Human Knowledge* (1973), Translated by Ronald Taylor, London, Methuen and Co., 1977, p. 27: referring to the medieval philosophical concept of *fulguratio*.

[48] It was called even *Jupiter fulgurator*.

spark" of the beginning, the proof of the action of creation. The use of Poseidon's trident and the gifts of Athena had the same meaning of beginning and, thus, cause of things.

What does a cause generate? It generates a movement or transformation, as the recipient of the impetus would respond conscientiously to the impulse or sign of the exterior. Anyway, it's about a) *creation*: as Stoics have considered that the variety of forms in nature is made through continuous vibrations in the continuous πνεῦμα or breath of life of the world, or the Middle Ages' mystics have called *fulguratio* both the coming into existence of something and the indication of conscience of this coming into existence; the indication of conscience was conceived of as spontaneous, a spontaneous knowledge or insight; both this insight and the new phenomenon can be summarised as *emergence*; thus, creation is more than conservation, since it is the cause of the latter; or b) *interactions*; and the cause makes the receptor to react, thus as if it would have received a plan, a sketch, an idea, representation or form from the external object.

Indeed, the modern word of information derives from the Latin *informātio, ōnis*, meaning plan, sketch, idea, representation, form (from the verb *informo, āre*, to make, to shape, to instruct, to imagine, to invent): as if the cause would transmit to the result at least a unit of knowledge: that the *exterior cause exists* and *one has to accommodate with this existence*.

But we still have to add to this etymology something: the Latin preposition *in* means both *within* and *against*; thus *informo* and *informatio* signify at the same time that a certain form in the existence was shaped/imagined/invented *a novo*/ the existence as such was formed, as if realizing a plan, and that the new form was made just and only because the former one was destroyed. To inform means to cancel the former state of things and to create something new. This is, at the level of logos, the knowledge people construct and, thus, transform the reality as such.

And since information is "knowledge" without which no interaction exists and the receivers also inform, as causes, other receivers but, at the same time, re-act to their first causes/ information, the world itself is a *network* of networks of information, of superposing, intertwining, contradictory or same direction feed-backs[49].

[49] See Alexander Friedrich, "Metaphorical Anastomoses: The Concept of 'Network' in the Nineteenth Century", in Birgit Neumann, Ansgar Nünning (Eds.), *Travelling Concepts for the Study of Culture*, Berlin/Boston, Walter de Gruyter, 2012, pp. 119–144: starting from the new technological structures – structures of

Information is something *translated through mathematics*, a discipline which measures and relates quantities, their relationships, images of signs of a virtual world that, in its turn, would reflect at a superior level the real one. We know a lot about the treatment of information, but we do not yet know what it is. Namely, as a result of a previous consideration/use, or as a cognisance, information is the ground of our inferences: and we erect impressive constructions on this basis. However, beyond its characteristic as an epistemological unit or brick, its ontological essence is still ignored. Philosophy can help us. In its field, we try to understand the not yet known through analogies. Thus the *ontos* appears first through concepts having their intellectual histories and complicated intertwining. Interpreting all of these is not enough: philosophy dialogues with science in order to learn from it and to be proved true or denied, thus to continue to develop.

Indeed, information is easily understandable when we speak about life, about consciously or instinctively, but anyway nervously processed information. When it's about material inert bodies, there are laws of motion, forces, energies, fields, chemical and physical molecular and quantum reactions, and only metaphorically we call them "transfer of information". However, there is not only a kind of continuity between the inanimate and the living bodies but, since the latter have appeared from the former, even a *telos*[50]. The matter itself, through its permanent movement, reacts, emanates and grasps "information" concerning its existence and transfiguration. This is Mihai Drăgănescu's *ortho-meanings* and this is the basis of meanings constructed by the human conscience. Matter enters in relations with itself and new elements, characteristics and meanings result: the entering in relations is the result of the cognitive found/reason of the material and, later on, spiritual universe. This cognitive reason generates the *ortho-meanings* – which remain, as "pure perceptions", in the subconscious of man.

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communication as railways and telegraph –, the scientists have used comparisons between these structures and the organic structures and nerves. The analogy was useful to the understanding of the function of the nervous system: "the biological activity of nerves shall be understood in terms of electrical signal transmission" (p. 128).

[50] The Greek τέλος, completion, accomplishment, fulfillment, perfection, consummation, end/purpose, result, product, extremity, supreme power; from τελέω-ώ, to accomplish, to complete, to fulfil, to achieve, from where to execute, to carry out, to realise, even to cause.

Information in the profoundness of the material world is that which explains the *constitution of forces* as such: it is the *medium* between bodies and it is born both through the internal interactions, energy and forces of bodies, and the external interactions between bodies. As well as – it shows that the intentionality of conscience arrives from the permanent vibration of information in its unity with matter/forces/energy. This ground of matter-information unity allows the picking out of more and more profound meanings by the conscience: in fact, this is because the basis of these meanings is just the profound *interpenetration and intertwining of matter-energy and information*.

Information is just the *event* as signal of the matter, while the signal itself is the spark of the born relationship. At the level of the *ontos*, information is not at all sophisticated: it is only the signal of the existence as such, as well as of its profound manifestations (as being in relation, positioning etc.). It is phenomenological information (not in Kant's meaning, but in Husserl's). Only at the ontological level – thus of the human knowledge about existence, being and beings – it is structural information: of the structures of knowledge about the structures of the world. At the level of the *ontos*, the phenomenological information is inserted within the structural information constituting the structures of the world, but it not disappears through this insertion. At the ontological level, at least from a historical moment on, the structural meanings become insufficient and call for the grasping of the "ortho" ones, and for new intertwining of these different information and meanings[51].

But, if information forms with and within matter the ground of existence, its evolution toward and promoted by living beings, as well as the constitution of the human conscience would not be strange at all. On the contrary, it appears as "the spark of original conscience" of the universe, as the ground of the *telos* of the existence: life and, more, conscious life. The *continuity between inanimate and conscious life* would be just the result of the *original field of information*: the vacuum state/quantum vacuum that, just in virtue of its relative vacuity (relative because it has no particles, but forces and fields, in

[51] Mihai Drăgănescu, *Conștiința fundamentală a existenței*, http://www.racai.ro/~dragam/CONSTF_1.HTM, intended to keep attention to the problem of the presentation of information (or science): while the complexity of the structural information may be reduced/simplified, the phenomenological information cannot, because the phenomenological is not formal and formalisable. Therefore, the intertwining of these two types of information poses not yet solved problems.

fact "short-lives particles, each existing only fleetingly, yet still able to interact and engage in complex processes"[52]), allows the emergence and differentials of energy (as well as of spontaneous and temporary particles[53] which generate new events/information/force/energy and again energy etc.), namely of information. The characteristic of information as medium is proved by the phenomenon of quantum entanglement: where particles, irrespective of their distance, interact only on the basis of information they contain.

The interconnection and interconnectivity of information shows that the "numerical accidents" consisting of "the values that are assigned to the fundamental constants of nature"[54] have manifested in a non-randomly sense, as if in order to lead to an intelligent life[55]. The result of the physical evolution, this intelligent life, shows that many processes and time intervals have coincided, so that one can speak of blind forces of nature only taken separately: as if both an observer would have existed in order to involve in the cooperation of these forces (for example, in the quantum processes, without the observer we cannot take them for granted), and the many observers would certify the coherence of life and its *telos* as human conscience.

In fact, there is not about the observer: he deduces through his science (observation, experiments, mathematisation, scientific theories about the laws of nature) and describes the physical world in terms of simple and understandable and order creating regularities; but this world is much more complex than this simple picture formed by the laws of structures; and this complexity results from the random intertwining of innumerable "messages", structures, forces and energy resulting from and reflecting the discrete random components of existence; from this standpoint, the world is governed by indeterminacy. But, consequently, if "man was not expected in the world", but "if we consider life as a phenomenon of auto-organisation of the matter and developing toward more and more complex states, then, in very determined circumstances – and which do not seem to be of an exceptional rarity – life is predictable in the universe and constitutes

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[52] Paul Davies, *The Accidental Universe* (1982), Cambridge, Cambridge University Press, 1993, p. 106. And *ibidem*: „This seething, fluctuating *mêlée* exerts a gravitational influence in the same way as ordinary matter".

[53] Milton K. Munitz, *Cosmic Understanding: Philosophy and Science of the Universe*, Princeton, Princeton University Press, 1986, pp. 132–133.

[54] Paul Davies, p. 111.

[55] *Ibidem,* p. 112–118.

an as natural phenomenon as the fall of weight bodies"[56]. The forces of nature are blind only as representing "individual" tendencies toward existence and lasting: in their interactions – signalled by information, the complex result tends toward existence and lasting through mutual adaptation and thus "common" creation of a new state of self-organisation of matter-energy-information. The world is *indeterminate*, but its forces converge, even at random[57], toward at least local self-organisation. *This self-organisation is realised through information.*

Or to put it differently, as the ancient atomists have considered: the world exists through movement and the existence of movement is the *Necessity* or law/*logos*, and this Necessity imposes some paths, some interactions; only the big number of atoms, forms and interactions lead to the appearance of infinite and indeterminate variety; in fact, the road of Necessity leads to the development of forms – and thus even of life, not as the realisation of a pre-existent idea of forms and life, but as the result of combinations reflecting the *logos* of movement[58].

In both images concerning the determinate or indeterminate character of the world, there is a permanent tendency to stability (to self-organisation, or configuring of particles) that requires the subordination of movements and collisions of particles and structures to this tendency. This is the "*logos*", and if the subordination as well as the movements manifest through energy, the transfer of energy/the sparks and signs of movements is information.

Indeed, if information is regulation, adjustment, fine-tune according to the internal *conatus* and élan of energy and forces from the primeval quantum vacuum, *the continuity of information is the basis of a fine-tune corresponding* just to the *telos* – thus

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[56] Ilya Prigogine, Isabelle Stengers, *La Nouvelle Alliance. Metamorphose de la Science*, Paris, Gallimard, 1979, p. 193 (my translation). See also Leo Näpinen, "Ilya Prigogine's program for the remaking of traditional physics and the resulting conclusions for understanding social problems", *Trames*, Journal for the Humanities and Social Sciences, No 2, Vol 6(56/51), 2002, pp. 115–140, http://books.google.ro/books?id=rRllp1LallgC&pg=PA139&lpg=PA139&dq=ilya+prigogine+et+isabelle+stengers+the+new+alliance&source=bl&ots=tLpSIg4TSf&sig=J1zjXalCjpD8ZMcxcc0-bj39wuC4&hl=ro&sa=X&ei=Y1BhUcqZMY_ktQbkj4DAAg&sqi=2&ved=0CEkQ6AEwBA#v=onepage&q=ilya%20prigogine%20et%20isabelle%20stengers%20the%20new%20alliance&f=false.

[57] Jacques Monod, *Le hasard et la nécessité. Essai sur la philosophie naturelle de la biologie moderne*, Éditions du Seuil, 1970.

[58] Antoine Danchin http://www.normalesup.org/~adanchin/causeries/Atomistes.html.

more than *conatus* – of information as such. This is the reason some ones[59] consider that the birth of life is a "cosmic necessity"[60]. Life: as the continuity between inanimate existence[61] and the intermediate ground of conscience.

Further on, things are "simpler": man interacts with and within reality, in fact with the information showed by his environment, and thus, after and in the process of finding information as something necessary and valuable for his life, he provides/constructs information, consequently – a new world. The result of this entire evolution and process is, at the theoretical level, the *informational realism*: the

[59] See Ervin László, *Science and the Akashic Field: An Integral Theory of Everything*, Rochester, Vermont, Inner Traditions, 2004.
But there is a consistent tradition of the theory of adjustment of the fundamental numbers revealing the constitution of the universe and, on the other hand, the possibility of life and conscience. The entries in wikipedia: the *anthropic principle* and the *fine-tuned universe* describe some contemporary scientific reasoning and demonstrations concerning the compatibility between the physical constitution of the universe and the conscious life.

[60] In Romania, Dumitru Constantin Dulcan, *Inteligenţa materiei*, (Ediția a doua revăzută și adăugită), București, Teora, 1992, [The intelligence of matter], p 15: „in a pre-biotic period, the haphazard might have its role; but from the moment when the information of a viable structure was entered on a DNA sequencing, life surpasses the empire of chance and pass into that of necessity. That which appears randomly is fixed through selection and transmitted as a necessity trough the genetic information. Once on the way of life, the evolution of matter toward the living is without return".

[61] Klaus Mainzer, *ibidem*, p. 517: "viruses show how difficult it is to define life. They are organisms to the extent that they consist of complicated organic molecules such as nucleic acids and proteins, and posses genetic information for self-reproduction. On the other hand, they are constructed too simply to live and reproduce independently. A virus particle can only reproduce in the context of a living cell. ...the virus particle is a clear example of the fact that the dynamics of life processes require *symmetry breakings*. As a Platonic body...it is quite lifeless. To participate in the life of the host cell and reproduce, the virus particle must trigger an infection and thus give up its symmetry".
Or see Louis Pasteur, « Mémoire sur la fermentation appelée lactique », *Mémoires de la Société des sciences, de l'agriculture et des arts de Lille*, séance du 8 août 1857, 2e sér., V, 1858, p. 13–26. – *Annales de chimie et de physique*, 3e sér., LII, 1858, p. 404–418. *Œuvres complètes* de Pasteur, t. 2, Paris, 1922, pp. 3–13. Consultable sur Wikisource. Résumé dans P. Debré, *Louis Pasteur*, Flammarion, 1994, pp. 119–122: "When one reads this first mémoire, one finds that Pasteur has already almost found. (Pasteur called 'yeast' the living agents of fermentation he just discovered and talked about lactic yeast. In present scientific terms, a ferment is not necessary a yeast: yeast belongs to the family of mushrooms, while for example the agents of the lactic fermentation are bacteria, constituting the group of lactic bacteria. However, the expression 'lactic yeast' is still usual".

ontological discourse asserting that "the world is the totality of informational objects dynamically interacting with each other"[62].

And, since IT demonstrates once more that information does not deplete through its communication but, on the contrary, this communication and "consumption" lead to the enrichment of information, and that the transmission of information is cheap and relatively simple, and no needs of many raw materials and energy, thus the human information requires another type of administration and social relations (concerning the ownership): once more, information reveals as the common factor and denominator of ontology and ontology of the human.

In closing, let me summarise the place of information in *ontos* and ontological theory: since the origin is that of relations and fields, "at the beginning"[63] it was *chaos* which *fluctuates*[64], these fluctuations allowing, according to Gheorghe Ștefan[65] continuing Mihai Drăgănescu, three degrees of *order*: structural, phenomenological[66], and accidental; order is an interacting process between the structural (order) and the accidental disorder; this interaction is called interpretation: thus order *interprets*; the result is the *phenomenon* – mixture of structural order and accidental disorder and thus having a high semantic complexity – that *acts*; the action is the fluctuation introduced by the phenomenological order; the result of the action is the phenomenological meaning – namely, the *phenomenological information* – that results from the action of interpreting within a world of complexity; therefore, *information are the meanings in action*; the phenomenon "has more than signification, it has sense that recalls, beyond the current interpretations"[67] and thus, as in Suárez, "is a reality characterised by uniqueness"[68], an event which influence at least the near environment.

Therefore, the phenomenon is that which cuts out from chaos. The original chaos is meaningless. The meaning comes only when,

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62 Luciano Floridi, *Informational realism*, 2004, http://crpit.com/confpapers/CRPITV37Floridi.pdf.

63 This "beginning" could be observed in constructed computational devices.

64 This standpoint is similar to that of digital probabilistic physics, stating that the universe develops according to a nondeterministic model.

65 Gheorghe Ștefan, "The Phenomenal Becoming as the Deep Information's Interpretation", *Noesis*, no. XXV, 2000, http://arh.pub.ro/gstefan/DII.pdf.

66 The phenomenological order is in-formal, thus requiring interpretation in order to be accessible.

67 Gheorghe Ștefan, *ibidem*.

68 *Ibidem.*

from collision and fluctuation, accidental orders, namely structures, are shaping. Though the structure is a concept, reflecting the degree of knowing, it can be extrapolated in *ontos*, as order resulting from fluctuation and collision. Order means more stable, repeated relations. Which, at the level of the human knowledge, namely after man clashes with his observation of these more stable relations, gives the concept of structure. The structure is the order in certain relations and following some fluctuations and collisions.

Information is a concept too; it pertains to the human cognisance. In *ontos* there are only actions (and reactions, collisions, impetus/force, *vis*, sparks, events with new contents of situation). The action is a fluctuation introduced directly by the phenomenological order. When we climb up to the human level, i.e. to understanding and interpreting, the action appears as mediated by the interpretation performed by the structures of the phenomenological order. When man understands, he arrives at the exact cognisance (through experiments, measurement and verification) that in *ontos* there are also structures. Nevertheless, in *ontos* there is nothing cut out "logically", but only fluctuations, both accidental and necessarily aiming at stability order and disorder: thus relatively stabilising of fluctuations.

Continuing the inanimate *ontos*, life as the more elastic and open genetic programme was and is a purpose of the existence – since "the order and connection of ideas is the same as the order and connection of things"[69] –, but, contrary to Leibniz's opinion, it is not the only possible evolution. Although the constituency of the conditions leading to the conscious life was accidental (and this is the reason of the way of the anthropic principle of knowledge: from man to the universe, and not from the origins to man), the evolution as such is determined by two principles acting through forces, energy, matter, fields: the principle of *conatus* (of persistence, of maintaining in a stable state) and the principle of *signalling*. The vector of the latter principle is information.

Intermezzo

What does the phenomenological view mean?

The problem raised here is that of the human approach and grasping of information. The first and simpler answer takes place within the structural paradigm of the macro level of conscience:

[69] Baruch Spinoza, *The Ethics* (1677), II, prop. VII, http://www.gutenberg.org/files/3800/3800-h/3800-h.htm, http://www.gutenberg.org/files/3800/3800-h/3800-h.htm# chap02.

sensations, perceptions, representations, analogies, constitution of abstract concepts, and development of science. But obviously, I am not interested in discussing it. Plato has reminded us that besides the rational interpretation of signs of nature – this interpretation being the rational knowledge acquired by investigation (*ίστορία)* and this investigation being made with and aiming at the structures discovered by man – there is also a kind of "madness which comes from god", i. e. it is nearer to the understanding of things, including its capacity to make prophecy about the future[70].

The second answer is that of the phenomenological view which intends to question just the relationships between the human conscience and the process of knowledge.

Indeed, the constitutive intentionality of the life of conscience is related to the original élan of things to persist and thus to signal this *conatus*. The problem is to take this signal over, thus to copy information. Researchers have only begun to show the continuity between inanimate bodies and animate life, by arriving at the proofs about a certain diversity of the informational molecules: for example, now is proven that the ontogenesis no needs only RNA and DNA to encode and transmit information[71].

But if this is the biological and structural level of life – and this level is the reason of transmission of information in the "body" of conscience taken as a natural apparatus to carry information –, how does this process manifest at the superior level of constructed/ cultural information, as the ideas and reasoning, and how and why does this process manifest as a permanent awareness, or critique, of the structures of information?

The phenomenological school of philosophy helps us. The cultural information resulted in the process of knowing is a *representation* of reality and forms an intermediate reality between this first reality and our conscience. The result is a multitude of inherently fragmented structures without which man cannot react and persist. But if he stops for a moment, he is slapped by the real fact that he knows rather these structures than reality as such and that there is no a perfect overlapping between the structures of knowledge and reality. Consequently, phenomenology tried to remake the way of conscience in order to highlight both the totality and its "signals"

[70] Plato, *Phaedrus*, 244b–245b.

[71] *Move over DNA: Six new molecules can carry genes*, 19 April 2012, http://www.newscientist.com/article/dn21720-move-over-dna-six-new-molecules-can-carry-genes.html.

which exist in the deep reality beyond the structures emphasised at the level of the knowledge, and the real intentions of the human conscience, again – beyond the cultural structures it operates within.

According also to phenomenology, conscience as a copy of reality is only a moment in its understanding. In fact, we always have to re-run through the way of conscience in order to not forget what's lain at the basis of the cultural "copy" of reality. And the first result of this re-running is the fact that conscience always intends to understand something and that without this *intentionality* of the conscience we can really neither perceive things nor understand that there is something deeper beyond the meanings given by the cultural structures of knowledge.

Therefore: conscience intends something, it focuses on this intention; sensations and perceptions work, the ideas appear etc. Phenomenology remakes the *intentionality* of conscience, irrespective of the previous cognisance, of prejudices – with and without commas. The elements of knowledge appear, giving a more valuable and fresh image about the world. But these images are impregnated with the cultural, thus historical, structures of knowledge and thus they are not fully corresponding to reality as such[72].

Phenomenology is thus an implicit critique of the given cognisance: because the ordinary image of the world is indirectly given in symbols, in conventions, or man must also directly grasp reality. He has to give something in presence without swerving from that is essential, i.e. was intended by conscience. "Man should not forget the Being" has warned Heidegger, after Husserl's highlight that just this not yet consciously existent into the structures of knowledge is what is valuable in every science.

Only in this approach of the really existing things, beyond the already existing structures – signs that both unveil and hidden the "thing-in-itself" –, man confers a meaning (*noema*) through which he is conscious of the intended object.

How does information appear here? Through the sectioning of the known reality – ἐποχή – information is cleaned up and either something new or a new configuration appears. Phenomenology does not call the objectivity of the world in question, but posits the epistemological priority of the subject in front of this objectivity.

[72] As Gheorghe Ștefan, "On Integrative Knowledge", *Noesis*, no. XXVI, 2001. http://arh.pub.ro/gstefan/int_know.pdf mentioned: "The contextual meanings work like an irreversible informational process: the meaning occurs and the context disappears. The existence loses the knowledge about itself. *In its becoming, existence forgets*".

The subject is the creator of information, of meanings, of the world through which man knows in fact the real world[73]. But this world is, on the one hand, intermediary to the real one and on the other hand, the only "real" one, the only one through which man knows. Actually, it is not the only one. The only criterion of security is the subject (in the hard meaning of Descartes' *cogito*), but the subject only in so far as it critically looks its own endeavour to know. Only in this manner he arrives at something more profound. Phenomenology is thus both a means to call the information, to keep attention on it, and to aim at the not yet grasped totality/total meaning of the existence.

Information and the subjectivity-objectivity impasse of knowledge

Everything we know as existing passes through our mind, our ability to feel and express our relationships within and with the world. Would this reality be independent of the perceiving subject or, on the contrary, subordinated to and resulting from its endeavour? Empirically, people have long ago answered that the only fixed points according to which they cam live, think and act are *external* to them, as their terrestrial environment and... God. Philosophers have met the objectivity of common sense, by showing that practice is the ultimate criterion of the proving true of reality: and scientific experiment takes part from practice.

Therefore, if we experiment it, something ought *to be there*. But what does exist? And that which exists has it a relationship with the act of transmission? What kind of relationship? It is, first of all – because it's obvious, a relation like a light that illuminates us, so a *mediation* – the mediation realised through knowledge (the subject-object relationship) between our concepts regarding the being, the essence of things. But would this transmission "to us" be the only relationship accrediting the being?

Anyway, since reality is far greater than our knowledge and our truths concerning it, how could we know that they would correspond to the existence as such? By distinguishing the *objective reality* from the *objective truths*, philosophers have shown that there is a difference between the secondary qualities we perceive – colour, for example

[73] This is the reason Emmanuel Levinas, "L'oeuvre d'Edmond Husserl" (1940), in Emmanuel Levinas, *En découvrant l'existence avec Husserl et Heidegger* (1949), Paris, Vrin, 2001, pp. 70–71, has characterised Husserl's phenomenology as a philosophy of freedom.

– and the primary ones – the combinations of electromagnetic radiations – and that we arrive to know the latter through science, our complex logical and experimental activity that passes beyond our impressions[74].

We know by starting from our first known things, thus from the known and not from the unknown – though the unknown, the void, the mystery is for us that which is the ground, the starting point –, because we simply cannot drive further on without which is familiar to us, particular facts already known. These facts are represented, and without these concrete representations we cannot represent and operate with any abstract cognisance[75]. At the same time, the best abstract knowledge is that which could be simplified, that it, used as a model of different structures of qualities, and allows analogies. Finally, the greater the gap between our knowledge through structures and modelling, the greater the impulse toward surpassing the existent elements of knowledge is.

But what are the primary qualities? They form "the essence", the "thing-in-itself" presumably existing through and in the deep down of phenomena. Generally, these ones are known, in secondary and "primary" steps which, however, do never penetrate the essence[76]. But just this limit of our capability to know shows that reality is objec-

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[74] John Locke, *An Essay Concerning Human Understanding* (1689), Book II, http://www.gutenberg.org/cache/epub/10615/pg10615.html, has referred to:
• Democritus, as this one was remembered in Sextus Empiricus (see "By convention there are sweet and bitter, hot and cold, by convention there is colour; but in truth there are atoms and the void", Sextus Empiricus, (*Adversus Mathematicos*, VII, 135), *Against the Logicians*, Edited by Richard Bett, Cambridge University Press, 2005),
• Galilei ("I think that tastes, odours, colours, and so on are no more than mere names so far as the object in which we locate them are concerned, and that they reside in consciousness. Hence if the living creature were removed, all these qualities would be wiped away and annihilated", *The Assayer* (published 1623, reprinted in Stillman Drake *Discoveries and Opinions of Galileo*, New York, Doubleday & Company, 1957, p. 274) and
• Newton ("For the rays, to speak properly, are not coloured. In them there is nothing else than a certain power and disposition to stir up a sensation of this or that colour", *Optics* (1704, 4th ed. 1725, Part II, Prop. II, Definition, pp. 108–109, http://www.archive.org/stream/opticksoratreat00newtgoog#page/n128/mode/2up).

[75] Abel Rey, p. 93. This is the reason, for example, of the hypostases of the universals in Scholastics (because it's impossible for man to think something which is not somehow concrete) or of the use of mechanical patterns by quantum mechanics.

[76] Immanuel Kant, *Critique of Pure Reason* (1781), Translated by J. M. D. Meiklejohn, EBook, http://www.gutenberg.org/files/4280/4280-h/4280-h.htm.

tive: since it is "formed" from both essence and phenomena, and since we are able to have experiences involving phenomena. (And, obviously: since our experiences are not only individual, but existing in an inter-subjective agreement concerning the conditions, tenets and conclusions related to an historical collective experience of knowing[77], including at a scientific level).

In short, reality is independent from our perception only as being there[78]. But our truths are objective only at the extent they correctly – thus historically – represent the world. More: the *idea* itself of objective reality is not at all independent from our (subjective) knowledge, and people must be aware of the historical and relative characteristics of their truths.

A persistent idea in the history of philosophy was the *correspondence between the logic of nature and the human reason*: from the Greeks to Engels[79]. Relating to the first, Sextus Empiricus has summarised that the criterion of truth was conceived of either as not being at all (Xenophanes, Xeniades, Anacharsis, Protagoras, Euthydemus and Dionysodorus, Gorgias, Metrodorus, Anaxarchus, Monimus) or being in *logos* (Physicists", Anaxagoras, Pythagoreans, Xenophanes (again!), Parmenides, Empedocles, Heraclitus, Democritus) or being in *energeia* – with or without *logos* – ("Post-physicists", Plato, Speusippus, Xenocrates, Arcesilaus, Carneades, Cyrenaics, [Asclepiades], Epicurus, Peripatetics, Stoics)[80].

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[77] Just this fact/process keeps away our knowledge from the presumption that it would be only a set of (Bacon) *idola fori* and *idola theatri*, practical prejudices confirmed by practice and comfortable for us, but being real at the extent of Matrix.

[78] And although quantum mechanics has showed that the quantum *phenomena* exist only at the extent they are measured, so interacting with the observers, physics also pointed out that it's possible to obtain "information about the electron's position without interacting with it". And the physicist added: "this seemed to me to be a terrible paradox", *Oral History Transcript – Dr. Robert H. Dicke*, http://www.aip.org/history/ohilist/4571.html.

[79] In fact, Engels spoke about an isomorphism of the dialectic of nature and dialectic of history. The term "dialectic" could mean here both the separated objective logic of nature as being only reflected (and, after, of history) and the correspondence between the two worlds starting from the laws the human mind is able to arrive at.

[80] David Sedley, "Sextus Empiricus and the Atomist Criteria of Truth", *Elenchos*, 13, 1992, pp. 19–56 http://scholarlysource.daphnet.org/index.php/DDL/ article/ view/123/62, analysing Sextus, *Adversus mathematicos*, VII; he has mentioned the following references regarding the problem: G. Striker, Κριτήριον τῆς ἀληθείας, Göttingen1974; A. A. Long, "Sextus Empiricus on the criterion of truth", *Bulletin of the Inst. of Class. Studies of Univ. of London*, XXV (1978) pp. 35–49; J. Brunschwig, "Sextus Empiricus on the "Kriterion": the Skeptic as

But what is the basis of this correspondence and how is realised the necessary communication between these two levels of reality, leaving aside both metaphysical presumptions related to *logos*, Ideas and Holy Spirit, and sensationalism leading to the pre-eminence of the material world transposed into historical ideas? It could be information. Information highlights both the process of knowledge and the profoundness of the material world.

Information puts into evidence the world, it does observe/remark/reveal the worth of the world: from the *exteriority* of the subject which awakes and begins to be aware. But information is only a partial copy of the world, since it is followed by other information, by series and series of information – information compulsorily supposes multiple views, it is no more contemplation, nor a simple vegetative reaction[81]. And: since both the copy and the objective world appear only following the interaction with the subject, through his choice and decision – i. e. intentionality to confer meanings. The objectual-ity appears just and only after the awareness of this intentionality (there is no conscience in general, only conscience of something, stated Husserl). Being is just the conscience of intentionality. This is the objectual-ity interesting to philosophy: that which generates the meaning, the intentional object of the intentional feeling.

This understanding was helped by three facets of the crossroad of the 20th century: the Einstein's turning point in physics, Husserl's phenomenology and the avant-garde revolution in painting, all of them highlighting the conscience of the subject-object relations as constructing the world. That the world is objective, is clear: if we put our hand in hot water, we burn it. We no need questions for this, but for understand reality. Objective doesn't mean the direct, the empirical, but simply the outward to man. But as we know, not everything that is outward has meanings for us. In order that a thing/the world have meanings, namely to know that they are in a way or another, we have to know them, namely *to be aware of our interaction with the world*.

At the level of *ontos*, the world is the prime factor in this relationship. But epistemologically, we are the prime factor: we are not only aware of the world, but also we have the conscience of the worth of

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conceptual legatee", in *The Question of Eclecticism*, ed. by J. M. Dillon, A. A. Long, Berkeley, 1988, pp. 145–75.

81 Edgar Morin, (La méthode I) *La nature de la nature* (1977), Paris, Seuil, Points, 1981, p. 307: "The most remarkable and strange characteristics of information can be physically understood only by passing through the idea of *organisation*".

the world, as well as of the worth of our intentionality and meanings conferred by this intentionality. Phenomenology teaches us that man has to be aware of the values of information, and to separate the rationality of the empirical information from the worth giving meanings. Man realises this awareness with the help of ἐποχή (Husserl): the separation of the conscience of intentionality toward meanings from the common cognisance which become habits, from the metaphysical and methodological presuppositions, from the teleological conjectures[82].

Information is thus the sign and form of the subject-object interaction. In other words, information is that thing which arrives to man/the man is aware of according to his intentionality. The world is much more than information, but its meanings cannot be appropriated without information.

III

The ontological significance of information theory and technology

First of all, in this paper what is had in view is *information technology* as a new vector of existence. This new vector generates concretely a new factor of *ontos*, *the artificial information and intelligence* which lead to a new understanding of the wholeness of reality. Consequently, the artificial information and intelligence constitute not only a new factor of *ontos*, but also a new *ontological*, i.e. explaining factor[83]. Since this ontological factor would not exist in its concrete manifestation – as technology enriching reality, generating a new world of information, mediation and approach of existence –, information theory as such would not yet constitute a factor of existence. For this reason, here information theory is not discussed autonomously, but is considered only as subordinated to, or as "a pre-existent instrument" of information technology.

IT keeps attention on the *ontological fragmented view* of man, which has at the same time to outline for him a coherent and unitary world. Thus, IT shows that at the beginning, information is the missing content of man's knowledge: this knowledge/content exists only as a void (a place empty of information). Then information

[82] Here, Bacon has forerun Husserl.

[83] In this respect, the philosophical interpretation of IT I favour is like the philosophy of art and focuses on two problems: *IT in the context of the ontology of the human* and the *specificity of artificial informational objects*.

becomes something particular, demanded by internal and external stimuli. Man then abstracts, chooses and performs information through programmes. The result is the conscious reconstruction of the world through "positive" informational contents: the result of IT is au fond, holism.

The fragmented perspective of man transposed into the logic of IT has two consequences: it makes visible the persistence of things – which through the storage of information and the continuous running of programmes annul our impression about their evanescence[84] – and generates losses, since things which are not comprised into programmes go out from the field of conscience. Thus, this fragmented view does not annul the objectivistic standpoint resulted from the calculation of information: both the calculation and things represented through information are based on/transpose in their functioning implacable laws. The uncertainty itself is inserted in this objectivistic approach: since the uncertainty itself is a law/has a place in the law, is it/has it? And finally, IT emphasises the feed-back subject/man and information/object: they determinate each other in this law-based world[85].

Then, if ontology analyses the ultimate principles of the existence (the Being, in a classical formula), the question is to what extent is/constitutes IT an ultimate principle of existence? We speak about (ultimate) *principle*: because though it is expressed through abstract concepts, it is more than these concepts; and because it has to explain complexity in a unified coherent manner, something more than the subjective standpoints related to historical forms of complexity.

The computer reflects the process of conscience: the brain is the hardware and a part of the conscience is the software.

IT – the construction of computers and the programmes rolling within – simplifies us/shows in a simplified manner both the general process of communication and transmission of information, and the rational side of the human being. IT puts once again the light on the real world the signals show: what does exist in the back/down of the

[84] Indeed, though what we see on the screen of computer is only the multi-mediated "shadow" of real and ideal things, in fact this *what we see* signals us that things nevertheless are. This *what we see* is not "the trace" which could last much after the thing as such has disappeared (like the trace of dead stars), it is the "palpable" sign of existence. More, IT seems to compensate the relativity of things, like literature and art, or even more than these ones.

[85] The problem is – but this is a concern of the philosophy of IT, not of IT as such – to not instrumentalise this relation.

experience transmitted through coherent IT transmission? And how this transmission interferes between the real world and our knowledge? From this viewpoint, IT is an abbreviation of the *phylogeny* of the human rationality and its instrument, knowledge, and the bearer of the constitutive dream of man: his *possibility*. In fact, information technology – as art or science or construction, thus as every ποίησις, every instrumental activity with "technical" know how – reveals the ontological datum of man: that he is the being of the *possible*, an open being.

The phylogeny of the human rationality shows that this rationality was formed at the beginning as: 1) differentiation and specification of things[86]; the understanding of the importance of the *discontinuity* of information, namely the discovering of the discontinuity has meant the formation of abstract concepts; 2) But people have related the abstract (and general) concepts and have them subordinated to the heuristic function of rationality: indeed, the comparisons and metaphors were determined by the need of man to discover and understand new and new facets of reality; 3) Thus rationality means also to discover new concepts: being aware of their necessity and, at the same time, difference between their *genus proximus* and *differentia specifica*.

Information theory and IT describe and carry on the information just from the standpoints of these moments which insist on its *discontinuity*. But these moments form only the A aspect IT focuses on. The B aspect is that of the systems of information, highlighting the *continuity* of information. The C aspect is that of the discovering of the *possibility of n criteria of ordination* of information (in order to answer to the needs of people). This aspect generates the fascinating play of programming and discovering of new and new programmes. The D aspect concerns thus *the choice of information* and its guiding toward and in function of the demands of society: and this aspect too involves programming.

Consequently to all of these challenges, information theory and IT arrive to understand *that there are facets of existence which cannot (yet?) be articulated in an informational manner*: and the most significant such facets belong to man.

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[86] It is worth to remind that "our most primary experience in consciousness actually *is* of an implicate order (AB, of continuity in the whole). And our perception of the explicate order is constituted mostly by a series of abstractions from this... The basic order of the mind is implicate and the explicate arises as a particular case of this implicate order..., David Bohm & B.J. Hiley, *The undivided universe: An ontological interpretation of quantum theory*, London and New York, Routledge, 1993, p. 383.

Because *man is more than a rational being*: this means that inherently the computer will arrive to cover the human complexity. But is this inference possible? Irrespective of the radical affirmative or negative responses (that the computer will develop in the form of a super artificial intelligence (AI), or it will not), if AI could nevertheless develop to a certain degree, it results that near and together with man as the creative subject of the existence, another subject could arise, the AI. Consequently, the treatment of information within information technology transforms this treatment as such in an explaining factor of the world and keeps attention on the subject-object connexions: namely, on both the relative character of the uniqueness of the subject – the subject as such is unique, but its forms could be multiple – and the absolute character of the object, irrespective of its forms.

Simply put, information technology emphasises not only the place of information in the universe, but also the complexity of man (that man is more than information) and how and where this complexity is from.

Man as a challenge for computer

Man is an infinite totality. He thinks the subtlest things, he enjoys that he creates, or he enjoys the creation of (relatively) autonomous worlds from him, just because he creates *as a whole*, not only as his mind but more than his mind. Every cell from the human whole, body and mind, and probably its components, transmits its/their states to the human conscience. This transmission is both the result of their reactions to the environment formed by other cells, or reactions to movement, and the cause, through mediation, of new movements. If a single cell does not transmit the state of plenitude, or balance with its environment, the capacity of conscience to innovate is already altering. Therefore, the functioning of the brain does not involve only its own mechanisms, or differently put, those of the mind, but also the symbiosis with the body and, more, with the historical personality a certain individual is: with its history, reactions, feelings, activities and will, desires and ideals. As a result, "consciousness involves noncomputable ingredients", "the brain isn't exactly a quantum computer"[87].

At its beginning, information technology breaks the act of creation – which is the movement of information only within conscience

[87] Roger Penrose, "Consciousness involves noncomputable ingredients", in John Brockman, *Third Culture: Beyond the Scientific Revolution*, New York, Touchstone, 1996, p. 239.

– from this totality. More, information technology focuses on the reproduction of the mechanisms of the mind, postponing the problem of the conscience of these mechanisms. And information technology develops at this level just because this level as such is very difficult[88], and gives the evolution from the "simple" computer to the "simple" AI.

The second stage – that is obviously concomitant with the development of new standpoints in the conceiving of the hardware, as quantum, bio-artificial... – witnesses the attempt to introduce in computer the wholeness of man (feelings, emotions...). But could be reduced – to what? – the changing totality of signals (not yet digitized) of the body? And could be reduced the changing totality of signals of the human conscience (integrating signals of the body, of mind, of their interference, and all of these in concrete historical environments)?

There are no reasons to conceive of the stopping of research and development of the above-mentioned aspects. Consequently, intelligence as the *other quality in what we call existence* (besides inanimate matter, energy, forces and animate non-intelligent livings, *creative beings*) could double: as man *and* AI. But this doubling is, in principle and as an ideal trend, rather like a prime number/symbol near the original one (x and x′), than an absolutely different entity. The AI could be more efficient than man – like the automata towards the human errors –, and on this basis an entire optimistic representation about the substitution of man by AI and thus the solving of the present insolvable social problems could be conceived of[89], but the novelty, the always moving and creative insight and the emotional origin of decisions and actions that do not reflect only egotistic standpoints but also altruistic and idealistic élans, do not lower man in front of AI[90].

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88 It is composed by n problems linked to the storage, memorizing, finding again and processing of information in complex electronic (microelectronic), magnetic, electro-mechanic, electro-optic technological systems. Thus to the construction of memory units, calculus units, command units, as well as input and output units.

89 Ana Bazac, "Between aspiration and model: the social construct of the future man", *Proceedings of 2011 IEEE International Conference on Grey Systems and Intelligent Services (GSIS), 15th WOSC International Congress on Cybernetics and Systems*, Editor-in-chief Sifeng Liu, CD, Nanjing University, 2011, pp. 932–937.

90 And I think that even the rapid reciprocal compensations of the "fast" and "slow" thinking could be explained through the mediation of different social and individual élans. Or, at least, we should not ignore this aspect when we treat man in front of information.

A methodological moment interpreting information technology

Computers have determined us to not forget that ontology researches the ultimate principles of things not only "directly", but also through the mediation of signs – as symbols. Computers use in their programmes numbers: they "count". I am not interested here to remind that computers are the offspring of the former "calculating machines", but to focus on the digitization of the information data.

In fact, computers aim at transmitting an as possible true description of the objects of the considered reality as it could be. Before the age of computer, there were and people used only descriptions in the natural language but, because of the infinite objects, descriptions, connexions, all this information could be lost and/or arrives to people in a depleted manner. The depleted information is not, in this case, the result of the selection intended by the presumptive beneficiaries of information – and this selection is always a historically and socially framed process, namely a relationship between the providers or controllers of information and, on the other hand, those who demand it – but depends only on the technically poor means to gather, store, and transmit information.

Computers were created in order to erase this low "technical" condition of the control of information. The description of objects was transformed into digits: au fond, did Pythagoras not say that "the principles of mathematics were the principles of all things"[91]?

Digits put in order and simplify the model of transmitting information. In the programmes made by man, they are signs of the symbols/images of the objects. These signs are present only within the programmes: the users of programmes do not see them, but the "real" images of the objects: letters, texts, pictures, formulas. The programme is only the holder and provider of the intended information, i.e. of the signs of the symbols of the objects.

Information technology has again kept attention – after the focus of philosophy and physics – on the dialectics of the *continuous-discontinuous*, on that of *quantity and quality*, as well as on the *dialectics* of the mirroring of the essence of things not as it

[91] Aristotle, *Metaphysics*, 1, 5, also "they (Pythagoreans) supposed the elements of numbers to be the elements of all things", http://classics.mit.edu/Aristotle/metaphysics.1.i.html.

would seem natural to an abstract thinking[92] – from the simple to the complex – but on the contrary, from the complex to the simple.

As we know, in 1900 Max Planck has exposed his demonstration concerning the emission of electromagnetic energy only through the *discrete* form of quanta: the flux of radiation, or energy, being a multiple of a *quantum of action*. This discontinuous structure of energy has changed the classical image of continuity specific to every causal chain. Or, in fact, Planck's discovery has shown – and in the framework of the emergent quantum physics – that the parts and forces of reality exist in a dual, *both continuous and discrete*, form: all particles have a wave nature and all waves have a particle nature. Information technology too, interested in the storage and transmission of information[93], has shown that the flux of information can be expressed, kept and transmitted through the form of digits, of figures expressing inherently the *discontinuous content of continuity*, or the *discontinuous expression of continuity*.

At the same time, the digitization as the means of decomposition and transposition of the richness of information – since it is clear that this richness is had in view by the user, not the intermediary moments of quantification – shows that computer too emphasises the dialectics of quantity and quality. Digitization as a form of quantification is only a means – a *sine qua non* one, as quantification is in many "natural" processes of knowledge – to realise the informational flux necessary to people. These ones are interested about this flux and the different criteria of organising the information: but they know that before these results they are interested about the qualitative representation of existence and knowledge; that's why the criteria of organising information are the technical steps spread and carried on at the level of quantity and with its means. Finally, the quantitative is developed in the historical structural view of knowledge: the structures of causes cannot be understood without "counting". But phenomena (this word in both Kant's and Husserl's meanings) are far larger than the structures highlighted by quantification.

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92 "Who thinks abstractly?" [1807–1808], in Kaufmann, *Hegel: Reinterpretation, Texts and Commentary*, pp. 461–465, http://www.marxists.org/reference/ archive/hegel/works/se/abstract.htm.

93 It's interesting that both in physics and information theory the problem was posed by the flux (light, information), thus by the emission and transmission of energy.

As regards as to the understanding of the principles of existence, information technology too – after philosophy and physics[94] – has kept attention on the fundamental place of information as a brick of universe: as the problems of thermodynamic equilibrium were not solved in nature, but in a machine (Carnot's engine), as the functions, constitution and mechanisms of information were scientifically discovered not in nature, but in a technological device. The artificial/cultural system – later than nature or a fragment of nature, and more complex than nature/more complex in a specific way might better explain the historically primordial one – since the machine abbreviates and condenses the natural processes. Just like Hegel has thought that the general concept is only a moment in the grasping of the primeval concrete totality, but without which this grasping cannot proceed[95]: we understand the concrete totality only after a historical approach with inherently historical, limited concepts/generalisations, and only through experience; and since the most developed forms of experience – as art and science – are the most able to transcend the historical generalisations through which man always thought to come nearer to the whole (and the truth cannot be but the whole)[96], it results that just these experiences can better shine the origin and the whole. Or just like in Marx, where the latter and complex society, the capitalist system, can better clarify a social relation and concept, since this relation is the more developed here and exposes in a simpler and clearer manner the interests and limits of its bearers, than in former societies, where they are veiled by secondary, but more visible relations[97].

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[94] See Sadi Carnot's demonstration (1823, developed later on) concerning the relations between movement and balance in an engine.

[95] G.W.F. Hegel, *Encyclopaedia of the Philosophical Sciences* Part III, The Philosophy of Spirit (1817), Preliminary Concepts, esp. § 301 and 304, http://www.marxists.org/reference/archive/hegel/works/sp/ssintrod.htm.

[96] G.W.F. Hegel, *System of Science*, *First Part. The Phenomenology of Spirit*, Bamberg and Würzburg, Joseph Anton Goebhardt, 1807 (bilingual edition, 2008, http://ebookbrowse.com/hegel-phenomenology-of-spirit-bilingual-pdf-d294033134).

[97] Karl Marx, *Outline of the Critique of Political Economy* (*Grundrisse*) (1857), 1. 1., http://www.marxists.org/archive/marx/works/1857/grundrisse/ch01.htm#3. ("This very simple category, then, makes a historic appearance in its full intensity only in the most developed conditions of society. By no means does it wade its way through all economic relations"... "Thus, although the simpler category may have existed historically before the more concrete one, it can achieve its full (intensive and extensive) development precisely in a combined form of society, while the more concrete category was more fully developed in a less developed form of society"... "Labour seems a quite simple category. The conception of labour in this general form – as

Therefore, first people use concepts, general and abstract (which doesn't mean that all people necessarily think in an abstract manner), and the use of *which concepts* of all the concepts we know – or the content we favour – constitute a first epistemological concern related

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labour as such – is also immeasurably old. Nevertheless, when it is economically conceived in this simplicity, 'labour' is as modern a category as are the relations which create this simple abstraction"... The simplest abstraction, then,... nevertheless achieves practical truth as an abstraction only as a category of the most modern society."... "This example of labour shows strikingly how even the most abstract categories, despite their validity – precisely because of their abstractness – for all epochs, are nevertheless, in the specific character of this abstraction, themselves likewise a product of historic relations, and possess their full validity only for and within these relations"..."Bourgeois society is the most developed and the most complex historic organization of production. The categories which express its relations, the comprehension of its structure, thereby also allows insights into the structure and the relations of production of all the vanished social formations out of whose ruins and elements it built itself up, whose partly still unconquered remnants are carried along within it, whose mere nuances have developed explicit significance within it, etc. Human anatomy contains a key to the anatomy of the ape"... "But not at all in the manner of those economists who smudge over *all* historical differences and see bourgeois relations in all forms of society"... "The so-called historical presentation of development is founded, as a rule, on the fact that the latest form regards the previous ones as steps leading up to itself, and, since it is only rarely and only under quite specific conditions able to criticize itself – leaving aside, of course, the historical periods which appear to themselves as times of decadence – it always conceives them one-sidedly"... But "In so far as the bourgeois economy did not mythologically identify itself altogether with the past, its critique of the previous economies, notably of feudalism, with which it was still engaged in direct struggle, resembled the critique which Christianity leveled against paganism, or also that of Protestantism against Catholicism"... "It would therefore be unfeasible and wrong to let the economic categories follow one another in the same sequence as that in which they were historically decisive. Their sequence is determined, rather, by their relation to one another in modern bourgeois society, which is precisely the opposite of that which seems to be their natural order or which corresponds to historical development. The point is not the historic position of the economic relations in the succession of different forms of society. Even less is it their sequence 'in the idea' (Proudhon) (a muddy notion of historic movement). Rather, their order within modern bourgeois society"... "the purity (abstract specificity) in which the trading peoples – Phoenicians, Carthaginians – appear in the old world is determined precisely by the predominance of the agricultural peoples. Capital, as trading-capital or as money-capital, appears in this abstraction precisely where capital is not yet the predominant element of societies. Lombards, Jews take up the same position towards the agricultural societies of the Middle Ages"... "divergent positions which the same category can occupy in different social stages".
I made a so abundant quote in order to highlight the methodological valence of Marx's theory.

to the analysis of problems. Another concern is linked to the ability of people to articulate, or to carry on verbally logical reasoning. A later moment is that of the formulas toward which the reasoning arrives; these ones are, like the concepts as such, abbreviations that include the explaining process until them; but to discuss only in formulas: it's a jargon that separates people from the richness and concreteness of information. This is the reason of aiming at transmitting through information technology this concreteness and richness. Information technology has in its *arrière plan* the calculation – since we cannot directly observe the informational functions – and the mathematical expression and reduction of the real information. But people using computers are not related to this *arrière plan*: they grasp just the richness and concreteness of information, the coloured *form* of things, and neither the phenomenal qualities grasped through sensations (which give us fragments of reality, points, colour, parts), as has emphasised Ernst Mach in his 1886's *Analysis of Sensations*[98], nor the digits transposing those phenomenal qualities.

But even though the users believe/assume the fiction that the coloured form of things is the real existence, in fact it is not. This form is only an image. What does it lain in the background of this image? Would it be "the essence of things"? No: since this essence itself is real only through the measurement and experiment of the observer, as the quantum mechanics shows or as Berkeley has considered the essence or reality of physical bodies as being only their appearance[99]. However, although through the world given us by IT, people tend to live, together with Berkeley and Mach, within this world of "thought-symbols" for a reality where "the ultimate elements"[100] are colours, sounds etc. as if they would not so much reflect the real existence, but more, as if they would substitute it: in fact, the discontinuous information which gives the continuous appearance of the world pushes us to be *more aware* of the coexistence of *5 worlds* within which man manages to both understand more than the appearance and to create. These are: a) the *empirical* world, b) the world of *sensations/elements* in Mach's meaning, c) the *virtual* world given by information technology, d) the world of *common*

[98] Ernst Mach, *The Analysis of Sensations*, 1886, http://www.marxists.org/reference/subject/philosophy/works/ge/mach.htm.

[99] K. R. Popper, "A Note on Berkeley as precursor of Mach and Einstein" (1953) in K. R. Popper, *Conjectures and Refutations: The Growth of Scientific Knowledge* (1963), London, Routledge, 2002, pp. 224–236; here, 227 and 233–234.

[100] Mach, *ibidem*.

cultural concepts and ideas about the existence, and the e) *scientific and philosophical concepts and theories, including information, matter* etc[101]. With the help of IT, people do no longer tend to remain at the level of Berkeley-Mach, nor at the level of Plato's "real" world of ideas, and nor at the level of vulgar empiricism. Briefly, information technology – though it could be used in a way that estranges man from con-science, from understanding and action – helps him to no longer consider existence unilaterally.

Information technology as watchman and the human conscience as shepherd[102] of knowledge and existence

Are the elements of the digitalized information technology conscious of the programme they are parts of? Could a digit – 0 or 1 – finally understand at least the model of its/their presence and frequency, if not the significances had in view by this model?[103] Certainly, it/they could not. A digit, or sign acting together with other signs as signal for the symbol/image of a thing, is not analogous with a cell in an organism, thus *it is not an ultimate unit*. In fact, though the cell is connected to other ones and to the whole organism – i.e. it signals its states and receives the signals of the other cells and of the organism, and then it modifies its state and so on –, consequently, though there is a transmission process involving information, it is not about conscience or a conscious process. And since not even the ultimate unit of the organism can be conscious of its informational processes, we cannot expect from a sign to be.

[101] This last world reminds us the creative function of science and philosophy in such a way as to shape even the manners of scientists and philosophers to perceive the objects they inquiry: the existent influential patterns of science and philosophy form the framework within which scientists and philosophers develop their research intending to go deeper in the understanding of the world. See Norwood Russell Hanson, *Patterns of Discovery: An Inquiry into the Conceptual Foundations of Science* (1958), Cambridge, Cambridge University Press, 1972, and Thomas S. Kuhn, *The Structure of Scientific Revolutions* (1962), Chicago and London, University of Chicago Press, 1996.

[102] I am indebted to my colleague associate professor of mathematics, dr. Cătălin Ioniţă, for his suggestion regarding the connection between the words *guard* and *shepherd* in Romanian. I myself analysed their etymology and found some significances emphasised in the following.

[103] The problem was posed in a s-f sketch I read many years ago. Unfortunately, I don't remember its author or title, but the problem seemed to me very interesting, just because it was a demonstration of the impossibility of the parts – be they digits or even sparks of information – to understand the 'logic" of the whole (process/programme).

But, pay attention: the digit is the sign of a spark or impulse in an informational flux: do these sparks or impulses not compose the informational process? They obviously do, but not all the informational processes, even those from the profoundness of the material world, involve the conscience of their purposes and mechanism. In this respect, I think we should be more sceptical in front of some conclusions of Mihai Drăgănescu who spoke about a state of *infra-conscience* – which still belongs to something as a conscience – or/and a possible *fundamental conscience of the existence*[104] as correspondent to the ortho-meanings: to put it in a simpler mood, according to Mihai Drăgănescu the information process as the origin of the world would involve a certain conscious aspect even from this origin.

I think this is not the case. Indeed, we have: 1) to not consider the conjectural moment of thinking as being tantamount with that of (scientific) certainty; Mihai Drăgănescu was related to the first; 2) to not forget the results of the entire school of evolutionary biology[105], which demonstrate not only that conscience appears at a certain superior level of evolution, but also that *a superior property* (conscience) *cannot be reduced to the previous properties*: there are subatomic particles, atoms, molecules, cells, organs, organisms, and information circulates from the lowest/most fundamental level on, but this circulation explains only the constitution of conscience, not conscience as such; we cannot explain conscience as if it would be tantamount with the flux of information between subatomic particles etc. and that in the last analysis this flux would be equal with conscience; and 3) we have to better understand the specific of the human conscience.

Indeed, what is conscience? It is, first and foremost, *reflection and self-reflection*. It is, obviously, con-science, thus science about something. It is, at the same time, a collective awareness, since without this collective sharing of information there is neither language of communication nor significant information, able to relate the individual animals and to push them to self-awareness and control.

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[104] Mihai Drăgănescu, *Conştiinţa fundamentală a existenţei*, http://www.racai.ro/~dragam/CONSTF_1.HTM [The fundamental conscience of the world].

[105] See the contributions of George C. Williams, Stephen Jay Gould, Richard Dawkins, Brian Goodwin, Niles Eldredge, Martin Minsky, Daniel Dennett, Stephen Pinker in John Brockman, *Third Culture: Beyond the Scientific Revolution*, New York, Touchstone, 1996

But what does it mean to have science about something? This science about something is the structural level of information. It can be taken over and provided by computers. As a store of this science, computer corresponds to the structural knowledge: of that which is articulated/articulable.

But does science/structural information reflect the real state of the *system world* and of the *system man*? In these worlds, but rather in the second, there are not only the unknown, and the not yet known, but also the permanent un-articulable[106] (feelings, élans, the joy of life, the sentiment of good and evil, a regard, a grimace, an implicature etc.).Their understanding, taking over and processing is realised by conscience: in this sense, *conscience means also the "non-computable"*.

The human interpretation of science/knowledge takes place through the collective "language games" (as Wittgenstein called them) and thus man may interpret the articulable and non-articulable reality. The main operations realised by computer correspond only to the structural information, more generally to the science of the articulable. In this sense, computer is a *guard/watchman* of knowledge/science/(articulable) information. It is a very important function, because the guard of knowledge lights the memory and access to information. Computer works on the basis of a structured mathematical knowledge. Mathematics provides precision. But the interpretation of precise information is more complex than an added/multiplied precision. On the contrary, imprecision arises.

We are conscious of this imprecision because we are conscious beings. More, the calculus concerns only the knowledge of fragmentary phenomena and processes. The infinite multiplication of calculus by a computer does not erase the fundamental non-determination, or *lack of a unique and universal telos*. Since "we have rules to express correctly the programs, not to construct programs"[107], we know that conscience outside the computer is much larger and deeper: just in order to dream, create[108] and live outside the computer. Consequently, the human conscience is more than a watchman of knowledge: it is the *shepherd* of both knowledge and existence.

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[106] But it is not necessarily inexpressible.

[107] Gheorghe Ștefan, "The Phenomenal Becoming as the Deep Information's Interpretation", *Noesis*, no. XXV, 2000, http://arh.pub.ro/gstefan/DII.pdf.

[108] See for example Cristina Vănoagă Pop, "The E-researcher", *Caietele Echinox*, 20, 2011, Literature in the Digital Age, http://phantasma.ro/wp/?p=617.

Programmes help us to understand and create theories – which are windows through which man contemplates (Sloterdijk) – concepts and new arrangements of concepts: all of these helping to discover the meaning of being. But we must not confuse the instruments – programmes, hardware, the entire conception about the computer manipulating information – with the shepherd who is their master.

There is a kind of similarity or overlapping between the word guard/watchman and that of shepherd. Both signify the *care* for those had in view: in Sanskrit, watchman is *rakSaka/rakSAbhaTa/rakSin/ArakSaka/ArakSika/rakSApuruSa*, while care is *rakSA*; and even, sometimes, the watchman is a shepherd: *sthAnapAla* – *ajapAla* and the words with *Sa* and *ala* (for watchman) and *meSapAla* for shepherd; or the core of the activity of the shepherd is the care: *meSapAla*, *avipAla* and *vRSNipAla* for shepherd, and *pAlana* for care.

More: both, but the watchman does it more, *protect*: *rakSaNa* – protection; however, what does protection mean? It means to keep the protected entity in his/her limits. A guard protects. But a shepherd is more than a guard: he is the master of the flock, namely he can change the world of the subordinated beings, he can force them multiply etc.

The Greek has kept and shows the roots: βοσκός means not only shepherd, but also to lead to pasture (from βόσις, feed, and βόσκώ, to feed animals), and thus in Latin *pastor, oris*, already meant not only shepherd, but king, monarch. The watchman is not a monarch: he could be a shielding guardian – *curator*, *custos*, *susceptor* –, but only in determinate circumstances and concerning a specific social-temporal framework; from *suscipio, ere, epi, eptum* (to support, to care of) the noun *tutela, ae* could mean also a master who protects.

Indeed, a shepherd is more responsible than a watchman. And if a tool like the computer can care of the information through programmes which forbid its oblivion and organise it in order to better use it, this tool is like a *guard* of the knowledge always arising from man. Man with his conscience is the *shepherd* of every science – and thus of existence as such (see Heidegger's man as the shepherd of the Being[109]) –: and he cannot be dethroned by AI, which is no more than a tool with a (relatively) autonomous life.

[109] Martin Heidegger, "Letter on Humanism" (1947). In *Pathmarks*. Edited by William McNeill. 233–276. Cambridge, Cambridge University Press, 1998, p. 252.
Or: the known religious reference to God as shepherd (see Psalm 23 to David, *Lord is my shepherd*).

In principle, it's possible that computer arrives to become a shepherd: but as long as this not happens, AI does not dethrone man[110]. Obviously, the computer is no more conceivable as a tool – prolonging man's organs and parts[111] –, since it has the ability to create knowledge (and thus tools). But as technology – namely, related to man's rational ability (*logos*) and creative ability leading to the autonomy of his instruments –, the computer reflects the social-historical conditions, including the social and political relations, within which man thinks, decides and creates: and as long as these conditions determine that man create technologies with uncontrollable effects, it results that these technologies could not be seen as representing a shepherd. Moreover, *nor such a man could be a shepherd*. However, as long as the computer did not yet develop as a full AI – as *another conscious being* – and man is that who has conscience, able to choose and change the present trend of suicide, he still is/could be seen as a shepherd.

IT continues and develops the choice and intervention into being made by the human mind. It manipulates the re-presentations presenting the original intentions and things. By manipulating signs, IT creates a world that gives significances to "man's experience as not yet clear to him"[112]. A computer that casts symbols and casts them up does so because they constitute a medium for knowledge, for the "world 3" of Popper.

Would this medium be only full of light, of clearness? As fragmented – as existing in specific programmes – or rather as fragments of castings up, they are clear enough. As a whole symbolic world – that in fact does not exist –, it obviously contains shady parts: as the entire "man-made" world of cognisance and culture.

Therefore, if "man is the measure of all things" (Protagoras), he has to measure his own choices and reason. Information technology can, obviously, help him to understand and accumulate more human significances of existence and information: to arrive at a human life full of meaning, to a subjectivation related to the meanings of life, and not to the manipulation of objects. Information technology has two

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[110] But both man and IT have dethroned God from its role of shepherd of being. God appears now as the *perfect metaphor* for all the states of man.

[111] See Michael Chazan, *Locating Gesture: Leroi-Gourhan among the Cyborgs*, http://www.semioticon.com/virtuals/Locating%20Gesture.pdf.

[112] *Samuel Todes,* "Part II. Shadows in Knowledge: Plato's Misunderstanding of and Shadows, of Knowledge as Shadow-Free", in *Dialogues in Phenomenology,* Eds. Don Ihde, and Richard M. Zaner, Den Haag, Martinus Nijhoff, 1975, p. 113.

origins of its transformation from a state characterised by positivism (like sciences in their period of fragmentation), a state that reduces man to a receiver of information, unaware about his manipulation as an object: one is the logic of scientific research (in IT, but not only) and the other is the social conscience developed concomitantly with a transformation of the social relations which nowadays lead to the present blind alley. In this process, the counting, the digitization, is certainly only a means.

Instead of conclusions

Ontology as research of the principles of the world is related to the historical relationship of man with this world. In the present paper, ontology was illustrated in a pre-Socratic key inquiring the being, thus *from the object to the subject*. This key was appropriated by Mihai Drăgănescu, as if the meanings of the world could exist besides man. In its turn, Heidegger – interested in elucidating the pre-Socratic inquiry of the Being – was forced to understand that the meanings of the world cannot exist without man. Being is in function of *Dasein*. Besides him, the objective world exists obviously. But: not the *meanings* of this world, or the world as it presents itself in front of man. Heidegger's view is important in order to not absolutize the object or to not depart from it to man: the meanings of the world exist only if we depart from the latter creation of the world, man.

This is the reason of the intertwining of ontology and epistemology: which both suppose a historical and sociological approach. In this perspective, man, God, information and so on are historical objects/concepts of the historical man. Any oblivion of this fact generates objectivism, be it materialistic or theistic: i.e., a conception about the natural and implacable determinism that transforms even the subject into a toy of the blind natural laws. The rejection of objectivism does not lead to subjectivism and relativism annulling the objective ground of existence: it simply shows that the understanding of the meanings of existence passes through man. At the level of *ontos* – and obviously as an epistemological assumption – the world is objective, it exists before and independent of man. But an assumption is only an assumption: it doesn't explain the process had in view/the world as such[113].

[113] And it's interesting that this objectivistic standpoint leave unsolved both the problems of the deep constitution of the objective world and of the specific of man (his freedom etc.). On the contrary, man becomes in the objectivistic

In the objectivistic approach, man is only a spectator of existence, possibly a guard, but not a shepherd: not responsible of the meanings of the whole. (That's why Badiou supplied only a meta-ontological discourse). And this is the reason of the "superiority" of the philosophical analysis of IT: it starts from and takes place within the line of Heidegger.

The computer is an abbreviation of the phylogeny of the human rationality. It shows not only that information is an explanatory factor of existence, but also that the *human treatment of information (IT) is such a factor*: or that existence as such depends upon this treatment. But this means that IT resumes on a different plan the philosophical analysis: that ontology is impossible without epistemology, and that ontology is impossible without the ontology of the human. We arrive to information as a brick of the ground of existence through the agency of the human information, of the human knowledge. This knowledge – more, the human being in its entirety – reveals as a mirror the real *ontos* and, at the same time, its limits. *The limit is the conscience of existence*. The processing of information through IT helps us to understand the historical limits of this conscience.

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approach a doubly-blind determined object: by the natural laws and by the "invisible hand" of an un-historically conceived society. Obviously, man as a subject is at the same time his own object: but this dialectics has to be known and should not be reduced to one aspect or another.

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