BIOCOSMOLOGICAL DEFINITION OF INFORMATION AND ITS NATURALIST CAUSATIVE SIGNIFICANCE, APPROACHING TO EVOLVE THE WORLD INFORMATION UNIVERSITY (WIU)

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Abstract. In this paper, in the context of their preceding explorations [Klimek 1981–2018; Khroutski 2001–2017], the authors use and unite their groundworks in the perspective of advancing the bases for evolving the contemporary Integralist approaches in scientific pursuits, firstly focusing at the Information³ foundations of scholarly endeavors. Realizing their efforts, substantially, authors apply the general Triadological approach (that is basic for the Biocosmological Association) – for achieving the objectives of research, finally aiming at the formulation of the basic tenets of the World Information University (WIU)-activities, which is the global, newly launched and under evolvement institution of Integralist knowledge.

Keywords: Information medicine; carcinogenesis; definition of Information; Information cause, Organicism; the Aristotelian OrganonKosmology; Naturalist aetiological causes; resonance cause; Integralist science; Triadological approach; Biocosmology; Aristotle 5.0; Russian organicism; ‘cosmological insufficiency’

Резюме. В этой статье, в контексте своих предыдущих исследований [Klimek 1981–2018; Khroutski 2001–2017], авторы стремятся использовать и объединить все свои наработки и достижения в перспективе продвижения оснований для развития современных Интегралистских подходов в научных исследованиях, в первую очередь, сосредотачиваясь на Информационных основах научных исследований. В реализации своих усилий, существенным образом, авторы применяют общий Триадологический подход (который является основным для Биокосмологической ассоциации) – для достижения целей исследований, в конечном итоге направленных на формулирование основных принципов деятельности Всемирного Информационного Университета (ВИУ), который является глобальным, недавно запущенным и развивающимся институтом Интегралистских знаний.

Ключевые слова: Информационная медицина; канцерогенез; определение Информации; Информационная причина, Органицизм; Аристотелевская Органон-Космология; Натуралистские этиологические причины; резонансная причина; Интегралистская наука; Триадологический подход; Биocosmology; Аристотель 5,0; Русский организм; ‘космологическая недостаточность’

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Заключение

Introduction

The issues of Information medicine were central at the congress “Biocosmology and cancer” held jointly with the 14ISBC, in Krakow, in July 2017 – the scientific event that brought about serious achievements and large-scale recommendations for the scholars engaged in the contemporary Organicist and Integralist research. This paper definitely deals with developing the ambitious targets and aims at giving proper impetus to the mainstreaming of sound objectives that were generated at the Krakow Congress. As a cornerstone in their research strategy, the authors have carried out the concrete definitions of their key notions: of Information; of Information cause, together with other Naturalist causes, including the ‘resonance cause’; of Information rays; etc.

In general, authors base their exploration on the Triadological (Biocosmological) approach to realizing the contemporary (of the 21st century) scientific pursuits, that is the recognition and equal pari-passu use of all the Three types of rationality and scientific activities: the currently dominating (or dictating) Dualist “scientific method”; but equally with other Two Types – the cosmologies and methodologies of the Organicist (neo-Aristotelian) and Integralist (Information) scholarly endeavors. In kind, the study emphasizes the need to rehabilitate and recognize the authentic significance of the Aristotelian archetype of OrganonKosmology as the essential matrix (and ‘the conceptual language’) for all the scientific men who is engaged in the contemporary Organicist and Integralist scholarly endeavors. Authors strongly believe that without this matrix and language (for the scholars’ common co-operation and mutual understanding) – the further
successful evolvement of culture (and progress of science) is hardly possible. In this way, as a possible contribution and effective means – the Invitation for scholarly participation in evolving the World Information University is realized.

*Human right: Out of sight, far from heart.*

1. FROM HIGG’S BOSON TO THE MEDICAL ASPECTS OF VERBAL HUMAN WORLD

Modern philosophy of being promotes the information implantation into medicine so that everyone could understand the primary significance of own personal life style in the formation of social health along with importance of caring about the environment inhabited by people. Medicine is the most important human domain dealing with theoretical principles how to protect or restore personal health and simultaneously putting them into practice. In this line, the essential challenge is how to recognize the meaning of the discovery of natural thermodynamic cause of cancer and infertility or prevention and psycho-neuroendocrine therapy of diseases, caused by the baneful socially information. According to old Eastern medicine the perfect health is a balance between body, mind, spirit, and social wellbeing. Presently medicine uses both meanings of information, i.e. belonging to animate matter and energy as well also existing as spirit and social wellbeing. Now over 30% caesarean deliveries are simply performed only due to maternal request (information) without medical indications, what incurred several risks not only for the baby, but also are related to appearance of cervical cancer of mothers [Klimek, 2018].

Every person, fulfilling himself in social life with other people, is created through the unification of generative cells of his/her parents as a unique single cell (zygote) to uphold the species. The reproductive cells of the grandparents influence the unique identity of the parents and in turn also of their grandchildren. First of all a single zygote defines the unique identity of each person, whose life is determined by own free will and even neoplasms. Oppositely, the development of the first neoplastic cell only extends the cellular form of life without the possibility of autonomous existence. Fetal cells are genetically heterologous to the mother; nevertheless they are tolerated thanks to mental, physical, biochemical, hormonal and immunological tolerance, whose potential avoidance contributes to the spontaneous initiation of child delivery. Before such true tolerance disappears, a caesarean section performed on request a week or more before the true delivery term often results in transfer of pregnancy cells (fetal or placental) outside the reproductive organ (not only to the postoperative skin wound), with other pathological consequences including carcinogenesis. Cesarean section (CS) performed before the natural onset of labor is associated with the significance of a reduced birth-related surge in lymphocyte formation for future immune function and health, because with increased risks of immune disorders.

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Scientists’ form Karolinska Institute tested whether the immune function at birth relates to mode of delivery. They linked the blood levels of T-cell receptor excision circles and k-deleting recombination excision circles with the mode of delivery, infant sex, gestational age, birth weight for gestational age and maternal characteristics (age, parity, BIM, smoking, diabetes and hypertensive disease). Compared with vaginal delivery, cesarean delivery (CS) delivery is associated with increased risk of immune disorders later in life, such as asthma and allergies, diabetes, celiac disease and inflammatory bowel diseases, obesity, immune deficiencies, leukemia, and other malignancies affecting young people. Possible pathways for their associations include lower and timely activation of fetal immune system due to absence of labor with reduced stress of being born, and altered bacterial colonization of the infant gut after CS. As elective cesarean delivery is almost exclusively performed before term gestation, lower gestational age has also been suggested to be in the causal pathway between CS and childhood and adult immune diseases. They found differential DNA-methylation related to mode of delivery in regions of genes involved in immunoglobulin synthesis. After the birth, the rate of stem cell differentiation peaks gradually declines. Cesarean section delivery without a clear medical indication has to be modified most rapidly, because of reducing number of T- and B-lymphocytes in newborn infant.

1.1. Sight, light and right – the conception of Information rays, resulting from the interchange and synthesis of Wroclaw Witelo’s and Albert Einstein’s historic breakthroughs

Each human word is the informational part of individual person who is quantum of human verbal world and may describe mathematically all phases or states of matter. Information rays fill all space (known e.g. as Higgs’s field) that allowed them to pass through it without obstacles and interact with matter and energy, but only in extreme cold (close to absolute zero) quantum physics suddenly becomes visible when all moving cosmic particles cease. The universe as the unity of all its parts (beings) is a self-realizing information with the principle of equivalence of mass, energy and information, mathematically expressed as an informational resonance feedback formula $E = mc^2$ [Klimek, 2014]. Matter and energy are just two aspects of the threefold informational essence of the reality, and because of this fact information as the perfect idea counts as more important than either of them. Mass is just super concentrated form of energy and both entities can turn from one form to the other and back again owing to information activity and pattern field, what only man can describe using his senses and knowledge. He himself is composed of the same

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elementary cosmic particles, but wrongly man realized that by looking in the mirror he perceived his form as material things or by changing their shape as appearance of related their energy (Fig. 1). However the mirror image does not contain a single human atom, because it is only the locally resonating information space (field) with the information rays coming from the personal real atoms [Klimek, 2016]. The mirror image (informgraph) is a local result of resonance of information field on human bidirectional information rays, which now we can see and even photography! Early only the effects of electromagnetic radiation have long been known, recently the gravitational radiation has been discovered and new types of neutrinos and Higgs particles have been demonstrated.

A. Einstein was awarded the Nobel Prize for postulating the existence of photons in the form of particles, but this did not stop the dispute about their double molecular-wave nature. Photon is a quantum of electromagnetic field and like any electromagnetic wave the light ray is a stream of photons and a beam of light covers all informational space available. The moment of its launch de facto coincides with the moment of reaching the destination, because for the photon the time flows with infinite speed as it moves between any points from which the initial instant lies on the end. That is why I previously recognized the speed of thought as exceeding the speed

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of light, while recollecting some personally known spaces. Importantly human sight accepts the bidirectional information rays coming from visible object (in case of black hole in their essential form) as ability to see often briefly and sometimes with emphasis familiar with everybody [Klimek, 2015].

Information as the elementary part of nature has its own fundamental laws which are based on its own primary parameters by analogy to physical ones. Information acts on matter and energy by means of determination of the range of their possible reactions to develop into functionally complete being which embraces the future potency of the each and every cosmic system. It is a medium that functions to organize, accommodate, and affect all of the elements and forces of nature, formed prior to matter and energy as antecedent estate [Challenging Integralism, 2017]. Like ancient ether information has no qualities (e.g. is not either hot, could, net or dry) and incapable of change with exception of change of place by its natural move in circles, and has no contrary or unnatural motion. It is weightless, transparent, frictionless, and undetectable chemically or physically, and literally permeating all matter and space. It is more like a piece of windows glass that ideal Newtonian emptiness, nevertheless as real constant and universal now even can be seen as informational picture (informgraph).

Already in the thirteenth century the Polish canon and physician of Wroclaw Witelo conducted observations, described in his „The mathematician and scientist Witelo about optic, i.e. about the essence, the cause and the projection of the rays of sight, of light, of color and of form, commonly known as Perspective, ten books” [10]. He investigated the rectilinear propagation, reflection and diffusion of sight and light as well as meteorological phenomena, being interested in the mechanics of the action of the eye and the subconscious functions of the mind. He claimed that the eye received no information other than sight, light, color and form from angular size. His work “Perspective” was printed in 1535 in Nuremberg and also in 1572 in Basel. He recognizes sight, hearing, smell, taste and touch as external senses of soul, and the imagination, fantasy, judgment, and memory as internal senses. According to Aristotle, the image does not appear in the eye, but in the viewer and Witelo supplemented him with a judgment of visible form, whose size depends on the angle of view and coordinates the movement of eyeball as a power of sensual distinction and memory by seeing and fixing individual forms that are comparable in every case.

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10 Vitellionis Mathematicii Doctissimi Peri Optikis id est de natura, ratione et proiectione radiorum visus, luminum, colorum atque formarum quam vulgo Perspectivam vocant Libri X, written in 1270–1273.
The observable universe is composed almost entirely of ordinary matter, as opposed to an equal mixture of matter and antimatter. Particles of matter and antimatter are the same, except for an opposite electric charge and bring them together annihilates. For example S. Hawking showed that black holes can radiate energy as at the same time particles are created in their vicinity, then cosmologists have recorded the gravitational waves emanating from black holes, which created a region of gravity so intense that not even light can escape its grasp. The asymmetry of matter and antimatter in the visible universe becomes now theoretically solved by the equation of mass-information-energy quantum equivalence \( E = mc^2 \), since the amount of the released energy is usually proportional to the total mass of the collided matter and antimatter [Klimek & Szkutnik, 2018].

The observable beings refer to the capability to detect not only light, but first of all the information rays coming from any object. We are to recognize the reality (of) and do need the conception (proposed by Rudolf Klimek) of information rays that can move in any direction not being restricted by the speed or barriers what e.g. happens with light or language. Language creates the informational basis for individual and social human life, although it is difficult to bring someone into permanent state to exert a decisive influence on him or her, or create a world that exists by virtue of being spoken [Bremer & Klimek, 2017]. One of the evidence is the fact that myths of all countries have a lot in common which unifies people with transcendent beings, and the understanding of cosmos and the earth as living entities of high complexity. Mathematicians have used their advanced methods to study unusual phases or states of matter in ordinary three-dimensional materials, in which quantum effects are often hidden by random particle movements. For example Smoluchowski-Einstein's equation of diffusion coefficient \( D = \lambda^2 / 2t \) (a distance \( \lambda \) that a particle can jump when diffusing in a time \( t \)) gives a connection between microscopic and macroscopic world of its particles.

Alas, A. Einstein in his theory of relativity disproved the ether known as the fifth element to air, earth, fire and water of antique universe, once thought to fill all space and allow waves to pass through it and interact with matter and energy. The equation \( E = mc^2 \) was related only to two of the three constant cosmic parts, which now man can directly observed. Presently it is possible to notify existence of information and why its appearance, e.g. conscience is the part of man that judges how moral his/her own actions are and makes feel guilty about thinks that have be done or only that feel responsible for them. Philosophy of being enables the verification not only the unity of micro- and macro-cosmos, but first of all the existence of human transcendental verbal world (ideas) in accordance with the principle of quantum equivalence of mass, energy and information expressed as an informational resonance feedback: input = ioutput. For example, it is most astonishing that people, during the acts of interrelations, have the outlet of emotions, like that of friendship or love, or hate.

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1.2. The autoteleological principle of the Information medicine

From the long ancient time the man was understood as the abstract soul and the real matter-energy body of a person, who, through words, can express his psycho-emotional state. Always truth as an informational event resonates with human conscience, which is linked with self-evaluation of personal achievements and motivation for performing them. What more, R. Tadeusiewicz developed a method of the abstract modeling of reality, based on the development of an imaginary (information) model of reality, subsequently testing it in practice [Tadeusiewicz, 2015]13. Through such model, and not only through theoretical considerations, truth can be defined as the existence of each event in a quantum state.

Man, as an individual unit of society, through his life and work with own free will defines his relationship to truth and good not only through action, but also through inaction in relation to his environment on the level of an informational coexistence. For the too longest time thinking was attributed to the brain, as if this part of the body could function without the circulation of blood or breathing. The same atoms make up the heart, the lungs, and the brain, but in nuclear magnetic resonance imaging they all resonate depending on their surroundings and the internal whole person's psycho-emotional state, taking even gender into account [Klimek, Lauterbur and Mendonca-Dias, 1981]14. This became possible due to defining life itself as a spontaneous interchange of the matter, information and energy of elementary cosmic particles. The word “spontaneity” in this definition functions as a variable in mathematical and physics equations, or in unknowns awaiting further explanation.

The part of any system which multiplied fits completely into the whole system – is called a quantum, for example a gram is a quantum of a ton and second – of an hour. The smallest unit of information is a qubit, which is used to determine the maturity of the fetus to the independent life and in women to monitor the pregnancy. Medical quantization scale of examined parameters is set on macro level in such a way as to make them multiples of a selected technical quantum. At the atomic level each subsequent new quantum of fetal maturity appears at a particular time which is inseparable from maturing fetal structures and functions. Accordingly to the quickness of appearance of the consecutive quanta some fetuses are already mature at 370/7 postmenstrual week of gestation while the other ones have to mature until 432/7 weeks. The fetal maturity level can be evaluated not only immediately after labor through obligatory assessment of just six of child features (position of the limbs, elbow angle, its mobility, breast nipple, plantar creases and lanugo), but using technical imaging (USG, MRI) also beyond the 26th week of single as well as

multifetal pregnancy. For each of those features one can allocate from 0 to 2 points, which maximally gives 12 technical points (quanta) of full fetal maturity, see Fig.2.

Fig. 2. Newborn with maturity index =12 points

In social human life truth, love and responsibility are some of the most fundamental properties of reliable information. Fortunately the twenty-first century started with the domination of information, which turns the focus upon the meaning of the moral-ethic dimension of humanity. Now the most efficient prevention of carcinogenesis and infertility is proper upbringing and education of every person to live and work according to her/his autoteleological principle of compatibility between deeds and socially acceptable human values. For example, premature delivery, pathological course of pregnancy, numerous pathogenic bacteria and viruses, contraceptive pills, etc. – cannot be treated as the only factors sufficient for neogenesis. Their total elimination, even as necessary factors, may only lower incidence of cancers or infertility, since a much greater pathological influence is exerted by factors lowering the human repairing and protective mechanisms of the whole human being, e.g. low economic and social status, improper diet, or even only by using the image of cancer in advertisements to frighten people buying alcohol or cigarettes.

Presently the whole universe becomes theoretically solved as visible by the capability to detect the information rays coming from any object and moving in any direction not being restricted by obstacles. Philosophy of being enables the verification not only the unity of micro- and macro-cosmos, but first of all the existence of human transcendental verbal world (ideas) of each person, who, through words, can express his psycho-emotional state with self-evaluation of personal
achievements and motivation for performing them. Dynamicity of life processes means the inner self-regeneration of a subject’s life activity and growth potentials, while cyclicity characterizes the ecological and evolutionary processes.

1.3. The Bipolar approaches – Entropic and Negentropic, equal in understanding the aetiology of tumors

The entropic approach to studying the carcinogenesis is fully implemented by Rudolf Klimek, and his findings are shared throughout many publications, including the contributions to the “Biocosmology – neo-Aristotelism”\textsuperscript{15}. The results of R.Klimek’s explorations are culminated in the scheme (see: Fig. 3:“Thermodynamic branch of cell’s inner states”).

\[ E = mc^2 \]

This scheme demonstrates that the cell (which that stands on the brink of metamorphosis into a cancer cell), and which is ready to reduce its additional production of metabolites for the use of the whole body – it can generate positive entropy sources only with the new genome, using the self-organization of cancer’s matter and energy of these cellular organelles that participated in the additional production of the substances for the benefit of the whole system. In the result, “in place of the existing inefficient cells there appears a disposable biological system (cancer) with increased dispersion (dissipation) of entropy in the environment.” [Klimek, 2016, p. 262]. In such a way, “Cancer is a natural alternative form of existence of the cell sentenced to death whose only further development as dissipative structure is responsible for the signs and symptoms of diseases popularly called cancer.” [Ibid, p.264]

Overall, life is a process intertwined with entropy. This one is a symbol of the dialectics of existence: life means entropy (disorder, contraries, and contradictions), both because of the wrong conscious reactions and also because of the life processes as such – the exchange of matter, energy and information with the environment. However, life means not only entropy, but also – and rather – negative entropy: just because the living organism is open and communicates with the environment by the exchange of matter, energy and information, it counteracts the second law of thermodynamics and, with free energy, “pumps” entropy outside it in order to maintain an internal equilibrium. Therefore, the problem is the proportion on entropy and its control by the life structures. Too much entropy that cannot be controlled by the organism is harmful, equally as the too less one. Cancer is certainly the uncontrolled disorder related to ageing, “disorder in large fluctuations of opposing metabolic processes and metabolism by dissipation of mass, information, and energy in the proximity of the neoplasma” [Klimek, 2014, p. 411], and the atrophy of the immune system: all of these in the individual’s environment. Therefore, the cancer therapy must take into account just these relationships of the natural processes of the individual with its social frame and existence.

At the same, basing on the Organicist (natural) law of Bipolarity – we can argue the existence of the two poles of entropy. As a matter of fact, while in the space evolution we have entropy that ever increases; on the contrary (polarly), we have the entropy of a developing embryo that ever decreases [Challenging Integralism, 2017, p.47]. Therefore, in this work, we would like to shed light to the opposite (polar – Negentropic) approach, thus applying the Bipolar (Organicist – Biocosmological) method in realizing the scientific pursuits. In this approach, it can be argued that, naturally, a dissipathogenic (carcinogenic) state equally takes place in the case of a loss (or breakdown) of the Organicist (Functionalist) order of a living thing. If so, then of course nothing but neuro-, immuno- or thermotherapy as a mean of treating the whole body can prevent and cure the carcinogenic states, as a primary cause of
carcinogenesis of any part of the body. Consequently the local ablative therapy must be followed by medical restoration of the body’s defense mechanism to prevent the recurrence of the disease.

First of all, we need to recognize and establish the foundational Naturalist principles of the living world (and its each thing’s) – Dynamicity, Bipolarity and Cyclicity (Triadicity), with its Self-generation and ontogenetic Self-evolvement, realizing the ascending evolution (ontogenesis) – in the natural succession from one level to another, and essentially increasing in the complexity of life organization. Therefore, in the Biocosmological (Organicist, of the Dynamic naturalism) approach – we naturally deal with the notions both of Entropy (measure of Chaos) and of Negentropy – measure of Kosmos (ordered system, as this is the original meaning of the Greek κόσμος). In reality, we ought equally to apply both the Entropic approach (measuring objective indicators of the loss of unused and unneeded for a living subject – entropic – energy, matter and information); and the Negentropic approach, herein by measuring reliable indications that relate to the effective (Functionalist and Self-generated – organized wholesome telic) actions of a living subject (and its/her/his life – Entelechist and Hylemorphist – potentials).

Significantly, in modern science, the concept and phrase “negative entropy” was introduced by Erwin Schrödinger in his 1944 popular-science book “What is Life?”16; herein the scholar coins the notion of “negative entropy” as a mathematical synonym for order, in an entropic sense, stating that negative entropy is the amount of order, and an organism thus “avoids decay to thermodynamical equilibrium or of maximum entropy”; Schrödinger utters: “life feeds on negative entropy”. In information theory negentropy is used as a measure of distance to normality (i.e. the functional efficiency of a living thing’s maintenance as of its own well-being, as contributing to the well-being of its organism and the environment). In turn, in the Organicist neo-Aristotelian approach (wherein the Aristotelian notion “Organon” originally means “instrument”, i.e. function) – Function is the inherent function of a living thing, and which is essentially the ultimate basis and ontogenetic destination for a living subject (e.g.; for a muscle cell – this is contraction, or for a liver cell – the specific hepatic biotransformation of molecules; or for a secretory cell – the specific secretion, for instance – cervical secretion, etc.) – thuswise the inherent Function is the basis and ultimate ontogenetic axis for a cell’s healthy Organisation and Normality, i.e. its Negentropy.

Fig. 4. Original cover to Erwin Schrödinger’s famous 1994 Dublin lecture “What is Life?”, the book that inspired James Watson to discover DNA (1953) and that initiated the famous life feeds on negative entropy supposition (taken from: http://www.eoht.info/page/What+is+Life%3F).

Summarizing this Organicist retreat, we consider it necessary to point out that all the identified objective factors of carcinogenesis are important (essential) and cannot be written off as insufficient. At the same time, the broader context must also be addressed, in which the Organicist bases of oncogenesis are to be given a due prominence in the contemporary scholarly milieu. First of all, the original Organicist hypothesis should be considered carefully (and which is based on the aetiological and methodological foundations of Dynamic naturalism; and which does not reject but apply the achievements of modern positivist science) – the hypothesis is that the onset of malignancy occurs due to both external and internal factors, and as for the latter (inherent causes) – we are confronted not with the loss of a cell’s (tissue’s, organ’s) resources, but precisely with the surplus of the (existing and cumulating, but functionally unrealized) life energy (matter and information), thereby limiting physiological efficiency of human’s whole life organization and thus reducing the capabilities of regulatory psychoneuroimmunological systems, causing eventually their failure and insufficiency of protective mechanisms (in more detail, see Khroutski [2002]17).

Therefore, as a matter of urgency – we consider it important to place at the top of agenda both approaches: the so-called (and long developed) ‘entropic’ research strategy; and the more recent and promising ‘negentropic’ approach, because now it has historical sense. In fact, as it could be stressed immediately – concrete evidence is the current untapped (unused) the entire adult life potencies and activities of older persons, that is – the insufficiency of the Functionalist engagement of elderly people into the sociocultural (in all its fullness) life. Moreover, obviously, the Functionalist organization is the best way to reduce entropy and restore the Normal (negentropic) organization of a cell (or any other living subject – the man, first of all), and, thus, to suppress the causes for carcinogenesis. Due to this (Biocosmological) hypothesis, to

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note this once again – cancer emerges both from the deficit and from the surplus of natural Organic-Functionalist energy (and chaotic information), but which chronically is not the subject for self-realization (in a genuine Organicist way) by the whole organism and within (and the subject to factors of) the given ecological surroundings.

In turn, making a general conclusion – we cannot but notice one more important conclusion: Inasmuch as both approaches (entropic and negentopic) are polar to each other (i.e. are based on the opposite scientific foundations – ultimately relating to the underpinnings of comprehensive cosmologies: the Platonic Dualist and Static; and the Aristotelian – Organicist and Dynamic) – we therefore need to propose and substantiate an adequate research strategy that could be able to efficiently integrate both polar scholarly approaches. The scientific attitude that we believe is appropriate and able to cope with the Integralist tasks is evident – this is the approach of Information science and Information medicine; and which is precisely the main topic of the given exploration.

1.4. Information as the essential quality of Nature: Notion of the Information cause, among other Naturalist causes

The Biocosmological significance of Information that is being developed in this work, of course, is strongly linked to the notion of Informative cause, as proposed in this section. In general, the core of the theory of causation has been generated by Aristotle, nearly 25 centuries ago, but which is lacking in the aetiology of modern science (accordingly, and in medicine). The gist is that the Aristotelian physics, as a whole, and its foundational theory of causation – both are based on the Naturalist aetiology, i.e. the Organicist, internal and intrinsic – Dynamic, Entelechist and Hylemorphist – aetiology. However, the aetiology of modern medicine is radically distinct – diametrically opposed, and which makes insufficient any reference to Aristotle. At present, inherent causes of the living thing (human being) are totally replaced by the significance of the absolutely different (i.e. essentially external and extrinsic) causal precedents (factors, influences, forces, causes) to a disease emergence.

The central theme, therefore, is that the Aristotelian authentic Organicist aetiology is out of use in the modern scientific milieu, wherein the contrary Dualist (Idealist/Materialist, of mathematical physicalism) rules the realm. However, as persuasively demonstrated in this paper – all the principles (in the Triadological reality) are equally essential: Dualist, Organicist, and Integralist. Therefore, all the Aristotelian Organicist aetiological causes – starting from the telic goal- and result-of-action driven causes – are of the utmost importance. In our work [Kudrin & Khroutski, 2017], we focus attention on the scientific concepts of Three-Valued Dialectic Logic and Ternary Informatics of Nikolay P. Brusentsov, as well as disclosing what had been the basis for his substantive progress and successes – this is Brusentsov's direct access to the scholarly heritage of the Stagirite and revealing (and using) his archetypal Organicist (scientific and philosophical) knowledge. First of all, Brusentsov reinstated the essential significance of Aristotle's “κατά συμβεβηκός
“κατά συμβεβηκός αιτίον” – cause by coincidence (or the circumstantial cause, or the resonance cause; but, never – “accidental”, as the scholar stressed).

The latter (cause by coincidence, or the circumstantial or resonance cause) can serve now as the efficacious basis – established notion and the conceptual framework – for recognizing the “triadic order” in logical constructions. The latter means that together with the currently dominating two-valued (binary) logic, but by acknowledging the Three-valued dialectical logic and Ternary informatics – we now have the possibility of using synchronously (concurrently) both types of logic order – of the three-valued and two-valued (ternary and binary) reasoning and logical construction. The scholar states: the Aristotelian “syllogistics is a three-valued dialectical logic that is incompatible with the exclusion of the third. After all, by the way of excluding the third – they exclude the incoming, centre-intermediate between "yes" and "no", thus not allowing the logic to be a living, adequate to reality, mode of rational reasoning” [Brusentsov, 2002]. The main conclusion to which the scholar has come – dialectical logic is “not the identity or unity, but the coexistence of opposites, and not a conjunction, but excluding their disjunction. The very essence of opposites is the co-existence of the incompatible values, rejecting the exclusion of the third [Brusentsov, 2008].”

Essentially, therefore, cause by coincidence (“κατά συμβεβηκός αιτίον” – the circumstantial or resonance cause) naturally serves to the unity of the subject and his surroundings, by virtue of active selecting the necessary (tyhe and to automaton) conditions and opportunities for normal existence and ontogenesis of the subject – the latter precisely makes it possible to realize the needed changes, and, on the whole, to ensure steady and successful ontogenetic evolvement. Throughout the paper, authors particularly emphasize a provision that it was the authentic Aristotelian syllogistics and modal logic that laid the sound foundation for implementation of remarkable conceptual constructs (in the fields of Three-Valued logic and Ternary informatics) of N.P. Brusentsov, as well as the technological breakthroughs (the “Setun” ternary computer) attained by the scholar and his colleagues. In general, Brusentsov claimed and argued that the introduction of modern Triadic approaches (in all spheres of rational knowledge) is impossible without direct conversion, recovery of the true meanings and the full evolvement of real scientific bases developed by the Stagirite and presented to the world in his comprehensive rational system of knowledge.

A similar approach has been realized in Hungary, wherein a scholar Katalin Martinás rightly points out, in her paper “Aristotelian thermodynamics” – “we are taught, that Aristotle’s physics is a premature, wrong mechanics, and nothing more.”

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The scholar underlines an important point – that Aristotle is Father of the theory of dynamics; therefore, if considering the modern theories of thermodynamics – we cannot forget about the bases of Aristotle’s physics, and which cannot be overlooked. Therefore her statement is worthy of attention: “We read some works of Aristotle on physics, (Physics, Meteorologica, De Generatione et Corruptione, and De Caelo, the very books, and not the interpretations [our italics. – Authors]) and what we found there, it was a wonderful ‘antique thermodynamics’.” [p. 264] K.Martinás likewise draws attention to a French physicist Pierre Duhem’s aim on the new physics (thermodynamics) that is (as the outstanding scholar stressed) “…the daughter of Aristotle, in that it is a theory of qualities, it is also a daughter of Descartes, in that it is a Universal Mathematics; in it there begin to converge the two tendencies which, for so long, have drawn Science and Nature in opposite directions.” In this case we see the clear example of an Integralist approach – the attempt to unite two polar methodologies (Organicist – the Aristotelian, of Dynamic naturalism and teleological physics; and the Cartesian approach that is basically Platonic, of Dualist essence – Idealist/Materialist, of mathematical physicalism). This is precisely the way we are evolving in this work, by constructing our Integralist – Information – approach.

Of course, the Aristotelian physical causes (the “κατὰ φυσιν”-causality: the Aristotelian material, formal, efficient and final causes) are crucial to evolving the contemporary scholarly endeavors. In the paper “Challenging Integralism” [2017] we try to give (substantiate) the right names to the Stagirite’s “κατὰ φυσιν”-causes: Hyletic (to material) cause – of whose presence something comes into being – e.g., the marble of a statue, in Aristotle (or, in our contemporary era of high objective knowledge, for analogy – we certainly should select atoms for molecules; amino acids for proteins; or nitrogenous bases – nucleosides and nucleotides – for DNA); Organic or Morphogenetic (to formal) cause – relating to the form (morphae – the “functional organ” – the living thing or organ itself); Generative (to efficient) cause – the father is the cause of the child, in Aristotle (on our definition – generation of the “functional organ”); Telic or Effective (to final) cause – the production (achievement, eventual actualization) of a needed effect – the result of action.

In this sequence, a special position is occupied by the (proposed) Information cause. Essentially, each structure or process in the universe is enrooted in its causative information, as the programmed objective of its action, a desired and immediately afterward created effect in the cause-effect feedback relationship of events, which are always accompanied by the production of entropy, what in medicine has enabled the understanding of an organism’s ageing and the emergence of cancer. In our ‘entropic’ approach to studying the issues of carcinogenesis, we see that ageing is characterized by a decreased ability for self-defense and self-regulation due to the gradual loss of internal equilibrium as a reaction to environmental effects. Fatigue is a sign of growing entropy, which production in living organisms is linked with the increasing (positive source) or decreasing (negative source) magnitude of molecular processes. In such a conversion of forms the cells and the formed from

them neoplasms are stable, while their intermediate state of dysplasia is characterized by an increased fluctuation of opposing metabolic processes. The spontaneous interchanges in the mass and energy of elementary particles requires the laws of nature to override those of own human social life in order to preserve the human species, because the free will of man is limited by the laws of thermodynamics. The appearance of mass seemingly from nothing in the moment of the creation of a Higgs boson proves that entropy appears each time anew, and its size must be larger than zero in order for the system to function. The basis for all irreversible processes of life, including carcinogenesis, can be expressed in the formula – diS/dt ≡ Sgen – the changes (d) in entropy production (diS) over time (dt), under the name of source of generated entropy.

In turn, if the production of entropy in a system decreases (physicists call this a negative source of entropy), the system can still exist via an increase of production of entropy in its environ count by the reality formula E = i mc², where “i” encompasses also the generative entropy. One cannot separate the name of the system or the environment from their threefold nature, which always links mass, energy, and information. People create expressions in different languages, but for the first time they have described the formula E = mc² containing, apart from energy (E) and mass (m) also information (I), denoted by the letter “i”, being the Latin abbreviation for the word informo (to form or transform) [Klimek, Tadeusiewicz and Gralek, 2017]. The essence of mass and energy is summarized in theoretically most famous equation E = mc², which in a holistic view R. Klimek has supplemented with the equivalent information. This new material-informational-energetic formula takes a special place, because it helps in understanding the causal purposefulness of observed structures and processes in liaison with their environment on account of the causative role of information [Klimek, 2018].

Reflecting on the substantive issues of our discussion, in the “Interview with Prof. Tadeusiewicz” – Ryszard Tadeusiewicz starts with emphasizing that “we have a continual transformation of various forms of matter and various forms of energy, but all that is always directed and organized by the component of information.” The scholar makes an important statement that “information is the causative agent in many material and energetic transformations”; and. moreover – “Information is the ‘spirit movens’, as an element that makes things run in the direction in which they run, selects one route, and only one route is followed.” In his reasoning, Prof. Tadeusiewicz stresses the cyclicity of the real world, pointing to its essential “feedback loops”; the “element of resonance”; “the circle of cause and effect”; and that “everything revolves, back and forth”. Another point of reference is the

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foundational significance of “interaction” of things and systems of reality. His conclusion is unambiguous – “information is the causative agent”; and “information is ubiquitous, is present in every structure which we observe, whether in space or in animate or inanimate nature.” Furthermore, in elaboration of his “concept of cognitive resonance” – R. Tadeusiewicz develops an idea that “information is a form of cognitive resonance.”

Throughout it all, reiterating our key moment – modern science (including biology, medicine, human and social sciences) deals with “nature” as the physical (materialist) world that, in principle, is “lifeless” (i.e. “aimless”). In fact, the natural sciences of today are totally purged from all the approaches that deal with the issues of telic Self-activity of natural things, i.e. which, by nature (κατά φυσιν) are inherently Entelechist and Hylemorphic, and naturally are capable of Self-generation, Self-changeability, ontogenetic Self-evolvement and self-actualization, etc., i.e. wherein main causes and forces substantially act from within, and not from without. Therefore, modern “natural sciences” (modern social institution of science) gravely violate the rights of a contemporary human being, for this social institution pays attention exclusively to (and authorizes the use of) scientific approaches that study only the lower levels (inorganic, vegetative and animal, so-termed by Aristotle), and only the states of ‘Static’ natural organization (created from without; and which are incapable for self-evolvement, i.e. which lack the substantial natural inherent telic forces that act from within).

Summarizing, and aiming at the definition – we argue that Information cause is essentially the Naturalist cause, which, by nature (the “κατά φυσιν”-causality), by testing and receiving (resonating with) all the needed essential contacts and messages – thus naturally is realizing (disclosing, discovering) the inherent (substantive) solution for uniting the congeneric polarities (opposite substances) – for the given subject of life effective Homeostatic existence and the entire Functionalist (Entelechist, Ontogenetic) Self-evolvement.

2. SCIENTIFIC (STATIC) MATERIALISM – VS – SCIENTIFIC (DYNAMIC) NATURALISM

Scholars from Hungary, Katalin Martinás and Balint Tremmel, in their joint work,25 note the following important point that so far the “generally accepted opinion is that Aristotelian physics is not a science of Nature.” Herein, authors likewise note the opinion of the Nobel Prizer Max Delbrück who admired Aristotle as a biologist, but also knew about the opinion of the physicists, thereby Delbrück wrote: “I should like to suggest, furthermore, that the reason for the lack of appreciation among scientists for Aristotle’s scheme lies in our having blinded for three hundred years by the Newtonian view of the world.” [Ibid, p. 178] In fact, as already J. Thomas Howe concludes: “In the early seventeenth century, a general consensus arose that nature, in the sense of the physical world, was «lifeless.» This consensus, called «scientific

materialism,” (our italics. – Authors) forms the basis of modern science.”26 [Howe, 2003, p.112] In turn, in that regard, J.Th. Howe refers to the conclusion of Alfred North Whitehead, which is made in his book “Science and the Modern World”:

There persists, however, throughout the whole period of the fixed scientific cosmology which presupposes the ultimate fact of an irreducible brute matter, or material, spread throughout space in a flux of configurations. In itself such a material is senseless, valueless, purposeless. It does what it does, following by a routine imposed by external relations which do not spring from the nature of its being [Ibid, p.113; (SMW, 17)]

Herein, characterizing the whole modern methodology of science, Howe adds that “these bits of matter are isolated individuals, related to other bits of matter only externally. Matter, or nature, exhibits no capacity for creativity, spontaneity, self-movement, or novelty. Nature is a “self-meaningless complex of facts” (MT, 132)27. This view of nature came to the fore through the work of Galileo, Mersenne, Descartes, Boyle, and Newton [Howe, p.113].

Returning to our topics, we start with the well-known fact that in extreme cold (close to absolute zero) quantum physics suddenly becomes visible when all movements of cosmic particles cease, thereby giving us the possibility of knowing the composition of Universe. Turning again to our main formula: \( E = mc^2 \); and, in its respect (dealing with the notions of “matter” and “energy”), we now refer to the official CERN-site and its study of “The matter-antimatter asymmetry problem”28. The later states that the Big Bang should have created equal amounts of matter and antimatter in the early universe; but, today, everything we see from the smallest life forms on Earth to the largest stellar objects is made almost entirely of matter (Aristotle would name it morphae). The CERN-authors conclude that “one of the greatest challenges in physics is to figure out what happened to the antimatter, or why we see an asymmetry between matter and antimatter.” [Ibid.] To our firm belief, this challenge firstly refers to our ways of thinking (cogitation patterns, thinking paradigms) – thereby we are to evolve the Types of rationality (Types of mentality or Types of cosmology). At any rate, so far, concerning the percentage of the Universe that is matter – specialists evaluate that “overall, dark energy is thought to contribute 73 percent of all the mass and energy in the universe; another 23 percent is dark matter, which leaves only 4 percent of the universe composed of regular matter, such as stars, planets and people.”29 In the result, the scholar concludes, “All the stars, planets and galaxies that can be seen today make up just 4 percent of the universe.

27 In this place, J.Th. Howe again quotes A.N. Whitehead, the work Modes of Thought (1968).
28 See: https://home.cern/topics/antimatter/matter-antimatter-asymmetry-problem
The other 96 percent is made of stuff astronomers can’t see, detect or even comprehend.” [Ibid.]

Ergo, the matter- and energy-constituents (that we imply in the formula $E = mc^2$) – comprise several per cents (less than 4%) of the Universe’s total volume. But, of course, science ought to refer to all the issues of the entire physical reality, and not to its smaller part. Or, at least, not to attach the total importance to the modern Dualist “scientific method”, especially that Aristotle (world-recognized Father of science) has brought into the world the archetype of the opposite OrganonKosmology – the rational (super)system of comprehensive knowledge. In all cases, however, as we claim it – all the forms of matter and energy in the Universe are integrated (Organized) by Information. The latter is essentially minimal in relation to Matter and Energy – a fraction of a percent, maybe one tenths of a percentage or less. The obvious conclusion from the foregoing is straightforward – we promptly need to transform radically both our contemporary scientific foundations and rational cosmologies on the whole (i.e. the foundational rational approaches, with their own aetiologies, gnoseologies, methodologies, anthropologies, basic evolutionary and sociocultural theoretical principles, etc.). Certainly, in this way, we must never abandon but to preserve and develop further the currently dominating (or, rather dictating) Platonic Dualist scientific cosmology, with its derived chief method of mathematical physicalism (the so-called “scientific method”). At the same time, on equal terms with Platonism – we ought to reinstate (recognize and rehabilitate, and give priority to) the opposite (to Platonism) – the Aristotelian Organicism (his entire rational OrganonKosmology – the supersystem of scientific Dynamic naturalism); but, of all – for advancing and evolving the contemporary Integralism, starting with the Information approaches and Information medicine itself.

Therefore, we are ready (basing on the evidence that is discussed above) – to offer our proposal regarding the response and explaining “the greatest challenge in physics” of today (concerning the “the matter-antimatter asymmetry problem”, see above), namely regarding the emergence and existence of all (material – Hylemorphist) things and the material Universe as a whole; i.e. how a material thing emerges (instead of being annihilated into energy) on the basis of the primary matter/antimatter pair. Our answer is that the foundation for the matter (hylemorphist morphae) emergence is the third basic quintessence, which we call “Information”, and which is able to realize the ‘homeostatic’ conditions for organisms (living things), thus actualizing its main ability of synthesizing the polar potencies (energies of the polar constituents), i.e. channeling the entire energy (of the preventable annihilation) towards the emergence, self-preservation and self-evolvement of the living thing.

In our midst of examples, the Information basis (mesostasis – the “golden mean” – the intermediate fundamental Integrating nature) is naturally able for striking the right stable balance between the polar activities (within the Triadic whole of the thing’s life organization). In the midst of our examples, this is the neutron (and the whole nucleus, relating to positron and electron); or the egg cell that is a basis for fertilization and zygote emergence, with the further entire process of healthy
pregnancy and delivery; or the heart as an organ, which enables the constant physiological (homeostatic) living processes and provides the conditions for consistent alteration of the polar Diastole/Systole physiological phases; or the physiological organism (body) of a living thing (human being) that is capable of maintaining all the homeostatic internal parameters for the healthy (of entire ontogenesis) activity and is the basis for the alternating Sleep/Awake-cycles that are essential for the ontogenetic growth and efficient Functionalist activities of the given subject. Herein, a key principle (but taken in its Triadological unity) is that Information has basically the intrinsic significance, but each living subject essentially needs the extrinsic information as well – for the ultimate stable realization of the homeostatic (healthy, wholesome) life condition and aiming ultimately at the actual thing’s (living organism’s) realization of effective Functionalist (Entelechist) life activity during (as the final result of) its/her/his entire ontogenesis.

At any rate, substantially, from the very beginning – we ought to take into consideration the two essential things:

A) Visible (or material) universe is a smaller part of the whole world (Universe, Kosmos);

B) Kosmos is basically asymmetric, that is to say the real physical world is substantially Dynamic, Bipolar and Cyclic, i.e. is constituted of the opposite substances and their self-dependent potencies as matter and antimatter; or positron/electron opposed particles; or the polar independent phases of Systole and Diastole that are absolutely necessary for the right heart function; or the physiological opposite cycles of Sleep and Wakeful activities; and so on, et cetera, everywhere in all the real universe.

2.1. Come On! – The real need for proposing, launching and implementing the Bio-naturalist laws and the Three Types of rationality and scientific activity

In fact, the time is ripe (and “Come on!” of the Club of Rome [2018], see the references below, is calling for the same) – to change our basic scientific approaches: the latter means that we need to use in full and to develop further with no interruption (but in the Triadological unity with the two other Types of rationality) the Platonic Dualist cosmology, which is the Scientific materialism and that is Unipolar, Static and Monolinear; and which is the ground for the widely accepted biology based on the modern mathematical physicalism, given that the chief significance have the external – from without – forces and causes; and wherein the scientific analytical assessment systems of external quantitative significance normally prioritize. At the same time, concurrently with this essential (Dualist) approach – we urgently need to recognize and rehabilitate the opposite Aristotelian OrganonKosmology (and which is not only equal in significance, but of higher priority, at present and for future). This Organicist naturalism (teleological physics) of the Stagirite is truly can be termed as the Biology and Bio-sciences (from the capital letter), that is based on the understanding and recognizing the natural laws and Naturalist fundamental principles of the real Organicist world, such as its naturalist Dynamicity, Bipolarity, Cyclicity
and Triadicity, and which all rest on the Entelechist (telic) and Hylemorphic forces
and causes. Essentially, the latter all are inherent, i.e. act (by nature – κατα φυσιν) – from within; and which thereby require the foundational qualitative (Entelechist) approaches, thus paving the way to a true contemporary Integralist scientific use of both quantitative and qualitative analytics, starting from Information methods). In
general, a fundamental turnaround from the Platonic Dualist cosmology (positivist
science) with its basic study “of events” (through the external – mathematical-
functionalist – analytics) – to the Aristotelian OrganonKosmology (Dynamic
naturalism), wherein the ultimate grasping and definition “of substances” (that are
essentially Entelechist and Hylemorphic) ought to be realized. Naturally, in this way,
the contemporary Integralist approaches (including the Information medicine) – that
synthesize the polar cosmological (Dualist and Organicist) scholarly means – at
present are of central significance.

Since the launching of the Biocosmological Association, in July 2010 – we have
the perspective of Biocosmology, which main aims and scope is the expansion of the
current accepted laws of nature by recognizing and adopting the Organicist (neo-
Aristotelian) natural sciences laws and the contemporary foundational principles of
Organicist aetiology, gnoseology, methodology, anthropology, of the evolutionary
and sociocultural knowledge, etc. In fact, all this is the urgent need for appropriate
progress in science and medicine. For instance, even the authors of an important
Report to the Club of Rome [Wijkman and Weizsäcker, in their landmark book
“Come On!”, 2018\(^\text{30}\)] – Wijkman and Weizsäcker state that modern life sciences
cannot meet all the challenges of human well-being of today. In a metaphorical way,
the authors place the image of a dissected rat (Fig. 5, see below, left side) and
comment it in a way that “Dissecting a rat means killing it; ironically, this is called
life sciences.” [“Come On!”, p. 85] In this vein, we add the contrary image of a rat
(on the right side of Fig. 5) that is subjected to the training and emergence of new
skills, attitudes and behavioral capacities.

termism, Population and the Destruction of the Planet. A Report to the Club of Rome (by Ernst von
Weizsäcker and Anders Wijkman, co-authors in cooperation with 34 more Members of the Club
of Rome; prepared for the Club of Rome’s 50th Anniversary in 2018). Springer,
Now, we see the symbols of the two opposing systems (Types) of knowledge: Dualist (Idealist/Materialist – of mathematical physicalism; which is a basis for modern biology) vs Organicist: of Dynamic naturalism and teleological Organicist physics, which is the foundation for challenging Biology; and both Types and approaches could be integrated by the Information medicine. A cornerstone is the fact that life activity of each living thing is essentially self-changeable – self-generative and self-evolving, i.e. Dynamic; as well as Bipolar and Cyclic. That is to say, every time – during each Biorhythm – we have both the cycles of “sleep” and “keeping awake”; or, in a heart cycle – of “systole” and “diastole”, etc. It is essentially the Triadic life, i.e. of synchronous permanent co-existence and alternate domination of the Three spheres: two polar, to each other; and the third intermediate – Integralist – homeostatic basis. The rat (Fig. 5) that is actively trained – it is clear that its life activity essentially is coming from within (and by virtue of inherent life telic – purposeful – potentials). Significantly, however, modern Organicist approaches in life sciences (of the neo-Aristotelian essence), and which are in a full opposition to modern conventional (materialist) foundations of science – they are taboo (forbidden) in the current scientific practice, and we cannot agree (with) and accept such a state of affairs. Therefore, we do need to rehabilitate the Aristotelian (old) and advance new needed (Organicist and Integralist) principles of scientific pursuits.

In our Biocosmological approach, we firmly believe that precisely the Aristotelian OrganonKosmology could serve best of all as the matrix (framework of references; general address) for all the scientists engaged in Organicist and Integralist studies. In this way, in rehabilitating the Aristotelian foundational (of the recognized Father of science) Organicist principles – we are to essentially recenter our knowledge over the natural Bio-laws and Bio-principles (fundamental, for Nature; and, foundational, for Bio-science) – starting from the basic for all natural things
principle of Self-changeability (Self-genesis, Self-evolving and Self-actualization); and the fundamental, essentially intrinsic – from within – principles of Dynamicity, Bipolarity, Triadologic Cyclicity, Biorhythmicity, etc., as well as the fundamental principles of entelechism and hylemorphism of the natural world. Notably, these issues are specially presented in the fourth section of the article.

In general, the real need exists for proposing, launching and implementing the Bio-naturalist laws. Essentially, whenever the scholars take the scientific terms and notions that contain the prefixes self-, re-, inter-, co-: for instance, as used in this text: self-organization, self-changeability, self-genesis, self-evolvement, self-actualization, self-realization, etc.; or resonance, regeneration, reproduction, etc.; or intergeneration, interrelations, interconnections, etc.; or co-ordination, co-acting, etc. – they all (although implicitly) every time relate to the Organicist and Integralist essence of science (but they do not have the essential meaning, because these notions are impossible or extremely difficult to express in the terms of the Dualist scientific approaches). An attempt to face these challenges is realized in the article “Forming an evolutionary vector to the Aristotelian pole of scientific Organicism (Biocosmology)” [Khroutski, 2013]. This work provides a comparative analysis of the Three Types of scientific knowledge, including the “Comparative analysis of modern physics, biology and Bio-sciences” [p.33]; “Metaphorical comparison of the Biocosmological approach with the cyclic dynamic theory of Pitirim Sorokin” [p.37]; and the “Comparative analysis of the three main cosmologies” [pp.43–45]. In conclusion, the author proposes and substantiates the Triune formula – 50-(Physicalist) /10-(Organicist) /40-(Integralist) – of the overall organization of contemporary scholarly endeavors. His main claim concerns the prompt introduction into the actual scientific work of all the three – really autonomic – spheres of scientific pursuits (of Organicist, Physicalist, and Integralist essence).

2.2. Urge for the own (of ultimately the Bio-scientific essence) theory for contemporary medicine

Still in the 1941, a substantial conclusion has been made by the renowned Austrian physician and scholar Bernard Aschner: “the majority of all diseases does not come from without (like injury or infection), but from within....” [Aschner, 1941, p.261] Significantly, the scholar recognized the need to develop and use the potential of the modern empiricist and technological medicine. Yet, as Aschner emphasized – the organicist (“neo-Hippocratic”) forms of medicine should not be neglected. He stressed upon the essence of Hippocratism to be “synthetic, cosmic, constitutional, humoral, biological, dynamic, and artistic, helping the self-healing power of nature, (physis) to a large extent by appropriate medical treatment.” [Ibid, p.262] As is well known, for instance, from the “History of medicine” [Guthrie,
1945\textsuperscript{33}, Aristotle, “probably the greatest scientific genius the world has ever seen”, and “closely following Hippocrates” – Aristotle “though not himself a physician, exercised a profound influence upon the practice of medicine.” \[p.60\]

All the more so at the present time, medicine has the features of high technological effectiveness (which we admire) and the achieved great successes in curing and management of diseases. At the same time, modern medicine is also characterized by a so-called “aetiological paradox” (in detail, see Khroutski, 2010\textsuperscript{34}), because despite the great successes of modern hi-tech medicine in the treatment (of acute) and management (of chronic) diseases – biomedicine still is unable to disclose and rationalize the aetiogenesis of chronic diseases (chronic non-infectious and non-traumatic diseases). Because of this, so far, medicine cannot develop a healing approach that enables complete recovery of the persons who suffer from chronic diseases, including tumoral diseases. In fact, all this – the inability of modern medicine to apply the aetiotropic (causal) treatment that is aimed both at the prevention of chronic diseases and full recovery of the diseased man – all this can be treated as a human rights abuse.

The core of the theory of causation has been generated nearly 25 centuries ago, based on the Naturalist aetiology by Aristotle, and which is radically distinct – diametrically opposed to the one used nowadays in the Western medicine. Today, as we all know, the inherent causes of a living being (human being) are totally replaced by the significance of the absolutely different (i.e. essentially external and extrinsic) causal precedents (factors, influences, forces, causes) to a disease emergence. In other words, modern medicine (including biomedical research) does not consider (recognize) the telic – goal- and result-of-action driven causes (the “κατα φυσιν”- causality: the Aristotelian material, formal, efficient and final causes; as well as “κατά συμβεβηκός αιτίον”- causality – cause by coincidence \[Kudrin and Khroutski, 2017\textsuperscript{35}). Essentially, modern science (and medicine, inevitably) is Dualist and Positivist (ultimately founded on the grounds of Plato’s Idealist/Materialist cosmology). In this approach, the physical world (which synonyms are material or outer world, or tangible world) is categorically deprived of any inherent telic (goal-driven) activities but is strictly inanimate and mechanistic; and which is Static, i.e. which in all cases is the given – created by a Demiurge or by Man (whose consciousness is the image and likeness of Demiurge – the Divine). In the result, starting from the 17th century and during the further New age evolvement – the Aristotelian OrganonKosmology based on the principles of Dynamic naturalism (with its teleological physics) eventually is removed from the sphere of medicine (and science, in general), and factually is forbidden and now is taboo in the modern educational and scholarly milieu.

\textsuperscript{33} Guthrie, Douglas. (1945). \emph{A History of Medicine}. London: Thomas Nelson and Sons Ltd.


Another essential result of such a historical development is that modern medicine and biology still are deprived of their own theory. In this respect, the Lithuanian scholar Edmundas Lekevičius has arrived at an insightful conclusion:

My long experience prompts me that the development of biological methodology is a matter of concern of biologists themselves: nobody can devise it but we ourselves. We need a methodology that would be an effective tool of logical simplification allowing to preserve essential properties and inherent specificity of biological objects [Lekevičius, p. 16].

In actual fact, modern biology and medicine still is using the methods that are borrowed from physics and chemistry (i.e. the study of non-living aimless mechanistic matter). In the result, such an approach, in principle, although enhanced by the greatest advances and methods of obtaining knowledge from quantum mechanics, theory of relativity, the branch of physics called thermodynamics, and biocybernetics with synergetics – all this, although possessing huge resources of positivist (Dualist – Platonic) rational knowledge, but they all appear to be unable and inappropriate for modern biology and medicine to reach a full understanding on the issues of the individual’s health and the specific mechanisms of its failure, with the consequent emergence of chronic, including malignant, diseases.

Throughout it all, reiterating our key moment – modern science (including biology, medicine, human and social sciences) deals with “nature” as the physical (materialist) world that, in principle, is “lifeless” (i.e. “aimless”). In fact, the natural sciences of today are totally purged from all the approaches that deal with all the issues of telic Self-activity of natural things, i.e. which, by nature (κατα φυσιν) are inherently Entelechist and Hylemorphist, and naturally are capable of Self-generation, Self-changeability, ontogenetic Self-evolvement and self-actualization, etc., i.e. wherein main causes and forces substantially act from within, and not from without. Therefore, modern “natural sciences” (and the whole modern social institution of science) gravely violate the rights of a contemporary human being, in respect to the self-realization of his natural life potentials, for this social institution pays attention exclusively to (and authorizes the use of) scientific approaches that study only the lower levels (inorganic, vegetative and animal, so-termed by Aristotle), and only the states of ‘Static’ natural organization (created from without; and which are incapable for self-evolvement, i.e. which lack the substantial – Dynamic – natural inherent telic forces that act from within).

2.3. Information medicine as the pioneer of nascent Integralist science

Medicine is the unique human activity: firstly, medicine is factually the all-encompassing knowledge; and, furthermore – medicine is the activity in which man is not only the object but who simultaneously connects directly the theoretical achievements with the art of the protection of life and bringing people back to health, i.e. who is the subject of her/his own inherent (healthy) ontogenetic life activity. This obliges people to continuously track the progress of both general knowledge and its technological use, and to rehabilitate and apply the Organicist (neo-Aristotelian) scholarly knowledge, including the introduction of purely informational diseases – all this is one of the greatest challenges and perspectives of the twenty-first century medicine. In this course, for instance, lies, telling untruths, or concealment are treated as an adequate cause of diseases, which destroy motivated human behavior.

The conception of informational resonance is emphasized in our approach. First of all, informational resonance plays a decisive role in the intergenerational transmission of human life. The resonance is the condition of any system in which there is a sharp maximum probability for the absorption of energy or capture of particles as well as information, i.e. the power to evoke enduring images, memories, and emotions by the synchronous action of a neighboring object or environment.

In compliance with it, and in a remarkable manner – both authors of this article (after meeting and working at the Congress “Biocosmology and cancer”, in Krakow, in July 2017) – they simultaneously have arrived at the essential conclusion (at one moment, during the conversation over a cup of coffee) that the whole world (Universe) is constituted of life – of living things (that means agreeing directly on the true Aristotelian – Organicist – understanding of the world), i.e. that all tangible (physical) things are essentially the living things that are telic and inherently goal-driven; but, at the same time, the Kosmos is Organicist and Hierarchic, and only the higher Kosmic levels (vegetative, animalist, rational-human, and higher levels) can be animated, thus allowing for complex Informational activities and interrelations.

Essentially, modern medicine has the features of high technological effectiveness (which we admire) and the achieved great successes in curing and management of diseases. At the same time, modern medicine is also characterized by a so-called “aetiological paradox” (in detail, see Khroutski, 201037). This means that, despite the great successes of modern hi-tech medicine in the treatment (of acute) and management (of chronic) diseases, and what fully accords with the aforementioned conclusion of Bernard Aschner [1941] – modern biomedicine still is unable to disclose and rationalize the aetiogenesis of chronic diseases (chronic non-infectious diseases – CNID; and chronic non-traumatic diseases – CNTD). Because of this, so far, modern medicine cannot develop a healing approach that enables complete

recovery of the persons who suffer from chronic – CNID and CNTD – diseases, including tumoral diseases. In fact, all this (the inability of modern medicine to apply the aetiotropic (causal) treatment that is aimed both at the prevention of CNID and CNTD, and full recovery of the diseased man) – all this can be treated as a human rights abuse.

What are needed are the newly developed (Naturalist and Integralist) knowledge and the ability to apply the effective scientific approaches (belonging to the different Types of rationality and their integration) within the contemporary theoretical and practical activities. A reasonable starting point is the aetiological studies, beginning with the Aristotelian OrganonKosmology, for the core of the theory of causation has been generated by the Stagirite, nearly 25 centuries ago; but which is lacking in the aetiology of modern medicine. In general, the cornerstone of Aristotle’s physics as a whole, and its foundational theory of causation – they are based on the Naturalist aetiology, i.e. the Organicist, internal and intrinsic – Entelechist and Hylemorphic – aetiology. On the contrary, the aetiology of modern medicine is radically distinct – diametrically opposed, and which makes insufficient any reference to Aristotle. At present, inherent causes of the living thing (human being) are totally replaced by the significance of the absolutely different (i.e. essentially external and extrinsic) causal precedents (factors, influences, forces, causes) to a disease emergence.

Turning again to the aforementioned metaphor of “dissected rat” (Fig. 5), as opposed to the alive animal that is under observation and training – we would like to reiterate our position in stressing once again the importance of maintaining the distinction between the sought Organicist (of Dynamic naturalism) Bio-approach and the essential disposition of modern biology that treats the living matter as substantially the lifeless – materialistic, i.e. mechanistic, thus fully aimless, which is deprived of its own self-motivated and goal-oriented activity. Of course, appreciably, the objective positive knowledge is very important, i.e. if we know the mechanical (biological) cause of a given structure’s break (failure) – we then become rightfully capable to (mechanically – in a reconstructive way) repair the structure and restore its functionality (in full, or partially). Therefore, essentially – we do need both: biological (Dualist) and Biological (Organicist); and, basically, the integrative Information approaches in contemporary science, essentially aiming at the Integralist synthesis of the polar means (and, in this, firstly taking advantage of the perspectives of Information medicine).

The major challenge today is how to integrate (unite) both types of knowledge on the basis of Information principle and by means of Information medicine. Naturally, this task is not easy, without the full rehabilitation, recognition and reintegration into the contemporary scientific life of the Biological (Biocosmological – neo-Aristotelian) approach that has the essence of Dynamic teleological naturalism, and which is equal (and of higher significance) to modern “scientific method”.
Essentially, the Aristotelian Dynamic naturalism (as the type of scholarly knowledge) cannot no longer be denied for scientific activities, and the cornerstone principle is that both methods (and their basic methodologies) are to be integrated on the basis of Information principle and by virtue of true Information scientific approach (with the initiative significance of the Information medicine). In this, essentially, we urgently need an adequate ‘conceptual’ language for the mutual understanding, communication and cooperation of all scholars who are concerned with Organicist and Integralist scientific pursuits. More than that, as it is well known – “New is long forgotten old”.

2.4. The Triune (Bipolar) medicine – of both polar Health and Disease; and the synthesizing Integralist axis

Stressing the complex (factually – the all-encompassing) subject matter of the human’s health – we are to remember the essential statement of Aristotle’s Physics (and which is an important momentum serving as a ‘propellant’ for the contemporary analytical processes) that “the underlying nature is knowable through analogy: (191 a 9).” In our application we call the cognition “by analogy” as the method of “essential metaphor”. The latter is characterized in the article of 2011, in its section “The method of «essential metaphor»38 – for the realization of universalizing modeling in the research of life processes”. In the given exploration, and applying the Aristotelian method of analogy (“essential metaphor”) – we can argue that such a way of tackling issues immediately gives rise to understanding the universal Dynamicity, Bipolarity and Cyclicity – Triadicity – of the natural (real, substantial, actual, physical) world. Therefore (if to consider man as the product of the Cosmic evolution, and the latter is a matter of fact – i.e. things as they are) – cognitive activities (scholarly endeavors) likewise naturally have the Triadological essence (of the concurrent synchronous integral co-existence of the Three natural Types of rationality: two polar (opposite to each other); and the third, or the first in significance – intermediate basic Integral Type). This approach was presented at the Vienna congress on “The Concepts of Health and Disease”, in 2013 (see its Proceedings39). Herein, the Triadic (Triune) model of (comprehensive) medicine has been proposed and substantiated. Schematically, it looks like:


Exemplifying the method of essential metaphor, and in the given context – we should firstly point out to the achievements of Russian physiology, namely to the theory of Metasympathetic nervous system. The latter has been proposed and substantiated in the 1980s by the Russian physiologist Alexander D. Nozdrachev. Substantially, Academician A.D. Nozdrachev is a direct follower of the scientific tradition of Russian organicism (its neo-Aristotelian essence is considered below). Academician Nozdrachev is the sixth (in sequence, since 1863) head of the department of General Physiology of St. Petersburg State University\(^40\) (where he had served close to 30 years, as a head of the chair), after Ph.V. Ovsyannikov; I.M. Sechenov, N.E. Vvedensky, A.A. Ukhtomsky, L.L. Vasiliev, and N.V. Golikov. As to the theory of Metasympathetic nervous system, Nozdrachev informs in his article entitled “Structural and functional organization of the vegetative (autonomic) nervous system”\(^41\) that the autonomic nervous system is triadic, for it is subdivided into the sympathetic, parasympathetic and metasympathetic parts. The scholar states that “the metasympathetic system includes the complex of microganglia situated in the walls of visceral organs and having marked motility activity (the heart, ureters, intestine, stomach).” Therefore, according to the localization, separate areas of this system can be defined by its site (for example, the cardiometasympathetic area in the heart). The main finding of Nozdrachev is that “the metasympathetic system attains the features of true autonomy. Its cells have no direct connection with the high centers: this connection is established through mono- and polysynaptic sensory and afferent units of sympathetic and parasympathetic nature.” [p. 937] However, the effective

\(^{40}\) For the information, see the SPBU-website – https://bio.spbu.ru/faculty/departments/physiology/history.php (in Russian)

(healthy) vegetative regulation of the organ’s life activity is realized by (in principle is possible on the condition that) all the three (triune) divisions of the whole autonomic nervous system are permanently, synchronously and effectively active (but which, in their potentialities and activities – are fully independent in their Functionalist systemic organization).

Correspondingly, inasmuch as we live in the one universal Cosmic world – our scientific activities likewise must rely on the foundations of the Three Types of rationality (hence, on the Three equal “scientific methods’’). With regard to Metasympathetic nervous system (MSNS), as submitted by Nozdrachev, the system has a definite set of functional elements including sensory ones (mechano-, chemo- and thermosensitive those), oscillators, interneurons, tonic neurons. Neurons of the metasympathetic system are incorporated through interganglionic connections into the common functional network of the organ. Nozdrachev adds that “Besides well-known systems of mediation including cholinergic and adrenergic ones (thus, MSNS clearly demonstrates its Integralist essence, for it substantially unites the means from both poles – adrenergic and cholinergic. – Authors.), the metasympathetic system has its peculiar purinergic transmission.” [Ibid.]

3. BIOCOSMOLOGICAL DEFINITION OF INFORMATION

In the light of our (Biocosmological, substantive neo-Aristotelian) approach, but pursuing a logically valid interpretation of the word Information – we might propose the elucidation of ‘giving Form’ as ‘from withIN’, and ‘for the Aetio- or Aitia’, i.e. the effective causal activity or energeia); therefore Energy (concurrently with the modern meaning) can be treated as the natural inherent dunamis-potency; and Matter – as the hyle with the properties of active hypokeimenon (for self-organization. i.e. which is Dynamic and Telic), like amino-acids are (for proteins), or nucleotides (for nucleic bases); or atoms (for molecules), etc. Therefore, naturally, the actual Information organ (Dynamic – Homeostatic and Functionalist) is permanently realizing both the emitting and spreading information rays – ‘away from itself’, and is actualizing the Information forces of attraction – ‘towards itself’ (of the needed for its life ontogenetic activities hyletic elements and telic hylemorphist units), and the latter has the primary significance for its existence.

In his Physics, Aristotle develops the Triadic essence of the physical world and comes to the following conclusion: “So, the starting points are in a certain way not more than contraries, but two in number in this way of speaking, but neither are they altogether two in account of the being different from them of the underlying thing, but three.” (190 b 37 – 191 a 2); and “It was said first that only the contraries were starting points, but later that something must also underlie them and that they must be three;” (191 a 17-18)\(^{42}\). Overall, as we propose – the generation of matter (visible and tangible things) is primarily the Self-generation and Self-realization of organ(ism) – by means of the inherent Information – and which is ultimately the organon (οργάνων, i.e. the Functionalist – Entelechist and Hylemorphist – entity) – the living

thing that (through Information) converts the Dynamic (potential) energies of the united polarities (polar things and their potencies that are synthesized and actualized) in the organ(ism) for its Homeostatic existence and actual Ontogenetic Functionalist Self-activity and Self-evolvement, thereby accumulating all the experience gained through the consistent polar cycles of life activity. Essentially, to stress this once again – the natural life activity (and this is the Naturalist law) has the Triadological essence, which is the **sine qua non** for self-realizing the ultimate telic (Entelechist – Functionalist) destination in its/her/his ascending life ontogenesis, i.e. by Dynamic alternation of the polar cycles of life activity, but, consistently, on the common Information base (which is the third, or the first in significance – Self-dependent Type-realm of each living-material thing).

In general, we ought to claim (but this is the objective reality) that the real world (Kosmos), in relation to Physics – the entire Kosmos is subdued both to the non-organic physicalist laws (as Gravity, or Affinity) and equally to the Organicist (Bio-naturalist) laws, including the Bio-naturalist laws of Dynamicity, Bipolarity and Triadological Cyclicity (and Biorhythmic ascending Circlicity), and the law of Ontogenetic life cycles and the ascending Self-evolving Circlicity (and all this long ago has been introduced into the world culture by Aristotle, or Chinese Taoism; but, paradoxically, is taboo in the modern scientific milieu). Likewise (as we argued above), an essential moment is that the whole world (Universe, Kosmos) is constituted of living (life) things, which all have (exist in) their own ontogenetic life cycles – wherein they all undergo the individual origination (coming-into-being – ‘birthquake’), growth and the inherent potency maturation, with further realizing the ultimate effective Functionalist activity, and in the end dying-away; but which all (material or living things) are organized on the different ascending hierarchical levels, including the animated life activity (which mainly is realized at the rational-human level); on the latter (that should be emphasized) Aristotle defines *psychè* as “the first *entelecheia* that is organikon”[43].” [In *De anima*, II, 412b5]

Therefore, we are ready (basing on the evidence that is discussed above) – to offer our proposal regarding the response and explaining “the greatest challenge in physics” of-today (concerning “the matter-antimatter asymmetry problem”, see above), namely regarding the emergence and existence of all (material – living – Entelechist and Hylemorphist) things and the material Universe as a whole; i.e. how a material thing emerges (instead of being annihilated into energy) on the basis of the primary matter/antimatter pair. Our answer is that the foundation for the matter (*hylemorphist morphae*) emergence is the third basic quintessence, which we call “Information”, and which is able – as the Third substance-matrix for synthesizing the polar potencies (energies of the polar constituents) – to realize the ‘homeostatic’ conditions for organisms (living things, all things), thus actualizing their main Functionalist abilities. That is, Information is the natural(ist) channeling and

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[43] Taken from: Aristotle (1907). *De Anima*. Ed. by R. D. Hicks. Cambridge: Cambridge University Press. Herein, the words “actuality” and “body” are replaced into the original *entelecheia* and *organikon*; and taking into account that originally, from Greek – *organikon* means instrumental (functional).
organizing the entire energy of polarities (of their preventable annihilation) towards accumulation and the further Entelechist (i.e. effective) emergence, self-preservation and self-evolvement of a living thing.

Therefore, in our Biocosmological approach – we define Information as the primary basis – the foundational Naturalist Self-generation of a stable Homeostatic organ(ism), i.e. Information is the Naturalist ability to provide stable equilibrium of all the united polarities (but, this is ‘stable non-equilibrium’) and their Entelechist potencies; and further to apply their natural forces (causes) to realizing the Bio-rhythmical cyclic consistent stages of the organ’s Ontogenetic growth and its Functionalist self-realization.

Essentially, in this light, Information is a Naturalist entity, rather Naturalist law – that each natural primary (hyletic) element and the further Self-evolved living thing-subject-organ(ism) – each living (Naturalist) subject’s Homeostatic (Self-sustainable - running for the entire ontogeny) in-being (existence) and Ontogenetic (Functionalist) Self-actualization is based on its own inherent (Entelechist) Information (“know-how” for the given subject). All this, the genuine (authentic), but Ontogenetically Self-realized, effective “know-how” – is carried out in manifold semiotic systems, and substantially is focused at realizing primarily the Homeostatic (healthy) life condition of the given living thing, as well as accumulating the entire life experience. The latter (living subject’s) life growth and experience is achievable exclusively through the other two polar dunamis/energeia – Sleep/Awake – Types-realms of life activity, but which both are based on the synthesizing Integral Homeostatic backbone of the whole organism and its/her/his whole ontogenesis – the backbone that is Self-changeable (Self-evolving), Hierarchical and semiotically diverse – all this is Information.

A keystone is also that Information has its intrinsic (primary) and extrinsic (secondary) modes. In our article on the “Challenging Integralism” we devote the 9th section to the “Animate (natural, entelechial – from within) and inanimate (artificial, idealist – from without) Types of Information; and their relation to carcinogenesis aetiology” [2017]. An important moment is likewise that Information exists in constant flux, search and adjustment to better Self-realization of the essential Ontogenetic goals, ultimately aiming at the most successful (effective) Self-actualization of the subject’s Entelechist Ontogenetic (Functionalist) route of life. In the outcome, as we see it – the Biocosmological definition of Information (that is evolved in this work) has the substantial (fundamental) links, or, at least, intimate connections to the significance of foundational conceptions and the meaning of Dao (in Taoism); and Meditation, as a way of life (in Buddhism). At the same time, the Biocosmological approach is a more rationalized alternative (especially, in relation to our current “scientific” epoch).

In turn, the crucial starting point in our (Biocosmological) approach is the right use of the Aristotelian OrganonKosmology. We strongly support, firstly, the

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44 And, in turn, which (the life experience) is possible exclusively through the ongoing fixation-memory and the consistent automatic retrieval and immediate use of the (ready for use) needed life reaction.
rehabilitation of Aristotle’s authentic Dynamic naturalism; and the termination of its current active misinterpretation (misinformation) – the on-going Platonization of the Aristotelian Organicism, thus poisoning the consciousness of contemporary scholars with false information and cognitive attitudes. Instead, we strongly urge colleagues to rehabilitate, recognize and actively apply the Aristotelian Organicist naturalism and his entire (super)system of comprehensive rational Organicist knowledge, firstly as the matrix of essential notions, principles and conceptual constructions, which are indispensable for the mutual understanding and effective cooperation of all the scholars who are striving to realize the contemporary Organicist and Integralist efficient research. Without such a matrix (common rational grounds and the needed common ‘conceptual language’ for mutual understanding of all the engaged scholars) – the progress of contemporary Information approaches is hardly possible.

Overall, Information (intrinsic and extrinsic) basically realizes the Homeostatic sustainability of a life organ(ism) (living thing) and its Functionalist activity aimed at the effective delivery of inherent wholesome results of life activity – through the efficient organization (uniting) of polar (hylemorphist) elements-organs, and realizing their cyclical and Biorhythmically Circlic (replicable) Functionalist growth, regeneration and Self-activity. At any rate, in evolving the Information approach (and the Information medicine) – we need to move forward from the initial stages and consistently building our basic constructions.

At the moment, we treat the Information basis as mesostasis – the “golden mean” – the intermediate fundamental Integrating nature, which is able for striking the right stable balance between the polar potencies and activities (within the Triadic whole of the thing’s life organization). In the midst of our examples, this is the neutron (and the whole nucleus, relating to positron and electron); or the egg cell that is a basis for fertilization and zygote emergence, with the further entire process of healthy pregnancy and delivery; or the heart as an organ, which enables the constant physiological (homeostatic) living processes and provides the conditions for consistent alteration of the polar Diastole/Systole physiological phases; or the physiological organism (body) of a living thing (human being) that is capable of maintaining all the homeostatic internal parameters for the healthy (of entire ontogenesis) activity and is the basis for the alternating Sleep/Awake-cycles that are essential for the ontogenetic growth and efficient Functionalist activities of the given subject. Herein, a key principle (but taken in its Triadological unity) is that Information has basically the intrinsic significance, but each living subject essentially needs the extrinsic information as well – for the ultimate stable realization of the homeostatic (healthy, wholesome) life condition and aiming ultimately at the actual thing’s (living organism’s) realization of effective Functionalist (Entelechist) life activity during (as the final result of) its/her/his entire ontogenesis.

Information is of fundamental importance in all events in nature, in which feedback is an example of Information’s action, found on both sides of the equation of equivalence: $E = mc^2$ of every cause-and-effect relationship. Each beginning ($=^{i}$) is a real new Information which on the one hand belongs to its source, while on the other – to the newly created process or structure. This approach (and the notion of
“each beginning (=i) as a real new Information”) is in full accordance with the Aristotelian potentiality/actuality theory and, in general, his Organicist (Dynamic – Bipolar and Triadic) cosmological naturalism, wherein the entelecheia of each thing\(^{45}\) is self-realizing its essence both (and consistently) in the polar spheres (realms) of Potency (\textit{dunamis}) and the generation of an effective \textit{morphae} (Functionalist organ), and the realm of Activity (\textit{energeia}), with the final production (i.e. \textit{the telos}) of the needed effect (result, product). As the Stagirite concludes in his Physics, “It was said first that only the contraries were starting points, but later that something must also underlie them and that they must be three; (191 a 17-18).”\(^{46}\)

In our approach, the notion of “information resonance” is essential\(^{47}\). Resonance is a synchronization of a source with its reactive subject. In humans, there are many areas of the psychological structures, which are ready to resonate with various things. The word becomes a causative agent only if there is an agreement between the person who gave that word or other information, and the person who willingly accepted it, and used it in an appropriate way. There is also a reverse relationship: material phenomena, for example received pain evokes specific information response, which is linked with certain type of changes at the molecular level, or even the submolecular one. The human mind, confronted with many very different problems, generally can cope with them by focusing on certain fragments, usually the most visible ones. The feedback loop (input → output) is a very special type of informational system, the return of part of the output to the point of input for monitoring or self-regulation.

With all this, we need essentially to take into account the Homeostatic and Ontogenetic attributes of Information. In this, referring to the arguments stated above – we urge to pay attention on the Biocosmological course of considering Information in the entire spectrum of Naturalist laws (bio-naturalist and Bio-naturalist), including the natural sciences laws of the higher level of the world Kosmic Organicist array, starting from the universal laws of Dynamicity, Bipolarity and Cyclicity; and opening the way to new heights (and recognizing the higher) principles of Biorhythmicity and Biocirclicity, including the Homeostatic Triadicity and the Ontogenetic Triadological Functionalist (Entelechist and Hylemorphist) Self-Evolvement of the living being (living subject, living thing). In general, we are to recognize (for new academic initiatives) that the real world is Organicist and Self-Changeable, thus Entelechist and Hylemorphist, Hierarchic and Finite (Ontogenetic), and Functionally Heterogeneous. All these principles, as, foundationally, the underlying Biocosmological rationale (with its substantial aetiological, gnoseological, methodological, anthropological, etc. foundations) – all this is essential as for the contemporary sociocultural evolution, as

\(^{45}\) But, which itself (the entelecheia), within the living subject’s general ascending hierarchic way of approaching Nous (Noosphere) – every time (for the next new higher hierarchical level) is generated (\textit{from within}) consistently, but anew.


for the successful resolution of the scholarly issues of medicine efficiency, including the aetiological understanding of carcinogenesis.

Special significance of Information, as we argue (and to stress this, once again) – Information has a similar (backbone) meaning as the holistic Dao (in Taoism) and Meditation, as a way of life (in Buddhism). However, now we seek to attach more scientific importance to the meaning of Information and, thereby – achieve the direct compatibility of contemporary Information (in our 21st century) with the existing effective scientific facilities. Therefore, the notion of Information (we propose) relates to the Triadological (Organist, basically of Dynamical naturalism) world-viewing, and it naturally reflects all the Three self-dependent rational approaches (Types of scientific pursuits) in our cultural milieu: the polar Organist and Dualist; and the intermediate synthesizing Integralist Type of knowledge. Primarily, of course, Information has the Integralist essence.

Therefore, essentially, the Biocosmological Information realizes the Triune essence and potential of Health sciences, i.e. equally and perfectly combines the naturalist qualities as of the Dualist medicine approach – of human consciousness withstanding, cognizing and conquering-suppressing the harmful forces (conditions) and adverse health effects, as disclosing the natural healing all-round causes and forces – by applying the opposite Organicist approach; and equally contributing into the Integralist further strengthening (or restoring) the permanent natural Homeostatic well-being of the human being. In our approach, thereby – the basic notion Information should be defined and simultaneously characterized as the Kosmist law and Universal substance – the Naturalist ability of each living (tangible substantive physical) thing to Self-realize the Functionalist integration (holistic consolidation, systemic and complex, on the inherent matrix) of the appropriate polar entities (potencies) – for their fusion and nexus, and the ultimate generation of the living subject’s Functionalist (effective, terminative-wholesome, fruitful) activity.

Essentially, likewise, Information is the sustainable unique option of resolving (finding out) this synthesizing substance that generates the sustainable Homeostatic (of the “Golden mean”) basis for uniting the appropriate polarities and generating the life condition for the Functionalist (Self-evolving) substance (living subject). A key moment, herein, is that Information is both the sustainable basis for uniting and organizing the needed substantive polarities (polar potencies), and equally is the route for the wholesome ontogenetic Self-evolving and Functionalist Self-ascendance of the living thing (subject, human being, society, civilization, Noosphere) – up to its/her/his highest Functionalist level of Self-actualization.

In general, our conclusive definition of Information is the following:

*Information is the Naturalist law and entity, and its essence is the subject’s inherent realization of the Functionalist Triadological (and in all semiotic realms) Triunity of the essential polarities (potencies) and their Homeostatic Integrity (Integral basis), and which is equally the Ontogenetic axis for the subject’s (living thing’s) entire life route (Entelechist and Hylemorphist) Self-evolving actualization.*
Appreciably, this Biocosmological notion is stressing the intrinsic qualitative (Dynamic, non-linear) Triadological attributes of Information, while modern definitions (for the overwhelming majority) are focused on the extrinsic quantitative (Static, linear) features of information. The fact is that our approach relates to the essentially distinct (self-dependent) Types of rationality (Organicist and Integrated), while the present definitions are embedded in the Dualist Type of mentality. For instance, Capurro and Hjørland conclude, “Shannon’s definition of information is quantitative concerning possible selections from a repertoire of physical symbols. It is, in fact, as Underwood [2001] remarks, a theory of signal or message, not of information transmission.” [2003] However, the comparative analysis of the current concepts of information is not the function of this exploration.

4. ARISTOTLE 1.0; ARISTOTLE 2.0; ARISTOTLE 3.0; ARISTOTLE 4.0; ARISTOTLE 5.0

In the landmark book, “Order Out of Chaos” [1984], Nobel Laureate Ilya Prigogine and acclaimed philosopher Isabelle Stengers formulate the notion of “the general language of dynamics”, which “was discovered by nineteenth-century scientists.” [p.68], and that “the language of dynamics presents a remarkable consistency and completeness” [Ibid.], as well as that “Dynamics is such a language; being complete, it is by definition coextensive with the world it is describing.” [p.74] In this book we likewise meet the well-known (Prigogine’s) saying (quoted many times):

The a priori conditions of experience are also the conditions for the existence of the objects of experience. This celebrated statement sums up the “Copernican revolution” achieved by Kant’s “transcendental” inquiry. The subject no longer “revolves” around its object, seeking to discover the laws by which it is governed or the language by which it may be deciphered. Now the subject itself is at the center, imposing its laws, and the world perceived speaks the language of that subject. No wonder, then, that Newtonian science is able to describe the world from an external, almost divine point of view! (our italics. – Authors) [p.87]

The authors conclude that “According to Kant, science does not engage in a dialogue with nature but imposes its own language upon it.” [Ibid.]

Their main conclusion is unambiguous: “each language can express only part of reality” [p.225]; and “no single theoretical language articulating the variables to which a well-defined value can be attributed can exhaust the physical content of a system.” [Ibid.] The authors prove in their study that the world we are living in is universal, but each rational-scholarly approach (type-pattern-paradigm of scientific pursuits) could achieve only a partial effect. With that, of course, we need to apply the knowledge of the laws of Nature that is based on their extended understanding,

including the Dynamic essence of physical reality. Their judgment deserves special attention:

Various possible languages and points of view about the system may be complementary. They all deal with the same reality, but it is impossible to reduce them to one single description. The irreducible plurality of perspectives on the same reality expresses the impossibility of a divine point of view from which the whole of reality is visible. [p.225]

Following the “logic” behind this reasoning we can naturally see the next (consistent, of the general Circle) stage of the world science evolution – the emergence of a new Type of rationality dominance in scientific activity; but which, in actuality (in the Cyclic and Cyclic order of reality) – new is always well overlooked old, in our case – the Aristotelian OrganonKosmology and the compatible ancient (“axial” – as termed by Karl Jaspers) Organicist and Integralist (super)systems of comprehensive rational knowledge. All this means that a contemporary (of the 21st century) scholar also (together with the classic forms) ought to acquire the capability to apply the Organicist and Integralist Types of rationality. To a large degree the authors pay attention to Aristotle. Noteworthy, they likewise are concerned with the study of our “Type of rationality” topic, as illustrated by their reasoning:

In any case, for an Aristotelian it is more interesting to know why a process occurs than to describe how it occurs, or rather, these two aspects are indivisible. One of the main sources of Aristotle's thinking was the observation of embryonic growth, a highly organized process in which interlocking, although apparently independent, events participate in a process that seems to be part of some global plan. Like the developing embryo, the whole of Aristotelian nature is organized according to final causes. The purpose of all change, if it is in keeping with the nature of things, is to realize in each being the perfection of its intelligible essence. Thus this essence, which, in the case of living creatures, is at one and the same time their final, formal, and effective cause, is the key to the understanding of nature. In this sense the “birth of modern science,” the clash between the Aristotelians and Galileo, is a clash between two forms of rationality. In Galileo's view the question of “why,” so dear to the Aristotelians, was a very dangerous way of addressing nature, at least for a scientist. The Aristotelians, on the other hand, considered Galileo’s attitude as a form of irrational fanaticism. [p.40]

Even more so given the fact that we know (from Pitirim Sorokin, for instance) that approximately every 400 years there is a dynamical inherent change of the foundations of sociocultural activity within the given civilization (culture). Therefore, now it is the time to appeal to the courage of contemporary learned scholars who presently (“as if bewitched”) are unable “to get close to things themselves”. We now imply (under “things themselves”) the Naturalist pursuits, and stress the unacceptable
loss of Aristotle’s Organicist Dynamic (Entelechist and Hylemorphic) naturalism, and emphasize the urgent need, in our time of crises – to reinstate Aristotle’s comprehensive Organicist supersystem of rational knowledge and re-establish the genuine language and the whole conceptual edifice of the Aristotelian OrganonKosmology archetype. Along that line, we firstly have to grasp a couple of cornerstone moments: 1) Aristotle’s philosophy is the self-dependent OrganonKosmology and the archetype of Organicist rationality; 2) Aristotle’s philosophy has its own language and the apparatus of indispensable notions, terms and concepts; but which are heavily misinterpreted in our modern time; for instance, the Aristotelian (purely Dynamic) notion entelecheia is now translated as “actuality” (but it never may get such a Static meaning).

In De anima, II, 412b5, Aristotle defines psychè as “the first entelecheia\textsuperscript{49} that is organikon\textsuperscript{50}.” Thus, in Organicist reality, in each natural body – both hyle and morphe (form) are teledriven and relate eventually to the eventual (actual) Organon (Functional organ). In this, we can discern first entelecheia that actualizes (on the inherent consistent hyletic basis) the given Functionalist potency (gives birth to the appropriate morphe – form – Functional organ); and further launches the second entelecheia’s (the given morphofunctional) activity, thus eventually providing the needed effects for wholesome life activity. Thus, first entelecheia (that produces morphe – morphofunctional structure), and second entelecheia (that produces the needed effects – the functional results of activity) – they are quite opposite (Bipolar) to each other, but naturally united within the one Organicist – Inherent, Bipolar, Dynamic, Cyclic and Circlic Ascending – Spiral (and Biorhythmic) naturalist mode of life activity.

4.1. Aristotelian OrganonKosmology as the matrix for realizing the contemporary Organicist and Integralist research

In all cases, to repeat this important moment, once again – Aristotle’s hyle is not the chaotic mechanical matter, kind of the building stones (‘bricks’) for the creation of new constructions by artificial (‘from without’) work – by realizing divine or anthropocentric activities. Quite the opposite, hyle is a kind of telic monomers (like nucleotides, or amino acids) – the predisposed “functional blocks”\textsuperscript{51}, with their intrinsic (‘from within’) forces (energy) to contribute to the processes of self-organization and production of the need-driven functional structures, and their further actual generation of the needed effects (results or products of life activity). In general, as we have concluded in our “Challenging Integralism” [2017] – the material

\textsuperscript{49} Taken from: Aristotle (1907). De Anima. Ed. by R. D. Hicks. Cambridge: Cambridge University Press.

\textsuperscript{50} Emphasizing, once again, that originally, from Greek – organikon means instrumental (functional).

(hyletic) components of living organisms at every level of their organization can perform their necessary biological function only after they have been integrated into the appropriate structure (morphe). In this Organicist order – of the telic (Entelechist – inherent Functionalist) organization, with its/her/his readiness to execute the due ontogenetic Functionalist activity – we can treat each living subject, from atom to molecule, organelle, cell, organ and the Functionalist system of organs, the biological and social organism, and the man, ultimately, who is the Functionalist GeoBioSocioEcoKosmic entity.

“The theory of dissipative structures moves us closer to Aristotle’s conception,” [Prigogine and Stengers, p.171] – as authors conclude, as well as “classical science denied becoming, natural diversity, both considered by Aristotle as attributes of the sublunar, inferior world.” [p.305] In this sense, Prigogine and Stengers stress – “classical science brought heaven to earth”; however, they note, this apparently was not the intention of the fathers of modern science. By the way, they recall Aristotle’s claim that “mathematics ends where nature begins” [Ibid.] In line with this reasoning, we cannot but note the achievements of another eminent scholar of the 20th century, Thomas Kuhn, and his outstanding “The Structure of Scientific Revolutions”52 Therein, the scholar argues that “before Newton was born the «new science» of the century had at last succeeded in rejecting Aristotelian and scholastic explanations expressed in terms of the essences of material bodies.” [p.104]; and that Aristotle and Galileo were the two “fundamentally at cross-purposes” men. [p.132] Kuhn reveals the transformations of the paradigms in the world history of science, for instance, “the transition from the original Aristotelian to the scholastic impetus paradigm for motion.” [p.120]; and that “like the early Copernicans who criticized Aristotle’s proofs of the earth’s stability, they did not dream that transition to a relativistic system could have observational consequences.” [p.72] In the result, the scholar concludes that “Einstein’s general theory of relativity is closer to Aristotle’s than either of them is to Newton’s.” [p.207]

Martinás and Tremmel, summarizing up Kuhn’s voluminous scholarly material (in their work53), explore the momentum of Thomas Kuhn’s advancing the notion of “paradigm” – it was precisely his studying and comparing the systems of the Aristotelian physics and that of the modern natural sciences, and, in the result – the identified “differences of Aristotelian physics and Newtonian mechanics lead Kuhn to the discovery of paradigm changes.” [Martinás & Tremmel, 2014, p.178]. In other words, the scholar (Kuhn) had been deeply impressed by their own consistency and credibility (of both – Aristotelian and modern – comprehensive systems), but, at the same time – by their full incompatibility with each other (of being ‘incommensurable’, in Kuhn’s term). Noteworthy, the authors disclose Kuhn’s way to the discovery of paradigms, referring to John Horgan’s summarizing: “In 1947 while

reading Aristotle’s Physics, Kuhn had become astonished at how ‘wrong’ it was. How could someone who wrote so brilliantly on so many topics be so misguided when it came to physics?” [Ibid, p.178] J.Horgan himself arrives at a following conclusion:

Kuhn used the term paradigm to refer to a collection of procedures or ideas that instruct scientists, implicitly, what to believe and how to work. Most scientists never question the paradigm. “Different paradigms have no common standard for comparison; they are ‘incommensurable’, to use Kuhn’s term. Proponents of different paradigms can argue forever without resolving their basic differences because they invest basic terms – motion, particle, space, and time – with different meanings. The conversion of scientists is thus both a subjective and political process. It may involve sudden, intuitive understanding – like that finally achieved by Kuhn as he pondered Aristotle. Yet scientists often adopt a paradigm simply because it is backed by others with strong reputations or by a majority of the community.” [Horgan,54 1991]

At the present time, however, acknowledging the realities of our current scientific world – i.e. that we (implying the existing Western social institution of education and science) live now in the strictly unipolar scientific realm, based on solely the Dualist Static cosmology, i.e. in the “real” world that is created as an ultimate construction by a Transcendent or Transcendental (by Demiurge or the Consciousness of man; but not Naturalist) power. In this vein, the applied scholarly methodologies totally are based on the derived Dualist mathematical-physicalist epistemology, so-termed as “scientific method”). Quite the contrary, the main Biocosmological approach (that is supported by the BCA-associates) strives to explain the essential need of synchronous and integrated use of all the Three Types of rationality (and scholarly endeavors) – of both polar Dualist and Organicist Types; and the intermediate Integralist order of knowledge and information organisation, and firstly aiming at tackling the issue of human health and well-being. At the same time, as it is disclosed in the outstanding work of Pitirim Sorokin – his four-volume “Social and Cultural Dynamics” (1937–1941) – we contemporarily have entered the dominance of Integralist type of sociocultural organization (naturally including the institution of science). Therefore, we need to evolve the Integralist theories that are able to integrate (on their own cosmological bases) the potentialities and active means (conceptual frameworks, approaches, methods, practices, etc.) of both the polar Types of rationality – Organicist (neo-Aristotelian, of Dynamic naturalism and teleological physics), and Dualist (Platonic – Idealist/Materialist, of mathematical physicalism). In turn, Integralist approaches, already existing in the form of systemic, complex, holistic, etc. studies – they urgently need to recognize and clarify the essential foundational principles and the conceptual backbones of the Organicist (relating to the Dynamic – Entelechist and Hylemorphic – naturalism) Type of

rationality – to further apply them in the Integralist conceptual constructions and approaches.

In the Biocosmological Association, it is our firm view that to achieve these action lines – we do need to reinstate the authentic significance of the entire Organon Kosmology of Aristotle, starting with rehabilitating the significance of the Aristotelian physics. As previously stated, the type of mentality of a modern scholar is very rigid and fixed over the Dualist – Unipolar, Static, and Monolinear – approach to studying the concrete reality, including the issues of human health and well-being. The more, therefore, we need to introduce and develop a kind of matrix (framework of references; general address) for all the scientists engaged in Organicist and Integralist studies; and in our (BCA) considered opinion – this is precisely (and solely) the Aristotelian Organon Kosmology (his entire comprehensive supersystem of the Organicist rational knowledge). Otherwise, an effective communication and mutual understanding of scholars (who are proponents of Organicist and Integralist approaches) will be hardly possible. Then, first and foremost – we need to restore the authentic meaning and significance of the Aristotelian crucial (essential) terms, notions and concepts. In our joint work devoted to the Challenging Integralism [2017]55 – we have put special emphasis on this issue.

4.2. Aristotle 5.0 is the scientific and cultural challenge of our time

The rich discussions and resulting proposals of the Biocosmological Congress and the 14ISBC (held in Krakow, July 2017) – all this has become a significant milestone for the BCA initiatives evolvement. BCA President, Prof. Xiaoting Liu, from Beijing Normal University, China – he opened the debate, and his contribution on the “Mother Earth” topic gave a new constructive impetus to the cooperation of BCA associates. Myth of Mother Earth is the oldest and most systematic in Chinese philosophy of the earth due to the coherence of Chinese civilization and the possibility of close observation. In general, Chinese cultural thought basically is align with Organicist Type of mentality, wherein Nature essentially has the inherent potentials of self-changeability and self-organization, and wherein humankind constitutes a higher (heterogeneous, but universal) level of the one whole Kosmic (in its Greek spelling) world – namely Earth-Kosmic Organicist world.

In this course, X. Liu emphasized that the earth and the heaven are all concrete and sensible, which means both of them have the accessible personified existent. From the perspective of neo-Aristotelism, the mere emphasis on status and value of the earth and regarding the earth as a living organism is just a kind of theoretical description. Earth is not only the object of experience and the basis of life, but it is also the world of co-existence with man, which means that the life of man is

connected with the life of earth. Man has to be accustomed to earth and experience earth so as to maintain a relationship with the world and to have a poetic dwelling. He believes that “dwelling is a way of human existence on the earth”, “dwelling itself must always be a stay with all things on earth”, and only then “on the earth and in the earth, historical people laid the foundation of their dwelling in the world. All these efforts show that nowadays we should re-examine the traditional earth thoughts and reconstruct the new earth philosophy through the Biocosmological perspectives, after all the twists and turns. To sum up, and aiming at major achievements in the given course – we do need have at our disposal as the adequate solid conceptual foundations (ready to serve as reliable grounds for realizing and building the efficient Organicist and Integralist activities and constructions, on both the theoretical and practical levels), as the adequate effective matrix (framework of references) for all the scholars who are committed and engaged to the Naturalist (of Dynamic Organicism) study of the world – for their mutual understanding and effective cooperation (we strongly believe that this is the Organon Kosmology of the Stagirite).

According to Xiaoting Liu, Chinese Earth-Mother philosophy changes the priorities for contemporary scholarly endeavors and thus evolves relevant scientific pursuits in the Biocosmological perspective. The evolvement of contemporary Integralist (Holistic) conceptions occupies a special place, including the studies on the Earth topic. The Russian scholar Vladimir I. Vernadsky, an eminent representative of the cosmological trend of Russian cosimism (that embraces the different cultural spheres: of natural sciences and philosophy; and the arts), and who is the author of the revolutionary theories of Biosphere (in 1920s) and Noosphere (in 1930s) – Vernadsky defines (as it is summed up by a researcher\(^56\)) that “the Biosphere is the single greatest geological force on Earth, moving, processing, and recycling several billion tons of mass a year.” In his works “Scientific thought as a planetary phenomenon” and “The Biosphere and the Noosphere” (published in the Collection of works, entitled as “The Biosphere and Noosphere Reader”\(^57\)), V. Vernadsky remembers that since 1910s his scientific pursuits were directed towards “geochemical and biogeochemical manifestations in circumambient nature, the biosphere.” [p. 96]; and eventually all this has led him to the awareness that:

There arises the problem of the reconstruction of the biosphere in the interests of freely thinking humanity as a single totality. This new state of the biosphere, which we approach without our noticing it, is the noosphere. In my lecture at the Sorbonne in Paris in 1922–23, I accepted biogeochemical phenomena as the basis of the biosphere. The contents of part of these lectures were published in my book Studies in Geochemistry, which appeared first in French, in 1924, and then in a Russian translation,

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in 1927. The French mathematician Le Roy, a Bergsonian philosopher, accepted the biogeochemical foundation of the biosphere as a starting point, and in his lectures at the Collège de France in Paris, introduced in 1927 the concept of the noosphere as the stage through which the biosphere is now passing geologically. He emphasized that he arrived at such a notion in collaboration with his friend Teilhard de Chardin, a great geologist and palaeontologist, now working in China. The noosphere is a new geological phenomenon on our planet (our italics. – Authors). In it for the first time man becomes a large-scale geological force. He can and must rebuild the province of his life by his world and thought, rebuild it radically in comparison with the past. Wider and wider creative possibilities open before him. It may be that the generation of our grandchildren will approach their blossoming. Here a new riddle has arisen before us. Thought is not a form of energy (our italics. – Authors). How then can it change material processes? That question has not as yet been solved. [p. 99]

4.2.1. To overcome the current ‘cosmological insufficiency’

As we see, within the revolutionized Vernadskian approach – Noosphere is the geological, i.e. Naturalist (CosmoBioGeoChemical) product and the Self-evolved integrated (innate congenial) level of the One Whole Kosmic Organicist Evolutionary Process (and which is basically “geological” – Naturalist), thereby driven by the intrinsic Naturalist causes and forces (i.e. that each thing is generated and self-changeable by Nature – by the nature of a thing, its/her/his inherent Self-evolving ascending potentials). Therefore the scholars who associate themselves with the Organicist and Integralist (Holistic) approaches to scientific pursuits – they ought to be firmly opposed to the currently accepted (of Dualist essence) opinion that noosphere is “the sphere of human thought” (as it is given, for instance, in Wikipedia). Quite the contrary, the true Noosphere is the Organicist notion and “the geological phenomenon” (i.e. the result of the Dynamic Naturalist evolution); and, as for the Type of rationality – which directly refers to the Aristotelian Dynamic naturalism (and OrganonKosmology, on the whole); and, substantially, Vernadsky concluded nearly a century ago58:

At present we cannot afford not to realise that, in the great historical tragedy through which we live, we have elementally chosen the right path leading into the noosphere. I say elementally, as the whole history of mankind is proceeding in this direction. The historians and political leaders only begin to approach a comprehension of the phenomena of nature from this point of view…. [Vernadsky, 1999, p. 99]

We are entering the noosphere. This new elemental geological process is taking place at a stormy time, in the epoch of a destructive world war. But the important fact is that our democratic ideals are in tune with the elemental geological processes, with the laws of nature, and with the noosphere(our

Substantially, Vernadsky does not refer (in his conceptual constructions) to the foundational principles of the Aristotelian OrganonKosmology (although, as is evident, he is the bright contemporary representative of neo-Aristotelism, i.e. of the Dynamic naturalism). The latter is the common calamity, the shared present tragedy of all humankind. In the BCA we call this phenomenon as the contemporary ‘cosmological insufficiency’. For instance, to repeat the authoritative opinion of colleagues that “still, Vernadsky himself and many of his fundamental concepts remained largely unknown”\(^{59}\). It is our firm view that if Vernadsky had a good knowledge of the Aristotelian Organicist comprehensive (super)system of rational (scientific) knowledge, he could seriously deepen and strengthen his subject matter abilities and conceptual framework. First of all, a cornerstone and the Aristotelian tenet is (and which is a spontaneous outcome and agreement, made by the participants of the Biocosmological Congress in Krakow, in July 2017) – all the things in our world (Universe, Kosmos) are the living things (Organicist representatives of the “living matter”) that have (each) the inherent telic potential, and which (being inanimate at the given moment) can be in future included (their telic potential and self-evolved activity) into the generated active organisms (that are already animated and driven from within), or the passive constructions (built by a human mind from without).

Still, however, the potential of Noospheric evolvement so far is not realized (and, even, Vernadsky’s “fundamental concepts remained largely unknown”); while the global cultural world (and its substantiating philosophical and scientific foundations) still chiefly serve the scene of heavy fighting and violent clashes among the various dominating clans, which thus are realizing their wild ambitions for world domination; and all of this – in the general (Dualist) conquering and subordination of the surrounding world (environment – “circumambient nature”), both natural and social. Materially, the theories of Biosphere and Noosphere by Vladimir I. Vernadsky (generated by him in the 1920s and 1930s) are of particular significance. Turning again to the estimation provided by the team of renowned scientists, who edited the first full edition of “Biosphere”, and to other opinions (for instance, from the researchers stress\(^{60}\)) that “it is quite surprising that Vernadsky’s Biosphere\(^{61}\) was only published in English in 1997” [W.M. Edmunds and A.A. Bogush, 2013, p.239]; nevertheless, “the unique and pioneering role of Vernadsky in earth system science


\(^{61}\) While the first publication was made in Russia, in the 1926, see: Vernadsky, Vladimir I. The Biosphere. Leningrad: Nauchnoe khimiko-technicheskoye izdatel’stvo; 1926 (in Russian).
has however recently been acknowledged by Grinvald, Margulis and others” [Ibid.]
The authors studied this issue and now inform us that “the reasons for his lack of
recognition in the geochemical literature ... was that the holistic idea of the
‘biosphere’ created scientific confusion among the prevailing mechanistic,
reductionist views in western mainstream science.” [Ibid.] Significantly, however,
their main conclusion is that “Vernadsky is increasingly regarded as a figure as
important as Charles Darwin for our understanding of the evolution of life on the
Earth.” [Ibid.] In turn, as I.Trubetskova [2004] informs, “Vernadsky’s The Biosphere
and the Noosphere published in American Scientist in 1945, was the first publication
about his revolutionary theory of the Biosphere and Noosphere in English”; and that
“the paper was written in 1943 and reflects the summary of V.Vernadsky’s concept of
the Biosphere and Noosphere as a planetary and cosmic phenomenon that he has been
working on during the first quarter of the 20th century.” However, already according
to the information of Lynn Margulis and other colleagues (in their Foreword to the
full version of The Biosphere publication [1998]), “Still, Vernadsky himself and many
of his fundamental concepts remained largely unknown” [p. 15]; and that “even
James E. Lovelock, the British inventor and the other major scientific contributor to
the concept of an integrated biosphere in this century, remained unaware of
Vernadsky’s work until well after Lovelock framed his own Gaia hypothesis.” [p. 16]
Notably, Vladimir Vernadsky himself held an optimistic view on the mankind
future. Just before his death on 6 January, 1945, he wrote to his friend and former
student Alexander Petrunkevitch: “I look forward with great optimism. I think that we
undergo not only a historical, but a planetary change as well. We live in a transition to
the noosphere.” [The Biosphere and Noosphere reader, p. 40] In general, however,
and it is clear for us (regarding the sociocultural evolution) – the global cultural
leaders (in the second half of the 20th century) have failed to put mankind on a
Noospheric path toward a true sociocultural – peaceful and sustainable – evolvement.

4.2.2. The scholarly tradition of Russian organicism

Essentially, Vladimir Vernadsky is just one of the galaxy of Russian scholars
who have generated and presented to the world an essential tradition of Organicist
(precisely of the Aristotelian essence, based on the Dynamic Naturalist attitude to the
world and its rational study). However, political differences between the countries
and systems in the 20th century and their deadly enmity and military-political
confrontation with terrible battles and resistance – all this caused an adverse effect
when “a baby was thrown out together with bath water”. It means here that alongside
with the fierce fight with political rivals (including the suppression of the Soviet
political and cultural system) – the “baby” itself, i.e. the scientific school of Russian
Organicism (also called as Russian cosmism, Russian cyclism, Russian pulsationism,
Russian functionalism, etc.).

At the same time, the great advances of Russian scholars (who apply the
Organicist neo-Aristotelian approaches) were subjected to severe sociocultural
pressure and, in practice, are taboo in the current cultural milieu. However, this is
totally unacceptable, and we urge the immediate release of the Russian Organicism as
the indispensable resource for the ongoing and future safe and efficient sociocultural (scientific, first and foremost) self-evolving and growth, especially in the conditions of the current global sociocultural crisis. In this perspective, we can firstly note “the inherent principles of a civilization” of the cyclic civilizational theory by Nikolay Ya. Danilevsky; “goal-directedness” of evolutionary processes by Karl Ernst von Baer; the physiological conception of “internal inhibition” and the basic psychological notion of “free will” by Ivan Sechenov; “Tectology: the universal science of organization” by Alexander A. Bogdanov; the conception of the ruling orthogenetic “internal principle” in the evolutionary theory of “homogenesis” by Lev S. Berg; intrinsic “cyclic development” of economic processes by Nikolay Kondratieff; “the goal reflex” and “unconditional reflex” in Ivan Pavlov’s physiological constructions; “the dominant theory” and the conceptions of “functional organ” and “chronotop” by Alexei A. Ukhtomsky; “intrinsic activity of living matter” by Vladimir Vernadsky and his theories of Biosphere and Noosphere; “the general theory of functional systems”, based on the conception of the leading significance of the inner “result of action” by Pyotr Anokhin; Pitirim Sorokin’s conception of the “immanent determinism” of a sociocultural system and his cyclic theory of social change (“social and cultural dynamics”); “the concept of universal functional units” in the field of evolutionary biology, by Alexander Ugolev; “the need-informational theory of emotions” by Pavel Simonov; the concept of “passionarity” by Lev Gumilev, and others – all these fundamental concepts (and their psychophysiological and sociocultural conceptual constructions) are reduced to Nature-centrism (AnthropoKosmism) and essentially include the leading significance of Organicist intrinsic cyclic activity and the whole-organizing and inherent (entelechist) teleo-driven causes (similar to the Aristotelian telic causes). Essentially, these leading (Entelechist and Hylemorphist) causes which are independent of human consciousness or of any transcendent or transcendent(al or of Dualist empiricism) ideas – exactly these Entelechist potencies and forces, and their Hylemorphist functional organs (in accordance with the domination of the due inherent life cycle) realize consistently the wholesome ontogenesis (evolution) of the given subject of life: bio-organism, the individual, society, state, civilization, biosphere, noosphere.

In actual fact, we can call this galaxy of Russian (and from other countries) scholars as the generation of (using the language of programmers) Aristotle 4.0. Overall, we can distinguish at least four generations of Aristotle’s (Organicist) Type of rationality viable historical application: Aristotle 1.0 is the emergence of his original great (super)system of knowledge and its further development (since the 4th century B.C.); Aristotle 2.0 is the Medieval construction of onto- and cosmotheological Integral knowledge; the next is Aristotle 3.0 – of the epoch of Renaissance (14th–17th centuries), including German Idealism, and which were the pre-stage of the following Modern era (since the 16th century). Eventually, Aristotle 4.0 can be described and explained on the example of the achievements of Russian (and Soviet) scholars (and scientists from other places), mentioned above. However, these advances have not been sufficient to profoundly alter the course of the dominating Type of rationality, and which essentially is founded on the Platonian
Dualism and its derived mathematical-physicalist “scientific method” based on the external, non-naturalist (transcendental) – from without – relation to the natural world. Therefore, all they are to be preserved and (their potentials) transposed into the new (next) generation – Aristotle 5.0; and which we urgently need for resolving the current global crisis and the most pressing issues of our time, including carcinogenesis). In actuality, Aristotle 5.0 should emerge and gain momentum.

In this perspective, a particular emphasis should be placed on the subject-matter of Vernadsky’s studies, as we have stressed – the “physics of living matter”, that is really close to the topics of Biocosmological studies. Likewise, it should be emphasized once again (which is essential in our exploratory context) – Vernadsky’s Biosphere is a clear example of Integralist approach in realizing scholarly endeavors. The gist is that Vernadsky equally uses both (polar to each other) as the Dualist recognized “scientific method” (applying explicitly the methodology of mathematical physicalism), as the Organicist Type of rationality (although applying it spontaneously and implicitly to the Stagirite and his OrganonKosmology and Dynamic naturalism); all of this for realizing the truly intermediate synthesizing – Integralist (Holistic) – approach, and which is based on its own cosmological grounds, with the cornerstone significance of the “living matter” notion.

4.2.3. Summarizing the section

Summarizing up our reasoning, and aiming at the advancement of new foundation and Types of rational (scholarly) knowledge – we first and foremost should focus on resolving the task of rehabilitating and actualizing both perspective (and essential) types of rationality – Organicist and Integralist; primarily for uniting (on the Integralist bases) the two polar systems and types of knowledge: of mathematical physicalism (the so-called “scientific method” that is realized in positivist and science-centered models of rational activity); and of teleological Organicist physics (based on the Aristotelian Dynamic naturalism). In our way, we see the major challenge as how to integrate (unite) both types of knowledge on the basis of Information principle, and by means of Information medicine. Naturally, this task is not easy. However, it is clear, at least, that we will not be able to undertake this task without the full rehabilitation, recognition and reintegration into the contemporary scientific life of the Biological (Biocosmological – neo-Aristotelian) approach that has the essence of Dynamic teleological naturalism, and which is equal (and of higher significance) to modern “scientific method”, and which cannot no longer be denied for scientific activities, but both methods (and their basic methodologies) are to be integrated on the basis of Information principle and by virtue of Information medicine means.

In the Organicist (of Dynamic naturalism) approach and as a matter of fact – a man (the pinnacle of bio-evolution) and the next ascending social and global levels (of the one whole Naturalist or Kosmic evolution on Earth) – all these levels are based and organized chiefly on the inherent telic (final, goal-based, purposeful, mission-oriented, goal-directed, dedicated, specific, intended, directed, targeted, on the result-of-activity, etc.) causes. The latter is the tangible evidence and hard facts
that are evident for every sane man (scholar). However, the global modern (Western) institution of modern education and science, still, remains as an unassailable fortress for the actual proposals and initiatives (of the neo-Aristotelian essence) that are aimed at the evolving of contemporary Organicist and Integralist scholarly endeavors; but which continues the prohibition and prevention of their use in the contemporary scholarly milieu. One of the main reasons, herein, is the huge subconscious inertia because of modern scientists due to the historical legacy of a dominating (Dualist) type of scholarly rationality – a hard consolidated tradition, since the 17th century that is based on the Dualist (Platonic) type of mentality and cosmology. However, a matter of fact is that at present, in our 21st century – science still is fully based on the Dualist foundations laid down yet in the 17th century – an evident and unacceptable paradox (and crisis)! Still, however, we are being hostage to the situation in global science that was claimed by Vladimir I. Vernadsky yet in the 1930s: “It took many years before I realized (in the mid-1930s) the backwardness of philosophy (in its global scale) in the historical moment in the life of mankind, which we are experiencing ... It stands in essence on the basis of the seventeenth century, not realizing the impossibility of studying new phenomena by «old furs» ...” [Vernadsky, 1988, p.237].

Similarly, in the 1620, Francis Bacon (1561–1626), in his famous “Novum Organum” (and which bears a strong anti-Aristotelian charge) concluded that scientific gentlemen (of his time) were under “the spell of antiquity, of authors and of consent”, which had “so shackled men’s courage that (as if bewitched) they have been unable to get close to things themselves.” At the present time, astoundingly, we have the similar situation, but of inverse significance – when men of science are under a huge (although being unconscious of this) pressure by a modern powerful institution of education and science (which, similarly to pre-Modern time, bears the qualities of so-termed “the new inquisition” or “a new intellectual apartheid” – of the One philosophy and One science over all the alternative sources), already of the truly Baconian (Dualist – Platonic) essence.

A matter of fact is that we (scholars, due to the contemporary education and specialization) subconsciously are following the classical traditional (from the 17th century) “scientific method” (and its Modern – Platonic – Dualist cosmology, and the derived Static – Idealist/Materialist – methodology). However, we have already entered the 21st century and are confronted now with its tremendous challenges (that have the Integralist essence). Therefore, first of all, we now need to put forward new (Organicist and Integralist) foundations of science. In this, essentially, we need

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urgently an adequate ‘conceptual’ language for the mutual understanding, communication and cooperation of scholars. More than that, as it is well known: “New is long forgotten old”. Therefore, we firmly believe that precisely the Aristotelian Organon Kosmology could serve best of all as the matrix (framework of references; general address) for all the scientists engaged in Organicist and Integralist studies. In this way, in rehabilitating the Aristotelian initial (of the recognized Father of science) Organicist principles – we are to essentially recenter our knowledge over the natural Bio-laws and Bio-principles (fundamental, for Nature; and, foundational, for Bio-science)\(^66\) – the essential for all natural things Self-changeability (Self-genesis, Self-evolving and Self-actualization); essential intrinsic – from within – Dynamicity, Bipolarity, Cyclicity, Triadicity, Bio-rhythmicity, etc., as well as the fundamental principles of entelechism and hylemorphism of the natural world.

In the Biocosmological Association, it is our firm view that to achieve these action lines – we do need to reinstate the authentic significance of the entire Organon Kosmology of Aristotle, starting with rehabilitating the significance of the Aristotelian physics. As previously stated, the type of mentality of a modern scholar is very rigid and fixed over the Dualist – Unipolar, Static, and Monolinear – approach to studying the concrete reality, of human health and well-being. The more, therefore, we need to introduce and develop a kind of matrix (framework of references; general address) for all the scientists engaged in Organicist and Integralist studies; and in our (BCA) considered opinion – this is precisely (and solely) the Aristotelian Organon Kosmology (his entire comprehensive supersystem of the Organicist rational knowledge). Otherwise, an effective communication and mutual understanding of scholars (who are proponents of Organicist and Integralist approaches) will be hardly possible. Then, first and foremost – we need to restore the authentic meaning and significance of the Aristotelian crucial (essential) terms, notions and concepts. In our joint work devoted to the Challenging Integralism [2017]\(^67\) – we have put special emphasis on this issue.

Presently the main task for scientists and cultural figures is precisely the comprehension and rationalization of the Integralist natural potentials, and, on this basis – of their actualization within the needed natural sociocultural organization. Of course, there is an optimistic looking into the future in this perspective, which is based on recognizing the natural potentials of the world sociocultural evolvement. Best of all they are expressed in findings and conclusions done in the great research by Pitirim Sorokin (and contained in his four-volume scientific treatise “Social and


cultural dynamics”, 1937–1941). In the Foreword (already of his one-volume version of “Dynamics”68), Sorokin states:

Up to roughly the fourteenth century the creative leadership of mankind was carried on by the nations of Asia and Africa, while West had still a primitive way of life and culture. The great civilizations: the Egyptian, the Babylonic, the Summerian, the Hindu, the Chinese, the Creto-Mycenaean, the Graeco-Roman and the Arabic emerged and fluctuated in their repeated blossoming and decay for millennia. The Western, Euro-American peoples have taking the creative leadership only during the last centuries, especially in the fields of technology, fine arts, politics, and economics. At the present time the European monopolistic leadership can be considered as about ended and the history of mankind is being staged on the much larger scenery of Asiatic-African-American-European cosmopolitan theater.

5. INVITATION FOR SCHOLARLY PARTICIPATION IN EVOLVING THE WORLD INFORMATION UNIVERSITY

World Information University (WIU) aims to contribute (to) and release the resources for scholarly programs and scope that deal with the issue of Information as the universal natural harmonizing entity – Information that generates the origin and evolvement, and is the basis of our physical (Organicist) world. We believe that Information substantially relates to the living matter, and that in the world-Kosmos – each thing is a life-thing, although Kosmos is Heterogeneous and Hierarchical, and only the higher Kosmic levels – vegetative, animalist, rational-human (as termed by Aristotle) – can be animated, thus allowing for complex Informational activities and interrelations. Overall, Information (intrinsic and extrinsic) basically is realising the Homeostatic sustainability of a life organ(ism) (living thing) and its wholesome Functionalist activity, ontogenetically aiming at the effective delivery of inherent functional results of life activity – through the efficient organization (uniting) of polar (Hylemorphism) elements-organs, and realizing their cyclical and Biorhythmically Circlic (replicable, but ascending) Functionalist growth, regeneration and self-activity. At any rate, in evolving the Information approach (and the Information science) – we need to move forward from the initial stages and consistently building our basic constructions.

We especially underscore that Information is the essential natural aetiological force, which is among the major and immediate natural causes that generate our real physical world. In general, whenever the scholars take the scientific terms and notions that contain the prefixes self-, re-, inter-, co- : for instance, as used in this article: self-organization, self-changeability, self-genesis, self-evolvement, self-actualization, self-realization. etc.; or resonance, regeneration, reproduction, etc.; or intergeneration, interrelations, interconnections, etc.; or co-ordination, co-acting, etc.

– they all (although implicitly) every time have the Information essence and relate to the Organicist and Integralist Types of science (but they are unessential for the Dualist Type, for these notions are impossible or extremely difficult to express in the terms of the Dualist scientific approaches).

The Biocosmological definition of Information is: Information is the naturalist law and entity, and its essence is the subject’s inherent realization of the Functionalist Triadological (and in all semiotic realms) Triunity of the essential polarities (potencies) and their Homeostatic Integrity (Integral basis), and which is equally the Ontogenetic axis for the subject’s (living thing’s) entire life route (Entelechist and Hylemorphist) Self-evolving actualization.

We firmly believe that the Biocosmological rational concept of Information (serving the goals of the 21st century safe, peaceful and wholesome evolvement) is essentially close to the great notions (and their comprehensive systems) of Dao, in Taoism; Meditation (as a way of life), in Buddhism; and Entelecheia, in the Aristotelian Organon Kosmology. In the latter respect, it is absolutely essential to directly use all of the conceptual framework of Aristotle (but starting from his Physics) – his entire comprehensive (super)system of the Dynamic naturalism – as the essential matrix for all the scholars engaged in the contemporary Organicist and Integralist (system, holistic) scientific activities – for mutual understanding and cooperation, thus using the common ‘conceptual language’; in our view, there is no other alternative.

The initiative itself of the World Information University (WIU) came from Prof. Rudolf Klimek, who has substantiated and proposed WIU at the congress “Biocosmology and cancer”, held jointly with the 14ISBC, in Krakow, in July 2017. The prerequisites to the WIU-initiative appearance is the undergoing global sociocultural and ecological crisis, and the actual need for virtuous valid ‘tectonic shifts’ in humankind’s rational mentality; all this is reflected in the Report to the Club of Rome (published in the book by Springer, in 2018).

At present, WIU is going through the institution-building process and realizes the search, discovery and recruitment of its main resource – like-minded fellows, who will tackle the serious challenges within the spheres of Organicist and Integralist (Information) scholarly endeavors. In this way, and aiming at a brief and substantial characterization of WIU-initiative, we believe it appropriate, primarily, to point out to its motto, formula, and the basic tenets of WIU-activities’ etiology, methodology, and anthropology.

WIU motto is:

_Do not be afraid of Evidence and Truth, and Do Telic Good!

WIU formula is:

\[ E = mc^2 \]

Wherein “i” – Information has the definition that is outlined above.
**WIU fundamentals for aetiology** are:
Priority is given to the Information cause (as stated above), together with the full rehabilitation of the Aristotelian four physical (κατα φυσιν – intrinsic, telic) causes: hyletic (material); generative (efficient); organic or morphogenetic (formal); telic or effective (final); and the full reintegration of the Stagirite’s teleological physics (but on the basis of his authentic Dynamic naturalism).

Likewise, the priorities are designated for the Aristotelian “κατά συμβεβηκός αιτίον” – the resonance cause (or the circumstantial cause), which is essential for the reintegration of the Three-valued logic and Ternary informatics, concurrently and equally with the currently dominating Two-valued logic and Binary informatics – for the benefit of their Integralis forms.

**WIU fundamentals for methodology** are:
Priority is given to the principle of autoteleology of John Paul II, and, recognizing the Triadological essence of rational knowledge (as it is outlined above) – to the Integrative methodology that unites (synthesizes) both poles (their opposite means and facilities) – of the Dualist (Platonian and Cartesian – of mathematical physicalism), and the Organicist (Aristotelian – of teleological physics and the Dynamic naturalism) rational (scholarly) approaches.

**WIU fundamentals for anthropology** are:
Priority is given to the recognizing and understanding of the GeoBioPsychoSocioEcoNooKosmist (AnthropoKosmist) integral position and the Telic Wholesome life activity of the Man in Kosmos.

**Conclusion**
Coming to the conclusion, we can stress that our research carries out its main task of placing at the forefront the Information approach (of the Naturalist essence) in the contemporary scientific pursuits (starting from Information medicine), herein applying the rationale of Biocosmology (neo-Aristotelism), including the Organicist (Naturalist) foundational principles of Dynamicity (Self-changeability of a living subject, in the aspects of its/her/his Homeostasis and Ontogenesis), Bipolarity and Cyclicity – Triadicity, and Circlicity (Biorhythmicity) of each living (animate) subject and the natural world (Kosmos) as a whole. Within this framework, by drawing the needed unanimous references to the Aristotelian authentic Dynamic naturalism (as the essential matrix and conceptual language) – for building the mutual understanding and effective collaboration of engaged scholars – we note in the work the world natural cyclicity in manifesting the significance and influence of Aristotle’s Organicism in the cultural history, by distinguishing the eras of the so-called Aristotle 1.0; Aristotle 2.0; Aristotle 3.0; Aristotle 4.0; and Aristotle 5.0; the latter includes the scholarly tradition of Russian organicism, based on the Stagirite’s archetype of OrganonKosmology – and which is entirely the needed foundation (with the other
two Types of rationality) for the contemporary challenging Integralist ‘tectonic shifts’ and science-based effective breakthroughs in cultural and scientific realms of our life.

As a result of this work, the definitions of Information and Information cause have been formulated. Information is the Naturalist law and entity, and its essence is the subject’s inherent realization of the Functionalist Triadological (and in all semiotic realms) Triunity of the essential polarities (potencies) and their Homeostatic Integrity (Integral basis), and which is equally the Ontogenetic axis for the subject’s (living thing’s) entire life route (Entelechist and Hylemorphist) Self-evolving actualization. Likewise, Information cause is essentially the Naturalist cause, uniting the congeneric polarities (opposite substances) – for the given subject of life effective Homeostatic existence and the entire Functionalist (Entelechist, Ontogenetic) Self-evolvement. Essentially, Information cause is inseparable from other causes of the Aristotelian aetiology, both “κατὰ φυσιν αἰτίαν” (the causes: hyletic-material, organic-formal, generative-efficient, and telic-final); and “κατά συμβεβηκός αἰτίαν” – the cause by coincidence (resonance cause). The essential point is that the Biocosmological (neo-Aristotelian) definition of Information (that is evolved in the work) has the substantial (fundamental) links, or, at least, intimate connections to the significance of foundational conceptions and the meaning of Dao (in Taoism); and Meditation, as a way of life (in Buddhism). At the same time, the Biocosmological approach is a more rationalized alternative (especially, in relation to our current “scientific” epoch). In general, the study’s findings provide guidance for proposing the Invitation for scholars to participate in evolving the World Information University (WIU).

References


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