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Editorial

Our modern world is undergoing major changes in its rational (scholarly) foundations that are essential for the further coherent (safe and holistic, of varied nature and good future, global and local) sociocultural development. At the same time, the current foundational bases of the world – of rational human activity – remain basically Dualist (Platonic), laid down back in the 17th century, in modern European time. Thus, at present we are dealing with the obvious and unacceptable paradox (an obvious discrepancy) of the current foundational principles, core values and strategic priorities – to the existing challenges and realities of the current (Integralist) era, which (the existing ‘cosmological insufficiency’) creates a potentially hazardous situation and dangerous threat to our future – all this is absolutely unacceptable!

BCA and its Journal strive to make their positive contribution in this direction – of overcoming the crisis of the existing cosmological insufficiency. In this regard, in the submitted Issue – it is important to note immediately the article of the outstanding contemporary philosopher and environmentalist – John Cobb, a prominent researcher in the field of process philosophy (follower of A.N. Whitehead). In his article entitled “The Whitehead community” much interesting information is given, including the ideas of neo-naturalist development.

In the same vein, in the Issue, but in line with the adopted (in BCA) rehabilitation of the genuine significance of Aristotle's (super)system of knowledge (as the Type of Organicist rationality, Biocosmology) – multidirectional works of other authors are represented (which aim chiefly at the development of new – autonomic multifaceted effective – Integralist approaches): “Aristotle’s Biocosmology – teleological Functionalist naturalism – as the Type of rationality”, by K.S. Khroutski; “Aristotelian Organicism, Yin Yang Theory and our Representation of Reality”, by Marianna Benetatou; “Towards Engineering 4.0: A contemporary expression of Biocosmology and neo-Aristotelism”, by Xiuhua Zhang; “Chekhovian neo-Aristotelianism and idea of a perfect man in the age of anxiety”, by Anna Makolkin; “From the discovering of reality to creating multiple realities: The Aristotelian roots of modern anthropocentricism”, by Abdul Wahab Suri; and “Entelecheia as the synthetic multidimensional concept of the inner space of individual, artistic, sporting and educational activities”, by Stanislav V. Dmitriev.

In 2015, an important event was the holding of the 10ISBC in Beijing, which has become an important impetus to the fruitful development of Biocosmological explorations. We are pleased today to welcome our new authors (and who were the active participants of the conference) who presented original studies for the Issue: “No-boundary emergence and Book of change” in the co-authorship of Sheng Sun and Jianhui Li; and “Research on Marx’s theory of relationship between human and nature”, by Shang Li. In the future, we look forward to the emergence of new and interesting works of our colleagues from China and other Asian countries.

Another important point is the emergence of new works of our major contributors – Sergey N. Grinchenko and Victor B. Kudrin. The former has prepared two articles, the first is realized in co-authorship with Julia L. Shchapova, on the
topic of “Archaeological epoch as the evolutionary sequence of intersecting “with overlap” generations of developing subjects – the carriers of arearchaeological sub-epochs”; other is devoted to the topic of “Bipolarity and Triadicity: Cybernetic view of the problem”. The work of V.B. Kudrin studies the matter of “Complexity of prime numbers and correlation informatics”.

In the section “Criticism and bibliography” three works are placed: the response of Vladimir N. Alalykin-Izvekov on the article of K.S. Khroutski (from the previous issue), which analyzed the significance of Pitirim Sorokin’s great discovery – the Triadological approach to the studying of sociocultural phenomena and processes; review of the book by Slovak scholar Ladislav Kováč, entitled “Closing Human Evolution: Life in the Ultimate Age”, which is written by Georges Chapouthier; and a review of the collective monograph (authors: Jean Audouze, Georges Chapouthier, Denis Laming, et Pierre-Yves Oudeyer), its title is “Mondes Mosaïques: Astres, Villes, Vivant et Robots” (Mosaic of the world: stars, cities, living entities, and robots), the reviewer – Jean-Philippe Uzan.

February 18, 2016

Konstantin S. Khroutski, Editor

В 2015г. важным событием явилось проведение 10ISBC в Пекине, который стал важным импульсом к плодотворному развитию Биокосмологических исследований. Мы рады сегодня приветствовать наших новых авторов (и которые были активными участниками конференции), представивших свои оригинальные исследования для Выпуска: «No-boundary emergence and Book of change», подготовленную в соавторстве: Sheng Sun и Jianhui Li; и «Research on Marx’s theory of relationship between human and nature», ее автор –Shang Li. В дальнейшем мы рассчитываем на появление новых интересных работ наших коллег из Китая и других стран Азии.

Еще один существенный момент составляет появление новых работ наших основных авторов – С.Н. Гринченко и В.Б. Кудрина. Первый представил две работы, в соавторстве с Ю.Л. Щаповой, по теме «Археологическая эпоха как эволюционная череда пересекающихся «внахлест» поколений развивающихся субъектов-носителей археологических субэпох»; и отдельно труд «Биполярность и Триадичность: Кибернетический взгляд на проблему». Работа В.Б. Кудрина изучает тему «Сложность простых чисел и корреляционная информатика».


18 февраля 2015г.

К.С. Хрущук, Редактор
THE WHITEHEAD COMMUNITY

John B. COBB, Jr.¹

ABSTRACT. When universities were open to questions about humanity, its relation to the natural world, and its destiny, Whitehead’s thought was recognized as relevant and important. The shift of universities from centers of intellectual reflection to collections of narrowly-focused value-free research has excluded it. A few thinkers have kept it alive and developed its implications at the fringes of higher education and public discussion. Since it is unlikely that a livable planet will be reclaimed with the pattern of thinking that is now working against that goal, the need for an organic, nondual neo-naturalism is greater than ever.

KEYWORDS: value-free scholarship, neo-naturalism, radical empiricism, causality, prehension, Rene Descartes, David Hume, Immanuel Kant, William James, Alfred North Whitehead, University of Chicago, Buddhism, Christianity, ecological economics, eco-feminism, industrial agriculture, perennial grain

Contents

1. The Roles and Fortunes of Whitehead’s Thought
2. Some Major Ideas of Whitehead
3. Relevance to Saving the World

Alfred North Whitehead was a revered teacher at Harvard University from 1924-37. During that period and for some years thereafter he was regarded as one of the leading philosophers in the United States. A good many people would have listed him as the most important. His role in the United States extended beyond the university to a segment of the general public.

Today there is no interest in his thought at Harvard or, indeed, at the great majority of American universities. Those of us who appraise Whitehead as one of the great philosophers of all time constitute a tiny ghetto with few participants in major academic centers. Why has this change occurred?

1. The Roles and Fortunes of Whitehead’s Thought

I think I can say without fear of contradiction that the change did not result from the refutation of Whitehead or by improvement on his work. If that were the case, the small ghetto of which I wrote would not exist. The change has been in the nature of philosophy and of the university as a whole.

¹The Center for Process Studies, Claremont, CA.
When Whitehead flourished, universities understood themselves to be places for intellectual reflection and conversation about the issues of concern in the wider culture. Among the most important such issues were those stimulated by developments in biology and physics. In different ways these developments raised questions about the relation of human beings to the rest of the world and the place of values and of religious ideas including the reality of God. Cartesian dualism was disrupted by evolutionary theory. Kant offered an epistemological dualism to replace it, but many Americans were not satisfied. Other options were considered. Whitehead directly addressed all of these issues in original ways. This conversation seemed relevant to much of the university community, but it had its home in philosophy.

Already there were other philosophers who wanted to redefine their task. Some followed Kant in assuming that “knowledge” is limited to what is empirically known. This can give us only a phenomenal and deterministic world. They disagreed with Kant’s talk of another kind of reflection, one about practical affairs. They were not interested in the inevitably uncertain speculations that played a large role in the discussion in which Whitehead took part. For them philosophy’s task is largely limited to showing why that kind of talk is useless and meaningless. The growing edge of philosophy limited it to analysis. The sort of synthesis that Whitehead sought was no longer considered a proper goal. In the forties and fifties many philosophy departments were still somewhat open to including those who sought synthesis, but by the sixties analytic philosophy was clearly dominant and often exclusive, and it remains so today.

In fact Whitehead made contributions to analysis as well as synthesis, and a few philosophers, such as his students, Bertrand Russell and Willard Quine, appreciated that. But in general the new school simply ignored or dismissed Whitehead. As philosophy had been newly defined, Whitehead was not a philosopher.

The victory of this type of philosophy was supported by changes in the university as a whole. It ceased to be a place for intellectual activity and focused instead on scholarly research. Most universities now define themselves as “research universities”. They judge that research is best done when one approaches the task within the confines of a narrowly defined academic discipline and without any judgments of better and worse. So they describe themselves as “value-free.” Since most of the questions raised by the culture cross all such disciplinary boundaries and concern the relation of facts and values, the research contributes only information to the discussion of action or policy or humanistic understanding. Clearly there is no place for traditional philosophy in a value free research university. Philosophical analysis can have a small claim to a role in the research university by supposedly bringing greater clarity to the issues. But whereas Whitehead’s type of synthetic philosophy was central to the intellectually-oriented university, it has no place in the research university. Even analytic philosophy is marginal.

That Whitehead survived at all in higher education is because it includes professional schools. These have to pay some attention to real world issues. They did not immediately or wholeheartedly subscribe to value-free research in narrowly define disciplines. Schools of education, that is, those that prepared teachers took
some interest in ideas excluded from the research university. When one thinks of how to teach children, it is hard to exclude questions of better and worse altogether. Whitehead wrote a book about education that had some influence among educators even after philosophy departments excluded his work.

Theological schools are given the task of preparing people to serve the churches. Here too it was not possible to be completely free from questions of better or worse. Also the sorts of questions that Whitehead dealt with were asked by people in the pew. Whitehead continued to play a role in a few schools of theology, especially at the University of Chicago Divinity School.

However, even in the professional schools, most courses came to be taught according to the model of the academic disciplines created for specialized valued free research. The Divinity School at Chicago now prides itself on the excellence of its work in these disciplines. Whether they serve the needs of pastors is not a major concern. Whitehead has disappeared from the curriculum.

This means that to maintain an interest in Whitehead is to be a critic of higher education, particularly of the abandonment of any effort to provide a comprehensive understanding of human life and its place in the natural world. We believe that the university has structured itself and understood its purpose based on bad philosophical assumptions that it is incapable of discussing. We believe that we must witness to a different possibility. This requires us to build on a movement that flourished briefly in universities and then was excluded.

When I studied at Chicago 1947-49 this movement was called neo-naturalism. My faculty in the Divinity School believed that it was clear that since we now knew that human beings are fully natural, we could not continue to think of nature in purely objective terms. Nature includes subjects as well as objects. In the previously dominant understanding of nature, building on Descartes, nature is exhaustively understood as a material mechanism. Human beings know ourselves as something more than that. Re-thinking nature so that we could understand ourselves as part of it seemed to be the central intellectual task posed by the new evolutionary understanding.

The faculty was especially interested in scientists who shared this view and made helpful suggestions. They recognized Whitehead, the mathematician, logician, and physicist, as one who was doing this. They appreciated the work of Charles Hartshorne, who was teaching in the philosophy department at Chicago. Hartshorne had been an assistant of Whitehead and was inspired by him as well as by C.S.Peirce, who’s collected writings he co-edited with Paul Weiss. A few of the neo-naturalists became serious Whiteheadians. Most of the followers of Whitehead in my generation were students of this faculty.

One reason that intellectual activity flourished in Chicago during those years was that it was strongly favored by the chancellor, Robert Maynard Hutchins. However, Hutchins left Chicago a few years later, surrendering to the rising tide of scholarly research through self-enclosed academic disciplines. Our professors at Chicago, of course, continued to teach neo-naturalism for some years under the leadership of Bernard Loomer. However, after Hutchins left, the neo-naturalist
faculty dispersed and retired, and the University of Chicago ceased to be a center for this kind of thinking. Indeed, the issues with which this faculty had dealt ceased being discussed in North American universities. They did not fit into any of the academic disciplines developed for research purposes. The term “neo-naturalism” has also largely disappeared.

However, before the dispersal, Loomer had introduced another label used especially for the neo-naturalist thinking influenced by Whitehead. He called it “process thought.” Loomer’s leadership was such that this term was quickly picked up and adopted. The word “process” was already prominent in this community since the title of Whitehead’s magnum opus was “Process and Reality.”

Those of us who, while studying at Chicago, learned the importance of intellectual life were distressed that the Chicago Divinity School faculty was no longer providing the leadership we had appreciated. Whitehead’s own students kept some interest alive quite independent of Chicago, and in their diaspora some of the Chicago neo-naturalists continued to influence students. But these rather isolated influences were barely keeping the memory of Whitehead alive.

To resist the continuing decline of what some of us considered a crucial dimension of thought, we created a journal, *Process Studies*, and (in 1973) a Center for Process Studies in Claremont, California. The Whiteheadian process movement has not recovered the status in the United States that it had during Whitehead’s life or for a decade after his death, but it has survived, developed, and achieved some international visibility.

In Europe interest in Whitehead developed largely independently of what we had done in the United States. Isabelle Stengers, in her work with Prigogine, became interested in Whitehead’s contribution to science, and she was joined in this regard by Bruno Latour. Stengers’ *Thinking with Whitehead* is one of the most important studies of his philosophy. However, the opening of European universities to Whitehead resulted chiefly from his importance being recognized by Deleuze.

What is appreciated in European universities is primarily the early, less speculative, and less radical Whitehead. For secular European intellectuals to take Whitehead seriously requires the denial of his theism, whereas *Process and Reality* gives a major role to what Whitehead calls “God.” The fact that the Center for Process Studies is located at a school of theology makes Whitehead suspect on both sides of the Atlantic. That it does not prevent the Chinese from being uniquely receptive is an ironic twist.

However, there has been a third strand of interest among Catholic philosophers, who have a center in Leuven. This was has been connected closely with the Claremont center. Leuven has attracted students from around the world and its graduates have taken process theology to Congo, India, and the Philippines. The Catholic strand has been influential in creating some interest in Poland and perhaps also in Romania and Bulgaria. The International Whitehead Network, which grew out of a CPS conference, keeps this global reality alive and visible through international conferences every other year.
2. Some Major Ideas of Whitehead

To deal with questions raised by scientific and intellectual developments of the nineteenth century, Whitehead actually broke with the dominant Western tradition. He developed a metaphysics and cosmology more similar to classical Buddhism than to any preceding Western thinker. But he developed this vision in dialogue with Western science, philosophy, and religion far beyond what any Buddhist has done.

The great majority of Western thinkers from the Greeks to the present time have thought that our basic relation to the world was mediated through the sense organs, and most have focused on vision. Hume made clear for all time that if we begin with this assumption we are limited to a phenomenal world. The phenomena are all given as objects. That is we have no direct relation to subjects, and their existence cannot be “known” in the Kantian sense.

Whitehead rejected this starting point. Obviously the senses are very important in giving us clear conscious knowledge, but this is not primitive. The experience of sight begins with the world impinging on our eyes and brain. This is prior to our projecting patterns of color. It is true that we are far more clearly conscious of the colors we project than of the primitive experience of being impacted by the world. But that we experience this relationship also, even if only at the largely non-conscious level, is evidenced throughout. We do not really doubt the existence of a world. Babies are convinced very early. Indeed, we do not doubt the existence of other subjects. It is foolish to suppose that we arrive at these conclusions by reasoning from sense experience.

William James taught us radical empiricism, that is, that we should examine experience radically to bring out elements other than sense data. For example we all know that our experience in the present moment is affected by past experience, most of all by immediately preceding experience. We do not infer that this is the case from sense data. In each moment we experience the causal efficacy of the past experience. Similarly we do not arrive at the idea that we are embodied through examining sense experience. We experience our bodies apart from any sense experience.

Whitehead thus analyzes two dimensions of human experience. There are perceptions in the mode of “causal efficacy.” I have been discussing these. There are also perceptions in the mode of “presentational immediacy.” These include touch and vision. Most philosophers have begun with the latter, and if they are fully consistent, they are thereby led in the direction of solipsism of the present moment. However, if we actually analyze our experience, we will find that perceptions in the mode of causal efficacy ground the perceptions in the mode of presentational immediacy. We begin in a social world, not an individual one.

Whitehead goes to some trouble to explain how presentational immediacy arises out of causal efficacy. To deal with these in detail he invents a new word, “prehension.” A prehension makes something given a participant in a new instance of becoming. Perception in the mode of causal efficacy makes an aspect of some preceding event a participant in the new becoming. So there are prehensions in the mode of causal efficacy. These are called physical, because their data are already actual and are felt as such.
But clearly the patches of color presented to us immediately are not objectively there before we see them. Their reality is bestowed on them in the seeing by the new occasion. Therefore, the prehensions of these shapes and colors are not physical in this sense. These data are felt as potentials for actualization. These potentials are not limited to visual data or even to sensory data as a whole. They may be emotional tones and urges and anticipations. Whereas the potentials actualized in vision are largely determined by what happens physically in the sense organs and the brain, some of the potentials are what we call ideas and ideals that shape our action. Whitehead calls all of these prehensions of potentials “conceptual.” They constitute the mental aspect of each moment of becoming. Every instance of becoming has both a “physical pole” and a “mental pole.” This polarity replaces a dualism of physical and mental substances without minimizing the importance of either physicality or mentality.

Using the term “causal” in naming the most primal perceptions is an indication that Whitehead rejects both the Humean and the Kantian view of causality. We know what a cause is because we experience ourselves as deriving what we become from others. In a causal feeling the present reenacts what is give in the past or incorporates that past within itself. The simplest feelings are deterministic. The present necessarily prehends and in some part reenacts what it prehends. This is why the world holds together and so much can be predicted with confidence. It is why so much has been accomplished by Cartesian science employing a mechanistic model.

It is important to see that in order to understand causality, we must distinguish subjects from objects. Every event in the process of its own becoming is subjective. It subjectively prehends past events. These were subjects, but they have now become data or objects for the new event. Here, too, dualism is rejected. There is not one kind of thing that is inherently subjective and another that is inherently objective. In its moment of becoming everything is subjective. As soon as in has become, it is an object for its successors. We cannot have any understanding of causality if we abstract the world from its moment of subjectivity as science insists that we do.

If the physical feelings that I have described were all there is, then the scientistic model would work for everything. But Whitehead is analyzing subjects rather than objects as primary. The subjects do reenact what they receive. But they also integrate the many things they receive into a new unity. This integration is quite simple for simple occasions but very complex for complex ones such as human experiences. It always involves potentials as well as what is actual. It actualizes some potentials but not others. Whitehead calls this a “decision” which means a cutting off. Not all potentials can be actualized. This role of potentials constitutes the germ, in even the simplest occasion, of what becomes mentality in complex occasions.

I will take this discussion one step further. Causal feelings are feelings of the physical feelings of antecedent occasions. The causality of the past is mediated through contiguous experience. But there are other influences on the coming to be of an experience that are not as scientists anticipate. The mental aspect of earlier experiences can also be prehended. Whitehead calls this the physical feeling of a feeling of what is potential. The feeling of these past “conceptual feelings” is not
limited to contiguous events. There is, therefore, action at a distance both at the quantum level and in animal experience. At the quantum level physicists call it “entanglement”. At the human level we are talking about our sense of the feeling tone of a whole group of people or memory of past experiences or telepathic communications.

Rather than eliminating purpose from nature, Whitehead affirms that every event arises out of the aim to become and to become whatever value is possible in the given situation. This aim is derived from the ordering of potentials relevant to the situation. This is the way God enters into every event. In every moment of our experience, we are called to actualize those potentials that provide the greatest value in the momentary event and in its relevant future. In fact we often fall short and this leaves us humans with the sense that we often “miss the mark.”

My formulations have assumed some things that need to be made explicit. For Whitehead, actuality consists of events rather than substances. The quanta of which the world is made up are not substances. They happen. Whitehead applies the same notion to human experience. There is no underlying experiencer who remains the same while experience changes. Nor can experiences be viewed as substances. They are events.

Like William James, Whitehead thinks that the flow of our experience is not continuous. Instead it consists in successive experiences. The descriptions above presupposed this. They talked about the becoming of a single moment of experience. The most important contributor to this event is almost always the previous moment of experience, the one that we identify as the same person’s. But in each moment we take account of data that were not available in the preceding moment. A person is not absolutely self-identical through time. A person is a process. Whitehead calls this kind of process a macro-process.

This macro-process can be analyzed into the micro-processes that make it up. It is these micro-processes that are the “atomic” units that ultimately make up the world. These units are atomic because they cannot be broken up into smaller events. Their analysis is the account of the process through which they came into being as an indivisible whole. For Whitehead, each of these indivisible actualities is an “actual entity” or an “occasion of experience.”

I began by referring to similarity to Buddhism. The Buddhist analysis of what we are likely to consider enduring substances is similar. Also, in Nagarjuna we have a clear account of what he calls pratityasamutpada. Every entity is an instance of this, and this is the way all things come together to constitute us in each moment. Whitehead’s formulation is that each actual entity is an instance of creativity, and creativity is the many becoming one and being increased by one. Most of what takes part in constituting me now also takes part in constituting other people.

Of course, we cannot live without discrimination, and we need to identify, with regard to every decision, what is most important. But Whitehead reminds us that this is always an abstraction. In fact everything is relevant to everything. We cannot avoid ignoring a great deal, but decisions to ignore need to be open to constant revision. Again, this points in exactly the opposite direction from the organization of the
university in more or less airtight academic disciplines. Whitehead shares this with Buddhists although he emphasizes the positive role of concepts, with all their limitations, more than most Buddhists.

Whitehead emphasizes, much more than Buddhists, two things. First, every actual entity “decides” just how it will synthesize all the elements that the world contributes to it. Most of what it will be is decided for it, but it participates in its own creation. Second, every entity aims to actualize value. It organizes around that aim. The aim is to achieve the most value possible in itself and in its effect on the future. It may decide accordingly, but it may refuse to fully accord with that aim. It derives that aim from the divine ordering of potentialities.

In other words, Whitehead’s metaphysics is Buddhist, but his theology is Christian. In Japan process thought plays its most important role in the Buddhist/Christian dialog – a conversation in which Japanese intellectuals are often interested. This discussion is also increasingly important in the United States.

In the Abrahamic scriptures, clearly, God is an actual entity. However, most philosophers assume that God must be “ultimate.” Thomism has tried to identify God both as Supreme Being and as Being Itself. Whitehead regards creativity as the ultimate, that is, what plays the role of Being Itself in the West. But he agrees with the scriptures that God is an actual entity, not creativity as such. Thus whereas Buddhists aim to realize their true nature, called Buddha nature, Christians want to respond fully to the call of God. For a Whiteheadian these goals, oriented respectively to creativity and to God, can be viewed as complementary.

3. Relevance to Saving the World

For us, the need to keep this kind of thinking alive was intensifi ed by the global environmental crisis. The victory of value-free research disciplines has rendered universities more part of the problem than part of the solution. With few exceptions, they have not addressed the issues facing humanity or even recognized that they should try to contribute to saving the world. An influential book is directed to faculties, entitled “Save the world on your own time.” It makes clear that professors are hired to teach and do research on whatever they can get the money to investigate. They are not hired to work for bettering the human condition.

We in the Whiteheadian community feel the need to muster thinkers to the task of considering how the biosphere can be preserved and how the earth can be kept habitable for humans. These questions are, of course, shaped by our valuing of life. The refusal to acknowledge such values seems to us to be absurd and even demonic. We believe that most people in universities agree, but that their graduate studies have socialized them to prioritize research and through their teaching to socialize the next generation of teachers to avoid allowing their values to influence their academic work. Few can even imagine another way to teach and learn. To some of us it seems quite clear that the dominant Western philosophy has contributed extensively to bad actions and bad policy. It is difficult to have much hope for the needed changes being made while these ideas remain unchallenged.
The most obvious example is economic theory. Economists are extensively consulted by governments and corporations, and over recent decades their advice has generally supported moves in the wrong direction. There is now much more self-criticism among economists than there has been in the past. Many realize that the extreme gap between the very rich and the very poor, to which the policies they have encouraged contributed, is not desirable. But the even more serious problems resulting from their encouragement of increasing market activity have barely been acknowledged. Almost all economists continue to encourage governments to work for economic growth. At best they seek to balance economic considerations, assuming this focus on growth, with questions of sustainability.

Around the edges, people who are not part of the guild have proposed that we should seek to develop economies that aim at meeting human needs without increasing the pressure we place on the natural environment. To Whiteheadians this seems to be a question economists should be asking but refuse to ask. If we reflect as to why economists cannot consider changing their discipline to fit the needs of the time, we quickly run into deeply entrenched commitments of a sort historically discussed by philosophers. The economists’ descriptions of the nature of the human being qua economic actor fit the individualism and indifference to values that the university as a whole encourages.

Before 1970 a Whiteheadian economist, Herman Daly, proposed that, given the location of human activity in the context of a larger natural system, growth economics should be replaced by steady-state economics. He is now recognized as the father of ecological economics. He was, of course, excommunicated by the economics guild and has not been allowed to teach. But among environmentalists and church people he is widely recognized and admired. There is, I think, only one university in which ecological economics is taught, but the topic is widely discussed outside the university.

Let me make it clear that ecological economics could have been developed by someone who knew nothing of Whitehead’s thought. If so, we Whiteheadians would still support it wholeheartedly. We are not sectarian in the sense of only wanting to promote our own work. But I think it is not an accident that Daly was influenced by Whitehead and is part of our circle. This is also true of Mark Anielski who has published a book on “The Economics of Happiness.” The only country that aims at human happiness rather than enlargement of the market is Bhutan, a Buddhist kingdom.

Our habit of critiquing the dominant economic and political practices has made us highly critical of the increasing takeover of American democracy by corporations and especially by Wall Street. We are strongly opposed to American imperialism. On the whole we are less taken in by American propaganda than most academics, religious leaders, and political pundits. The world leader in exposing the government’s lies about what happened on 9/11 was a process theologian, David Griffin.

I hardly need to say at this point that a Whiteheadian view of education calls for drastic changes. There are a few liberal arts colleges that have developed the sort of
curricula for which a Whiteheadian hopes. There has been some influence of Whitehead’s thought, but our support for such experiments does not depend on that. In Beijing there is a Whitehead kindergarten, indeed, a group of kindergartens that go by that name. In Korea there is a grade school being developed on Whiteheadian lines. Whiteheadians have developed a few programs in American universities. But we support also many other experiments that are taking place. I keep hoping that the absurdity of value-free education and research in a desperately needy world will soon be widely recognized.

Agriculture is an area in which many people recognize that we have gone in the wrong direction. There has been very little truly sustainable agriculture in human history, and many regions that once were fertile are no longer productive. Now we are dealing with the whole planet and the need for sustainability is global and urgent. But our actual practice is becoming worse as we continue to shift from small farms to industrial agriculture.

This shift is the result of the influence of economics on agricultural policy and practice. Increasing “productivity” is now the key goal, and this is measured in terms of output divided by labor. Slow loss of soil is not considered a problem because of the habit of economists to discount the future. Social costs are not factored in, nor are the consequences of increasing the dependence on oil products. Since the calculations of economists are favorable to the interests of agricultural corporations, they support one another. The schools of agriculture in the United States teach nothing else. Governmental departments of agriculture at state and national levels join the schools in serving the corporations.

Outside of these schools there is interesting work being done. Wes Jackson has devoted his career to creating perennial grains that are as productive as annuals. He has had significant success, now recognized even by schools of agriculture. If a polyculture of perennials can succeed the monoculture of annuals, the production of food can be accompanied by the maintenance and even improvement of the soil. We would, of course support such moves regardless of the philosophy of the leaders, but I do not think it an accident that Jackson is a Whiteheadian.

China has been particularly receptive to our initiatives. In the area of agriculture, most of the professors were educated in the United States, and China was on its way to replacing thousands of villages with industrial agriculture. A few Chinese, mainly those affirming traditional Chinese values, were opposing this and seeking village development instead. We threw ourselves in with these, especially with Sheri Liao, begging the Chinese not to make the mistakes that have done so much harm in the United States. We have been surprisingly successful. President Xi now supports the development of eco-villages rather than replacing villages with industrial plantations. Of course, the project may yet fail, but it stands a much better chance than once seemed possible. In China this change is associated with the goal of “ecological civilization” that has been written into the Chinese Communist Party constitution. Both the goal of eco-villages and that of the broader “ecological civilization” are associated in China with Whitehead, partly because many Chinese have come to Claremont to the conferences we have held on these topics.
For our contribution to healthy change in American society, the most important development has been eco-feminism. A good many eco-feminists are consciously Whiteheadian. The teaching of the others is so congenial to Whitehead that it matters little to us whether those who teach these ideas are interested in Whitehead’s thought. Because of the pressure on universities to include more women, eco-feminists have penetrated universities more successfully than any other spokespersons for Whitehead-type thinking. They are under enormous pressure to conform to the disciplinary norms, and to a large extent departments of “women’s studies” have done so. One leading feminist, Mary Daly, complained of “methodicide.” But many of the women who do the teaching still constitute a potentially subversive group inside the university walls. In business, government, and churches the effects of feminism have been enormous, and much of this has included rethinking the relation of human beings to nature.

A relatively bright spot is the status we now have in the old-line Protestant churches. Of course, they are aging and dying, so that success within them does not mean a great deal. In the first decades of my career, these churches considered continental neo-Reformation theology, especially that of Karl Barth and Emil Brunner, to be the norm. Obviously process theology was not taken seriously. Those theologians who wanted to do philosophical theology, despite the opposition of the dominant school, turned to Paul Tillich, who was also regarded as part of the serious theological dialogue. He was much less uncongenial to Whitehead, but he dealt very little with the issues of neo-naturalism. Those who looked for other philosophies as partners in their work usually wanted to relate to philosophies that had prestige in universities. Whitehead was, of course, excluded.

The situation began to change when Black theology and Latin American liberation theology captured North American theological attention. We joined in supporting these, but we were treated with suspicion because of our commitment to a philosophy that was seen, with some justification, as responding to the intellectual problems of the North American white bourgeois, rather than to the suffering of the oppressed. We gradually overcame the suspicion and now work closely with the heirs of liberation theology in Latin America. We have been helped by the fact that one of the major biblical scholars of the liberation movement, George Pixley, identified with process theology.

Gradually, issues of science and religion and of the relation of Christianity to other wisdom traditions reasserted themselves. Feminist critique of patriarchal institutions and culture were typically quite similar to ours. And in ecological theology, we were recognized as leaders. A little book I wrote in 1970, entitled “Is It Too Late?” is recognized as the first book on ecological philosophy and theology. The theologies that once marginalized process theology have faded, and in a sense we are the “last man left standing” in the rather small and largely ignored field of progressive theology. This is not a great achievement, but it puts some responsibility on our shoulders.

I fear that celebrating what success we have had may give the impression that I think we are significantly affecting the fate of the planet. I know all too clearly that
we are not. Except in China, I realize that the decision-makers do not know or care about our existence. In the university and in the media the issues are not posed in a way that makes our contribution even relevant.

If there is a real cultural awakening to the need for drastic change, we stand ready to make proposals and enter into the very different discussions that would then take place. I look with hope to the remarkable leadership of Pope Francis. But thus far our efforts, and the more important efforts of many others, have not prepared people even to consider the changes that are needed. American political life is irrelevant or worse – much, much worse. When I get up in the morning, it often seems foolish to continue the effort. But not trying seems worse.

Conclusion

To mobilize thinkers and academics to help guide the world away from self-destruction, we need a deep understanding of the intricate interrelationship of “facts” and “values.” We need also a deep and widely agreed on commitment to gaining and sharing wisdom. This requires overthrowing or undercutting the models and images derived from Descartes and Kant and the prejudice against synthetic thinking. Our best hope is to be found in the neo-naturalist movement and especially in the form given the new naturalism by Alfred North Whitehead.
ARISTOTLE’S BIOCOSMOLOGY –
TELEOLOGICAL FUNCTIONALIST NATURALISM –
AS THE TYPE OF RATIONALITY

Konstantin S. KHROUTSKI

ABSTRACT. The author strongly urges to rehabilitate the genuine significance of Aristotle’s supersystem of knowledge as the autonomic (one of the Three) Type of rationality – Type of (Bio)cosmology. First and foremost, we need to reinstate the true meaning of Aristotle’s Organicistic (Four-causal) aetiology, wherein all Four causes are telic (teleodriven): hyletic (which is called nowadays as “material”); organic or morphogenetic (“formal”); generative (“efficient”); telic or Functionalist (“final”). As we substantiate, modern perception (and conventional apprehension) of “material” and “formal” causes, as well as the removal of telic causes from modern scientific environment demonstrates a bad misinterpretation of Aristotle’s (Bio)cosmology – the (super)system of scholarly Organicist knowledge – and the autonomic atemporal (one of the Three) Type of rationality (of Functionalist naturalism). Likewise, an attempt is to introduce the Bipolar and Triadic essence of Aristotle’s teleological (Functionalist) naturalism that comprehensively encompasses (substantiates) all the domains of science and philosophy, thus uniting the knowledge of all kinds into the one overall scheme (Biocosmology or OrganonKosmology). However, during the long time of cultural history – Aristotle’s rational heritage had been badly misinterpreted and is out of use at present. This is an absolutely unacceptable state of things – a culturally ‘sick-world’. Therein, progression of the current ‘cosmological insufficiency’ takes place, which occurrence makes impossible at present time the further realization (even planning) of a satisfactory intellectual and cultural life, first of all the safe and wholesome global sociocultural evolution. In this light, therefore, the author’s work (within the general activity of the Biocosmological Association) – is the impetus to start (relying on Aristotle’s Biocosmology) the process of overcoming the specified ‘cosmological insufficiency’.

KEYWORDS: Aristotle, hyletic, hylomorphism, Four-causal telic aetiology, Type of rationality, Functionalist naturalism, Organicist science, Biocosmological association, cosmological insufficiency

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Conclusion: To overcome the current ‘cosmological insufficiency’

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Introduction

Greek greatest geniuses (Aristotle and Plato) occupy the unique position in the history of world culture, for their systems of knowledge have been taken as foundations and patterns – the Types of rationalities – for the contemporary educational systems and institutional organization of science and other sociocultural activities. In this, Plato’s Type of cosmology currently dominates (or dictates), while Aristotle’s Type fall into a disadvantage state of deep stagnation through the relation of global scholarly community. In very deed, we strongly urge to rehabilitate the genuine significance of Aristotle’s supersystem of knowledge as the autonomic (one of Three) Type of rationality – Type of (Bio)cosmology – of Functionalism naturalism essence.

The contents of the “second circular” for the Congress “ARISTOTLE 2400 YEARS” is substantive in this aspect. Prof. Demetra Sfendoni-Mentzou, President of the Congress – justly emphasizes that Aristotle is “the universal philosopher,” whose work “spreads over the broadest range of topics, covering all major branches of Philosophy such as Logic, Dialectic, Syllogistic, Metaphysics, Political-Moral Philosophy, Rhetoric, Poetics and extending in an impressive way into areas related to all fundamental scientific fields, such as Physics, Biology, Zoology, Botany, Taxonomy, Mathematics, Meteorology, Astronomy, Geology, Psychology, Medicine, Economics, Humanities, Law and Political Science, Economics, Health Sciences and even Technological Sciences.”

All this clearly represents the evidence that the rational heritage of Aristotle has not merely the value of a great philosophical or scientific system, but this is precisely the (super)system of knowledge – all-encompassing (Bio)cosmology – the Type of rationality (which essence is the teleological Functionalist naturalism). Not less significant is the realness that Aristotle’s (Bio)cosmology is the polar supersystem of rational (scholarly) knowledge – polar to the currently dominating (or dictating) Plato’s Dualist Type of rationality – and which both represent (in the best possible way) the atemporal (time-independent) polar Types of rationality – of all-encompassing knowledge, Types of (Bio)cosmology – which are permanently active and actual in all times and epochs.

1. The Biocosmological approach

In 2010, in Veliky Novgorod, Russia, the Biocosmological Association (BCA) – of the neo-Aristotelian approach – was launched. BCA’s approach has a deep correlation with the dynamic cyclic (Triadologic) theory of the Russian-American outstanding scholar Pitirim Sorokin (mainly realized in his phenomenal magnum opus “Social and Cultural Dynamic”, 1937–1941). In general, Sorokin made a phenomenal discovery – sociocultural reality has the dynamic cyclic and Triadologic essence, i.e. is constituted of the Three autonomic Types of sociocultural supersystems (T_SCSS). Thereupon, characterizing the BCA’s approach, it could be
mentioned that together with the rehabilitation of the neo-Aristotelism\textsuperscript{2} – another basic tenet is the viewing of the cultural history as the naturally dynamic and cyclic evolutionary process (as it is substantiated in the cyclic dynamic theory of Pitirim Sorokin) – as the domination by turns of the T\_SCSS.

From the standpoint of both Aristotle’s Biocosmology – as the Type of rationality (of teleological naturalist essence); and Sorokin’s theoretical Triadologic dispositions – we have every right to consider both Plato and Aristotle (referring to their monumental rational cosmologies) as (both) Fathers of Philosophy and Science\textsuperscript{3}, i.e. Fathers of different polar cosmo
dologies – the all-encompassing (super)systems of rational knowledge. That is to say, Plato and Aristotle have created the supersystems of knowledge (cosmo
dologies) – which are polar (opposite to each other) and which, nowadays, form the foundation (for) and the contemporary supersystems (frameworks and matrix) of rational knowledge. Thus, basically, we consider contemporary philosophical and scientific knowledge as, in essence, naturally heterogeneous, at least, of Triadic essence – constituted of the Three autonomic cosmologies: two polar; and the third intermediate – Integral – Type of cosmology.

In the Vol.5, No1-Issue of the BCA’s “Biocosmology – neo-Aristotelism” journal, starting with the work of Marianna Benetatou\textsuperscript{4} – we have started the development (and the discussion over) the study of Plato’s and Aristotle’s (super)systems of knowledge as the autonomic (independent, in their whole organization) cosmologies – the polar Types of rationality – i.e. which have their own foundations and frameworks (aetiological, gnoseological, methodological, anthropological, etc.), and own conceptual matrix. Our general aim is to define and substantiate clearly both poles of knowledge (polar Types of rationality), thus advancing the foundation for the true Integralist (in-between the two poles) studies, which have their own cosmological foundations, but equally and essentially use the scholarly means from both poles, thus “uniting the opposites” and maintaining the “golden mean” (‘homeostasis’) states of harmonious being.

Primarily, however, our primary goal is to rehabilitate the significance of Aristotle’s supersystem of knowledge – as the all-encompassing (Bio)cosmology and the Type of (Organicist) rationality. However, as we give evidence – the latter (genuine Aristotelism) currently is removed from the actual spheres of philosophy

\textsuperscript{2} Due to the specific approach, we have decided to introduce the neologism ‘Aristotelism’, instead of the conventional “Aristotelianism”. Therefore, our (Biocosmological) developing of Aristotelism is an attempt and endeavour to evolve the genuine Aristotle’s theory (of the significance of Biocosmology, i.e. with the essence of teleological Functionalist naturalism and the Organicist Type of rationality), which, thus, is radically distinct and independent from the modern dominating Platonist cosmological Dualism – the basis for currently dominating (or dictating) mathematical physicalism, accepted as the only possible contemporary scientific approach.

\textsuperscript{3} At present, Aristotle is generally recognized as the Father of science, while Plato – as the Father of philosophy.

and science. From our point of view, this is an absolutely unacceptable state of things. In our thinking (in medical metaphor), this is a kind of ‘cosmological insufficiency’ – we currently live in a unipolar cognitive world (instead of naturally Bipolar and Triadologic realm), i.e. within the solely Plato’s cosmology, thus in a cultural ‘sick-world’: of both the long-running modern prosperous material progress and (but) failure to thrive in intellectual (noetic) development – inevitably resulting in general confrontation (with permanent world wars and global crises).

2. Current ‘cosmological insufficiency’ and the urgent need to reinstate Aristotle’s genuine hylomorphism and telic aetiology

All this is a consequence of long existing activities and domination (since Modern era) of societal institutions of education and science (and the Sensate Type of sociocultural supersystems\(^5\), in general), which intermix Plato and Aristotle, but with ultimate reduction of all to the bases of Plato’s Dualist cosmology, including the derived and developed foundations of (modern) mathematical physicalism – so-called “scientific method”. The other widely accepted (and equally misinterpreting form) is the mixture of Aristotle and Thomas Aquinas (in the Aristotelian-Thomistic tradition – of theological essence).

Nowadays, we need urgently to reinstate the true significance of Aristotle’s philosophy – as the substantive autonomic (super)system of knowledge – (Bio)cosmology or (Organon)Kosmology of the teleological naturalism (of Bipolar and Triadologic essence), which comprehensively encompasses (substantiates) all the domains of science and philosophy, which thus are united into the one overall scheme. WM. E. Ritter rightly emphasized (in 1932) that “Aristotle seems now to be recognized by everybody as the founder of the science of living nature. The "father of biology" (or, rather ‘father of Biology’. – K.K.) is a common short characterization of the man.”\(^6\) Therefore, we strive to propose a contemporary exploration of the basic Aristotelian science theory (and, firstly, his teleological physics), but of all taken as a whole (as the true Aristotle’s Type of rationality – Biocosmology – Organicist science), independently from the modern partial points of view, either formal or material, and which ultimately are reduced to Plato’s Dualism and Idealism.

However, at present, in respect to his teleological naturalism – Aristotle is totally misinterpreted. The notions “hyle” and the derived “hyletics”, “hylozoism” and “hylomorphism” can be examined in this relation. For instance, at the Merriam-Webster dictionary – hyle is the synonym of matter and means “whatever receives form or determination from outside itself”\(^7\); in Collins dictionary – “hyle is matter;

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\(^5\) “Type of sociocultural supersystems” – T_SCSS – is the cornerstone concept of Pitirim Sorokin’s dynamic cyclic theory. Due to the Russian-American scholar – there are three main atemporal (independent of a historical epochs) T_SCSS, which always exist synchronously and are constituted of the Three main types: two polar (opposite to each other: Sorokin called them Sensate and Ideational); and intermediate – Integral (Idealist).


\(^7\) Q.v.: http://www.merriam-webster.com/dictionary/hyle
everything with a physical form”. In turn, in Wiktionary – “Hyletics is the study of matter or raw impressions of an intentional act; the abstraction from the form”\(^8\); while “hylozoism”, in the American Heritage Dictionary – is “the philosophical doctrine holding that all matter has life, which is a property or derivative of matter”. Finally, hylomorphism (from Greek hylē, “matter”; morphē, “form”)\(^9\), in Oxford dictionary – is “the doctrine that physical objects result from the combination of matter and form”\(^9\), while Encyclopedia Britannica define it as the “metaphysical view according to which every natural body consists of two intrinsic principles, one potential, namely, primary matter, and one actual, namely, substantial form. It was the central doctrine of Aristotle’s philosophy of nature.”\(^10\)

Notably, the terms “hylozoism” and “hylomorphism” refer to the modern history, i.e. have a fairly recent origin. Referring to Soren Brier\(^11\), the English term “hylozoism” was introduced by Ralph Cudworth in 1678; although the doctrine of hylozoism is considered to be especially characteristic for the Ancient Greek philosophy. In turn, referring to Danie Strauss and his study of “Hylozoism and Hylomorphism” – the term “hylomorphism” came into use only by the beginning of the XX-th century\(^12\).

Hylozoism and hylomorphism, and their scientific forms (scientific hylozoism and scientific hylomorphism) are radically distinct from both panpsychism and animism (and Whitehead’s panexperientialism), and are the polar alternatives to (against) a mechanical view of the world (wherein the term matter is appropriate), and which upholds the idea of a unity of organic and inorganic nature, and derives all actions of real (tangible, empirically verified) things from natural causes and laws.

Substantially, in Aristotle’s genuine meaning – hyle and morphe do not refer to “matter” and “form” (shape), in principle. In very deed, hyle and morphe do not receive “determination from outside itself”; nor that they are any “abstractions”, and never they are “derivative of matter”, as well as hyle and morphe are not the parts (or principles) of which “every natural body consists”. Essentially, hyle is as much substantial as the “substantial form”. As Francis Peters showed in his work\(^13\), “Hyle, a purely Aristotelian term, does not have its origins in a directly perceived reality… (p. 88). Hyle, then, is the primary substratum of change (hypokeimenon, q.v.; Phys. 1, 192a), the ‘thing’ that receives the new eidos (Meta. 1038b)... [p. 89]. But to call it a “thing” is misleading. Hyle is like a substance….” [Ibid.] Therefore, the introduction and use (replacement) up to now the terms matter and form (as the “synonyms” of

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9 Q.v.: http://www.oxforddictionaries.com/us/definition/american_english/hylomorphism
10 Q.v.: http://global.britannica.com/topic/hylomorphism
hyle and morphe) is badly misinterpreting and misleading Aristotle’s basic notions (and, thus, his supersystem of knowledge on the whole).

Aristotle was the first to use the terms hyle and morphe. In this, many scholars assume that Aristotle equally uses the terms morphe and eidos (in an interchangeable mode). On other words, the accepted view is that morphe and eidos are synonymous. In turn, Plato’s eidos and Aristotle’s eidos are radically distinct. Francis E. Peters speaks about the Aristotelian vs. Platonian “dilemma of immanence vs. transcendence” [p. 50]; wherein the former is “the Aristotelian eide as immanent formal (morphogenetic. – K.K.) causes with an orientation toward matter (hyle. – K.K.)”; and the latter is the Platonian “eide as the thoughts of God, a position that continues down through Plotinus (see Enn. v, 1, 4) into Christianity,” [Ibid.]

Genuinely, due to Aristotle’s philosophy (Biocosmology or OrganonKosmology) – his hylomorphism is not the combination of the two principles (“of matter and form”), as the modern scholarly definitions say, but it is just the expression of the essential Bipolarity and (dynamic cyclic) Triadcity of each living thing. In truth, hyle and morphe do not refer to “matter” and “form”, but are the integrated elements and stages of the hierarchical ontogenetic – dynamic cyclic – Organicist process of the given Function (telos, organon) self-realization. Put differently, hyle and morphe (equally, but consistently) contribute to one the same whole Functionalist process that is aimed at the satisfaction of the basic needs of a natural thing.

In general, the ontogenetic process of a thing’s inherent Functioning is essentially Bipolar and Triadic (dynamic, cyclic). In each case, the two polar autonomic stages are realized: of gaining the Functional ability (potency), i.e. producing the structural-functional organ (morphe) – the Functional(ist) tangible organ; and this Functionalist organ’s (morphe’s) actual exercise of the given function, thus producing the needed Functional effects (results) – for satisfaction the primary causative need. In other words, every Biorhythm of life activity is constituted of the cycles (and polar stages): of gaining – in the hierarchical ontogenetic process – the Functional(ist) ability (potency), i.e. generating the structural-functional tool – Functionalist organ(on); and the successive (but polar) stage of this Functionalist organ’s use and the actual exercise of the given Function – by producing the needed Functional effects (results).

An interesting comment, in this respect, is given in Gareth B. Matthews’s book on “Thought's Ego in Augustine and Descartes”, concerning the sincere utterances of Thomas Aquinas, that “Thomas was struck in reading Aristotle’s Physics how a term like morphe, whose obvious meaning is the external shape or contour of an object, is used in graded ways to mean any property of a thing, then its constituting essential element. All this in the first book of the Physics.” [1992, p. 92] It can be concluded, in this respect, that Saint Thomas Aquinas treated (and used) Aristotle’s conceptual

14 Therefore, the synonym of hylomorphism is ‘hyloeidetism’ (but the latter is evidently less appropriate in linguistic relation).
constructs exclusively from theological (but not from the Aristotelian themselves, as they originally are) dispositions.

The overall outcome, however, in terms of cultural historical impact – for the contemporary sociocultural milieu (educational, scientific, philosophical) – is that *hyle* was is equated with *matter*, and thus Aristotle’s aetiological *hyletic* principle (*hyletic cause*) nowadays is called (and understood) as *material principle* (*material cause*).

Essentially, however, all four Aristotle’s aetiological forces: *hyletic* (“material”), *organic* or *morphogenetic* (“formal”), *generative* (“efficient”), and *telic* or *Functionalist* (“final”) – all the Four are essentially teleological and cosmologically distinct from the four that are accepted at present (*c.materialis*, *c.formalis*, *c.efficiens*, *c.finalis*). First proof, in this respect, can be found in the fact that Aristotle’s cornerstone notion *entelecheia* (under the conditions of materialistic reading of his works) is not translated (by modern commentators) in its original sense but is replaced by the term “actuality” (we discuss this moment below).

We are fully in agreement with the statements of Helen S. Lang\(^{16}\) who stresses an important thing that “although the term «teleology» is regularly applied to Aristotle, it is a modern one, and is quite definitely fixed in meaning by contemporary use.” \[p.36\] Thus, due to this misinterpretation, “Aristotle’s teleology is often identified with his account of «final causes» as if, apart from them, the rest of his physics (or philosophy more generally) were not teleological.” \[p.274\]. Indeed, essentially – all the Four causes of Aristotle’s aetiology (*hyletic, organic-morphogenetic, generative and Functionalist-telic*) are equally teleodriven and subdued to the natural inherent telic forces.

In reality, each natural body does not “consist” or “combined” of the “two intrinsic principle” but both (*hyle* and *morpha*) are teledriven within the natural body – Organ(on) – in actualizing the *first entelecheia* of the given Functionalist potency (and which is ontogenetic and hierarchical) – thus starting the process of generating the actual Functionalist organ (*morpha*) – on the inherent *hyletic* basis, which (*morpha* – the actual Functionalist organ) is already the realization of the second *entelecheia* (of the given Function actualizing) – of all organized within the natural body as the inseparable (*Organon*Kosmological) unity, but which incorporates the autonomic and polar (opposite to each other) substances\(^{17}\) that are carried out within the changeable Triadic (dynamic cyclic) reality of the given thing and the surrounding world.

In all cases, evidently, Aristotle’s *hyle* is not the chaotic mechanical matter as the constructional elements (‘bricks’) for the creation of new constructions ‘from without’ – due to divine or anthropocentric activities. Quite the opposite, *hyle* means the predisposed “functional blocks”\(^{18}\) with their intrinsic (‘from within’) power to

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\(^{17}\) And, spheres (and Types – cosmologies) of life activities.

\(^{18}\) The notion of “functional blocks” is introduced into science by the Russian scholar (physiologist) Alexander M. Ugolev (1987) – author of the conceptions of “New functionalism” and “Universal functional blocks“. A.M. Ugolev’s main works are: (1985). Evolution of Digestion and the
contribute to the processes of self-organization and production of the need-driven functional structure – for the further actual exercise of the needed effects (results or products of life activity).

Another essential moment is that hyle has the direct relation to steresis (privation). F.Peters’ characterization is: “Steresis, which Aristotle defines (Meta. 1011b) as the “negation of something within a defined class,” is one of the three essential elements in Aristotle’s analysis of genesis in Phys. I: the permanent substratum (hypokeimenon) and the passage of one form to its opposite (enantion) demands the existence of a lack of that second form in the substratum (Phys. I, 191a-191b).” [Peters, 1967, p. 180].

Nowadays, we need urgently to reinstate the true significance of Aristotle’s philosophy – as the substantive autonomic (super)system of knowledge – (Bio)cosmology or (Organon)Kosmology of Functionalist naturalism (of Bipolar and Triadologic essence), which comprehensively encompasses (substantiates) all the domains of science and philosophy, united in the one whole (Bio)cosmology. Notably, yet in 1960, John Herman Randall Jr., renowned specialist in Aristotle, asserted that modern scholars “have come at Aristotle from the standpoint of the later medieval developments and problems” [Randall, 1960, p.iv]; and that the early modern scientists (including Bacon, Descartes, and Kant) had discarded Aristotle in rebellion against his religious interpreters.” [Ibid.] He also seriously doubts, “whether Aristotle can survive translation into the Latin substantives of the scholastic tradition, or whether it is possible to state his fundamental functionalism in the Latin tongue.” [Ibid.] These statement are in accord with the conclusion of Alexander Herzen, which was made in the 1845, about the “revolt against Aristotle” because of the “originality of the new thinking” and that “one must not forget that Aristotle of the Middle Ages was not the true Aristotle, but the one transcribed to Catholic morals, ... Descartes and Bacon, alike, denied him as the canonized pagan.” [Herzen A.I., 1946]

In a similar vein, David Charles [in his “Aristotle on Meaning and Essence”, 2000] argued that Aristotle’s actual account is distinct from the one often described and attacked as “the Aristotelian essentialism.” He states: “Aristotle’s account of essentialism is, I argue, distinct from that offered by its major competitors (whether conventionalists or Platonists, as these are characterized in Chapter 1), and is immune to some of criticisms developed by (for example) Descartes, Locke, and Quine. [p. 3] He concludes, “Aristotle is not, in my view, the type of Aristotelian essentialist they attack. Indeed, the form of essentialism he defends is preferable (in certain major respects) to the alternatives currently available.” [Ibid.]

At any rate, Aristotle’s hyle (and, thus, his basic principle of hylomorphism) does not have the meaning of the Latin notion matter which belongs to another Type of cosmology19, and which refers to the external physical (mechanical chaotic) world,

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19 In the BCA Triadologic approach (which establishes the independent existence of the Three Types of cosmologies – two polar: of AntiKosmism and RealKosmism; and the intermediate
upon which external constructive effects are materialized. In contrast, the meaning of \emph{hyle} is akin to the potential substance – \emph{first entelecheia} of a thing – capable of organizing (generating) the specific Functionalist unity (entity – \emph{morphe}) of the given (living) thing; in turn, \emph{morphe} is the ready for actual exercise Functionalist organ or \emph{organon} (structural-functionalist system) – \emph{second entelecheia} – ready for the telic (tropic) activity (energeia), i.e. Functionalist generation of inherent effects.

Again, referring to the substantive analysis of Francis Peters: “\emph{Hyle}, a purely Aristotelian term; does not have its origins in a directly perceived reality – as is true in the case of extension or magnitude (megethos, q.v.) – but emerges from an analysis of change (Phys. I, 190b – 191a); it is not known directly but by analogy (\emph{analogia}, ibid. 191a8) [Peters, p. 88]. Thus, naturally, Aristotle’s \emph{hyle} has no relation to the modern meaning of matter. Peters concludes: “In Meta.990b Aristotle has maintained that the logic of Platonists’ arguments would require them to posit an \emph{eidos} of every individual thing. Aristotle escapes this necessity, as we have seen, by making \emph{hyle} the cause of individual differences.” [Ibid., p. 91]

3. Aristotle’s Bipolar and Triadologic approach (physics)

In Physics\textsuperscript{20}, Aristotle writes:

It is clear then that if there are causes and sources of the things that are by nature, from which first things they are and have come to be not incidentally but what each is said to be in virtue of its thinghood, then everything comes to be out of something underlying and form. (190 b 18–22)

But while the underlying thing is one in number, it is two in kind. (190 b 26-27)

Hence, there is a way in which one must say that the starting points are two, and another in which they are three; and there is a way in which they are contraries; (190 b 31–33).

But this is also resolved by the underlying thing’s being something different, for this is not a contrary. 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)

…it is clear that something must underlie the contraries and the contraries must be two. But in another way this is not necessary, for it would be

\textsuperscript{20} As it is clearly seen, privation (\textit{στέρηση}) – deprivation of form, in Aristotle, is the active natural cause.
sufficient if one of the contraries were to bring about the change by its absence and presence. (191 a 4-8)

And the underlying nature is knowable through analogy: (191 a 9).

This then is one starting point (though it is not one thing, nor is it at all in the same way as a this), and one starting point is the articulation that belongs to it, and further there is what is contrary to this, its deprivation. (191 a 12–15).

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).

But whether the thinghood of the thing is the form (in Aristotle’s text – εἶδος21 – K.K.) or what underlies it, it is not yet clear. But that the starting point are three, and in what way three, and what their character is, is clear. (191 a 21-23)

The aforementioned judgments of Aristotle clearly point out to his Bipolar and Triadological perception of the natural order of the world (cosmos). At the same time, Aristotle’s hyle absolutely does not acquire (in the modern English translations) its intrinsic – immanent telic causal – meaning and reflection. Instead, the term matter is used at present, which is clearly extrinsic in relation to transcendent patterns or divine ideas (or human conscious) – elementary, chaotic and mechanical. The same applies to the other cornerstone concept of Aristotle – entelecheia – a neologism introduced in the scientific life precisely by Stageirite.

4. Entelecheia – Aristotle’s (Father of science) crucial notion that is withdrawn from modern scientific life

From this place and further on – we need to focus on Aristotle’s foundational theory of potentiality (dunamis – δύναμις) and actuality (energeia – ενέργεια), which are the principles of an important dichotomy that is essential for the Bipolar, dynamic and cyclic existence of each real natural (evident, tangible) Organic thing. Dunamis is the Greek word that is translated as capability, potency, potential, ability, power, strength, force. Energeia22 is a word based upon έργον that means "the product of work" (result of action). In turn, kinesis is translated as movement (motion, change), used by Aristotle as a particular kind of energeia. In this context, the notion of

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21 Aristotle’s εἶδος (again referring to Peters, 1967, p.50) means “the Aristotelian eide that are immanent in matter (hyle – K.K.) and direct the entire teleological structure of the individual existents…”.

22 “ONLINE ETYMOLOGY DICTIONARY” explains that the word “energy” originates from Greek energeia “activity, action, operation,” and that it was “used by Aristotle with a sense of "actuality, reality, existence" (opposed to "potential") but this was misunderstood in Late Latin and afterward as "force of expression," as the power which calls up realistic mental pictures.”
entelecheia (which is crucial in Aristotle’s potentiality-actuality theory) is the issue of our special attention. Significantly, at present, entelecheia is hardly applicable in the practice of a modern scholar; and, moreover – its genuine meaning is badly misunderstood (precisely, it usually has the theological or spiritual meaning, but essentially not the original – Aristotelian – significance).

Noteworthy, entelecheia\(^{23}\) is the word that is constructed of several semantic units. Following (and appreciating) the conclusions of Mikko Telaranta\(^{24}\), they include: a) the prefix “en” (Greek ἐν-), which is indicated with “internal functioning”, that is “the functioning of the organism according to its own nature”; and which is “crucial for all Aristotelian teleological thinking”; b) the process of internal functioning which leads to the end that is also internal, thus “having the telos within”. Thus, studying the laws of nature, Aristotle discovered and kept in mind the purposive unity of living things. The third part of the term entelecheia, herein we use Joe Sach’s explanation, entele is combined “with echein (= hexis, to be a certain way by the continuing effort of holding on in that condition, while at the same time punning on entelecheia (persistence) by inserting telos (completion))\(^{25}\). This is a three-ring circus of a word, at the heart of everything in Aristotle’s thinking, including the definition of motion.” [Sachs, 2004, p.245] Sach emphasizes that “some commentators explain it as being-at-an-end\(^{26}\), which misses the point entirely, and it is usually translated as “actuality,” a word that refers to anything, however trivial, incidental, transient, or static, that happens to be the case, so that everything is lost in translation just at the spot where understanding could begin.” [Ibid.]

We can now assert that the loss of Aristotle’s philosophy as the whole (Bio)cosmology (and the atemporal Type of Organicist rationality) had led to the basical unacceptability of Aristotle’s entelecheia (and his other original notions) in the (post)modern systems of knowledge, which are based on Plato’s cosmology (Plato’s Type of Dualist rationality), i.e. which have the Dualist foundation and mathematical-physicalist (mechanistic-constructive) approach to the study (of) and impact on the surrounding world (objects under study). In this, in Plato’s approach, an essential moment is that all pre-existing materials – for a divine (Transcendent), or anthropocentric (Transcendental – analogy to divine Demiurge’s) creative and constructive activities – are characterized as material (or physical) “chaos”; and that all the constructive efforts are realized on the basis of knowing (likewise pre-existing) idealist “eternal patterns” (“immortal forms”), approaching to which is possible exclusively on the basis of mathematical achievements. Thus, essentially, all

\(^{23}\) The terms entelecheia and energeia are the neologisms and notions introduced into the world of rational knowledge originally by Aristotle.


\(^{25}\) Yourdictionary.com, dealing with the etymology of entelechy, states that it originates from Classical Greek entelecheia - from en, in + telei, dative of telos, end, completion + echein, to hold (see: http://www.yourdictionary.com/entelechy)

\(^{26}\) But this (semantically) – “being-at-an-end” – is an obvious Functioning.
is done ‘from without’, following an ‘external’ epistemology, thereby constructively (due to the use of mathematical abstract laws) reorganizing and shaping of (putting into order) the physical world. Precisely as it is noticed by Richard McDonough27: “By ‘chaos’ Plato does not mean the complete absence of order, but a kind of order, perhaps even a mechanical order, opposed to Reason”. Substantially, this primordial “chaotic order” survives the imposition of Form and is “always threatening to break out and undermine the rational order of the world.” [Ibid.]

In general, during the long history of Western civilization, Aristotle’s (Bio)cosmology on the whole and the notion entelecheia as its constituent (in its genuine sense) was factually deleted from the milieu of modern scholarly endeavors. This is not surprising, for, repeatedly, Western civilization is substantially enrooted in Platonic type of mentality (rationality). “The safest general characterization of the European philosophical tradition is that it consists of a series of footnotes to Plato” [Whitehead, 1967, p.39]28. Due to this foundation, it is typical that the notion entelechy (entelecheia) is not used, for, in principle, it is unacceptable and cannot be used in the Western mind-set wherein the world (cosmos) is the space filled with material bodies that are (primordially) subdued to a mechanistic chaotic order and are the objects to divine (of a Demiurge) or anthropocentric (of a human mind, analogy to divine Demiurge’s) active intervention (‘from without’, following an ‘external’ epistemology) and constructive (due to mathematical abstract laws) reorganization and shaping of the physical world.

Therefore, it is not surprising that M.Benetatou does not mention entelecheia (or energeia, or topos) in her valuable analysis, for she is (as we all are) the products of the existing (Western, globalized) type of education and institutional setting of (modern) scientific activity that are foundationally set exclusively on the Platonic (Dualist) Type of mentality29. Equally, in the result, it is not surprising that modern translators and commentators of Aristotle do not use entelecheia (and other cornerstone notions of Aristotle’s Type of rationality, as aforementioned hyle or morphe) as the inconceivable and unacceptable notions. We can note that this practice grows to a greater extent, over the time.

In this context, hereafter, two translations (excerpts) of Aristotle’s De Anima (412a21-412a28) are exemplified: the first is made by Robert Drew Hicks, from his monumental edition of Aristotle’s De Anima (1907); editor of the second translation and commentaries is the distinguished scholar Jonathan Barnes [1984]. Both translations are placed below. The original term entelecheia is returned into the text (and marked in bold) in those places where it was replaced by translators onto

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29 Notably, Plato himself realized his conceptual constructions in the Integralist realm (of his sociocultural epoch), but having substantially formed the rational bases and general vector (of global significance) precisely of (to) the Dualist pole and type of knowledge. Significantly, this direction (in its full meaning) nowadays is completely realized and has the total characteristics of P.Sorokin’s Sensate T_SCSS.
“actuality” (significantly, in this passage of De Anima Aristotle speaks about the polar Sleeping and Waking cycles of life activity):

Such substance is actuality [entelecheia]. The soul, therefore, is the actuality [entelecheia] of the body above described. But the term ‘actuality’ [entelecheia] is used in two senses; in the one it answers to knowledge, in the other to the exercise of knowledge. Clearly in this case it is analogous to knowledge: for sleep, as well as waking, implies the presence of soul; and, whilst waking is analogous to the exercise of knowledge, sleep is analogous to the possession of knowledge without its exercise; and in the same individual the possession of knowledge comes in order of time before its exercise. Hence soul is the first actuality [entelecheia] (all italics are mine. – K.K.). of a natural body having in it the capacity of life. And a body which is possessed of organs answers to this description. [Hicks, 1907]

But substance is actuality [entelecheia], and thus soul is the actuality [entelecheia] of a body as above characterized. Now there are two kinds of actuality [entelecheia] corresponding to knowledge and to reflecting. It is obvious that the soul is an actuality [entelecheia] like knowledge; for both sleeping and waking presuppose the existence of soul, and of these waking corresponds to reflecting, sleeping to knowledge possessed but not employed, and knowledge of something is temporally prior. That is why the soul is an actuality [entelecheia] (all italics are mine. – K.K.). of the first kind of a natural body having life potentially in it. The body so described is a body which is organized. [Barnes, 1984]

We see that both commentators do not use (conventionally) the original term entelecheia in the main text (replacing it with “actuality”)30. More nearly, instead of the original “soul is the first entelecheia” – the authors use: “soul is the first actuality of a natural body” (Hicks); and, “the soul is an actuality of the first kind of a natural body” – thus dissolving the Bipolar and Triadic essence of Aristotle’s scholarly approach. Especially, J. Barnes (predictably for the postmodern scholar) melts the fundamental notions of “first entelecheia” (potency) and “second entelecheia” (actuality) into the external notion – for a human consciousness’s “reflecting” knowledge – that is based on the Dualist relation to the external physical (primarily mechanical) world under study. In reality, however (and as it is stated above) – we clearly see that first entelechy refers to dunamis (i.e., which formation takes place purely within the realm of Potency), while the second entelechy – to energeia (i.e. which is put into operative activity), which thus is manifested in the realm of Actuality.

At the same time, in 1907, Hicks used “entelechy” (in its proper sense) in the Introduction and Notes. In general, Hick’s translation (in the beginning of the 20th century) is evidently nearer to Aristotle’s theory of motion (kinesis) and his

30 Notably, in the Russian four-volume edition of Aristotle’s works (including the edition by Valentin Ferdinandovich Asmus, 1976), the original notion entelecheia is essentially used.
foundational potentiality and actuality theory. In the Notes, he discloses the essential features of *entelecheia* (soul, formal cause) referring to their Bipolarity. Hicks stated: “Of whatever exists potentially the entelechy is the notion, essence or formal cause.” [p.342] His another substantive conclusion is: “In Aristotle the body is the natural instrument of the soul,” while “In Plato body is opposed to soul.” (Introduction, p.xliv) Likewise, in the Introduction, Hicks emphasized:

In other words, the soul is the power which the living body possesses and the lifeless body lacks. This is first actualization or first entelechy. Again, the actual possession of faculties unused still stands to the exercise of these faculties in the relation of potency to act. Life itself, the use of actual power, is the second stage, energy. The actual use must be preceded by actual power. [Introduction, p.xliv]

In the light of aforesaid, we might conclude that Aristotle clearly set the bases of Bipolar and Triadic approach in scholarly knowledge – of the universal existence of two polar (opposite to each other) autonomic realms; and the third intermediate – basic Integral sphere – Organism’s axis for its/her/his natural (normal) ontogenesis. From this perspective, we can claim – Aristotle’s soul (*entelecheia*, organic cause) itself is truly the natural function (instrument, *organon*) of the comprising Kosmic organic world.

The more valuable, therefore, is the following conclusion by R.D. Hicks (in his Notes), “This being so, the first entelechy, whether it is or not operant, equally gives form to matter, and is soul in both cases alike.” [p.313] Aristotle’s expression, herein, could be – to organize the functional organ out of the *hyle* elements (primary *functional blocks*)31, and which are inherently (naturally) predisposed to organize the given Functional(ist) organ32, i.e. to organize the structural-functional organ that is *hyletic* (corporeal and tangible, but Organic) in its wholeness and readiness to execute effectively the given function.

In general, from above stated, we clearly see that first *entelechey* refers to *dunamis* (i.e., which formation takes place purely within the realm of Potency), while the second *entelechey* – to *energeia* (i.e. which is put into operative activity), which thus is manifested in the realm of Actuality. Paul Fearne33 uses the definition to *entelechey* (taken in the Oxford English Dictionary) that it is “a move from potentiality to actuality” [Fearne, p.26]. Fearne also notes that, in *De Anima*, Aristotle propounds a conceptual framework which commentators (on the work) have called ‘entelechism’. Hugh Lawson-Tancred (translator of *De Anima*, 1986) is one of them. The first part of his Introduction to *De Anima* is titled *Entelechism*34.

32 “Functional organ” is the cornerstone notion of the Russian physiologist Alexey A. Ukhtomsky, introduced in the 1920s.
Normally, at present (as the scholarly convention) – Aristotle’s principles of potentiality and actuality are understood as opposed and separated to each other. However, as it is stated above, Aristotle basically unites (within the thing’s whole living activity) the opposite poles of Potentiality and Actuality, for that end introducing the notion (neologism) of Entelecheia. In turn, if Aristotle’s entelecheia naturally integrates both poles of Potentiality and Actuality (respective to the thing’s given organon-function), then the entelecheia of the whole individual naturally has the hierarchical ontogenetic essence (substance and structure), and the dynamic cyclic process of its/her/his self-actualization, in this consistently implementing the stages-cycles of the first entelecheia (with the result of forming the potential abilities) and second entelecheia (with the result of self-realizing the actual activity).

5. Aristotle’s teleological Functionalist naturalism as the Type of rationality

Substantially, Aristotle’s Kosmos (or Biocosmos, thus the scope of Biocosmology) is originated ‘from within’, and is primarily qualitative (Functionalist), hence – finite (dynamic cyclic) and basically heterogeneous (Bipolar, Triadic and, in Functionalist relation – hierarchically differentiated). In this Kosmos there is no space (as in Plato’s biocosmology) but only place, and everything is ever the unity of hyle\textsuperscript{35} and morphe (hylomorphism\textsuperscript{36}), while any change (movement and development in Kosmos) is based on the Four telic causes (hyletic, organic, generative, Functionalist) and the dynamic (cyclic Functionalist) interrelation of the synchronous but polar and autonomic (independent in their organization) and successive realms of Potentiality and Actuality. On the contrary, Plato’s (bio)cosmology is essentially Static, basically dealing with a created (from without) world – within the space (with its dimensions of height, depth and width, within which all things chaotically exist and mechanistically move), but not in relation to the active search of one’s inherent place. Essentially, therefore, Aristotle’s principle of hylomorphism reflects the unity (of hyle and morphe)\textsuperscript{37} of each thing and living being.

In turn, obviously, and in the light of aforesaid – without the essential consideration of Aristotle’s cornerstone notions and principles as entelecheia, dunamis, energeia, hyle, morphe, topos telos, organon, etc. – of all from his original (Bio)cosmological standpoint; as well as his basic principles of Potentiality and Actuality, and their natural organic dynamic interrelation) – an adequate

\textsuperscript{35} Let us stress, once again, that modern term “matter” (which replaced hyle in the contemporary scientific milieu) has the essentially extrinsic significance in relation to the dominating transcendent patterns (divine ideas or human consciousness), i.e. is elementary, chaotic and mechanical; and, categorically, has no relation to Aristotle’s hyle that is, regarding aetiological standpoint – is essentially intrinsic: of immanent nature and telic causality.

\textsuperscript{36} Or hyloeidetism (see the section 2).

\textsuperscript{37} Emphatically, we need to use precisely these terms – hyle and morphe (stressing their inherent teleological meaning and the belongingness to the ‘intrinsic’ gnoseology) – but not the usual “matter and form” (clear representatives of the ‘extrinsic’ epistemological approach), and which significantly distort the value of the Aristotelian concepts.
understanding and application of Aristotle’s supersystem of knowledge (Biocosmology) is impossible in principle. Likewise, besides entelechism – it is impossible to characterize in full (and, further, to analyse) Aristotle’s conceptual frameworks without taking into consideration his cornerstone principle of hylomorphism and the essential notion of place (τόπος, an innermost – individual, first – position in the world, which is inherently used by the thing). Substantially, Aristotle’s Kosmos (Biocosmos and Biocosmology) is finite, (primarily) qualitative and inherently changeable (dynamic cyclic), and hierarchically differentiated. In this Biocosmos, based on the telic hylomorphist foundations – the notions of entelecheia and topos point to the unity of the thing and its/her/his surroundings (environment), and the organic unity of the thing and Kosmos on the whole.

Contrary to Plato’s approach, Aristotle’s teleodriven causes (all Four) are the originative sources in all things’ self-realization of their kinesis, primarily of their Functional(ist) organs appearance – thus their organon (οργάνον) in realization the given Function – ultimately for generating and presenting the results (products) of their inherent and effective Functionalist activity – to the one whole Kosmic all-embracing (Biocosmist) dynamic whole. All this is fully opposite (polar) to Plato’s approach wherein the organic order (with the single – for everyone – divine Righteousness and Goodness) is implanted by a Demiurge (from without) into the elemental (chaotic, mechanistic) space, and is based on the transcendent “eternal patterns” (“immortal forms”). In other words, in Plato's approach both divine and human agencies are (also) necessarily telic or goal-oriented beings, but they are aesthetically (outwardly) determined and, herein, in all cases – telic-orientation and relations are either divinely, or humanly prescribed, and they have no natural inherent (Organicist) origination.

In this line or reasoning, we fully agree with Helen S. Lang (and the conclusions of her “The Order of Nature in Aristotle's Physics”, 1998) wherein she emphasizes that Aristotle’s teleology deals with an “immediate active orientation in the moved, the element, for its actuality, to which it is moved – its natural place.” [p.192]; and that Aristotle’s teleology is, properly speaking, “nothing other than this immediate intrinsic relation of moved to mover.” [Ibid.] On the contrary, Plato’s approach realizes a divine (Transcendent) and anthropocentric (Transcendental) interventions (into) and constructive shaping of the global (or local) world, which is elementally chaotic (mechanistic) – “Aristotle’s teleology is incompatible with any form of mechanical explanation.” [p.57]; and that “Aristotle’s physics is not proto-mechanistic physics with teleology added on.” [p.146]

As Helen Lang continues and concludes, in Aristotle’s teleology, indeed, “there is no difference between the order of nature and teleology of nature.” [p.274] In respect to Aristotle’s central notion of an intrinsic force, she adds that “in natural things, matter is never neutral to form, and form never needs to impress itself or be impressed (by another) upon matter.” [p.53] This order presents “the teleology of nature: all natural things (and artifacts insofar as they are made of natural things) are oriented toward its proper place, and hence activity, by an intrinsic relation that never fails (but can be hindered from the outside).” [p.278] Essentially, the author refers to
Aristotle’s theory of potentiality and actuality. She stresses “the active orientation of potency toward actuality”, and that it is crucial to the account of “things that are by nature.” [p.47] This is a cornerstone for Aristotle’s teleology of nature being “everywhere a cause of order,” [p.47] including “his account of elemental motion.” [Ibid]

Therefore, in Aristotle’s theory, “what is potential is not thereby passive: in natural things what is potential is caused by its proper actuality because it is actively oriented toward it.” [p.64] H.Lang concludes that “this active orientation of the potential for the actuality that completes it lies at the heart of the order and teleology of nature.” 38 [Ibid.] Likewise, the author argues that “this position stands in sharp contrast not only to Plato but also to later philosophy, including the Stoics and Philoponus.” [Lang, 1998, p.64]

The current misinterpretation of Aristotle (the dissolution of his realistic Hylomorphist supersystem of knowledge in Plato’s Dualist realm; we call it the contemporary ‘cosmological insufficiency’) – caused the misunderstanding of Aristotle’s teleology and organicism. Indeed, as Marianna Benetatou states, for Plato, the world is a “living animal, endowed with reason and movement.” [Benetatou, 2015, p.15] In response to her substantive paper, we stated, making a general conclusion, that Plato’s Dualist and Transcendent (Idealist, theological) Static biocosmology, including his organicism and teleology – all this is radically (fully) distinct (polar) to Aristotle’s Biocosmology that is naturally Hylomorphist and Immanent (Functionalist), and essentially Dynamic – Bipolar and cyclic (regarding the alternation of the cycles of Potentiality and Actuality, united by the thing’s entelecheia), and thus naturally Hierarchic and Heterogeneous.

However, on the one hand, while modern scholars have realized the full (or over-full) potential of Plato’s (bio)cosmology – on the other hand (in their unintentional immense passion), modern science organizers and scholars did erase (cancel, delete – from the sphere of scientific activity, in institutional aspect) the real potential of Aristotle’s Biocosmology. This unfavorable process started yet in the Middle Ages (mainly due to the works of St Thomas Aquinas, although which have their own indisputable cultural and historical reference point and great significance). At present, we likewise criticize an idea to focus on the exceptional importance of Descartes (or any other modern European scholars) and their exceptional contributions to the emergence of modern foundations of science. On the contrary, we stress the present urgency of moving back to the original texts of both Greek geniuses – aiming at the rehabilitation and reinstatement the initial and originative existence of the two independent polar (opposite to each other) great cosmologies’ initial existence – Aristotle’s and Plato’s – that gave birth to the two essential atemporal Types of rationality (of Functionalist Hylomorphism-naturalism and of Idealist Dualism that further brought about modern mathematical physicalism).

Indeed, we have nowadays (in medical term) the ‘cosmological insufficiency’ and a really dangerous state of affairs in respect to sociocultural development. In fact,
Aristotle’s Biocosmology (as Functionalist naturalism) is the polar, but essentially equal (to Plato’s) supersystem of knowledge – polar Type of Organicist rationality (polar T_SCSS, hence – the autonomic type of scholarly endeavors). Without the true understanding and (equal) use of Aristotle’s Biocosmology (as the Type of rationality) – contemporary cultural figures (including men of science) cannot, in principle, effectively respond to development issues and crises challenges (while they possess only the knowledge of Plato’s methodology). Indeed, due to Plato’s approach – they need every time (as a starting point) to ‘create’ the situation of a “primary chaos” (mechanical order) – for their further studying the case and realizing the eventual (re)constructive activities (using mathematical laws and bringing the situation into a sought-for organic order).

It is not surprising, in this light, that we have already two world wars in the 20th century and the coming third world war in the 21st century. We do need to agree with Anna Makolkin: “Aristotle is more than relevant to the current reality – he is urgently needed to lead us away from the pathway of our own destruction.” [Makolkin, 2013, p.686] The point is that Plato’s Dualist ‘external’ (bio)cosmology has its essential imperative (in the case of facing a living body with the inherent organic order) – always to restore the ‘primary’ chaos (for the subsequent constructive intervention from without) and the eventual (re)construction of the desired order. Therefore, if we persist (in keeping on and developing the modern tradition and general disposition) of rendering exclusively Plato’s Dualist cosmology and the derived mathematical-reductionist (‘scientific’) method – we then, on the one hand, will continue the celebration of technological progress; but, on the other hand (bringing forward the complete dominance or dictate of Plato’s Dualist (bio)cosmology) – we shall inevitably achieve the disastrous disruption of natural harmonic (‘homeostatic’) existence and evolution, with (instead) induction of crises, wars and catastrophes into the global sociocultural realm. Certainly, we are to do our best to avoid this disastrous self-destructive way of global wars and catastrophes (although with concurrent technological progress), which reasons lie in our current cosmological insufficiency.

Therefore, we do need to urgently accelerate and achieve the clear understanding and permanent right balance of interaction between the two great polar (Types of) cosmologies (Aristotle’s and Plato’s). In this way, naturally, our first aim is to rehabilitate the vital significance of Aristotle’s Biocosmology, thus overcoming the existing cosmological insufficiency. In a predictable manner, only further (on) we could count on finding out the optimal variants of harmonious (local and global) sociocultural evolution (chiefly, by developing the Integralist approaches), i.e. effectively synthesizing means taken equally from both polar (bio)cosmological Types of sociocultural (including scholarly endeavours) activities: of Plato’s Dualist Static (of external epistemology and mathematical physicalism); and Aristotle’s Hylomorphic Telic (Bipolar, Dynamic, Triadologic) Organicism and Teleological physics (Functionalist naturalism).
Conclusion: To overcome the current ‘cosmological insufficiency’

Essentially, these are the polar cosmologies: Plato’s supersystem of knowledge (all-encompassing cosmology) is ultimately reduced to the Transcendent (nowadays – Transcendental anthropocentric) Static world of idealistic prototypes (exemplars, patterns); and Aristotle’s supersystem, which ultimately is reduced to the Dynamic Functionalist (natural inherent Organicist) essences of the particular things and the dynamic Organicist (Biocosmist or RealKosmic) reality on the whole. Conceptually, both great thinkers achieved brilliant (phenomenal) results having created effective (foundational for the world culture) rational cosmologies (supersystems of comprehensive knowledge) but which are essentially polar (opposite) to each other. Essentially, in their mutual polarity, both two supersystems-cosmologies (Types of rationality) – naturally provide the foundation(s) of the really all-encompassing (scholarly) knowledge. However, during our long cultural history – we have run eventually into the current misinterpretation of Aristotle – the dissolution of his realistic Hylomorphist Teleological supersystem of knowledge in Plato’s Dualist (and modern Anthropocentrist) or Thomistic theological realms; and which have led us to the result of ‘cosmological insufficiency’, which essence is the current loss of Aristotle’s supersystem of knowledge as the Type of Organicist rationality (one of the Three) with the essence of teleological Functionalist naturalism and scientific Organicism.

The cornerstone of BCA’s initiative is that in the case of effective rehabilitation of the original, true significance of Aristotle's Functionalist naturalism (Organicist science) – we acquire both real poles of rational knowledge (opposite Types of rationality), and, therefore – the real perspective of creating and building functional (meaningful) Integralist sociocultural systems, thus substantively realizing our hopes (and needs) for a better, safer and more prosperous (Organic) future for all. Due to the current global sociocultural reality (and in accordance with the main findings of Pitirim Sorokin's dynamic cyclic theory) – our expectations of positive changes in our lives relate solely to the realization of powerful Integralist approaches. In turn, the latter (true Integralism) is impossible without the rational Triadologic approach in science and philosophy, thus – without the rehabilitation of other pole of Aristotle’s Biocosmology (its genuine significance as the all-encompassing Type of Organicist rationality), thus reinstating Stagereite’s principles of natural Kosmos’ Hylomorphism, Bipolarity, Dynamicity and cyclicity (changeability – Triadicity), Hierarchical order, Functionalist heterogeneity, etc.

We do need urgently to rehabilitate Aristotle’s (super)system of knowledge – his (Bio)cosmology – as the Type of rationality (of teleological Functionalist naturalism). Still, however, in the currently existing situation of ‘cosmological insufficiency’, i.e. under circumstances wherein the contemporary global scientific and philosophical academic milieu conventionally accept exclusively Plato’s Dualist approach, and forbid the application of Aristotle’s Biocosmology within the scope of scholarly activity – a present-day researcher has no other choice than to follow Plato’s Dualist cosmology. This is the entirely unacceptable state of affairs! Therefore, the pressing challenge is to overcome the existing cosmological insufficiency – to decisively
rehabilitate Aristotle’s teleological naturalism and the Biocosmological Functionalist approach, and to reinstate generally the natural status of Aristotle’s Biocosmology as the equal pole and Type of contemporary rational activity. In fact, the latter is essential and crucial in resolution the topical issues of current sociocultural development. In this perspective, special and primary importance\(^{39}\) is laid to the development of Integralist (system, complex, holistic, etc.) methodologies – which are intermediate and posed in-between two poles, and which, although cosmologically autonomic – equally use the means from both poles: Aristotle’s and Plato’s.

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\(^{39}\) And this was the main conclusion of Pitirim Sorokin’s theorizing.


ARISTOTELIAN ORGANICISM, YIN YANG THEORY AND OUR REPRESENTATION OF REALITY

Marianna BENETATOU

ABSTRACT. The paper discusses Aristotelian organicism and the yin yang theory from the view-point of their overall adequacy to provide a comprehensive conceptual context to aspects, at least, of our contemporary representation of reality. The context may refer to specific fields of scientific research, to our everyday mode of thinking and acting, or to both. As the survey goes on, it is increasingly made clear that we deal with two different types of conceptuality. The yin yang bipolarity may be defined as a pattern of change with a practically unlimited field of applicability. The Aristotelian organicism outlines a model of change which stirs our rational faculties to search for a purpose amidst the accumulated data. In the first case the pattern may be creatively used within a vast variety of contexts. In the latter, the theory creates a conceptual context based on the four causes as first principles.

KEYWORDS: opposites, yin-yang, purpose, function

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Introduction

The paper discusses Aristotelian organicism and the yin yang theory from the view-point of their overall adequacy to provide a comprehensive conceptual context to aspects, at least, of our contemporary representation of reality. The context may refer to specific fields of scientific research, our everyday mode of thinking and acting, or both. As the survey goes on, it is increasingly made clear that we deal with two different types of conceptuality. The yin yang bipolarity may be defined as a pattern of change with a practically unlimited field of applicability. The Aristotelian organicism outlines a model of change which stirs our rational faculties to search for a purpose amidst the accumulated data. In the first case the pattern may be creatively

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used within a vast variety of contexts. In the latter, the theory creates a conceptual context based on the four causes as first principles.

1. All-Pervasiveness of the Yin Yang Bipolarity

I start from the observation that the yin yang bipolarity, in its endless declinations, currently seems to gain in popularity at the most heterogeneous fields, from medical science to interior decoration. Notwithstanding the fact that European thought most frequently favors a binary conceptual pattern, the reason for such a “rush” may well be due to the practical aspect of the Chinese bipolarity.

First, the yin yang theory describes natural processes by spontaneous alternance of pairs of opposites. It advances a model of becoming ruled by automation (ziran, lit. self-so) characteristic of nature. Laozi and subsequent philosophers, both Daoists and (Neo-) Confucians, underline the impersonal character of the activity of opposites. In the Laozi, we read that “Heaven and Earth [the archetypal pair of opposites] are not humane [pu ren]; They consider the myriad things to be straw dogs” (Laozi, 5). The characteristic of the Confucian virtue of humaneness is caring, loving, taking care of, fostering and preserving. By omitting such functions from the workings of the paradigmatic pair of opposites, Laozi rejects both the idea of purpose, even unconscious instinctive, and that of a conscious agent as creator or regulator of natural processes. The incessant alternance of successive pairs of opposites suffices to account for reality as becoming. Wang Bi comments the passage in these terms: “Heaven and Earth engage what is natural to things. They accord with ‘non-action’ and ‘non-creation’ and the myriad things order themselves of their own” (cited in Chen, 1981, 69). The contrast between human purposefulness and natural automation is explicitly illustrated in another significant passage: “Thirty spokes converge at one nave, but only when there is non-being does the function of the carriage exist; We mould clay in order to fashion a vessel, but only when there is non-being does the function of the vessel exist” (Ibid., 11). The commentarial tradition explains that being designates utility and non-being designates function (Chen, 1981, 90). Without contesting this interpretive line, I point to the tension introduced by Laozi between, on the one hand, human intentionality and production, and, on the other, natural creation coming from spontaneity, non-action, non-intention. In the Daoist context, a realistic and pedagogic account of natural processes stirs clear of any idea of nature as planning, going on by trial and error and ultimately of evolution or progressive change.

Neo-Confucianism, following the path of classic Confucianism, conceives nature as self-changing and self-organizing. The metaphysical principle of li might provide a platform for a reflection on natural finality, either on the individual level of natural beings or on that of nature as a whole. Far from that, Neo-Confucians have focused on the impersonal quasi automatic arranging or organizing capacity of li. Although it is immaterial and precedes forms, i.e. physical things, it is immanent in their manifestation as individual beings. A. C. Graham explains it thus: “[Li] is itself conceived as a vast three-dimensional structure which looks different from different angles. In laying down the lines along which everything moves, it appears as the Way
in that the lines are independent of my own personal desires, it imposes itself on me as Heaven (tian); as a pattern which from my own viewpoint spreads out from the sub-pattern of my own profoundest reactions, it appears to me as my own basic Nature (xing)” (in Angle, 2009, 35). S. Angle sums up the situation as follows: “Li is indeed a kind of pattern or network of interdependencies, a pattern that is constituted partly by my own ‘profoundest reactions’” (Ibid.). The component of ‘profoundest reactions’ introduces subjectivity in the heart of the structuring process of reality. It is only one aspect of li; the other one is the objective conditions of the environment, of the external context to which I respond. An intelligible world cannot leave aside important aspects of subjectivity, such as emotions. When we speak of emotions we speak of aspirations and pursuits. Therefore, Neo-Confucian analysis does not discard personal aspirations and intentionality as co-factors of the structuring process of reality. It is equally true that a certain degree of suspicion surrounds human affects in the sense that more often than not they express egotistic tendencies. Instead of establishing networks of cosmic dimensions, they isolate to monad-like closed milieu.

Such instances, easily multiplied, point to a conception of nature and naturalness that rejects any idea of purposeful direction. Nature and natural beings are not goal-oriented; they just make the most of the present circumstances and when everything works well, i.e. to the mutual benefit of everybody involved, then harmony is achieved. Even personal emotions and intentions are not the driving forces of humanity. No-action in Daoism or humaneness in neo-Confucianism is beyond the sphere of personal or collective drives. They express a more fundamental level of depersonalization, expressed as return to the original nature and pristine naturalness.

In these terms, the yin yang bipolar model of change appears as automated and purposeless. There is no teleology; just the alternance of opposites. It is equally significant that the yin yang theory enjoys a tremendous momentum in contemporary Western literature. It well coincides with the current denial of any idea of teleology in the natural processes. This is a long persistent reaction to Christian dogma of divine providence; the denial of providence has also banned any idea of searching for purpose or goal in the natural world. Science describes and explains processes and so does, in its own idiomatic manner, the yin yang pattern. In fact, the yin yang pattern, ready to put forward opposite extremes, may facilitate the propagation and understanding of some aspects of modern science which seem too abstract or abstruse to the average reader. The super symmetry cosmological theory, for instance, has attracted much attention by Daoist scholars. Matter and anti-matter may be rendered in terms of being and non-being, the foundational pair of opposites preceding Heaven and Earth (Laozi, 1). Such combinations of Western scientific theories with the yin yang tangible and easily perceived pattern of change are made possible by the shared idea that it suffices to give an account of natural processes in order to explain how nature works.
2. Aristotle’s criticism of pairs of opposites as principles of change

With Aristotle we come to an entirely different conception of nature. Here teleology plays the first role and organizes beings-not processes or events- as finalizing or goal-oriented individuals. The vocabulary also expresses a person-oriented conception: Beings are accounted for as interactive living entities inasmuch as they pursue natural goals. They thus are naturally endowed with a purpose in contrast to the previous view which explains functions and events. Aristotle perceives an innate inner perception of every living being to pursue excellence. Living beings have focus whilst living delineates such focus to so many pursuits. Pursuits vary, change, come back and obsess. There are infinite declinations to the theme of aspirations and goals and all of them define and structure every single individual life.

Aristotle is familiar with the pattern of change by means of pairs of opposites. His Greek predecessors had thoroughly delved in such theories. He singles out Parmenides on the one hand and the so-called – by him- Naturalists, as Democritus, on the other. In Physics I, he surveys their views in order to advance his own theory on the principles of natural change. In main lines, he does not reject the explanation of change by pairs of opposites. Indeed, change is the transition from one extreme to the other or to the intermediate; in any case, the extremes or the intermediate must be clearly determined. Accepting the general pattern, does not mean that Aristotle accepts his predecessors’ various theories. He finds them simplistic and erroneous: Bad reasoning based on bad premises. So, let’s survey briefly his main points of criticism. First he remarks that all of them take as principles the opposites. This is all too understandable inasmuch as principles cannot come one from the other or from other things, whilst everything must come from the principles. This concerns the first pair of opposites which come neither from other things, nor from each other (Physics, I, 188a 27-32). As a general rule, Aristotle concludes that things born and things decayed come from opposites or end in opposites or intermediates. The intermediates do not create any difficulty as they come from the opposites, as, for example, colors come from white and black (188b 25-28). “Therefore, all beings becoming naturally, are opposites or come from opposites” (188b 28-30). Aristotle finds out that his predecessors may well agree on the general idea of opposites as principles, they nevertheless diverge as to the content of opposites. In his view, this is a futile discussion, as the standard of choosing one pair of opposites rather than another is entirely arbitrary, based on subjective criteria (188b 30-189a 11).

The discussion takes a fresh turn with a seemingly incongruous question: Are the opposite principles two, three or more (189a 12-13)? They definitely are neither one nor -as advanced by Anaxagoras-infinite (189a 12-23). They are finite and at this point Empedocles was right (Ibid.). Here comes the Aristotelian twist, which changes everything. “But if they [the opposites as principles] are finite in number, one reasonably may not conceive them as two; for one may wonder how density may naturally act somehow upon thinness or thinness upon density. Likewise for all other opposition; for friendship does not mix up with hatred, neither creates something from it, nor does hatred from friendship; but both [act] in another third [term]” (189a 24-30). Naturally, the third term is none other than the subject-substance-matter,
whilst the opposites are the predicates-form. A further argument makes clear that whatever becomes is composed of subject (matter) and form (190a 15-190b 22-23). Now, the introduction of the subject transforms the idea of opposites. Opposites do not need to be two in order to bring about change: “because it suffices one of the opposites, with its absence or presence, to bring about change” (191a 7-9). At this point, Aristotle advances that matter is one of the principles and form is another. Matter, as subject cannot have an opposite and the opposite of form is deficiency (191a 13-15).

Aristotle takes great pains in order to adapt the concept of change to hylomorphism. Pairs of opposites as principles of change become obsolete. They explain all right, but-as we shall soon see- they are inadequate to give precise information on the modality of change. They merely describe the general framework wherein change takes place. They don’t explain what changes and for what reason. According to Aristotelian substantialism, what changes is a subject; it changes either by itself or moved by some external force (192b 12-14). The line of arguments points to a major innovation in the field of natural movement, namely purpose. Form is primarily the organizational principle of life. Beings exist, but they don’t just drift about, left in a thoughtless stream of growth and development. They have a purpose, a goal. Aristotle makes the distinction between the end and the goal, for “not every end is a goal, but only the best” (194a 37-38). Imagination and instinct in animals, reason and intention in humans, even the drive to nourishment and growth in plants, go far beyond mere function. All, in their personal manner, pursue what is best for them; some do it quasi-instinctively, others need deliberation, decision and choice. The what for (to hou heneka) is the driving force of natural beings and the great contribution of Aristotle on what a living being individually and collectively really means.

The distance taken from pairs of opposites as explanatory principles of nature and natural beings leads to another important consequence: It conditions the space of initiative and goal-oriented action – purpose again- where beings evolve according to natural tendencies but with more or less freedom. The main objection of Aristotle to the pairs of opposites seems to focus on the issue of necessity and randomness versus freedom and self-determination. Let’s follow the argument.

According to the representatives of pairs of opposites, natural phenomena are not driven by a telos but by necessity (anagkê). For instance, the warm is so by nature and likewise the cold, etc. Such things happen by necessity (198b 13-18). Such explanations give an impersonal, “scientific” account of phenomena, seemingly unassailable. Nature may well act not in view of a certain purpose or for the best, but in the manner of Zeus who rains by necessity and not for maximizing harvest. For when vapors ascend they cool down and the cold turning to water returns to earth. The maximization of harvest is just a consequence (198b 20-28). Teeth likewise grow diversely and accidentally their different shapes respond to different functions (198b 29-34). “And naturally, the beings to which all happened as if there were in them a teleological destination survived, for they were found adequate; the others, which were not made in this way, disappeared and disappear, as Empedocles says about
cattle with human face” (198b 35-40). Aristotle raises two objections. First, natural phenomena are always or most often as they are. Random and spontaneous phenomena appear exceptionally and cannot claim to constancy and permanence. Much rain in winter and heat in summer cannot be accidental phenomena or simple coincidence. Therefore, they exist in view of some purpose. However, such things exist by nature, as the proponents of such ideas advance. Therefore, purpose is within change and within natural beings (198b 42-199a 7). The second argument is based on the idea of time sequence, or prior and posterior. Nature works as we do; rather we work as nature does, but it is easier to start from the human level in order to understand the workings of nature. We make things for a certain purpose and likewise natural creation serves a certain purpose, “for the prior and the posterior entertain the same relation to each other in both artificial and natural things” (199a 19-20). This is particularly evident in the flora and fauna. Leaves are made for protecting fruits, swallows make their nest and spiders their web and all such phenomena prove that teleological causality exists within natural beings and changes (199a 27-32). Nature being the compound of matter and form, and form being the goal, for all else is made for this goal, it (form) is the teleological cause (199a 33-35).

Aristotle further mentions that the issue may concurrently be studied according to the bipolarity dynamis and entelecheia. Matter is no being by accident, whereas deprivation is no being in itself. Deprivation as no being cannot be essence, whereas matter being closer to being is in a way essence, but deprivation is absolutely not essence (192a 4-8). In sum, Aristotle points that previous philosophers who explained natural phenomena and change by pairs of opposites confused ontological categories, such as no being by accident or no being in itself, as on a parity with each other and with being.

3. And our Representation of Reality

Modern scientific theories wisely abstain from pointing to any purpose in natural phenomena. Having recourse to purpose in order to explain natural phenomena would be taxed as infantile fixation. As I have stressed earlier, the yin yang theory well accords with an impersonal order of things governed – as Aristotle has pointed out- by necessity.

In my view, goal oriented scientific explanations abound without being expressly taxed as such. The most prominent case is without doubt the theory of evolution by natural selection. Darwin defends his theory as an entirely hazardous series of occurrences which all concur in the most inexplicable and marvelous way to promote the survival and continuation of the fittest by the transmission of their characteristics to their descendants. Darwin follows a method of analogy reminiscent of the one familiar to Aristotle. He observes the way humans proceed to breed domestic races in order-as he prudently puts it- to perpetuate their favorite stock and then extrapolates to the workings of nature. As humans select the best animals to breed, natural selection permeates to the fittest individuals to transmit their characteristics to their descendants. Nature works in the manner of humans, therefore by observing the way humans work, we may understand the way nature works.
More than two thousand years before Darwin, Aristotle had firmly established the analogy in his discourse on the four cause theory. The human paradigm concerned a sculptor and his sculpture. The material corresponds to the material cause, the idea of what the sculpture will look like corresponds to formal cause, the agent/sculptor corresponds to efficient cause and the sculpture as a finished work of art corresponds to the final cause. Aristotle explained thus that human activity is always goal-oriented even if the goal is not always as obvious as in the case of a sculpture. Therefore, concludes the argument, nature works towards a direction. Natural beings have goals and aspirations and are goals in their own right. Darwin took up the same analogy human activity-natural process but denied to the latter part of the comparison the existence of purpose. He firmly denied any idea of evolutionary direction. However, it is hard to pass unnoticed the ascending direction from simple to complex organisms culminating – one is tempted to conclude naturally– to us, lucky humans.

Recent research recognizes the importance of teleology in Aristotle’s scientific writings, such as De Partibus Animalium, etc. There Aristotle applies the principles of his philosophy in a manner adequate to the subject-matter. He gives an account of organisms and their function. More specifically, he delves mostly in the workings of the nourishing soul – to be explained shortly- which corresponds partly to the biological level. This properly functional teleology constitutes scientists’ favorite field of glossing over. The so-called “scientific writings” reflect partially the teleological cause in its full philosophical development. In order to understand what Aristotle implies by teleology, we need to consult his philosophical writings. Due to time constraints, I shall focus on one major text from De Anima. In the discussion of the nourishing soul, the most basic and common to all living beings, Aristotle explains its purpose as follows: “Her [the nourishing soul’s] work is to give birth and nourish, for the most natural work of animals/living beings, those which are perfect and not imperfect, nor spontaneously born, is to create another being similar to them, animal to create animal and plant to create plant, in order to participate as much as they can to the eternal and divine. For all desire this and do for its sake whatever they do according to nature. The goal [lit. the for its sake] is of two kinds, the one is the final cause and the other is the whereby the end is achieved. As living beings cannot participate to the eternal and divine by their permanent individual existence, for none of the perishable may remain the same, inalterable and numerically one, each participates to the divine in the way it can, other more other less. It does not remain the same but similar to it, not numerically one, but one in species” (De Anima, II, 415a28-415b8).

The passage is not a marginal note, but a foundational text giving a precise definition of what the teleological cause means in respect to living beings. Its scope far exceeds the functional accounts of the zoological writings by determining a metaphysical perspective to all forms of life with the exception of imperfect or self-

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born beings. In seeking to participate to divine eternity, beings seek to mate and reproduce another being similar to them but quite distinct. What persists and participates to eternity are not individual beings but species. In other words, individual beings are perishable, but the various species are imperishable. The transmission of form from parents/father to children receives an almost sacred significance, inasmuch as it carries the print which permeates to parents to partake of immortality.

Aristotle equally makes provision for the final cause within the limits of an individual life. Individuals are the final cause of their creation and pursue ends and aspirations within their finite life span. Happiness is, for instance, an individual goal, the final cause of a rational human being and therefore its pursuit mobilizes all the resources of an individual. It may well be that these individual goals are species determined with personal and temperamental variations, as we may observe in the properly human goal of happiness and its endless modalities among its aspirants.

The philosophical development of the final cause introduces two important variants: first, the continuity of personal aspirations and behavior and the continuation of the species. As individuals aspire to immortality, they reproduce in order to persist in their descendants and thus contribute to the continuation of their species. The individual failure to become immortal becomes the inception to persist on a collective level. Personal choice, natural characteristics and proper behavior are the conditions for the continuity of life on earth. Whether species are literally inalterable or may gradually modify is a question left ambiguously unaddressed by Aristotle. The central idea is how the individual transmits the form and inversely a species depends on the performances and good health of its members.

The second variant is the value attributed to each and every living being. All living beings are defined as directional beings and as goals in themselves. Unlike human artifacts, living beings have or are capable of conceiving and pursuing specific purposes. They are not defined by their functions but by their goals. A goal is what seems best for its aspirant. Aristotle establishes the dignity of living beings on their absolute value as self-ends.

Conclusions

Today, the yin-yang theory attracts more attention as an overall pattern of describing practically all phenomena from inorganic matter to complex living organisms and from the supersymmetry theory of cosmology to the nanolevel of molecular biology. One is tempted to wonder whether a ubiquitous pattern provides an adequate explanation or merely perceives phenomena as the interaction of two opposite forces. In any case, it accords with the contemporary tendency to impersonalize scientific data.

Aristotle creates a detailed theory of finality and perceives all beings as goal-oriented. His theory has never seriously inspired intellectuals, let alone scientists.

The introduction of finality in the natural and man-made world changes priorities. Technology has arrived at a crucial point where questions of ethical and existential order are pressing. The question of finality and purpose are discussed in
the form of ethical doubts, regrets, wise warning, etc. It is all too clear that there is absence of forethought. Further, the question of purpose as inherent coefficient of growth and activity comes to the foreground with the advent of a new era in the production of artificial intelligence. Robots accumulate an enormous amount of data, comparable, before long, with human intelligence. The question of purpose, independently from their makers’ planning, starts raising doubts. If robots are complex enough to compare with human activity, they may or may not develop a will of their own. The final cause is clearly inherent to the product without having been introduced by external agency. It all seems to work as if the accumulation of data comports by its nature its proper finality. What this entails in real situation is yet to find out.

References

TOWARDS ENGINEERING 4.0: A CONTEMPORARY EXPRESSION OF BIOCOSMOLOGY AND NEO-ARISTOTELISM

Xiuhua ZHANG

ABSTRACT. Facing contemporary crisis of existence in pollution of environment and ecological deterioration, we have to reflect human engineering again and question that how engineering paradigm ought to be selected, in order to let artificial world can organically be embedded natural ecological system. According to methodologies of phenomenology and morphology, general human modes of engineering evolution can be described in the positions of organism, holism and process theory as follows: being-in-itself engineering, being-for-itself engineering, being-in-itself and being-for-itself engineering. With the trend of developing Industry 4.0, it is necessary that Engineering 4.0 will be present, because industry is grouping on engineering projects. Therefore, we can describe above general human modes of engineering evolution as: Engineering 1.0, Engineering 2.0, Engineering 3.0 and Engineering 4.0. Moreover, the both of general human modes of engineering evolution are consistent. These engineering modes respectively have shaped agricultural civilization complying with nature and industrial civilization dominating nature, and will enable mankind enter ecological civilization seeking to harmony between man and nature. Chinese practice of engineering is shaped by the general modes of engineering evolution in the way of time-space compression from 1840 to nowadays, and it is facing challenge of new industrial revolution. Matching with the Self-Aware Industry 4.0, Engineering 4.0 or being-in-itself and being-for-itself engineering will insist the principle of ethical priority and transcend Engineering 3.0 or being-for-itself engineering only seeking to utility and benefits, so it is a new expression of contemporary Biocosmology and Neo-Aristotelism. Then, we should pay attention to interaction, inter-interpretation and inter-response between engineering modes and ethical modes, select two paths of engineering ethics studies from engineering to ethic and from ethic to engineering, and construct whole system of engineering ethic including micro, middle and macro engineering ethics from different ethic subjects. Meanwhile, we regard engineering ethics as paradigm of practical ethics, and see engineering ethical praxis as a key research project to guide social shaping of Engineering 4.0.

KEYWORDS: phenomenology; morphology; Engineering 4.0; engineering mode; engineering evolution; engineering ethic; Biocosmology; Neo-Aristotelism

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Introduction

Facing contemporary crisis of existence in pollution of environment and ecological deterioration, according to the positions of holism, organism, evolutionary theory and process theory [Whitehead, 1978], I had made a strong judgement in my academic book of History and Praxis: Introduction to Engineering Existentialism [Zhang, 2011:1–32] in the perspective of phenomenology and method of morphology, namely, comparison with science and technology as ways of holding the world, modern engineering gradually begins from hidden backstage to apparent proscenium, so 21 century will be an age of engineering. However, the engineering has to be a new engineering mode which transcends traditional engineering only seeking to utility and benefit in the logic of capital. In general, nowadays contemporary engineering is still in the stage of engineering 3.0, then with the incoming forth industry revolution – Industry 4.0 as a kind of great trend [Sendler, 2014], Engineering 4.0 will become a new mode of engineering in 21 century. This situation is decided by internal relationship between industry and engineering, because industry is grouping on engineering project (by Yin Ruiyu). Therefore, facing to this great trend of Industry 4.0, China as a huge state of engineering has to catch up with, and hard work in order to transcend Engineering 3.0 and consciously goes toward Engineering 4.0, thereby seeks to the harmonious relations between man and man, human beings and nature, and realistically promotes construction of ecological civilization. Therefore, we can say that Engineering 4.0 is not only necessary expression of engineering ethic but also a contemporary expression of Biocosmology and Neo-Aristotelism. It is very clear that any organic cosmology can’t be actualized, if we are lack of organic engineering in human practice. This means that how to construct organic artificial world and embed it into whole ecological system by organic engineering is becoming an extreme important and urgent.

1. From Engineering 1.0 to 4.0: The Evolution of General Engineering Modes

Engineering is the closest human way of existence. We always create our own all life necessities by organized order labor according to engineering way. Moreover, human beings transform objective world and also change themselves in the practice of engineering. Meanwhile, people constantly confirm and promote their own
essential power in the activities of engineering, as well as construct and shape the universal civilization. Tracing back to human engineering history, we can find that engineering has been in the process of movement and development, and possesses organic and evolutionary characters. Seeing from larger scale, human engineering development generally possesses some regularity, according to morphology, human engineering evolution can be described as follows:

(1) Being-in-itself engineering complying with the nature in pre-industry society, pre-modern times or agricultural age.
(2) Being-for-itself engineering dominating and controlling the nature in industry society, modern or industrial times.
(3) Being-in-itself and being-for-itself engineering seeking to harmonious relation between man and nature in post-industrial society, post-modern or information age.

These engineering modes respectively have shaped agricultural civilization and industrial civilization, and will enable mankind enter ecological civilization in the future.

Not only that, we also can divide general human engineering modes in the perspective of relation between engineering and technology, namely:

(1) Attached on technology, weak or as a life substitute and complementary Engineering 1.0, this is an initial engineering mode. Of course, the technology is not modern technology here, but refers to technique or art of experience in the pre-modern society.
(2) It want to differentiate with technology (modern technology) and emphasize the uniqueness of engineering, but it is regarded as technological application or extension, so that technology also plays dominant role on aspect of engineering, thus it is a kind of engineering mode in the perspective of engineering view of technicalization which enter into next stage of Engineering 2.0 as self-knowledge.
(3) It lets all things belongs to engineering, and insists on the preferential principle for utility and benefit of engineering, moreover, and selecting technology is emphasized in engineering but technology is applied, then engineering has been entering new context from technological behind to foreground, this is contemporary arrogant Engineering 3.0 from dark place to bright position.
(4) With Engineering 4.0 coming on the stage, demand of technological personalization will become actual, so engineering no longer purely pays attention to technological dimension, and it also considers non-technological humanistic factors, such as ethical and aesthetic aspects, and so on. In other word, Engineering 4.0 will care for various factors in engineering, and it not only cares and tolerates the other, but also regards ethical principle as first principle, so it is whole engineering rather than segmentary, because it possesses ability of consciously reflection and autonomy.

Obviously, above two kinds of expression of general modes of engineering evolution, namely, the first expression, being-in-itself engineering→being-for-itself engineering→being-in-itself and being-for-itself engineering, is internal consistent with the second expression, Engineering 1.0→Engineering 2.0→Engineering 3.0→Engineering 4.0. Engineering 1.0 belongs to being-in-itself engineering, Engineering
2.0 and Engineering 3.0 is in the stage of being-for-itself engineering from self-
knowledge to self-leading, and Engineering 4.0, as reflective engineering of freedom, 
keeps consistence with being-in-itself and being-for-itself engineering.

In the fact, evolutionary modes of engineering are all consistent with industry 
mode, both have relationship of twinning. In other word, change of industry modes – 
industry revolution be nothing more than outside presentation of engineering modes 
transition. According to time order, conception of Industry 4.0 is raised earlier than 
Engineering 4.0 (This concept is given by myself in the paper of The Engineering 4.0 
in the Perspective of Philosophy of Engineering published by Guangming Daily at 
Nov 14, 2015), however, the latter enables the former actualization. Thus, toward 
Engineering 4.0 is necessary for promoting Industry 4.0 nowadays.

2. Promoting in Contextualization: Modern-Contemporary Changes of Chinese 
Modes of Engineering

The above evolutions of general engineering modes are more consistent with 
engineering ways of western capitalist countries of original modernity in logics and 
time. Due to Chinese modernization is passively involved in the movement of 
modernization in the process for history entering the world history and logic of 
globalization. Then Chinese modernity possesses following features and posteriority, 
as well as particularity in time and space, unique modernity, and it has been 
undertaken by Chinese modern and contemporary engineering since 1840. The 
evolution of Chinese engineering is only more than a century and a half, but it has 
gone through whole process of western engineering evolution in a lot of hundred 
years, unfolded all general engineering modes. Therefore, it is a kind of speedy 
changes in contextualization compressed time and space, moreover, contains 
individual (personality) in universality (common character).

In general, Chinese engineering can be distinguished following several stages:

(1) From 1840 to end of Qing dynasty, the movement of westernization had 
advocated reform in implements, and it had been displayed Engineering 1.0 in the 
technological view of engineering.

(2) From the republic of China (1912–1949) to earlier of new China, for desiring 
and pursuing west countries of modernization so that engineering consciousness and 
will was strengthened, then the mode of Engineering 2.0 in autonomic view of 
engineering was presented.

(3) From the reform and open to raising the view of scientific development, the 
upsurge of engineering building was promoted by guiding of thought of development 
as absolute principle, especially, engineering superiority and gesture of controlling 
and conquering the nature from engineers and workers, so Engineering 3.0 as the 
being-for-itself view of engineering was formed.

(4) From setting up the scientific view of development to putting forward the 
construction of ecological civilization, Chinese engineering facing new turn again 
and possessing new chance towards a new engineering mode as Engineering 4.0 with 
being-in-itself and being-for-itself or reflective view of engineering.

It is urgent for how to grasp this new chance and consciously to transcend
Engineering 3.0 into Engineering 4.0. There are two aspects of causes: on the one hand, this new mode of engineering possesses containment, reflectivity and a prior ethic principle, and no longer regarding consumers, social publics and environment as outside objects, then outside relation turning internal relationship, and fully considering the benefits and demands of the other, all will help to improve our life way and consciously construct ecological civilization. On the other hand, this is also a necessary selection for facing Industry 4.0, developing new technologies of cyber-physical-system, big data, and actively responding and welcoming new industry.

Just like director Lijie said: so-call Industry 4.0 is just a future blueprint about manufacture defined by German Government and industrial circle. They thought that application of devices of machine manufacturing in 18 century marks an age of Industry 1.0. The electrification and automation in 20 century symbol a time of Industry 2.0. Arisen informatization in 1970s of 20 century shows an age of Industry 3.0. Nowadays, mankind is going an age of Industry 4.0, namely, fusion of reality-physical world and virtue-network world, and Cyber-Physical System (CPS) is a core technology of industry revolution in new age [Lee, 2015: XII].

It is very clear that the evolutionary veins of industry modes of Industry 1.0 → Industry 2.0 → Industry 3.0 → Industry 4.0 are consistent with above logic of engineering evolution. Merely, the distinguishing for engineering modes mainly is based on technological update, and transition of engineering modes considers not only technological factor but concerns ethic dimension. According to the synchronism of evolution of industry and engineering, with coming of age of Industry 4.0, presence of Engineering 4.0 will be appealed.

3. Ethic Priority: A Key for Shaping Engineering 4.0

How do we go and construct Engineering 4.0? It is a key for consciously insisting on the principle of ethic priority in engineering, and the principle of ethic priority in engineering is also internal demands of engineering.

The fundamental differences from Industry 4.0 and previous industrial and engineering modes lie in: [Lee, 2015: VIII].

Industrial community no longer regards manufacture as starting point but sees user’s demands as starting point for Industry 4.0; industrial community no longer selects the model of movement from production or upstream to consumption or downstream but starting with user’s demand of value and offering productions and services of customization which is seen as common purposes in order to realize a synergy and majorization for various links in industrial chain. There are three supporting points for Industry 4.0:

(1) Manufacture itself is valualized (evaluated by value), that is, not only should produce good productions but reduce waste as lower as possible and realize the matching between design, making process and user’s demands.

(2) A function of Self-Aware for system will be actualized based on original robotization.

(3) It will be realized for taking fault-free, eliminating hidden trouble, accident and pollution, this is the highest realm in manufacturing system.
Hence, it can be seen, Industry 4.0 is a synthesis with ethic and idea allocations. It gives up the idea of production for only pursing higher productivity and efficiency but cares for the benefits of users or audiences, environment protecting, resources economizing, and engineering community as subject of action consciously undertakes social and environmental duties. Therefore, this attitude from Engineering 4.0 is not pure naturalism and one-sided position of humanism, but a new humanism which pays attention to Tao of the Haven (Tian Tao) or Aristotle’s nature or essence [Aristotle, 2005:122–123] of nature itself and respects nature (essence) of thing itself, then realizes the unity between heteronomy (necessity) and autonomy (freedom). This is a kind of deep existence with universal roots in the perspective of Biocosmology.

Thus, according to Industry 4.0, Engineering 4.0 has to mean that fully considers limitations and constrain in the aspects of nature, environment, energy sources, logistics (material flow), stream of people, etc., so it is different from Engineering 3.0 which benefits and utilities are preferential, but keeps the principle of ethic priority, becomes a mode of consciousness-freedom engineering with reflective and self-restraining abilities.

Thereby, it will be gradually eliminated for engineering alienation in the logic of capital, dominating and controlling nature, ignoring public benefits, and it will fully be embodied that engineering subject releases benefits to the other and loves the other, as well as seeks human and universal Common Good (by John Cobb), in order to let all things keep and realize their own nature in the universe. Consequently, human engineering no longer is an action of invading and depriving the nature in the way of mechanical enclosure ecosystem, and it is an organic becoming and ecological imbedding; this kind of engineering will be not only construct somewhat or things but create human civilization by responsible engineering belonged human actions to realize the universal harmony. This is also an engineering expression of contemporary Biocosmology and Neo-Aristotelism.

We can say, according to the path of research from engineering to ethic, the ethic requiring of very higher realm is raised in the mode of Engineering 4.0, and it will shape the mode of engineering ethic for regarding virtue ethic as leading, normative ethic as foundation, and utility ethic as base. Undoubtedly, the principle of ethic priority of Engineering 4.0 is a key and guarantee for the core value of Industry 4.0 with the function of Self-Aware. In this meaning, we can understand real meaning and ethic constraint of those new given words such as Cyber-Physical System (CPS), Internet of Things (IoT), Big Data, Industrial Internet, Intelligent Manufacture, 3D-Print, etc. Moreover, we can confirm that the forth industry revolution will change human life way in fundamental meaning and promote mankind going to new civilization.

Meanwhile, this also show the meaning and value of researches for engineering ethics in the situation of contextualization, especially inquiry for contemporary Chinese practice of engineering in the perspective of ethic morphology, we have to firstly research the modes and characters of Chinese engineering. It is possible that we construct morphology of engineering ethic in the context of China if only comply
with interaction, inter-interpretation, inter-response between engineering modes and ethic modes. In other words, the researches for contemporary engineering ethic morphology need to cognize Engineering 4.0 and consciously transcend Engineering 3.0.

The situation is calling another research approach of engineering ethics, namely, from ethic to engineering. That is, various ethic requirements for different engineering subjects or ethical subjects including individual, organization or group, state or society are proposed according to the existing theoretical resources of ethical modes, then engineering ethical codes concerning micro, middle and macro levels and fields are set up in order to construct whole system of engineering ethic, such as, we not only possess professional ethics of engineers, but also professional ethics about investors, entrepreneurs, managers, workers and other stakeholders in engineering community will be built; there are not only micro engineering ethics but middle responsibility ethics and system ethics for institution or enterprise, as well as macro state or social engineering ethics concerning politics, social public and ecological benefits. Robert C. Hudspith also argues that we should broaden the scope of engineering ethics: from micro-ethics to macro-ethics [Hudspith, 1991: 208–211].

In addition, we also have to regard engineering ethics as Practical Ethics (Pinkus 1997), moreover pay attention to researches of praxis of engineering ethic to serve and guide actual praxis of engineering ethic, for example, drafting agenda of praxis of engineering ethic in the 21st century, engaging in ethic education for engineers and other members in engineering community, carrying out engineering critique, environmental and social evaluation and assessment of engineering, etc. Thereby, it is possible for real toward “Engineering 4.0” and promoting the civilization of the cosmos.

Conclusion

According to the inquiry of phenomenology and morphology of engineering, we confirmed and analyzed above human general modes of engineering evolution in the perspectives of holism, organism and process theory [Whitehead, 1978]. Obviously, it is time that human beings transfer being-for-itself engineering mode or Engineering 3.0 as carrier of modernity in traditional industry mode which only seeks to growth of GDP in the violent logic as well as dominates and conquests the nature. Thus, our the first task is shifting the way of thinking of subject-object dualism, in the position of inter-subjectivity, let philosophy of engineering go back the life world and emphasize the humanistic feature and ethical dimension of engineering concerning the other such as social public and natural things in the world. In addition to we should grasp opportunity of new industrial revolution developing Industry 4.0, and consciously construct Engineering 4.0 with the characters of ethical priority and reflection, in order to actually promote ecological civilization and human sustainable development in the contextualization of different states.
References


CHEKHOVIAN NEO-ARISTOTELIANISM AND IDEA OF A PERFECT MAN IN THE AGE OF ANXIETY¹

Anna MAKOLKIN²

ABSTRACT. Anton Chekhov (1860-1904), a renowned Russian writer, known in the West as the master of inimitable short stories and plays, has never been considered, both in his native Russia and abroad, as a philosopher. Here, it is proposed to deal with Chekhov’s intriguing idea of civilization, notion of perfection of man and society as a form of neo-Aristotelianism on the basis of his correspondence and some works. Anton Chekhov, a physician by training, became a prolific successful writer, recognized early in his life time. Posited culturally and chronologically in the thick of modernism, modern confusion, Chekhov, paradoxically, offers a rather original and hopeful doctrine of perfectibility of Man and Society, remarkably akin to Aristotle and the best of Hellenic antiquity. As a philosopher, Chekhov is absolutely “immune” to the concept of the immoral in Schopenhauer, despair in Dostoevsky, fixation on the primordial in Freud, or Nietzschean anti-Christ. Living in the epoch of cultural rebellion and experimentation and play with values and language, Chekhov returns to the sobering wisdom of Aristotle, as a pathway of humanity to civilization, in harmony with itself and Cosmos.

KEYWORDS: civilized, perfect man, perfectibility, dictum of the beautiful, beauty, aesthetics, refined man, self-control, moral compass, degeneration

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Introduction

Anton Chekhov enters the international cultural stage at the point of the 19th century, the so-called fin du siècle period when European civilization was at the cultural crossroads and in transition to the all-transforming modernism that crossed out many achievements of the past. His first short stories were accepted for publication 1880, the year of the chronological beginning of modernism and cult of the modern. He witnessed experimentation with language, the rise of the aesthetic movement, known as art-for art’s sake, the ascendance of Wagner, Ibsen, Zola, the French Symbolists and the depressing collective mood of degeneration. Chekhov was a contemporary of Oscar Wild, J.Huysman, Nordau, Nietzsche, Pater, Baudelaire and many other others who revolted against the Romantic era, Victorian morality and aesthetics, and embarked upon the artistic and ideological newness at the cost of subverting valuable tradition. He was formed as a writer and thinker at the time of ambiguity, uncertainty, revolution in taste and morality.

The Victorian era of European luminaries, the rise of the novel, Romantic opera – the cultural pantheon of Byron, Pushkin, Lermontov, Turgenev, Dostoevsky, Dickens, Thackeray, Donizetti, Verdi, Tchaikovsky – was being forgotten in Chekhov’s time. This new century, like any others in the past, revolted against the conventions, traditions and ideology of its cultural antecedents or cultural parents, but, regrettably, could not offer anything that could approximate, replace or perfect the cultural past. It would become the age of anxiety, unhappiness and depression. Some, like Max Nordau would characterize it in a single term “degeneration.” This concept would be eventually picked up by Sigmund Freud who would medically upgrade and change it to “modern nervousness.” Nietzsche would seize the moment of intellectual confusion and develop his own new religion, denouncing civilization, art, knowledge, and morality, denying humans the capacity to reason and create purposefully and meaningfully. At the moment when European culture and civilization seemed to have lost their moral and aesthetic compass, there appeared a new artist-philosopher, Anton Chekhov who diagnosed the collective malaise of the century, having also offered even some cure along the Neo-Aristotelian philosophical lines.

1. A Laughing Moralist

Posited chronologically and culturally in the thick of modern confusion, Chekhov, paradoxically, offered a new hopeful doctrine of perfectibility of man, remarkably akin to Aristotle and the best of Hellenic antiquity. He was totally immune to the amoral man of Schopenhauer who had impressed Dostoevsky and Freud later, to the free new man of Dostoevsky or the anti-Christ of Nietzsche. Standing closer in time to the Victorians, he, ironically, philosophically, ethically and morally shared the wisdom of the ancient sage Aristotle. His writings conclude the Golden Age of the Russian cultural exhibition in Europe and symbolize the best of
the Romantic era, standing out in the overall cultural history of Europeans. Chekhov entered the heroic pantheon of European culture with the rest of the luminaries who promoted continuity of human culture from antiquity to modernity. Being in the midst of the fast evolving modernist culture-rebellion, Chekhov adhered to the canons of high aesthetic expression, remaining respectful of the cultural history of Europe and the world. He did not wish to overthrow the old luminaries, suggesting instead to study their legacy.

Unlike his contemporaries, more interested in subversion of Tradition and Culture for the sake of Nature and Natural man, Chekhov reaffirmed his traditional position on the common existential pathway of humanity, clearly instructing not to change the charted by history common civilizational trend and cautioning against making the dangerous cultural detour. He saw that the reversal to primitivism in art and ethics would lead to the reversal to barbarism. His high aestheticism and his critique of the new artists-rebels, with their new ethical and moral, and aesthetic principles, puts Chekhov in the canonical world cultural elite that transcends time, language, and geography. Greatly indebted to the world culture and classical Russian heritage, Chekhov was highly critical of his Russian and European contemporaries, who, in his view, had been undermining civilization. His primary training as a physician, a profession he never abandoned, had been nurturing his literary career and inspiring his imagination. The specificity of Russian culture, its censorial conditions, contributed to the special group of philosophers-writers who mainly delivered their philosophical arguments through fiction, be it a novel, a play, or a short story. Chekhov entered the cultural arena and acquired fame as a superb master of short story whom numerous European writers would wish to emulate in this genre. There were short story writers before his time and after his death, but none of them reached his mastery and perfection in this genre. Chekhov’s story was the genre of the new hectic century, that was the only feature that made it modern, while the depth of his philosophy made his work universal and eternally relevant, it transcends language, time, ethnicity, religion, gender, or age. None of the writers in history could compete with Chekhov in his mastery of the genre that preserves the Aristotelian terseness and philosophical depth, as well as striking with wit and laughter. He holds the crown of the master of the short story, carrying the deepest ethical message in the shortest possibly narrative, delivered with humor and elegance. Chekhov did not leave lengthy treatises or essays, but his voluminous correspondence, next to his short stories, reveals his stand on all philosophical, political and existential topics of universal appeal, serving as a gentle guide to the entire humanity, willing to better themselves and society.

2. Exposure to the Greek Language and Culture, and European Ideas

Anton Pavlovich Chekhov was born in 1860, in the interesting city of Taganrog, on the Azov Sea. Founded by Peter the Great in 1698, after Russia captured the Azov Coast from the Turks in 1696, his native city became a permanent part of the Russian Empire only in the 18th century, and was home to many nationalities. By 1712, Taganrog already had about 8 000 residents, among whom there were migrants from
Samara, Nizhny Novgorod, Saratov and Simbirsk. There was a substantial Tartar Moslem population, some Cossacks, Swedes, Turks, and many Greeks. In 1711, Turks declared war, trying to recapture the area, but by 1760, during the reign of Catherine the Great, the city became again a part of the Russian Empire, and the first naval base. Peter the Great made attempts to beautify the city by planting oak trees, imported from Constantinople, lemon and orange trees [2004:10-11].

Chekhov received his primary education at the Taganrog Greek Lyceum where most of the well-to-do parents used to send their children and where the curriculum was highly rigorous. Very early on Chekhov was exposed to Greek and Latin, and also to French, German and English languages, skill that became quite useful in his European travels, later in life In 1879, family moves to Moscow. In 1884, Chekhov graduates from the Moscow Medical School. Medicine would be his “legal wife”, as he jokingly recalled, and literature his “mistress.” In 1880, his first short story was published in the St. Petersburg comic journal, and , by the time of his graduation from Medical school, 300 short stories of his be published, having made him instantly famous. He would combine his commercial writing career and medical practice during his entire life, generously treating patients free of charge. Born and raised in the cosmopolitan multinational and multireligious city, that even in the 19th century had several foreign Consulates, Chekhov had a very strong pro-European sensitivity. He very early on understood the difference between European civilized society and backward Asian one. Born into a pious Christian family, Chekhov was an atheist and treated religion along Voltaire’s lines, like a superstition and church as an obscurantist institution and a barrier to civilization, having become a subject of his witty ridicule in his short stories. His images of priests are very powerful satyrical portraits, standing as symbols of hypocrisy, lust and gluttony, and useless presence in society. Throughout his short life – Chekhov died from the incurable form of TB at the age of 44 – he tried “to squeeze out a slave and barbarian out himself” and teach others how to do the same in order to become genuinely civilized. His idea of civilization stemmed from the classical canons of culture. Much like Aristotle, also a physician, Chekhov insisted on making body healthy, soul peaceful, mind reasonable and life beautiful, worthy of a truly refined Man.

3. Mens Sana in Corpore Sano or Chekhov’s Idea of Harmonious Beautiful Man

In his own creative way, Chekhov tried to elevate ordinary man by mocking, ridiculing, laughing at, symbolically criticizing and pitying small, petty semi-civilized beings, largely a majority, via metaphorical condemnation, following a certain set of standards. But in his voluminous epistolary legacy, one can find how Chekhov directly and bluntly articulated his strict doctrine of civility that connected him, a man of the fin du siècle with the thinkers of antiquity and the best minds in cultural history. In his letter dated March 1886 and addressed to his brother Nikolay, Chekhov constructed his code of civilized behavior. In his view, the well-brought up or “refined” man, first of all, has to be soft, polite, and agreeable. This relates him the Renaissance legislator of good manners, Della Casa, who developed the analogous doctrine of perfectibility and theory of gentle manners or method of making a
gentleman. Chekhov’s gentleman is above petty things and “does not loose temper over the lost hammer or a rubber band.” He controls his emotions, and this makes the Chekhovian ideal man related to the Aristotelian man, whose self-control places him above animals, savages and the semi-civilized. The Chekhovian ideal man “forbids the noise and cold, the overcooked or burnt meat. He is above trifles.” This civilized man shows respect to his parents and this makes him akin to the ideal man of distant Confucius whom he may not have even known. His gentleman or well-brought up man rushes to see his parents, knowing that “they have sleepless nights and get more grey hair not seeing their son.” His civilized man “honors laws, respects property and dutifully pays his debts.” He is honest and “afraid of lie that is insulting to the interlocutors, making them look trite.” The Chekhovian ideal man behaves equally respectfully at home and in public, not resorting to false dramatic effects. His gentleman is “devoted to his chosen activity which he performs quietly, not seeking fame or publicity and stays away from the mob.”

In addition, his perfect man is guided by the aesthetic principles to be followed every moment of one’s life. Chekhov, the physician, the healer of the body, and guardian of physical beauty, also aimed at making a beautiful mind, leaning towards Beauty in actions, thoughts, and aesthetic habitat. In this regard, Chekhov preached, “Everything in a man ought to be beautiful – one’s face, one’s attire, one’s soul and one’s thoughts.” The highly aesthetic foundation of his theory of civilized man places it into the context of the remote pagan antiquity and during the period of its revival, the glorious European Renaissance. Beauty, according to Chekhov, must be omnipresent, reflected in the habitat, actions, entertainment, tastes, leanings, in all human endeavors. The beautiful cosmos requires man be beautiful as well, as an integral part of cosmic universe. Beauty is the ultimate goal of perfection. Beauty must be in man, outside man, around him, accompanying in all daily activities, private and public. His civilized man is concerned about Beauty every minute of his life – “he would not sleep undressed on a dirty bedding, would not tolerate dirty floors, bug-infested walls and would not eat from the pot because it is against the dictum of the Beautiful.” Chekhov implies that there is a borderline between men and animals. While animals have no way of creating or seeing, men are endowed with the ability to beautify, making it orderly, neat and pretty. Cleanliness is tied to civilization in his demanding theory, so is the aesthetic impulse and principle.

His ideal man is not only concerned about his own personal hygiene, cleanliness of the habitat and beauty, but he also tries to tame and “ennoble the sexual instinct,” something that animals cannot do. Thus, the beginning of Culture and Civilization is at the moment of controlling, regulating sexuality or designing the sexual policy. This is an enormous achievement on Chekhov’s part and a real contribution to the modern theory of civilization in comparison with the later calls for the return “back to Nature,” myths of the “noble savage” or the “happy primordial man” with the unregulated sexual appetite. Chekhov formulates this most significant part of his theory in the confused and troublesome “age of the degeneration,” the time of the erosion of ethics and morality, firmly defending his ground and insisting on elevating man above animals and moving him away from his animalistic origins. This appeal
“for the ennobled sexual impulse” is in a sharp contrast with the anti-civilizational stance of Rousseau, Schopenhauer, Nietzsche, and Freud. Anticipating the future sexual revolution and erosion of ethics in the 20th century, Chekhov, a physician and moral philosopher, articulates clearly and boldly his pro-Civilization position that goes against the current of his age. Here, as a Neo-Aristotelian, Chekhov puts self-command on the pedestal of human values, just as Aristotle did two millennia prior. His man of civility and good manners is trainer of his own body who beautifies biology for the sake of culture and creating a harmonious new being with a healthy beautiful Body and Mind.

4. Civilizing Oneself

Similarly to Confucius, Chekhov placed individual responsibility and will to civilize on the operating table of perfectibility, believing firmly in human capacity to reform, civilize, elevate, beautify and humanize oneself. Neither one’s body, nor one’s origins should make one a prisoner of the given circumstances. In Chekhov’s firm belief, man possesses the power to overcome one’s environment, unfortunate circumstances, poor education, family origins, bad health. “To squeeze the slave and barbarian out of oneself” – this was Chekhov’s credo. All is possible but what is required is the Will, Effort and Education. Chekhov insists on daily self-improvement and discovering the wisdom of others. Expanding on the idea of “ennobling the sexual impulse,” Chekhov has a very strict prescription for the relationship between the sexes. In his letter dated January 2, 1889, and addressed to his brother Alexander, Chekhov expands on the sanctity of human family, treatment of women and children. He angrily writes, “what kind of heavenly or earthly power gives one power to turn women into one’s own slaves?!”. He condemns it as brutal despotism, worthy of savages. According to his doctrine of civility, man is not allowed to treat women disrespectfully, rudely and insult them verbally and with their slovenly manners. A woman to Chekhov was the creator of Beauty whose aesthetic sensibility should not be offended by male sloppy dress and rude verbal manners. Beautiful/ugly, clean/dirty, barbaric/civilized – there are juxtapositions that permeate Chekhov’s world view and his narrative, serving as a guiding map through his epistemological universe.

Children, as much as women, are his embodiment of the Beautiful World, they are “sacred and pure” to Chekhov who is making them worthy of real worship and love. “Even criminals consider them [children] angels,” he wrote. “Children are highly sensitive to the external and enjoy beauty, their eye should be trained by the Beautiful,” taught Chekhov who did not have children of his own. His ideal, healthy, beautiful man cannot attain his goal of perfectibility without the beautiful women and children. “A child is primarily affected by the appearance,” he wrote in another letter dated October 15–20, 1883. “Beautify the environment, verbal discourse, objects, interior, personal decorum not to offend the child, his sense of the Beautiful and it will help to cultivate and civilize an adult later in life,” he taught. Beauty-appreciative children eventually turn into the future beautiful adults, he thought. The future ideal society is made up from the adequately raised citizens, from harmonious relationships.
in daily human civilized families. Child- adult- family – was his Confucian-like formula of primary stage of civilizing Man and society.

5. Process and Method of Civilizing Humanity

Chekhov who had a wide knowledge of world history, philosophy and culture, and constantly studied religions, customs, historical and cultural achievements of humanity, from antiquity to modernity, had no illusions about human progress. In his view, the advancement of humanity was a slow, sluggish peripatetic process, with steps forward and backward, occasional leaps into barbarism and periodic interruptions in development. He was not particularly concerned about modernity, having no fondness for his age, but he asked to be objective:

*I am far from being enthusiastic about modernity, but to be fair and just (there is some progress, no matter what), if it is not so good now, if the present is appalling, the past was simply ugly*  

By “ugly Past” Chekhov meant primitive, backward and tyrannical societies, oppression by ignorance, prejudice and religious mythology. He shared Voltaire’s views and also regarded religion an atavistic remnant form the human barbaric past, having no place in the civilized society of the future. Future civilized society had to be secular in his view. It could be attained via hard education, painstaking efforts of enlightenment in all realms. “Today’s culture is just the beginning in the name of the Future. The work would take centuries for reaching Truth,” he wrote [1964: L. No.724, 463]. He developed his idea of advancement of humanity while observing the progress made by his native country. Chekhov objectively accessed the condition of Russia in the nineties – it was still predominantly an agricultural country even in his own life time. Chekhov did not share the views of some of his compatriots who worshiped her rural way of life and viewed the Russian social and cultural pathway within the framework of the archaic commune outside the European mainstream context. On the basis of his knowledge of European history, Chekhov, not unlike numerous European thinkers, perceived civilization as an urban project. Aware of the roots of the Roman Empire and her greatest accomplished civilizing mission in urbanizing the European continent, he categorically stated:

*Agricultural commune and culture are mutually exclusive notions, absolutely incompatible with each other!*  
[1964, vol.12, L. No.516.:252]

To him, civilization was inseparable from urbanity, Europeanness meant Romanness and her sophisticated urbanity, beautiful cities, beautiful architecture, theatres, galleries, museums, legal code, justice and freedom of expression which he could not find in his native Russia. Chekhov regarded Russia of the very enlightened 19th century (the age of Pushkin, Karamzin, Lermontov, Dostoevsky, Turgenev,
Tchaikovsky, Glinka etc.) still “an Asiatic country, without the freedom of the press, freedom of religion, a country where the government and 9/10 of society view a journalist as an enemy,” and a country having no culture of Debate and constructive discussion [1964: L. No.546, 289]. He was disgusted with “the custom of flinging mud at each other publicly or biting each other’s tails” that was passing for a dialogue. He considered civilized dialogue the beginning of civilized society. In this sense, Chekhov was a Ciceroonian ally who also advocated civilized rhetoric, hoping that one day people would be able to convince each other in a public debate rather than in a military conflict.

Chekhov was skeptical about the state, having no proper laws, no genuine legal code. If most of Europe has inherited the Roman legal code, Russia was lagging behind in this respect. He believed that “the idea of a state should be rooted in certain legal relationships, otherwise, there is nothing but an empty talk, dreadful for imagination” [1964, vol.12. L. No.536:278]. Despite the achievements of the Russian tzars, such as Peter the Great and Catherine the Great, Russia remained predominantly settled by sleepy provincial towns, lacking social and cultural life, where a small pub and a river boat were main attractions. Russia’s urbanity was not distinguished. For the same reason, Chekhov was very happy when Yalta had acquired a proper water supply and sewage system, the first sign of truly urban civilization, and a railway.

In contrast to the backward and not sufficiently urban Russia, Chekhov always mentioned Italy, the cultural heir of Roman Empire, the cradle of Europe and European civilization. Fascinated by beauty in general and having high aesthetic sensibility, Chekhov perceived Italy the citadel of Beauty, culture and foundation of civilization. Even in his time, at the end of the 19th century, the city of Naples was the European cultural capital, theatres nearly at every street, that he perceived as one of the important markers of civilization. Theatre, in his view, possessed the same **civilizing significance** as schools, libraries, museum or universities. The urban Italy, with her most beautiful cities in Europe, was in such a sharp contrast with Russia that “any Russian may have lost one’s mind in this world of beauty” [1964: L.No.235, vol. 11:435]. Having visited Venice in 1891, Chekhov, mesmerized by her beauty and uniqueness, recorded his most exalted impressions:

*I can say only one thing – I have not seen anything more wonderful than Venice. It is a total magic, glitter, joy of life. Instead of streets and alleys, there are canals, gondolas instead of carriages. Amazing architecture, there is no spot that would arouse one’s historic or artistic interest! You sail in a gondola and see palaces, Mona Lisa’s quarters, abode of the famous artists, cathedrals... And inside the cathedrals, sculptures and paintings the likes of which Russians have not seen even in their dreams! Charm – one word! The St .Mark’s Square is smooth and clean like a parquet floor. St. Mark’s Cathedral is indescribable! The palaces arouse the feelings similar to singing, I feel marvelous beauty and enjoy it immensely. In the evening, one is so overwhelmed that one can virtually die from...*
the aesthetic pleasures, the sounds touching one’s soul – violas, tenors, operatic arias... [1964, vol.11, L.No.253: 482-483].

He was passionately in love with Italy, the land of Beauty, her theatres, cathedrals and civilized people, having “galateo” or good friendly manners. To him, Italy was the embodiment of the civilizational foundation and hope that civilization could be attained. Of all the European countries he visited, Italy impressed him the most, it was totally in tune with his aesthetic sensibility, and it also possessed a special existential energy, moral health and force, enabling to enjoy life to the fullest. It was a highly civilized existential milieu, a mini cosmos of the best human invention.

Chekhov’s exaltation over Italy was predicated by his negative view of his native Russia that he regarded less civilized, despite her 19th-century cultural leap. He attributed Russia’s inadequacy not only to her rural origins and rurality-worship among some of her intellectuals but also to the lack of discipline and self-control among Russians:

Russian excitability has one specific quality: it is quickly followed by fatigue and exhaustion. A Russian, without much thought, right after school, takes on overly burdensome and ambitious numerous tasks – developing schools, educating peasants, rationalizing households, and publishing Vestnik Evropy, pronouncing speeches, writing letters to the ministers, fighting Evil and trying to save the world. [1964, vol.11 L. No.147:306]

He believed that this chaotic activity and lack of discipline among Russians tires them out so much that, by the age of 30-35, they fall into depression and boredom, unable to contribute to society in a meaningful manner any more. Unable to plan, select the most important things, and organize their lives, they fail to serve society in the long run and reform it along the civilizational lines. He does not openly say it, but implies that it is a younger civilization, without the centuries of forging the needed self-control, self-command and cultivating respectful behavior.

Like Confucius, whom Chekhov, perhaps, did not know, he also believed that changes do not come from above but from below, by reforming and perfecting each individual and his family, while the educated reformed multitude would eventually lead the rest to the civilized state, like healthy organs of the healthy body. Chekhov acknowledged his own quick tempter, but he developed a habit of controlling himself, following his own doctrine and practicing precisely what he had been preaching for others: “it did not behoove a decent civilized being to let oneself go”(1964, vol.11. L. No.48:1964). He was convinced that people, tutored in self-control, educated and brought up in civilized families, eventually could develop right attitudes towards others and are capable to influence society at large. The ideal civilized people feel and act in the delicate refined manner.

As a student of Nature and the Natural, Chekhov admired the beauty of Cosmos and was displeased with the ugliness in human society, i.e. the parallel
artificial cosmos:

_The universe is fine, but we are not. How unfair are we! How unwilling to perfect ourselves! We do not knowledge but are just self-assured and brazen beyond measure. Honor is nothing more than a decorum of the uniform. One has to work. The most important is to be just._ [1964, vol.4, L.No.225: 468]

His sense of justice as the most important feature of a truly civilized state was tested during the famous Dreyfus trial. Chekhov was the only Russian writer who publicly admired Zola’s stand as the defender of justice and highly praised France that had proven to be on the side of law and justice, or a really civilized country. Not immune to the prejudice himself and raised in the climate of intolerance, Chekhov courageously took the side of Zola and the progressive French forces. Zola demonstrated the best spirit of France as a country of Law, Liberty, and Justice, and Chekhov’s support for him had proven his own strive for the same values. By personal support and admiration of France, Chekhov showed again his leaning towards Europe and the direction Russian should take as a European country. He asserted his personal and national sense of solidarity with progress and civility.

His doctrine of civilization is more akin to that of unknown to him Confucius rather than Aristotle because Chekhov has more rules of personal civilized conduct in the privacy of one’s own home and family as the foundation of the civilized society. He did not write his own *Politics*, but the notorious Dreyfus affair put Chekhov closer to the thinkers of the past and assisted him in clear formation of his own theory of civilization. In his stories and correspondence, Chekhov clearly expressed what stands in the way of Russia’s modernization and attaining complete Europeanness. He detested rurality as a phenomenon and existential preference, as well as the lethargic spirit of the Russian provincial towns that dominated the overall urban landscape, the lack of urban beauty, the visually depressing architecture, poor infrastructure and inadequate cultural life. Even prior to Russia’s partaking European legality, justice and freedom, Chekhov was impatient with the absence of beauty, ugly buildings, narrow unpaved streets, few libraries, theatres and hospitals in her cities. Prior to becoming free and equal to Europe, Russia, in his view, had to be healed with Beauty, her cities had to emulate Paris, Berlin, Rome, Naples, Venice, or Genoa among others.

As a physician, Chekhov knew what impresses children and grown-ups first – the external appearance, cleanliness, shape and form, be it human or manmade. He saw beautification as the first step of civilizing his country. The next was the daily cultivation of aesthetic taste by exposure to the beautiful – bridges, gates, sculptures, building facades, parks, gardens like in ancient Greece or Rome. He grew up in the city, the site of the ancient Phoenician, Greek, and Italian colonies, later developed by tzar Peter the Great into a beautiful cosmopolitan port. His native Taganrog had some neo-classical facades, beautiful streets and stone staircases, hanging over the sea coast. His aestheticism developed in this pretty little city-port. Despite the love for
the proverbial Russian steppe which he immortalized in his novella “The Steppe,” Chekhov was an urbanite, and his idea of a pathway towards Russian Europeanization and modernization was conceived on the basis of beautiful urbanization, the legacy of the Roman Empire. He also grew up in a highly cosmopolitan city, dominated by Italian and Greek settlers who led the cultural development, but also lived side by side with the Moslem Tartars and Turks, Christian Armenians and Germans, and many others. Tolerance of Moslems and Jews in Taganrog was a prominent feature of the city. Chekhov, in a way, was very much ahead of many of his Russian compatriots in terms of exposure to otherness and practice of, what we call in modernity, as “multiculturalism.” In this respect, the Moscovites were more nationalistic and chauvinistic since the Slavic culture was more predominant there. Despite the size, Moscow was seen in many respects as a village and more intolerant of otherness, less free than his native small Taganrog. Chekhov’s idea of the future Russian society was very modern and ahead of his time.

Lack of curiosity, lack of desire for intellectual pursuits exasperated Chekhov, who, like Aristotle believed in human Reason, benefit of constant intellectual stimulation as an assurance of the perpetual differentiation from animals, and harmony between the mental and the physical in man. Aristotle used to call education “an ornament in prosperity and refuge in adversity.” Being once asked how the educated differ from the uneducated, he responded: As much as the living from the dead.” He also regarded “education as the best provision for the old age” (Diogenes Laertius, 1973, vol.1: 463). Similarly to Aristotle, Chekhov condemned gluttony as a symbol of human degradation and submission to the animalistic instincts. On April 7th, 1887, he expressed his indignation over the biological in man to the editor of the Journal Oskolki/ Chips, Leikin Nikolay Alexandrovich:

*The epitome of absolute Asia! Complete Asia! Wherever you go there Easter eggs, Santurini wine, babies, but there are no books, newspapers to be seen. The city is located in a beautiful spot, magnificent climate, with abundance of the earthly gifts, but the people are passive beyond measure... Everyone is musical, endowed with wit and fantasy, sensitive but all is wasted... There are neither patriots, nor business men, neither poets nor decent bakers... 60 000 inhabitants are solely preoccupied with eating, procreating and have no other interests beyond!* [1964, vol.2, L. No.58: 123]

Chekhov is annoyed at the primitive existence of the inhabitants in his native city whose life revolves solely around the satisfaction of their biological needs and is not suited to the beautiful natural mini-cosmos of Taganrog. They insult his aesthetic senses and the equilibrium he demands from the *refined people* and their environment. His own strict code of conduct he invented for all and observed himself was constantly violated by the primitive people and their animal-like existence. He exposes and passionately shuns people of different nationalities and religions who do not wish to raise themselves above their *common biological roots*. To him, they are gravely ill despite their physically healthy appearance, they are ill spiritually and
mentally deficient. People who do not exercise their brain by reading, do not apply their musical or literary gifts, are deficient in mental development and organization, regardless of their ethnic origins – be they Russians in Nice, or Greeks, Armenians, and Tartars in Crimea. His personal standards were very high. He offers the best example to others, he himself was the model of regular ongoing betterment and self-improvement.

6. Interest in European Culture

Being trained as physician, he read regularly not only medical literature, his reading interests were vast, unlimited by languages, times, geography, or discipline. They were so impressive that not every University professor could compete with Chekhov’s erudition. His reading list sent to his colleague-physician Iordanov Pavel Feodorovich (1858-1920) in August 1899 names the following titles that he is interested in:

1. **Cleopatra.** In free translation of Henry Houssage by M. Remizov, 1896.
3. **Virgil.** Trans. By Elisa Ozhezhkova, tr. from Polish by V.Lavrov, 1898.
5. **Prof. P.Giro. Fustel de Coulanges,** tr. by A.Chebotarevskiaia, 1898.
6. Andre Galle, **Beaumarchais,** tr. by V. Lavrov, 1898.
7. A.Bart. **Religion of India,** tr. with the introduction by S.Trubetskoy, 1897.
9. Otto Haupdt. **Herbert Spencer,** tr. from German by M. Futerman, 1898.
10. M.Berteleau. **Science and Morality,** extract from **Science et Morale,** tr. by K.Timiriasev, 1898.

This reading list alone gives an idea about Chekhov’s reading tastes and horizon of his intellectual interests – he is simultaneously curious about ancient Greece, Rome, England, France, the Renaissance Italy, drama, poetry, art, not to lose the sight of the latest in medicine at the same time. While he dispatches some books read as gifts to the libraries, he is asking from the Russian Society of Dramaturgs the following books:

1. J.Belokh, **The History of Greece,** tr. from German by Gershenzon (a famous in those days specialist in the field), 1899.
2. Brandes **Shakespeare,** tr. by Spasskaia, 1899.
3. Maris Louis Gaston Beauassiet. **The Fall of Paganism,** tr. by Korelin, 1892 (the work by a well-known in the day specialist in the area, the member of the French Academy of Sciences).
4. Haim. **Wilhelm von Humboldt.**
5. Hartman. **The Essence of the Historical Process,** tr. from German by A.Kozlov,
1898.
9. -----------------. *Religious Wars*, tr. by V. Nevedomsky, 1898.
16. Albert Shaw. *City Governance in Western Europe*, tr. by A. Belovessky, 1898.

In the same letter, Chekhov is making a request for M. Kovalevsly’s volume, *The Origins of Modern Democracy* but the work is not available. The requested reading list reveals Chekhov’s astounding curiosity about the world history, sciences, humanities in all branches of learning, and his voracious appetite for knowledge of the broadest possible scope – Greek and Roman antiquities, Western European history from early days to modernity, Western institutions, city governance, world religions, literatures, even such exotic ones as the Persian one, psychology, philosophy. All this above and beyond his training and interest in medicine. His wide range reading list alludes to the preparatory research for the possible future plans of formulating his doctrine of perfectibility that were not destined to be materialized, as well as concrete suggestions for modernizing his native Russia and moving it closer to Europe, away from Asia.

Asia, in his mind, was associated with tyranny, despotism, cultural lethargy and evident backwardness in comparison with Western Europe. Chekhov was convinced in Russia’s ability to make a leap forward.

His requested reading list is versatile, interdisciplinary and spans from antiquity to modernity of the world. It is interesting that all of the books he requests are translated from English, French, German by Russian translators and are available in Moscow bookshops of the day. This means that Russia, by the end of the 19th century, was completely in tune with the cultural events, cultural production and the latest accomplishments of Western countries and had the professional translators who disseminated this knowledge among the wide reading Russian public, not locking the sources in the original foreign languages. His reading list reveals a background
skeleton for the possible unwritten Russian version of *Politics*, a modern double of Aristotle’s treatise on ideal civilized and well-governed society, or a Russian neo-Aristotelian theory of civilization. Regrettably, he did not have at least another decade or two to produce a philosophical work on the same subject which he obviously was not simply interested in but already had concrete original ideas of his own, so far articulated either metaphorically in his short stories, or scattered in his voluminous correspondence to friends and relatives. The backbone of his theory was already there, so was the preliminary research.

7. Aristotelian Message

Very early on, Chekhov discovered his own personal talent and had found his own preferred genre. His poetic gift for metaphor and laconic expression made him turn to the most economic form of mediating the most complicated ideas and messages. Trying not to confine his discourse to the intellectual club or scholarly chamber, but reach the widest possible audiences, educate the masses and forge a civilized man. Chekhov chose the medium of a short story fiction as a weapon against barbarism. However, the message was still Aristotelian.

In Book One of *Nicomachean Ethics*, Aristotle condemned his contemporary life since he observed how “the masses prefer a life suitable to beasts” [1984, vol.2:1731]. The beast/human or barbarian/civilized paradigm is actually the running motif in Aristotle’s entire corpus of the texts. Trying to articulate his doctrine of civilization, Aristotle substantially relied on this comparative paradigm. He wrote in his *Eudemian Ethics* that “anger and appetite belong also to the brutes choice does not” (1984, vol. II: 1941). The Aristotelian “man of excellence” who is above the simple brute is able to make choices between the animalistic desires and those elevating him above animals. Millennia later, Freud would distort the theory of civilization by presenting “human beings as prey to passions, drives, instincts and thus deliberately excluded the human capacity for spirituality” [2015:65]. In fact, he was conducting his untangling of the civilizational web in Chekhov’s time.

The Chekhovian “refined man,” constructed simultaneously with the Freudian search for the “primordial man,” is analogous to the Aristotelian prototype but is in the opposition to the image-caricature of a “man-pig.” Unlike the Aristotelian philosophical transparent discourse, Chekhov’s symbolic portrayal of the despised man-animal the reader has to recognize the intended message and accept Chekhov’s idea in order to be convinced in the ugliness of the satyrical image. Thus, one encounters the following dichotomy in Aristotle and Chekhov:

<table>
<thead>
<tr>
<th>Aristotle – transparent</th>
<th>Chekhov – coded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man/beast</td>
<td>Man/pig</td>
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Chekhov’s story, *The Maskers (Riazhenye)*, is the best illustration of the symbolic messages, profoundly akin to the Aristotelian concepts. In 1886, he also published a satirical essay dedicated to exposing the Russian pseudo-civilized being. The portrait is actually a universal image of a being who could have lived any time,
including the remote antiquity and be equally ridiculed by Aristotle. The Russian masker has a related prototype – an Athenian, parading as a civilized man but actually not differing much in his ways from an animal:

Here comes, marching down the street, with his head raised in dignity. Something dressed like a human. This something is fat, flabby, dressed according to the latest fashion, uttering nonsense but with pomp. It has just dined, drunk some Elisseevsky beverage and it about to decide – to visit Adel, or to go to have a nap or play cards? In three hours, he is going to have supper, in five – it will go to bed Tomorrow. He will wake up at noon, have lunch, drink his beverage and will do the same, asking the same questions. The day after, he will do the same. Who is it? This is a pig.

[The Maskers, 1964: 106; 403]

This is one of the very few occasions when Chekhov gives his despised man untouched by civilization to the masses in the undisguised non-metaphoric attire. This direct address summarized hundreds of his metaphorical portraits, underscoring his idea of man/beast.

Conclusions
Chekhovian doctrine of perfectibility is based on the Aristotelian barbarian/civilized paradigm, despite the millennia that separate them and the untimeliness of the modern cultural context. It also embodies the overall undying interest in Aristotle in European East and the prominent orientation in Russian philosophy which would remain pro-Aristotelian.

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ARCHAEOLOGICAL EPOCH AS THE EVOLUTIONARY SEQUENCE OF INTERSECTING “WITH OVERLAP” GENERATIONS OF DEVELOPING SUBJECTS – THE CARRIERS OF AREARCHAEOLOGICAL SUB-EPOCHS

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KEYWORDS: archaeological epoch, archaeological sub-epoch, development, evolution, generations butt, generations overlap, subject-carrier of archaeological sub-epoch

SYNOPSIS

1. Having defined “subject-carrier of the archaeological sub-epochs (ASE)” as the holistic virtual sequential totality of all individuals-participants (consolidated by unified level of information complexity) of corresponding ASE development/evolution process, let us characterize it as the generation in development/evolution of archaeological epoch (AE).

2. Not everyone evolvement successive steps of arbitrary form object it is possible to present as joined “butt” (i.e. replacing each other). If developing object is the sequence being replaced – by means of generations chain (replacements) – relatively short-lived elementary components, then appears more complicated scheme, combining corresponding life cycle steps-stages of these components “overlap” (i.e. synchronously and parallely).

3. The situation of “overlapping” as superposition of developing AE – its ASE –

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components fragments on general time scale, for the first time in world literature was noticed, theoretically comprehended and mathematically formalized by J.L. Shchapova within frameworks of developed by it multidisciplinary archeology [Chchapova 2001, Shchapova 2005, Grinchenko, Shchapova, 2015).

4. In fig. 1 is presented historically ancient fragment of chronology and periodization AE model. Intervals between adjacent dates in scheme, measured in millennia up to BC are called by AE-periods. The figure visually educe the common tendency of duration increasing “overlap” from characteristic for biological prehistory of alone AE-period up to characteristic for social origin triad of AE-periods. Beyond that, and so important for the understanding of interaction peculiarities between subject-carriers of adjacent ASE the factors, as moments of information coups and informational revolutions [Grinchenko, Shchapova 2010; Grinchenko, 2011].

As is seen from, “overlap” is realizing here three latest periods of Lower Paleolith ASE and three first periods of Middle Paleolith ASE. In other words, the descendants of relatively primitive Homo erectus and them similar continued to exist and even to develop – as dominant – their material culture and social origin after their development branch out more complicated Homo neanderthalensis. Whereby made this in parallel with dialing its evolutilional potential H. neanderthalensis. It is clear that at the stage of “overlap” these ASE and the contacts between these branches of Homo genus representatives has not been excluded.

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**Fig 1.** Stages comparison of evolutilional development of human ancestor forms (model conceptualization)
5. Conclusions:

1) generations chain at the stage of biological pre-history AE (and all the more earlier) evolves with “overlap” on minimal variant “one-to-one” AE-period;
2) the transition regime from minimal biological variant of “overlap” “one-to-one” AE-period to typical for AE social variant “three-to-three” AE-periods was realized in the course of bio-social archaeolith ASE;
3) beginning from Lower Paleolith ASE generations chain being replaced social ASE evolves with “overlap” on typical social variant “three-to-three” AE-periods;
4) the parity of some time segments in AE-periods, i.e. in dimensionless logarithmic time scale, do not means their parity in dimensional metric scale: e.g., three latest periods have lasted at Lower Paleolith ASE near 288 millennia, but at Upper Paleolith ASE only near 16, – with coincident of important properties of occurring in them series processes;
5) overall, the proposed synthetic (multidisciplinary) understanding of the archaeological science subject, being included in the educational context, it acquires the status of worldview.

References


4. На рис. 1 представлен исторически древнейший фрагмент модели хронологии и периодизации АЭ. Интервалы между смежными датами на схеме, измеряемыми в тысячелетиях до н.э., называются АЭ-périодами. Рисунок наглядно выявляет общую тенденцию увеличения продолжительности «нахлёста» от характерного для биологической предыстории единственного АЭ-périода до характерной для социального начала триады АЭ-périодов. Кроме того, здесь показаны и столь важные для понимания особенностей взаимодействия между субъектами-носителями смежных АСЭ факторы, как моменты информационных переворотов и информационных революций [Grinchenko, Shchapova 2010; Grinchenko, 2011].

Как видно, «нахлёст» здесь реализуют три последних периода АСЭ нижнего палеолита и три первых периода АСЭ среднего палеолита. Иными словами, потомки относительно примитивных Homo erectus и им подобных продолжали существовать и даже развивать – как доминанты – свою материальную культуру и социальное начало после того, как от их ветви развития ответвились более сложные Homo neanderthalensis. Причём делали это параллельно с набирающими свой эволюционный потенциал неандертальцами. Очевидно, что на этапе «нахлёста» этих АСЭ не были исключены и контакты между этими ветвями представителей рода Homo.

Рис. 1. Сопоставление стадий эволюционного развития предковых форм человека (модельное представление)
5. Выводы:

1) череда поколений на этапе биологической предыстории АЭ (и тем более ранее) эволюционирует с «нахлестом» по минимальному варианту «один-на-один» АЭ-период;

2) режим перехода от минимального биологического варианта «нахлеста» «один-на-один» АЭ-период к типовому для АЭ социальному варианту «три-на-три» АЭ-периода реализовался в ходе био-социальной АСЭ археолита;

3) начиная с АСЭ нижнего палеолита череда поколений сменяющихся социальных АСЭ эволюционирует с «нахлестом» по типовому социальному варианту «три-на-три» АЭ-периода;

4) равенство некоторых отрезков времени в АЭ-периодах, т.е. в безразмерной логарифмической шкале времени, отнюдь не означает их равенства в размерной метрической шкале: например, три последних периода длились у АСЭ нижнего палеолита около 288 тысячелетий, а у АСЭ верхнего всего около 16, – при совпадении важных свойств ряда процессов, происходящих в них;

5) в целом, предлагаемое синтетическое (мультидисциплинарное) представление о предмете археологической науки, будучи включённым в образовательный контекст, приобретает мировоззренческий статус.

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ОСНОВНОЙ ТЕКСТ СТАТЬИ

Как известно, движение – понятие, охватывающее в самом общем виде всякое изменение и превращение материи.

В свою очередь, развитие объектов, и материального, и идеального, – это необратимое, направленное и закономерное изменение, переход от одного качественного состояния к другому, процесс превращения объектов любой природы из одного состояния в другое: от низшего к высшему, от простого к сложному, к более совершенной организации всех уровней сложности (иерархической, информационной, производственно-материальной, социальной, духовной и культурной).

Понятие развития, определённое в информатико-кибернетических терминах, может быть соотнесено с понятием метаэволюции трёх иерархических составляющих Мироздания – неживой природы, живой природы и личностно-производственно-социальной природы, или Человечества. В контексте иерархического метаэволюционного подхода объект, развитие анализируемых субъектов-объектов удаётся представить в каждом конкретном случае, как естественную системную иерархию. Например, в метаэволюционном развитии такого системного объекта, как Человечество, можно выделять в его истории такие этапы, как формирование информационных технологий (ИТ) сигналных звуков/поз – мимики/жестов – речи/языка – письменности – книгопечатания – ...


Определён «субъект-носитель археологической субэпохи (АСЭ))» как целостную виртуальную последовательную совокупность всех индивидов-участников (объединённых единым уровнем информационной сложности [Щапова, 2012; Гринченко, Щапова, 2015]) процесса развития/эволюции соответствующей АСЭ, охарактеризуем его как поколение в развитии/эволюции археологической эпохи (АЭ).


Таким образом, и «развитие», и «эволюция/инволюция», и т.п. как процессы не существуют сами по себе, а всегда отнесены к соответствующему

3 Метаэволюция – процесс последовательного наращивания числа уровней/ярусов иерархической системы в ходе её формирования [Гринченко 2007].
объекту: движущемуся, развивающемуся, эволюционирующему, инволюционирующему и др.

Самый общий и простой вид процесса развития относительно целостного (неделимого) и сравнительно долгоживущего объекта показан на рис. 1А. Если же при анализе процесса развития такого объекта можно выделить признаки/свойства/маркеры, по которым он может быть подразделён на некоторые последовательности «шагов развития», то возникает схема рис. 1Б, где шаги по определению соединены «встык».

Однако далеко не все последовательные шаги развития объекта произвольного вида можно представить как соединённые «встык» (т.е. сменяя друг друга). Если развивающийся объект представляет собой последовательность сменяющихся – посредством череды (смены) поколений – относительно короткоживущих элементарных составляющих, то возникает более сложная схема рис. 2(А,Б), объединяющая соответствующие шаги/этапы жизненного цикла этих составляющих «внахлёст» (т.е. синхронно и параллельно).

Рис. 1. Примеры процессов развития: простейшего и линейно-пошагового «встык».

Рис. 2. Примеры «нахлёста» этапов процесса развития по поколениям

На этой схеме представлены «шаги» развития (в общем случае – усложнения) индивида по линии предок-поптомок (от поколения к поколению).
Очевидно, что здесь рождение потомка не приводит к немедленной смерти предка (частьный случай гибели лососевых рыб после нереста лишь подтверждает общее правило). И, следовательно, индивид сосуществует со своими потомками, возможно нескольких поколений, взаимодействуя с ними тем или инным образом.


Каждый системный объект, развитие которого отражает соответствующая АСЭ, нуждается в собственном наименовании. По этой причине естественно ввести интегральное понятие «субъекта-носителя АСЭ» как целостной виртуальной совокупности всех участников процесса развития/эволюции соответствующей АСЭ, начиная от предыстории АЭ, через археолит, низший, средний и верхний палеолиты, неолит, – вплоть до бронзового и железного веков (например, «субъект-носитель АСЭ археолита», «субъект-носитель АСЭ нижнего палеолита» и т.д.).

Системный объект – «субъект-носитель АСЭ» – не является биологическим многоклеточным организмом либо человеком, также развивающимися по поколениям. Введение представления о субъекте-носителе АСЭ позволило выявить наиболее важные в эволюционном контексте свойства АЭ, переведя в ранг второстепенных их иные наблюдаемые отличия.

Пример «нахлёста» процессов эволюционного развития субъектов-носителей АЭ нижнего и среднего палеолитов показан на рис. 3В. Здесь видно, что протяженности этих отделов АЭ составляют по шесть «АЭ-периодов» времени – в терминах предложенной Ю.Л.Щаповой «Фибоначчиевой» модели хронологии и периодизации археологической эпохи (ФМАЭ) [оп. си.; Гринченко, Щапова, 2015].

Как видно, «нахлёст» здесь реализуют три последних периода АСЭ низшего палеолита и три первых периода АСЭ среднего палеолита. Иными словами, потомки относительно примитивных Homo erectus и им подобных продолжали существовать и даже развиваться как доминанты [Гринченко, Щапова, 2014] – свою материальную культуру и социальное начало после того, как от их ветви развития ответвились более сложные Homo neanderthalensis. Причём делали это параллельно с навирающими свои эволюционный потенциал неандертальцами. Очевидно, что на этапе «нахлёста» этих АСЭ не были исключены и контакты между этими ветвями представителей рода Homo.
Рис. 3. Примеры «нахлёста» стадий эволюционного развития предковых форм человека


Поскольку процессы, происходящие в скрытые фазы, генерируют существенно меньшее — но не нулевое! — число дошедших до нас артефактов,
нежели процессы явных фаз, становится понятным, почему традиционная система «трёх веков» успешно датирует большинство – но далеко не все! – имеющиеся артефакты. И почему мультидисциплинарная археология отнюдь не отвергает, а лишь дополняет и расширяет систему «трёх веков».

Пример предыдущего в истории АЭ «нахлёста» процессов эволюционного развития субъектов-функционалов трёх составляющих АСЭ археолита показан на рис. 3Б. Здесь хорошо видно, что протяженности этих составляющих нарастили от двух до четырёх АЭ-периодов времени, а соответствующий «нахлёст» между археолитом-1 и археолитом-2 длился один АЭ-период, между археолитом-2 и археолитом-3 – два АЭ-периода, а между археолитом-3 и следующим за ним нижним палеолитом – три АЭ-периода. Иными словами, усложнение форм в цепочке Homo habilis-1 – Homo habilis-2 – Homo habilis обусловило переход от чисто биологического поведения к био-социальному и начаткам материального производства.


«Нахлёст» в череде поколений социальных индивидов очевиден и нагляден, но этого нельзя сказать относительно череды поколений биологических видов и, особенно, субъектов-функционалов АСЭ, а также иных им подобных объектов системы Человечества. На этом фоне роль теоретического модельного представления этих процессов трудно переоценить.

Три фрагмента рисунка 3 объединены на рисунке 4 в общую схему – исторически древнейший фрагмент модели хронологии и периодизации АЭ. Интервалы между смежными датами на схеме, измеряемыми в тысячелетиях до н.э., называются АЭ-периодами.


Учитывая изначальное различие в сложности, в частности – в интеллектуальных способностях параллельно существующих пар форм рода Homo, первая из которых порождает вторую, – степень овладения ими новыми информационными технологиями общения между собой также заметно различна. Это, согласно принципу обратной связи, усугубляет различие в интеллекте и в успешности их активной деятельности.

Рис. 4. Сопоставление стадий эволюционного развития предковых форм человека
Рис. 5. Двойная спираль АЭ в логарифмическом масштабе времени

Основные выводы

1) Череда поколений на этапе биологической предыстории АЭ (и тем более ранее) эволюционирует с «нахлестом» по минимальному варианту «один-на-один» АЭ-период.

2) Промежуточный режим перехода от минимального биологического варианта «нахлеста» «один-на-один» АЭ-период к типовому для АЭ социальному варианту «три-на-три» АЭ-периода реализовался в ходе био-социальной АСЭ археолита.

3) Начиная с АСЭ нижнего палеолита череда поколений сменяющих социальных АСЭ эволюционирует с «нахлестом» по типовому социальному варианту «три-на-три» АЭ-периода (несколько редуцировавшемуся к концу АЭ).

4) Равенство некоторых отрезков времени в АЭ-периодах, т.е. в безразмерной логарифмической шкале времени, отнюдь не означает их равенства в размерной метрической шкале. Так, например, три последних периода длились у АСЭ нижнего палеолита около 288 тысячелетий, а у АСЭ верхнего – всего около 16. Тем не менее, ряд важных свойств процессов, происходящих в них, совпадают.

5) Если некоторый объект развивается по схеме «череды поколений», то в этом процессе наблюдается тот или иной «нахлест» его фрагментов, реализующий их взаимосвязь и возможное взаимодействие.
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РЕЗЮМЕ. В статье впервые предлагаются: классификация простых чисел в виде алгоритма построения числовых рядов по «степеням простоты» и метод использования этого алгоритма в квантово-корреляционной информатике, утверждается необходимость исправления ошибочной терминологии, укоренившейся в Теории чисел.

КЛЮЧЕВЫЕ СЛОВА: простые числа, классификация, степени простоты, перевод терминов, кодирование, декодирование, неразделимые состояния, квантовые вычисления, квантовый коррелятор

SYNOPSIS

Having defined a number as “a set that is measured by means of units”, Aristotle left to the following generations of scientists the task of classification of numbers as well as itemization of kinds of numbers, in particular, determination of such a subset of natural numbers, which are prime numbers, and then – further itemization of subsets of prime numbers.

Juxtapose a series of prime numbers with a natural series, then construct another series made up of those prime numbers, whose “Nos.” are also prime. Repeating this operation successively, we will obtain, instead of conventional division of numbers into prime and composite ones, ordered series of numbers differing in “degrees of primality”. Each subsequent series will constitute a subset of the previous series.
Translating the essence of the suggested operation into any foreign language but the Ancient Greek, where αριθμός has the same meaning as the Russian word число, and a prime number is πρώτος αριθμός (which literally means: “first number”), makes a problem. The Latin for “prime number” is numerus primus, that is, literally, “number one”, which leads to confusion of the notions “number” and “No.”. The English term “prime number” – literally: “initial (but also main, primary) No.” is even farther from the essence than the Latin definition, as prime numbers did not at all arise as “initial” numbers, but rather “separated” from the set of natural numbers as a subset of theirs, and constitute a secondary concept relative to the concept of natural numbers.

Having originated as the most “away-from-reality” field of pure mathematics and made the basis of Number Theory, the teaching on prime numbers have become indispensable in such strictly applied area as cryptography and can later form a body of mathematics of quite new informatics based on the quantum correlation principle. It has gradually become clear that prime numbers are not an abstract concept, that these determine regularities of all the phenomena – physical, biological and social ones.

Yet, what hampers understanding unique properties of prime numbers is erroneous terminology established in Number Theory, which arose from inaccurate translations of the main notions of mathematical objects, in its turn, originating from a failure to recognize actual existence of different types of cosmologies, and above all, rejection of existence of Three Cosmological Types of Knowledge: two polar (mutually opposite) types; and one intermediate Integral type.

Though it was in the Russian language that the idea of application of prime numbers for encoding and decoding information was first stated, the Russian quantum informatics, having become dependent on English language sources (and accordingly, modern Anglo-Saxon – Platonic Dualistic Type – cosmology as all-encompassing knowledge), adopted such “howlers” as запутанное состояние, which is a literal translation of the English word entangled having no negative connotation inherent in its Russian analogue. But why would we be unsatisfied with the term несепарабельное состояние (inseparable state), which has already come into general use among scientists, or, still better, неразделимое состояние (indivisible state) (with reference to Aristotle’s Biocosmology)?

The uniqueness of factorization of any natural number enables to find a universal code, as well as unique codes to be applied for storage and transmission of indestructible and noise-immune information.

The universal code may be implemented based on a series of prime numbers, while individual codes may be based on derivative series of different degree of primality. These series may be “recorded: in the form of a hologram to any given degree of completeness, where such a degree will depend exclusively on the capacity of the hologram.

In scientific literature, suggestions were already made on possibility of creating an artificial quantum correlator similar to a human brain, which is a natural correlator [Kudrin, 2006, pp. 102–106; Menskiy, 2014].
An artificial correlator will enable to obtain information not only from “the thin layer of the present”, but also from the totality of all the “layers” of the space-time continuum. At creating an artificial correlator, such property of living matter will be used as the ability to memorize and actualize information (DNA transforms information perceived thereby into a “holographic form” and then actualizes the same in extended forms). Here, it is irrelevant, which particular kind of organism will be taken as a model for universal correlator. This could as well be a thin film of cell tissue grown on the model of a leaf of a plant, where such film would not only be able to be engaged in photosynthesis but also to actualize previously accumulated information. The “artificial leaf” will be a “three-dimensional entrance” into a multi-dimensional hologram, which would keep all the information accumulated by the leaf.

РЕФЕРАТ СТАТЬИ

Определив число как «множество, которое измеряется с помощью единиц», Аристотель оставил учёным следующих поколений задачу классификации чисел, а также – детализацию видов чисел, в частности, определение такого подмножества натуральных чисел, каковым являются простые числа, а затем – и дальнейшую детализацию подмножеств простых чисел.

Сопоставим ряд простых чисел с натуральным рядом, затем – построим ещё один ряд, составленных из тех простых чисел, «номера» которых – тоже простые. Последовательно повторяя эту операцию, мы получим, вместо привычного разделения чисел на простые и составные, – упорядоченные ряды чисел, различающиеся по «степеням простоты». Каждый последующий ряд будет представлять собой подмножество предыдущего ряда.


Родившись как наиболее «оторванная от реальной жизни» область чистой математики и став основой Теории чисел, учение о простых числах стало незаменимым в такой сугубо прикладной области, как криптоанализ, а впоследствии может стать математическим аппаратом совершенно новой информатики, основанной на принципе квантовой корреляции. Постепенно стало ясно, что простые числа – не отвлечённое понятие, что они определяют закономерности всех явлений – физических, биологических, социальных.
Но пониманию уникальных свойств простых чисел мешает укоренившаяся в Теории чисел ошибочная терминология, сложившаяся в результате неточных переводов основных понятий математических объектов, в свою очередь, происходящая из непризнания реального существования различных видов космологий, и, прежде всего – непризнания существования Трех космологических типов знания: двух полярных (противоположных друг другу); и одного промежуточного Интегрального типа.

Хотя идея применения простых чисел для кодирования и декодирования информации впервые была высказана именно на русском языке, отечественная квантовая информатика, попав в зависимость от англоязычной литературы (и, соответственно, современной англосаксонской – Платоновского Дуалистического типа – космологии как всеохватывающего знания), обогатилась такими «перлами», как «запутанное состояние» – буквальный перевод английского entangled, не имеющего негативной коннотации, присущей этому слову в русском языке. Но почему нельзя было бы удовольствоваться термином «несепарабельное состояние», и так уже вошедшим в русский научный обиход, или, ещё лучше: «неразделимое состояние» (используя термыны из Биокосмологии Аристотеля)?

Единственность разложения любого натурального числа на простые сомножители даёт возможность нахождения универсального кода, а также уникальных кодов, применяемых для хранения и передачи неразрушаемой и помехоустойчивой информации.

Универсальный код может быть реализован на основе ряда простых чисел, а индивидуальные коды – на основе производных рядов, различающихся по степеням простоты. «Запись» этих рядов может быть осуществлена в виде голограммы с любой заданной степенью полноты, причём эта степень будет зависеть исключительно от ёмкости голограммы.

В научной литературе уже высказывались предположения о возможности создания искусственного квантового коррелятора, подобного человеческому мозгу, являющемуся естественным коррелятором [Кудрин, 2006, С. 102–106; Менский, 2014].

Искусственный коррелятор позволит получать информацию не только из «тонкого слоя настоящего», но и из совокупности всех «слоёв» пространственно-временного континуума. При создании искусственного коррелятора будет использовано такое свойство живого вещества, как способность к запоминанию и актуализации информации. (ДНК преобразует воспринятую ею информацию в «голографическую форму», актуализируя ее затем снова в протяженных формах). При этом несущественно, какой именно вид организма будет взят в качестве образца для универсального коррелятора. Это может быть и тонкая пленка клеточной ткани, выращенная по образцу листа растения, способная не только к фотосинтезу, но и к актуализации накопленной ранее информации. «Искусственный лист» будет «трехмерным входом» в многомерную голограмму, которая хранит всю накопленную листом информацию.
Введение

В настоящей статье мы постараемся показать, как неправильный перевод древнегреческих терминов породил неверную терминологию, укоренившуюся в Теории чисел, и наметить пути исправления этой терминологии.

1. Простые числа в древности и история понятия

Важно вначале отметить характеристику пифагорейской школы математики, высказанную Аристотелем в «Метафизике»:

В это же время и раньше так называемые пифагорейцы, занявшись математикой, первые развили ее и, овладев ею, стали считать ее началами всего существующего. А так как среди этих начал числа от природы суть первое, а в числах пифагорейцы усматривали (так им казалось) много сходного с тем, что существует и возникает, — больше, чем в огне, земле и воде (например, такое-то свойство чисел есть справедливость, а такое-то — душа и ум, другое — удача, и, можно сказать, в каждом из остальных случаев точно так же); так как, далее, они видели, что свойства и соотношения, присущие гармонии, выражимы в числах; так как, следовательно, им казалось, что все остальное по своей природе явно уподобляемо числам и что числа — первое во всей природе, то они предположили, что элементы чисел суть элементы всего существующего и что все небо есть гармония и число. И все, что они могли в числах и гармониях показать согласующимся с состояниями и частями неба и со всем мироустройством, они сводили вместе и приводили в согласие друг с другом; и если у них где-то получался тот или иной пробел, то они стремились восполнить его, чтобы все учение было связным. Я имею в виду, например, что так как десятка, как им представлялось, есть нечто совершенное и охватывает всю природу чисел, то и движущихся небесных тел, по их утверждению, десять, а так как видно только девять, то десятым они объявляют «противоземлю». В другом сочинении мы это разъяснили подробнее. А разбираем мы это ради того, чтобы установить, какие же начала они полагают и как начала эти подходят под упомянутые выше причины. Во всяком случае очевидно, что они число принимают за начало и как материю для существующего, и как [выражение] его состояний и свойств, а элементами числа они считают четное и нечетное, из коих последнее — предельное, а первое — беспредельное; единое же состоит у них из того и другого (а именно: оно четное и нечетное), число происходит из единого, а все небо, как было сказано, — это числа» [Аристотель, «Метафизика», V. 985b23 – 987a25].

П.П. Гайденко поясняет:

«Предел-беспредельное» — первая из десяти пифагорейских противоположностей, которые называет Аристотель. Далее он перечисляет следующие пары: чет-нечет; прямое — кривое; единое —
множество; свет – тьма; правое – левое; хорошее – дурное; мужское – женское; квадрат – параллелограмм. Из этих противоположностей строится все существующее, само число тоже состоит из противоположностей – чётно и нечётно» [Гайденко, 2000, С.28].

В «Физике» Аристотель разъясняет пифагорейское учение о чётности и нечётности следующим образом:
«…пифагорейцы считают бесконечное чётным числом, оно, будучи заключено внутри и ограничено нечётным числом, сообщает существующим вещам бесконечность. Доказательством служит то, что происходит с числами: именно, если накладывать гномоны вокруг единицы и сделать это далее (для чётных и нечётных отдельно), в одном случае получается всегда особым вид фигуры, в другом – один и тот же» [Аристотель, Физика, III, 4, 203 а].

Современный исследователь С.Н. Никаноров так подводит итог классификации видов чисел Аристотелем:
«Аристотель полагает три свойства количества. Во-первых, количество – то, что не имеет себе противного. Аристотель разделяет величины, составленные из частей, имеющих взаимное расположение, от величин и частей без взаимного расположения. Величинами без взаимного расположения являются линии, поверхности и тела. Величины без взаимного расположения суто числа, слова и время. Величины с взаимным расположением частей являются пространственными. Величины без взаимного расположения – не пространственные» [Никаноров, 2009].

Далее Аристотель устанавливает категорию количества, делящуюся на дискретное и непрерывное, причём это деление не совпадает с делением на пространственные и непространственные величины.

Третье деление, по Аристотелю, – на остающиеся и последовательные, в котором уже предугадывается противопоставление постоянных и переменных величин.

Хотя в трудах Аристотеля мы не находим термина «классификация», Аристотель фактически произвёл дифференциацию всех родов наук в терминах понятий и принципов своей метафизики. При этом математика, выделившись в отдельную науку, ещё не имела чётких структурных подразделений на отдельные дисциплины. Это стало задачей уже последующих мыслителей, использующих метод Аристотеля. Определив число как «множество, которое измеряется с помощью единицы» (Аристотель, «Метафизика»), он оставил учёным следующих поколений и задачу дальнейшей детализации понятия числа, в частности, определение такого подмножества натуральных чисел, каковым являются простые числа.

Около 300 года до Р.Х. Евклид привёл следующее доказательство бесконечности количества простых чисел: «Представим, что количество
простых чисел конечно. Перемножим их и прибавим единицу. Полученное число не делится ни на одно из конечного набора простых чисел, потому что остаток от деления на любое из них даёт единицу. Значит, число должно делиться на некоторое простое число, не включённое в этот набор» [Евклид, 1949].

Затем Эратосфен Киренский (276–194 гг. до Р.Х.) разработал алгоритм нахождения всех простых чисел до некоторого целого числа n – так называемое «решето Эратосфена».

Впервые точная формулировка и доказательство теоремы о единственности разложения любого натурального числа на простые множители, получившей название «основной теоремы арифметики», приводятся в книге К.Ф. Гаусса «Арифметические исследования», изданной в 1801 году [Калужин, 1969].

2. Классификация простых чисел и трудности перевода

Мы привыкли к термину «простые числа», забывая о том, что «простые» они лишь по отношению к операции умножения. Но по отношению к операции сложения единственным простым числом является число 1 (формально к простым числам не относящееся), а все остальные числа – составные.

Попробуем произвести классификацию простых чисел. Сопоставим ряд простых чисел с натуральным рядом, затем – построим ещё один ряд, составленных из тех простых чисел, «номера» которых – тоже простые. Последовательно повторяя эту операцию, мы получим, вместо привычного разделения чисел на простые и составные, упорядоченные ряды чисел, различающиеся по «степеням простоты». Каждый последующий ряд будет представлять собой подмножество предыдущего ряда.

Представляет трудность перевод сущности предлагаемой операции на любой иностранный язык, кроме древнегреческого, в котором аριθμός имеет тот же смысл, что и русское слово «число» (О различии этих смыслов уже говорилось в работе «Гилетика в суперсистеме знаний Аристотеля», с. 417).

По-латыни «простое число» – numerus primus, то есть буквально – «номер первый», что совершенно не соответствует сути понятия. Гораздо ближе к ней гречское πρώτος αριθμός – «первое число».

Английское выражение prime number – буквально: «начальный (но также и главный, основной) номер» – ещё дальше от сути, чем латинское определение, так как простые числа вовсе не возникли как «начальные» числа, а постепенно «выделились» из множества натуральных чисел в виде их подмножества, представляют собой вторичное понятие по отношению к понятию натуральных чисел.

Понятие простых чисел стало основой отдельной математической дисциплины, получившей название Теории чисел – также условное и не вполне точное, так как в ней рассматриваются не все числа, а лишь числа натуральные.

Но переводы на русский язык работ даже таких признанных англоязычных столпов Теории чисел, как Дон Цагир [1985] и Пауло Рибенбойм [2003]
страдают от неверной передачи основных терминов Теории чисел – не по вине переводчиков, а именно от изначальной неспособности английского языка адекватно выразить смысл этих терминов.

3. Прикладное значение Теории чисел

Родившись как наиболее «оторванная от реальной жизни» область чистой математики и став основой Теории чисел, учение о простых числах стало незаменимым в такой сугубо прикладной области, как криптография, а впоследствии может стать математическим аппаратом совершенно новой информатики, основанной на принципе квантовой корреляции. (Признание этого принципа не означает непременного признания справедливости так называемой «Стандартной модели» квантовой механики).

Постепенно стало ясно, что простые числа – не отвлеченное понятие, что они определяют закономерности всех явлений – физических, биологических, социальных. Учение о простых числах позволяет арифметизировать всю математику.

Огромное принципиальное значение имеет алгоритм нахождения простых чисел. О.Н. Василенко, в работе «Теоретико-прикладные методы в криптографии» (2003), так формулирует современное прикладное значение Теории чисел: «В настоящее время, по некоторым оценкам, практически весь мировой парк средств асимметричной криптографии в математическом плане основан на теоретико-числовых методах».

Но идея применения простых чисел для кодирования и декодирования информации впервые была высказана именно на русском языке!

4. Принцип квантовых вычислений


Позже, попав в зависимость от англоязычной литературы, отечественная квантовая и информатика обогатилась такими «перлами», как «запутанное состояние» – буквальный перевод английского entangled, не имеющего негативной коннотации, присущей этому слову в русском языке.

В работе С.Я. Килина «Квантовая информация» автору счастливо удалось избежать употребления этого неудачного термина, заменив его выражением «перепутанное состояние» – буквальный перевод английского entangled, не имеющего негативной коннотации, присущей этому слову в русском языке.


В 1994 году Питер Шор показал, что квантовый алгоритм способен свести задачу факторизации (разложения целого числа на простые множители) к полиномиальному классу сложности, в то время как обычный алгоритм экспоненциально зависит от входных данных.
Именно единственность разложения любого натурального числа на простые сомножители даёт возможность нахождения универсального кода, а также уникальных кодов, применимых для хранения и передачи неразрушаемой и помехоустойчивой информации.

Р.В. Ленников и А.А. Яшин [2010] разработали математическую модель записи информации в объектах живой материи (включая человеческий мозг), представленную «волнами» расширяющихся матриц простых чисел. В рамках этой задачи ими было произведено исследование распределение простых чисел в натуральном ряду, подтверждена формула нахождения простого числа по его номеру в ряду натуральных чисел.

Авторы высказывают предположение, что в процессе эволюции биосистем базовая информация передаётся в поколенной цепи на основе распределения простых чисел:

«Природа, ее фундаментальные законы, адекватно формирует процессы и объекты, изначально «неделимые».

Поэтому вряд ли вызовет вопросы утверждение, что математическая запись (аксиоматика) исходной информации – от ее записи на неуничтожимых объектах Вселенной до головного мозга человека с его физиологической структурой – базируется на матрицах простых чисел; во-первых, они как раз и относятся к категории неделимых, во-вторых, любые целые числа \( n>3 \) есть простые, или сумма двух простых, или сумма трёх простых чисел» [Ленников и Яшин, 2010, с. 102].

Авторы рассматривают функцию простых чисел как исходную форму записи информации в объектах живой природы, исследуют «волны» расширяющихся матриц простых чисел – своего рода аналог дискретно-волновых процессов, применяя эти матрицы к проблеме нахождения распределения простых чисел.

Но в работе Р.В. Ленникова и А.А. Яшина, к сожалению, ничего не говорит о возможности применения свойств простых чисел для решения проблемы надёжного сохранения и передачи информации путём создания универсальных и индивидуальных кодов.

5. Возможные пути создания квантового коррелятора

Вместе с тем, универсальный код может быть реализован на основе ряда простых чисел, а индивидуальные коды – на основе производных рядов, различающихся по степеням простоты. «Запись» этих рядов может быть осуществлена в виде голограммы с любой заданной степенью полноты, причём эта степень будет зависеть исключительно от ёмкости голограммы.

Голограмма, подобно зеркалу, содержит информацию не в отдельных фрагментах, а во всей своей поверхности. Мы видим не аналоговое и не цифровое представление предмета, а сам предмет. Лишь его «место» в пространственно-временном континууме отличается от исходного. Голограмму можно считать дальнейшим шагом к усвоению после обычного отражения. Если зеркало выполняет лишь простейшую пространственную инверсию, то
голограмма уже увековечивает мгновение, в котором она была создана, хотя голографическая запись и продолжает все еще пребывать в рамках вещественного мира, занимая для своего хранения определенный объем трехмерного пространства. Ни зеркало, ни голограмма не «кодируют» преобразуемую ими информацию, и принципы этого преобразования коренным образом отличаются от принципов цифровой записи. Зеркало и голограмму можно считать преобразами границы мира физического с миром непротяженным, границы, не разделяющей эти миры, а скорее связывающей их. Однако голографическая запись может быть представлена в цифровой форме. Как известно, информация, хранящаяся в голографической форме, может быть извлечена из любого ее фрагмента, причем размер фрагмента влияет лишь на четкость отображения (с размером повышается детализация), но не на размер отображаемого участка физического пространства.

Непрерывная детализация «записи», при полном сохранении идентичности уже записанного, достигается тем, что суммарная частота любого фрагмента записи сохраняется неизменной, а все составляющие этой суммы обрастают все новыми и новыми «обертонами», делая запись все более и более живой. Это – полная противоположность амортизации записи, свойственной сегодняшним записывающим устройствам. Как отражение (простейшая форма преобразования информации), так и актуализация голографической информации, могут быть представлены в виде математических операций, которые уже в случае зеркала не сводятся к элементарным «арифметическим действиям».

Следует отметить, что голограмма, подобно «обычным» носителям информации, таким как бумага, магнитофонная лента или дискета, – все еще система без обратной связи, транслирующая информацию строго в одном направлении: из прошлого в будущее. В отличие от голограммы, зеркало работает в режиме «реального времени», но не обладает способностью фиксировать прошедшие мгновения. Многомерная голограмма отличается как от зеркала, так и от обычной голограммы тем, что она способна к усвоению входящей информации и последующей актуализации этой информации. Если при позиционной системе записи информации разрушение физического носителя приводит к потере информации, то при ассоциативной системе информация неуничтожима, так как многомерную голограмму невозможно разрушить. Можно лишь временно разучиться актуализировать уже усвоенную голограммой информацию. Время в физическом смысле внутри голограммы уже не течет, но сохраняются не только все вечные математические истины, но и память обо всех событиях, происшедших в физическом мире.

Таким образом, многомерную голограмму, имеющую не только пространственные, но и временные измерения, можно считать физической моделью числового пространства или, иными словами, физическое пространство есть актуализация числового пространства. Физическая корреляция не есть просто омоним математической корреляции, а есть
конкретное проявление в вещественном мире обмена информацией, происходящего по законам корреляции математической.

В научной литературе уже высказывались предположения о возможности создания искусственного квантового коррелятора, подобного человеческому мозгу, являющемуся естественным коррелятором [Кудрин, 2006, с. 102–106; Менский, 2014].

Недавно ушедший от нас учёный, д. физ.-мат. наук, главный научный сотрудник Физического института имени П.Н. Лебедева РАН М.Б. Менский утверждал сосуществование всех времён, проявляющееся в квантовой корреляции:

Тщательный анализ показывает, что сверх-интуиция требует не переноса из будущего в настоящее квантовой информации, а корреляции между некоторой квантовой информацией в будущем с квантовой информацией в настоящем. Поэтому ключевую роль в явлении сверх-интуиции играет не квантовая информация как таковая, а корреляция двух фрагментов квантовой информации, один из которых находится в настоящем, а второй – в будущем. Это не запрещено теоремой о невозможности квантового клонирования. Научное озарение не означает получения решения проблемы (новой парадигмы) из будущего. Новые идеи рождаются в настоящем. Но корреляция с будущим позволяет отбросить те альтернативы, которые генерируют сценарии, не приводящие к правильному решению. Оставшиеся альтернативы породят сценарии, приводящие к правильному решению [Менский, 2014].

Вслед за Хью Эвереттом, М.Б Менский признавал равнобытийное существование вселенных, в которых были сделаны разные выборы, – так называемую Многомировую интерпретацию квантовой механики. Но для создания искусственного коррелятора признание справедливости Многомировой интерпретации не представляется необходимой. Алгоритм квантовой корреляции совместим и с обычной Теорией струн, и с Теорией суперструн.

Искусственный коррелятор позволит получать информацию не только из «тонкого слоя настоящего», но и из совокупности всех «слоёв» пространственно-временного континуума. При создании искусственного коррелятора будет использовано такое свойство живого вещества, как способность к запоминанию и актуализации информации. (ДНК преобразует воспринятую ею информацию в «голографическую форму», актуализируя ее затем снова в протяженных формах). При этом несущественно, какой именно вид организма будет взят в качестве образца для универсального коррелятора. Это может быть и тонкая пленка клеточной ткани, выращенная по образцу листа растения, способная не только к фотосинтезу, но и к актуализации накопленной ранее информации. «Искусственный лист» будет «трёхмерным входом» в многомерную голограмму, которая хранит всю накопленную листом
информацию.
Возможно, что толщина этого искусственного листа будет слагаться из суммарной толщины нескольких слоёв графена.

Но хранилищем информации будет не поверхность листа (вернее – не только она), а весь четырёхмерный объём кубита. Информация будет выводиться на его поверхность посредством жидкокристаллической плёнки.

Внешне квантовый коррелятор будет выглядеть как обычный Notebook или даже мобильный телефон, не превышая их по размерам.

Заключение
Исправление укоренившейся в Теории чисел ошибочной терминологии, устранение терминов, основанных на неудачных переводах – позволят прояснить смысл основных понятий теории чисел, произвести классификацию простых чисел по степеням простоты и, тем самым, будут способствовать созданию универсальной информационной системы, основанной на принципах квантовой корреляции.

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NO-BOUNDARY EMERGENCE AND BOOK OF CHANGE\textsuperscript{1}

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\textbf{ABSTRACT.} This work attempts to respond to Thomas Aquinas’ Cosmological Argument in a way that combines Set Theory with the idea of the ‘Book of Change’. The study defines the $i^{th}$ Cause Set on which to operate on, which leads to the ontological commitment of austerity that the ‘First Cause’s Compromise with emergence’ cannot be avoided. It is argued in the present paper that the concept that ‘emergence only consists of Synchronic Emergence and Diachronic Emergence’ should be extended to a broader notion of emergence, which is made up of the two discussed elements and a third one ‘No-Boundary Emergence’ (beyond the time dimension). The article defines the concept of No-Boundary Emergence, proves why it is a type of emergence that differs from the traditional two types, and asserts that it underlies the bottom layer of the cosmos. This study describes the common feature of all emergence as communication protocols between layers. The assemblage of all emergences behaves similar to a distributed system that cannot be restricted by Gödel's theorem. The paper provides evidence (in Big Bang Cosmology, Conformal Cyclic Cosmology, Superstring Theory, Quantum Gravity) for this point of view, and notes that emergence (in the context of No-Boundary Emergence) is not only a simple scientific theory but also a progressive scientific research programme that can spontaneously grow from scientific theory based on Platonism at the expense of a degenerating shift to the ontological commitment of austerity. This paper proposes an improved model of Schrödinger Cat that provides a new explanation for quantum measurement and argues that there must be a forbidden zone of thought experiments. The study also introduces the implications of ancient Chinese thoughts (namely, the ‘Book of Change’ and Confucius). The paper comes to the conclusion that emergence (crossing the gap between ‘being’ and ‘nothing’, while ignoring the forbidden zone of thought experiments) relieves ‘cosmological insufficiency’ in the sense of Neo-Aristotelism.

\textbf{KEYWORDS:} Aristotle, Big Bang, Book of Change, Cosmology, Emergence, Hawking, No-Boundary, quantum measurement, research programme, Schrödinger

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Introduction

Emergence, as in the title of the paper, which was initially utilized to develop a type of integrated philosophy, refers to ‘the whole before parts’ and came into being during the period of debate between Vitalism (in Aristotle’s sense) and Mechanism in the 19th century. A lot of scientific philosophers believed that the philosophy of emergence is able to unify human knowledge.

Emergence [Goldstein 1999:49 & O'Connor 1994:92, 93] makes sense both ontologically and phenomenologically [Johnson IV 2013:284]. Emergence appears differently in theories to explain the characteristics a whole system has. However, there is something common: namely, emergent properties cannot be logically predicted from the parts. Emergence is often studied in the spheres of consciousness and biology, but not in that of cosmology.

Indeed, emergence has been classified into two categories: Synchronic Emergence [Stephan 2002:78] and Diachronic Emergence [Havlík 2015:132]. Both of these categories of emergence refuse to go beyond the time dimension.

Essentially, Jaegwon Kim developed the theory of emergence which claims that emergence cannot be deduced and ‘downward causation’ is the basic principle of
emergence [Kim 1999:19]. This criterion can be considered the primary criterion to judge whether there is emergence in a system.

1. PRELUDE TO THE COSMOLOGICAL ARGUMENT

Some scholars think that Aristotle's thought is far from modern science because the explanation of internality in vitality (Aristotle's energy) has been replaced by one of externality in mechanical force, which is often considered a metaphor of Aristotle's failure in physics as well as significant support for the notion of ‘an estranged real world which is utterly divorced from the world of life’ [Koyré, 1965:23].

1.1. Aristotle's Thought and Newton Mathematics

Newton's work on physics was more like a substitution than a revolution (more like mathematics than physics). In his book *Mathematical Principles of Natural Philosophy*, there is not an explanation about the cause of force, but description about the form of force, which is no cleverer than Aristotle's point of view. That is why the concept of force was criticized by contemporary physical scientists. Furthermore, in Galileo's work, nothing was put forward as new content metaphysically that was different from Aristotle's thought [Koyré, 1966:232].

In Aristotle's sense, ‘the stone falls because it is made of stone which is a kind of earth’. This explanation has an internal source of behavior [Aristotle, 2006:90] that was lost by Newton. Indeed, Newton's scientific theory describes only how the universe behaves, not why it behaves in that way. Thus, it is not conducive to understanding the cosmos.

For mankind, one regrets that there are now two paths (with blinkers) towards the same goal, but they are separated by walls, so there has been little attempt to join all forces to achieve the goal [Schrödinger, 1954:11, 12]. One path is modern science, and the other is metaphysics. In ancient Greece, the system of knowledge did not have this type of division [Schrödinger 1954:14]. Thus, returning to ancient thought is necessary [Schrödinger, 1954:3]. Scientists should learn from ancient thoughts (not only ancient Greece, but also ancient China).

Thus, to some degree we need a regression to Aristotle's thought at a higher level (for example, ‘Neo-Aristotelism’) to understand the world of life, as well as that of the cosmos. To balance Platonism (on which modern science is based), we also need integrating theory (for example, emergence) that will benefit the ‘Neo-Aristotelism’ and Platonism.

1.2. Thomas Aquinas’ Cosmology Argument

Scientific philosophy has also caught up in the debate between realism and antirealism, even leading the philosophy of science to the edge of nihilism.

From Mario Bunge’s standpoint, it is not a good choice for scientists to answer philosophical questions in the way that is inappropriately reductionist, for such polarized views are a sign of early human perspective [Bunge, 1977:75]. A certain number of philosophers also believe that it is necessary for scientists to recognize the autonomy of high-level theories when establishing scientific theories [Li, 1995:8].
Therefore, the discussion makes sense in the scientific world only when it is focused on a deflationary construal from an ontological commitment of austerity. In particular, the ontological commitment of austerity has to be able to explain the majority of the phenomenon and the creation of the universe, in which space, time, the First Cause and interactions among them cannot be avoided.

In modern cosmology, the Big Bang theory indicates the existence of singularity wherein the equations of gravitational field cannot be defined at some points in the history of the universe, pointing to General Relativity's failure in explaining the beginning of our universe. As a result, Big Bang theory posits that it cannot predict anything in our universe, which means that an arbitrary initial state resulted in an arbitrary current state. As we know, in Quantum Theory, there is a principle that everything will happen if not absolutely forbidden. If the creation of our universe were determined by a singularity, the Big Bang would occur at any time, which makes it clear that the predictability of world would disappear. If the law of physics fails in the singularity, it will fail in any place.

Science is supposed to provide knowledge about the local laws governing the revolution of universe. Revealing how the universe began is an issue of metaphysics or religion, wherein there is a well-known argument from design for God's existence proposed by Thomas Aquinas whose first three ways are proverbially considered cosmological arguments [Reichenbach, 1972:5].

Essentially, as far as we are concerned, causation can be regarded as the key point of his view. He claims that nothing can cause itself. Accordingly, every object has a cause. However, the existence of an endless string of objects causing other objects is absurd to imagine (the thought can be originally derived from the discussion of ‘infinite’ in Aristotle's book *Physics*), which means that there must be a first cause. Thus, the Design, God, the Mover or the First Cause can be defined as the one who caused the chain of existence for all things.

In the Big Bang theory, as a matter of fact, it is the physical law that determines the progress of ‘being’ being generated from ‘nothing’. Nevertheless, Kant thought that as a pure form of intuition, space and time are the background of thinking, rather than content or an object. Thus, although the basis of Kant's Philosophy is retorted by General Relativity in a manner, it still implies the failure of humans' cognitive abilities, not only in the physical world, but also in philosophy. The singularity is something similar to the First Cause, which would be a dreamy lunacy in Metaphysics.

2. FROM FIRST CAUSE TO EMERGENCE

The major result of Thomas Aquinas' Cosmological Argument was bringing about the First Cause of everything, which is thought of as the beginning of the universe and the conscious mind, rather than an object in the sense of epistemology. Thus, the First Cause can only cause effects; it cannot be caused as an effect. The First Cause, which is the cause of other causes directly, or indirectly, can influence other objects and events, but not vice versa.
2.1. Definition of Second Cause and $i^{th}$ Cause Set

Obviously, in our opinion, the argument can be analyzed in two distinct but logically related steps.

First, a cause named $C$ may be the effect of a combined action between cause $A$ and cause $B$, both of which has nothing to do with each other. That is, $A$ is not the cause of $B$ directly or indirectly, and vice versa, and it is the collection of element $A$ and element $B$ that plays a role in causation as a whole.

In light of the above, we have a new approach in Set theory to defining any cause. According to the idea, a cause can be probably defined as a Set that is a collection of elements, such as events and laws. Thus, the First Cause can be understood as First Cause Set (hereafter called the $I^{st}$ Set), which contains only elements that can cause other elements while not being caused by others. Moreover, originating in a point, representing any element in the $I^{st}$ Set, the causation will be traced as an arrowed line outward. The elements in $I^{st}$ Set cannot be affected by any elements out of the set, which means it cannot be reached, epistemologically. In spite of this, the elements in the $I^{st}$ Set can determine any other elements out of the set (directly or indirectly, alone or jointly).

A second cause and a third cause are needed for the logic string, if there exists a first one and a last one. Therefore, we can use an ordinal number $i$ to mark any of the causes that can be defined continuously until a number $N$. Although $N$ cannot be infinite (Thomas Aquinas), it can be very large. In this way, the definition of the $N^{th}$ cause is formulated.

2.2. First Cause's Compromise with the Second Cause

The section pertains to the analysis and operation of Thomas Aquinas Cosmological Argument in concept combined with Set Theory and the Book of Change, but it is a bit bothersome. If readers do not specialize in these fields, they can skip it. This section will pave the way for proposing a viewpoint of the First Cause's compromise with emergence ontologically.

Based on the two steps that are mentioned in the section above, from the $I^{st}$ Set definition, the Second Cause is converted into a Second Cause Set (hereafter referred to as the $2^{nd}$ Set), which we can deduce as a collection consisting of all the elements that elements in the $I^{st}$ Set directly pointing to. Thus, the elements in the $2^{nd}$ Set can refer not only to objects and events in the real world, but also to concepts in the mind, such as causes, principles and laws, which are not absolutely refused by human's abilities in thinking, understanding and linguistic logic.

What is more, all arrowed lines of causation from points (representing elements) in the $I^{st}$ Set point to ones in the $2^{nd}$ Set by definition. That is because originating in a point (representing any element in the $i^{th}$ Set), the causation will be traced as an arrowed line outward and we assign $1$ as $i$, the state of the $I^{st}$ Set is achieved.

In other words, there is no $i^{th}$ Set (where the ordinal number $i$ is larger than 2) that consists of elements pointing directly from elements in the $I^{st}$ Set. As a matter of fact, the $2^{nd}$ Set will be the only way through which lines can pass.

We find that all elements in the $2^{nd}$ Set contribute to affecting all other elements
beside the collection of the 1st Set and 2nd Set. In addition, it is obvious that the 2nd Set can be seen as a collection of elements that are generated somehow by certain elements in the 1st Set (perhaps some that act as generators and other that act as laws).

However, the elements in the 1st Set (whether they exist or not) that are suspected to be the ultimate causes of everything, are transparent (the transparent feature of emergence will also be mentioned in chapter 3) to any of the elements except those in the 1st Set and 2nd Set. For instance, the elements in the ith Set (i is larger than 2) cannot feel the influences made by those in the 1st Set directly, such that ‘the 1st Set’ is an unnecessary assumption for ‘the elements in the ith Set’ epistemologically and ontologically. If we use graphics to illustrate this, all the arrowed lines of causation from the elements in the 1st Set pass through the 2nd Set. In this case, we can put the elements of the 1st Set into the 2nd Set completely? This involves the following issues.

Which cause is more fundamental or ultimate, the First Cause or the Second Cause? Whose ontological commitment of austerity is closer to the philosophical presuppositions of the Big Bang theory? Are the First Cause and Second Cause separable strictly? Is there an explanatory gap between the two? Are there fundamental differences between the First Cause and Second Cause ontologically?

Next, we will show the analytical procedure to the questions above.

Obviously, the width of the natural gap between the First Cause and the Second Cause epistemologically (and ontologically), is determined by the possibility that elements in the First Cause Set can be cognized.

Remarkably, when the ith Set is defined, the number of its elements cannot be constrained. There was no point to that approach!

All the elements from all of the Sets create the ‘cosmos tree’ (which is something similar to a tree, but not exactly, because there is no guarantee that there is only one root node) of causality, wherein we can discover the relationship between any two elements more clearly.

When the node (element) in the tree has only one ancestor, it can be easily placed into a different set. When the node X has two ancestor nodes (Y and Z), there are three possibilities:

First, one ancestor node is the ancestor of the other;
Second, one ancestor is closer to the common ancestor W of the two (Y and Z);
And lastly, neither of the two is the ancestor of the other, and neither is closer to the common ancestor.

In the latter two scenarios, we have at least two types of classification for the elements of Cause Set. If we separate W and X into two Sets (for example, the ith Set and (i+1)th Set), there is no standard logically to tell us why Y belongs to the ith Set while Z belongs to the other. We cannot base this decision on the distance between the node (Y or Z) and the common ancestor W. (Attention! As we declare, to say ‘the node W is the common ancestor (of Y and Z)’ is only a relative and temporary concept, which is introduced only when the discussion starts. It cannot be a series or fundamental concept!)

A node can be connected with the common ancestor or with the common
descendant node, which leads to a different definition of the $i^{th}$ Set. We cannot easily delimitate the $i^{th}$ Cause Set by trees of nodes representing elements logically. Thus, we can conclude that there at least exists an element in the $i^{th}$ Set that is probably of the element in the $(i+1)^{th}$ Set, unless it is an element presented by a node of only one parent node. We cannot affirm that there is no element node having more than one parent node, because if we do that, the Set of the elements must be divided into massive Sets, the quantity of which can be the quantity of the elements in the original Set. Through investigations and operations on the elements in the First Cause Set, the concept of the First Cause entity disintegrates ontologically.

Similarly, the First Cause Set, or at least part of it, can be integrated into the Second Cause Set, which is probably a breakthrough of Thomas Aquinas' Cosmological Argument, ontologically and epistemologically.

If there is more than one type of classification method of the elements, in some ways, the First Cause can be finally deduced by the Second Cause ontologically [Sun, 2014:118]. In that paper, we provided the way (Inspired by Book of Change) to prove that the operation of transformation from the general definition of the $i^{th}$ Cause Set to a narrow one can also lead to the First Cause’s Compromise with Second Cause.

In general, we find that the First Cause is not an indivisible entity, but a set consisting of elements that can be operated on in different ways (containing the way of operation of the Book of Change). Furthermore, there still is something that can be separated from the collection called the First Cause.

William E. Carroll from the University of Oxford made a presentation called “Cosmology, Metaphysics, and the Origin of the Universe: From Stephen Hawking to Thomas Aquinas” at Beijing Normal University on November 13th 2015, wherein he illustrated that a ‘singularity’ cannot be concluded as the absolute beginning indicating creation(as we see, it should be understood that the First Cause has something more than a ‘singularity’, i.e., the First Cause is a collection rather than an indivisible atom), which provides evidence of my point of view that the First Cause should be the set consisting of elements which can be operated on.

To understand this, we have to concentrate on the structure of the tree of nodes, as well as the aspect of the feature of the elements.

2.3. Second Cause Coincidence with Emergence

What does the Second Cause refer to in the actual Physical World? In our point of view, it can refer to emergence, and it is concluded without question that all the basic needs of the minimized ontological commitment of Big Bang theory could be satisfied [Sun, 2014:120].

Let's go back to the physical world.

Actually, Einstein's General Relativity described a four-dimensional image, which illustrates that individual components are insufficient to interpret the nature of relativity. In contrast, geometrical properties must be introduced on a larger space-time scale, which is a reflection of ‘the whole before pasts’. In addition, it is worth mentioning that getting over ‘cosmological insufficiency’ [Khroutski, 2014:7] is, in a sense, very enlightening.
Is it a phenomenon of ‘downward causation’? Not exactly! However, it probably is an embryonic form of that! In this paper, we will eventually arrive at the point of view that the universe is a system of ‘downward causation’.

General Relativity, as the most powerful tool on researching the evolution of our universe, implies an idea of ‘the whole before parts’, which is a characteristic of emergence (not a necessary and sufficient condition, but the necessary condition).

According to Hubble law, the recession velocity of a galaxy is in direct proportion to the distance from the earth. Obviously, based on a series of derivations, several conclusions are inevitable. Everything in the universe occurs as a product of cosmic evolution, such as galaxies, atoms and molecules. Essentially, space-time also behaves as a product of the evolution, and the emergence of characteristics in the system of cosmos grows gradually in every stage of the cosmic evolution, which means space-time is proven to be an emergent property. Thus, it serves as a reference for the idea that ‘the whole before parts’ can be used as a candidate ultimate law of the universe.

In addition, more and more science theories implicate emergence as an ultimate law that can fundamentally explain the cosmos.

3. WHAT NO-BOUNDARY EMERGENCE IS

The ghost of the First Cause remains in the Big Bang model. The universe is expanding at exactly the critical rate to form atoms and galaxies, while avoiding collapse again [Hawking, 1996:51].

3.1. Emergence in Stephen Hawking's No-Boundary Proposal

The evolutions of universes vary from boundary condition to boundary condition. Consequently, a key point is that the First Cause can be paraphrased as the choice problem for the boundary condition. However, No-Boundary Proposal (Hawking's) indicates that “over all compact Euclidean metrics, the path integral for quantum gravity should be taken”, which can be understood to mean that “the Boundary Condition of the universe is that there is No Boundary” [Hawking, 2010:79].

Essentially, with the means of introducing an orthogonal imaginary time, the method of getting around the difficulty of singularity, over all compact metrics, takes a historical path integral for quantum gravity, wherein the calculation covers the cosmos outside the universal horizon and the evolution process of universe acts as a quantum process specified for the Schrödinger equation. Thus, it will connect half a Euclidean four-dimensional space with half a de Sitter space, which can easily describe the interpretation models of cosmological inflation as a tunnel effect that generated the expanding universe [Hawking, 2010:80–103].

Figuratively speaking, the universe of the No-Boundary Model with imaginary time is something similar to the earth with latitudes and longitudes in which we will find no particularity at the poles representing Singularity.

The No-Boundary Proposal enables a Wheeler–DeWitt equation (without time derivative) that crosses the gap between the two ends (one with the existence of time,
and the other without that), yielding the Schrödinger equation of the evolution of universe, which can be considered an emergent property in the system of cosmos.

This approach provides an emergence approach to the problem of the First Cause, which means that emergence (as the Second Cause) goes beyond time, just as the First Cause does. We can define No-Boundary Emergence as the Second Cause, which generated time and all other objects after that. Very close to the creation of cosmos, time cannot be defined in General Relativity, which means No-Boundary Emergence is ‘earlier’ than time itself, or exactly, No-Boundary Emergence is beyond the time dimension.

The Emergence theory developed by scientists and philosophers contains only two types (Synchronic Emergence and Diachronic Emergence, hereafter called traditional emergence), both classified with the time dimension, which means emergence is something in the time dimension. However, No-Boundary Emergence is obviously something beyond time [Sun, 2014:120]. The conflict between No-Boundary Emergence and the traditional ones seems irreconcilable, unless we reclassify emergence, with one type beyond time, called No-Boundary Emergence, and the other type in the time axis, called traditional emergence (which includes Synchronic Emergence and Diachronic Emergence).

Now, we know that, as the Second Cause, No-Boundary Emergence differs from traditional ones. The other question is whether No-Boundary Emergence is emergence. If it is true, No-Boundary Emergence is proven to be a new type of emergence. Can we go further?

3.2. No-Boundary Emergence Underlies the Bottom Layer of Cosmos

Einstein once posed the question of whether God has more than one choice in creating the universe [Hawking, 2012:165]. If No-Boundary Emergence is only the Second Cause, God is still free to choose the universe. However, something stops him.

Indeed, it is worth noting that, there is a great philosophical shift from the book Nature of Space and Time to The Grand Design, in which Hawking suggested that ‘the universe is free to generate itself from nothing, but when the universe is already a being, substances in it are not free to generate itself’, which balances the positive energy (in the form of mass and speed) and the negative energy (in the form of gravity) to keep the total energy of the universe always at zero [Hawking, 2012:179,180]. Thus, the universe is either an organic cosmos with something similar to consciousness preventing new substances from generating themselves, or an emergence with a power of ‘downward causation’ (that is why No-Boundary Emergence is emergence).

As we see, it is because there is only one ‘choice’ (Occam Razor would take effect on it if there is only one) for God (if he is still here). Thus, the ‘only choice’ is most likely determined by No-Boundary Emergence as the First Cause. If all of these are true, there is no anthropic principle, fine-tunings in laws, or apparent miracle, all topics that have tormented scientist for decades.

However, what is No-Boundary Emergence (as the First Cause) like?
Emergence is probably *a series of elements* similar to *a Distributed System* that cannot be restored to a deeper exclusive law, rather than something similar to M-theory, which is quite different from what Hawking believes.

Notably, the **Distributed System of emergence** cannot be described in an axiomatic system; that is, it will *never be restricted by Gödel's theorem*. Furthermore, it only helps different layers communicate with each other, which is similar to what network protocol does between the physical layer and the data link layer. At the same time, it *is transparent to* the objects and laws on the upper layer, which explains why emergence is usually criticized as a type of mysticism or anti-reductionism by its opponents.

In summary, as far as we are concerned, **No-Boundary Emergence underlies the Bottom layer of cosmos** [Sun, 2014:120].

### 3.3. More Implication of No-Boundary Emergence in Modern Physics

Roger Penrose elaborated a related thinking in his book *The Emperor's New Mind*. He claims that a substance in which the atoms were arranged to appear as crystalline, will *never have a property of fivefold symmetry* [Penrose, 1991:435], which is not determined by experience, but by *the inevitability of Mathematics itself* (only a few ‘choices’ for God).

In addition, Penrose developed a further point of view in the book *Cycle of Time*, in which he provides insight into ways the entropy began with *a minimum value* (in a balanced state) but ends in a maximum value (*also* in a balanced state). In his opinion, if singularity can be ignored, *(the problem of singularity has already been solved in the previous sections)*, this can be explained by the expansion of the Universe (it is also ‘the whole before parts’ and ‘downward causation’). The increasing Product Space [Penrose, 2010:32–34] (the product of phase space in a coarse-grained region and the external phase space, which will simplify the model) will provide *more variable room* for the entropy of all cosmos to occupy. In return, the two states are different in the dimension of the Product Space, because significantly more dimensions of Product Space will be produced in the future. Thus, entropy can be explained as one of the emergent properties from the evolution of cosmos system. As we see, *entropy is not ultimately used to define the direction of time in a cosmological sense*. Obviously, it illustrates that No-Boundary Emergence underlies the Bottom layer.

Essentially, regarding *the exact meaning of time*, a thought from ‘Conformal Cyclic Cosmology’ (the following referred to as CCC) [Penrose, 2010:137] enriches our understanding, using the method of Conformal Geometry (something similar to the three types of uniform plane geometry, as illustrated by Maurits C. Esche) to *connect the singularity of Big Bang with infinite ‘Heat Death’* (Penrose is opposed to the designation). Penrose believes that it will not be endless that the ‘Heat Death’ in the distant future will last ontologically and epistemologically [Penrose, 2010:139–149], which is quite different from what most of the scientists believes.

Indeed, the precise definition of time is based on earth's rotation, atomic vibration or energy-level transitions, all of which can be considered clocks. Thus, we
can imagine the Model of CCC ontologically, as a story of ‘Sleeping Beauty’. A beautiful princess has just woken up in her castle from a ‘100 years’ of sleep (during that period all the animals, clocks, winds, clouds and stars fell sleep with her). How can she know anything about how long she has slept? All the existence around her cannot tell her anything. Furthermore, if all the cosmos fall into sleep, who is awake to record the passage of time? Penrose demonstrates with his theoretical model of CCC that there is no particle awake as a clock in the distant future when black holes have completely evaporated and all the particles have decayed into photons.

Obviously, the definition of time is not eternal because its faster speed in the distant future is as ‘real’ as its inexistence in the narrow moment after the Big Bang (time is an emergent property in the evolution of cosmos), which means ‘CCC’ provides strong evidence to No-Boundary Emergence.

Surprisingly, we discovered that conflicting theories such as Big Bang and CCC can share the common ontological commitment of No-Boundary Emergence, which illustrates that No-Boundary Emergence underlies the Bottom layer (the philosophical assumptions of Big Bang and CCC).

4. EMERGENCE IN CONCEPT WORLD

It seems that philosophers are not good at foreseeing events in the sense of experience. However, if emergence is realistic in the real world, it has the ontological commitment of austerity, as well as meaning in science. Actually, a progressive scientific research programme should at least have excess empirical content over the degenerating one [Lakatos, 1989:31].

4.1. Progressive Scientific Research Programme

Emergence, in our opinion, ought not only to be considered as a specific quantified theory but also to be regarded as a scientific research programme. In the field of astronomy, Dark Matter is usually considered a new type of particle, or a new type of basic action force (as fundamental as the electromagnetic force, gravitation, the strong force and the weak force). The latter explanation, as we see, is not fundamental enough to answer what Dark Matter is. As a result, we cannot stop here. Dark Matter is more likely to be a result of the structure, which is determined by ‘downward causation’.

Thus, Dark Matter (Dark Energy as well) can be considered emergence, which can unify the four basic action forces, Dark Matter and Dark Energy as six different crystal facets of a Polyhedron.

There are already signs that the Dark Matter’s proportion differs from distance to distance (from the earth), which means Dark Matter evolves in different stages of the cosmos (scientists know that the farther into space we observe, the more ancient the sky is).

Cosmos change their governance by promoting Dark Matter or Dark Energy in different stages to ensure that the evolution of the cosmos would be a certain way. In the first moment, the tremendous Dark Energy satisfies the needs of the Inflation model well, explains the origin of the large-scale structure of universe, and makes our
universal horizon distant enough. Then, in a sufficiently long time horizon, the cosmos evolves into a picture where Dark Matter has been promoted as the ruling class. Currently, the cosmos has to speed up their expansion once again to avoid the possibility of the Big Crunch. This seems similar to a Feedback Mechanism of the cosmos system, which is absolutely not accidental from the viewpoint of the Grand Design (Hawking's). However, we explain it as No-Boundary Emergence.

If this phenomenon can be fully confirmed, it will be a correct prediction by **No-Boundary Emergence**, which will be proven to be a progressive scientific research programme.

### 4.2. Spontaneous Growth in the Concept World

Emergence also exists in the evolution of series of scientific theories, which occurs as a type of spontaneous shift from series of scientific theories to series. It is a shift between two scientific research programmes in Lakatos' sense.

For example, according to Thomas S. Kuhn's book *The Copernican Revolution*, the earth's motion from Copernicus' point of view should be considered the by-product of planets' problems rather than a fundamental hypothesis of theory [Kuhn, 1985:144], which is a revolution of Methodology in spite of the one of Ontology. In fact, the two models are mathematically equivalent.

Accordingly, the gap (between two sets of theoretical system) is not as wide as people usually think. Indeed, a spontaneous shift (which seems to be a result of a new ontological hypothesis) between two scientific research programmes can take place in a broader perspective from history, making the ontological commitment more of austerity.

A spontaneous shift as an emergence often acts as if it is an accidental product of an idea of genius. Nevertheless, the shift effectively has *the inner cause*.

For instance, between the Early 20th and Late 19th Century, there was a set of theories consisting of Galileo symmetry, Lorentz transformations and Maxwell's Equations, which were not consistent unless one of the three is abandoned.

The vast majority of scientists and philosophers believe that what Einstein did was to *extending Newton's theory to a broader notion* wherein objects can move near the speed of light, which means Einstein added something to Newton's theory.

However, extending the field of science is not what Einstein really did. Essentially, the facts prove otherwise. *One can easily discover that extension in science is actually deflation in philosophy.* Extension is not addition but subtraction. *Einstein just abandoned Galileo symmetry and kept the combination of Lorentz transformations and Maxwell's Equations.* Then, a revolution in science took place.

That is why we believe that scientific progress is at the expense of a degenerating shift to an ontological commitment of austerity, although it is not caused by the expense. However, from a more macro sense, there is only one ‘choice’ for the growth of the scientific research programme, that there must be a direction that is not a fundamental property but an emergent property of spontaneous shift in history.

Einstein believed that Special Relativity will also be discovered without him. It
can be understood that the system of scientific theories consists of a logical incompatibility among the three (Galileo symmetry, Lorentz transformations and Maxwell's Equations), which forced Einstein to make a decision whether to use his aesthetic intuition to propose a Constant Speed of Light and the Principle of Relativity.

This indicates a new content of emergence outside the real world, which can be called Theory Emergence.

Emergence can be regarded as Naturalism (a series of elements similar to a Distributed System) of Foundationalism (No-Boundary Emergence as basic belief underpinning others). After much analysis and many examples, we discover that for scientific theory based on Platonism, the closer to the pinnacle it is, the closer to the opposite (emergence) it will be.

Emergence (contains No-Boundary Emergence) can be considered as a new cosmology that is absolutely different from that of Platonism, and also as a new trend or direction as an emergent property in the evolution of series of shifts between scientific research programmes.

The extra spatial dimensions of Superstring theory is not crumpled up in an arbitrary way because the geometrical forms they can choose are severely restricted by the equations of Superstring theory. In fact, research (by Philip Candelas, Gary Horowitz, Andrew Strominger and Edward Witten) showed that there is only a particular class of six-dimensional geometrical shapes that can satisfy the conditions prescribed by the equations [Greene, 2003:207].

However, the number of nine space dimensions determined by mathematical formalism to avoid nonsensical probability values is so particular that nobody can reveal an intuitive answer in a nontechnical way without calculation [Greene, 2003:203].

In Superstring theory, the sphere inside a Calabi-Yau space shrinks down until the Planck scale, when continuing to shrink means starting to expand in the mirror world [Greene, 2003: 267], wherein force and matter transform into each other, and exchange the parity of dimension [Greene, 2003: 244,245].

Obviously, in the scientific research programme of Superstring Theory built on Platonism, there is still no hope to appropriately enduing the preference for a particular number with meanings to explain why the choice of Calabi-Yau space should be governed by this form of the equations.

In Superstring theory, the ontological problem in interpreting the particular choices of Calabi-Yau space is actually the problem of the First Cause, which connects the microcosmic worlds with the cosmoscopic universe. As we see, the answer is easily explicated in No-Boundary Emergence.

There is also a possibility of spontaneous shift (based on the evolution of series of scientific theories themselves) from a degenerating scientific research programme to a progressive scientific research programme in world 3 (in Karl Popper's sense).

However, the spontaneous shift to progressive scientific research programme is often at the expense of a degenerating shift to the ontological commitment of austerity.
5. IMPROVED MODEL OF SCHRÖDINGER CAT

The Delayed-choice Experiment is explained as the ‘integrity of system of observation apparatus’ or ‘participatory universe inspired by consciousness’, all of which can be imagined as the ‘future determines past’ in the sense of Platonism. What is it like in the sense of No-Boundary Emergence?

“We can only observe and operate on the record rather than on the quantum world.” said Shantena Augusto Sabbadini, professor at Schumacher College, when he discussed with us during his lecture at Yinhe SOHO in Beijing on October 31, 2015.

As we see, the experiment can be explained by the ‘downward causation’ (not only in the space dimension, but also in time dimension) in the sense of No-Boundary Emergence. The cosmos is emergence from the relationship between the observer and the quantum world. Further, quantum measurement does not collapse the wave function, but prepares an entangled state of the observer and quantum world. What's more, consciousness is nothing special in quantum measurement, and ‘observing on’ is nothing more than ‘communicating with’ (we consider the observer as a normal object without consciousness). That is to say, quantum measurement prepares an entangled state of the observer system and quantum world system.

As a result, Cosmos is nothing more than ‘emergence from the relationship between two entangled quantum systems’. Fortunately, this can be verified by experiments.

5.1. Three Boxes, Men and Cats

The model of the Schrödinger Cat from our standpoint is talks only about the question of ‘Are observers witnesses or murderers?’ We (Sun Sheng) proposed an improved model of the Schrödinger Cat. In the thought experiment, there are three equal (the relationship is different from the Schrödinger Cat model's relationship between observer and object) black box A, black box B, and black box C, inside of each of which we put a cat and a man (with a gas mask to ensure that he remains alive). From A to B, there is an observation hole (the man in A can make his decision to observe the cat in B through it at any time), and vice versa. This situation also applies to B and C (also C and A). Thus, we have three boxes, three cats, three men (observers), three bottles of poison, three hammers, three particles that can decay or not, and six observation holes (each pair of boxes has two holes, for example, A to B, B to A), but no consciousness beyond the three to observe from God's perspective.

For a man in a certain box, the state of the cat in the same box is certain, but he does not know whether his box has been observed by others. So far, this is a model that exhibits some sort of symmetry.

Man A knows (also ‘determines’) the state of Cat B, after observing Box B (for example, he gains the information that Cat B is dead). If man C observes Box B, what will happen? Man C learns the state of Cat B, which is already determined before his observation although it is not known by man C.

We all know one of Einstein's two basic assumptions of the Special Theory of Relativity is that ‘None of the inertial frames has special status in the form of mechanics laws [Blagojević, 2002:4].’ This can be called the democracy of inertial
frames. In some ways, it is a fundamental belief in physics. Not considering scenery outside the window, someone having just woken up in a maglev train cannot be aware of its state of motion (whether it is moving or parked). The key point is ‘how can you know that?’ which is similar to the situation we face to account for timing in the story of ‘Sleeping Beauty’. However, scientists always forget the belief when facing the quantum world. How can you know whether the state of particles we are going to observe has been already observed by another consciousness that is separate from our universe (in another Box) and does not pass any information to us until to be observed?

*Does the distribution of the measurement results acts as scientists expected? Or is it controlled by the man (in another Box) as a hidden variable or as God (he always observes earlier than us)? Who cares!*

### 5.2. Forbidden Zone of Thought Experiments

There is a *paradox*: Unless we believe the second step ‘man C observes Box B’ is essentially ‘man C observes the new quantum system consisting of Box A and Box B’. However, the new belief is probably the reality of the quantum world.

If we abandon the ontological commitment of ‘there is an Absolute Observation that can collapse wave function’, we can easily find the deflationary conclual that ‘observation can only be defined between two independent quantum systems’, which means ‘the observation is entangled states preparation of the two independent quantum systems, rather than quantum collapse’. Thus, there is no special status of consciousness in quantum measurement that can be understood as ‘establishing contact with the other’. It is something similar to ‘observation is communication between subject and subject’ (this is John Cobb’s point of view on quantum measurement, when he discussed with us in 10th International Seminar on Bio-cosmology). *However, my explanation has nothing to do with subjectivity*.

Further, in philosophical terms, Box B is an independent quantum system that can be considered *another universe separate from us*, and makes no ‘sense’ (in the sense of Friedrich Ludwig Gottlob Frege) to us. A ‘Description’ cannot be without a ‘sentence’ (a ‘sentence’ cannot be without ‘sense’) when we can *operate only on record* (in Sabbadini’s sense), which is a description rather than reality. Thus, Box B cannot be operated on. If something has *no ‘sense’* to us, it has *no ‘reference’* (in Frege’s sense) at all.

Or, perhaps more accurately, we're not sure if we can observe, or if we can know what we will observe. The thought experiment is based on a black box that is so particular that it perhaps never existed. Accurately speaking, there is a contradiction that the isolation refuses any access to information but allows observation, which is a bit such as the ‘Almighty’ God. ‘Almighty’ has a logical contradiction. For example, ‘is he capable to produce a stone that he cannot pick up?’

Indeed, we will not prove the similarity of the two here. Logical contradiction does not consequentially occur in images that ‘cannot be imagined’ such as a ‘circular form in the shape of square’. We can conclude that not all the situations that we can imagine are situations with coincidence logic. As a result, we come to the
conclusion that there must be some forbidden zone of thought experiments in the sphere which is farther and farther from the experienced world (closer and closer to origin of cosmos).

Thus, if we cannot do it in thought experiments, what can we do? Research from Mark Van Raamsdonk proved my viewpoint that if all the quantum entanglement disappears between two areas of a universe, they will become two independent universes that have nothing to do with each other [Van Raamsdonk, 2010:22–24]. Thus, you cannot operate on the other area of space if you make it a box as black as you can imagine, because it goes away without leaving a message about the new address and you cannot find it.

In his article, he notes that the universe structure is emergent from the quantum entanglement. His paper supports my point of view that there is a forbidden zone of thought experiments, and also provides evidence that No-Boundary Emergence is the origin of the cosmos whereas No-Boundary Emergence underlies the Bottom layer of cosmos.

That is to say, No-Boundary Emergence is even more fundamental than quantum entanglement which builds the Cosmos in which we live. In the next chapter, we will show its explanatory power in other areas.

6. LEARN FROM ANCIENT CHINESE THOUGHTS

We all know that many famous scientists learn from ancient Chinese thoughts. For instance, famous physicist Niels Henrik David Bohr was enlightened by Tai Chi, which was used in designing his family crest. John von Neumann's binary computer system was also inspired by Tai Chi.

Scientists began to believe that the relationship between ‘human and cosmos’ is similar to that of ‘wave and ocean’, which can be explained as ‘from the same origin but with different names’ in Taoism [Sabbadini, 2012:8–10].

6.1. Book of Change for Play

Operation (the paper used on ‘First Cause Set’) is the basic idea of quantum theory, as well as the basic idea in the Book of Change (which is often considered to be written by Fu Xi before 5000 B. C. in China, Edited by Ji Chang before 1056 B.C.), known as ‘I Ching’ or ‘Yi Jing’, wherein there are only two elements representing Yin and Yang, which is generated from Tai Chi (which is slightly different from Dao).

Most scholars in China believe that the Book of Change is not only mathematics or arithmetic, but also the cosmology of ancient Chinese thoughts (we know ontology and cosmology are the same in ancient China).

Why is the Book of Change difficult to read? The Book of Change is based on the concept that ‘cosmos is based on pattern and operation’, which cannot be understood as calculation or methodology. It is something for human to play, to see, to feel and to operate, but not to calculate, or to read. The Book of Change can help humans operate the world as well as predict the world.

‘Hetu Luoshu’ (as one of the earliest thoughts in China), an invincible weapon
that can defeat all devils (however powerful) in legend, is a magic square of cosmos that can operate all the cosmos and generate all substances, operating different digits (1/0) to different positions, such as metal, wood, water, fire and earth.

‘Han Zi’ (Chinese character), which is pictographic and ideographic, is operated from the Book of Change, and it is usually believed to be a simplified ‘Hetu Luoshu’, which many celebrities have tattooed to their bodies to get lucky.

Go (game) is produced in this type of view. It is regarded as the most difficult chess game. Even now computer cannot reach the level of world champions against human players. What can you feel in Go (game)? You can feel something similar to Combat between two martial arts masters; you can feel countless changes among Yin, Yang and hexagrams; you can feel how Heaven and earth work.

Remarkably, the correspondences of positions and hexagrams generated from operations are not arbitrary, as supervised by Dao (it generates Yin, Yang and hexagrams). From our standpoint, emergence is something such as the power of generating in Taoism, where No-Boundary Emergence is something similar to Dao in the Book of Change, generating Real World (Yang) and Concept World (Yin).

Indeed, the Book of Change provides an ontological commitment, as well as arithmetic in the methodological sense. However, it is quite different from Pythagoreanism, because it focuses on what the relationship between positions and operations means rather than the ontological implication of the digit itself.

In general, the Book of Change is a strategy for humans about how to play in cosmos, which can also inspire our understanding of ourselves and cosmos. The Book of Change accesses operation on the First Cause, which is the basis of the proof procedure (in chapter 2) that demonstrates what role No-Boundary Emergence plays. The approach is not easily classified as Naturalism or Foundationalism. Perhaps it can be understood as a two-sided coin: one side is in the tradition of Naturalism, and the other is in the tradition of Foundationalism.

The Book of Change informs us that the operation on the First Cause Set is not only a methodology but also an ontology, which means the argument of the First Cause is no longer tenable ontologically if the concept of the First Cause Set is disintegrated methodologically.

6.2. Chinese Confucius Thought

The importance of the relationship is emphasized by Confucius.

To answer Yan Yuan's (one of his students) question of what ‘benevolence’ is, Confucius stated, “Self-restraint and restoration of rites are benevolence.” We (Li Jianhui) discovered that ‘benevolence’ is an emergent property from ‘rites’ rather than from ‘Intelligent Design’ (by God or by Kings), which ought to be the relationship between two individuals (also between individuals and nature).

Regardless, we should learn from China, especially from ancient Chinese thoughts, such as the Book of Change, Taoism and Confucianism. In fact, the three are just the tip of the iceberg of ancient Chinese thoughts, with huge buried treasure.
Conclusions

Emergence should be considered in the sense of Neo-Aristotelism as a third pole of Cosmology that can relieve ‘cosmological insufficiency’, as well as balance Platonism.

Emergence is the Second Cause, as an approach to solving Thomas Aquinas’ Cosmological Argument, in a way that combines with Set Theory and the Book of Change.

Emergence, as a series of elements similar to a distributed system that cannot be restricted by Gödel’s theorem, includes our newly founded item, called No-Boundary Emergence, which underlies the Bottom layer of cosmos.

Emergence is also a progressive scientific research programme, which can spontaneously grow from scientific theory based on Platonism.

There is still a forbidden zone of thought experiments closer to the origin that can be explained as No-Boundary Emergence.

Emergence can be regarded as the Foundational Naturalism.

Predecessors' discussion on the First Cause is all about the relationship between Θεός and λόγος. If it were limited to the two poles in one dimension, the explanation would be mysterious or mechanistic. Fortunately, in the presence of No-Boundary Emergence, emergence is third pole that can provide a new dimension to balance the two.

No-Boundary Emergence generates a Real World and Concept World whereas Dao in the Book of Change generates Yang and Yin. We can learn more about this by studying the Book of Change and other ancient Chinese thoughts.

References


FROM THE DISCOVERING OF REALITY TO CREATING MULTIPLE REALITIES: THE ARISTOTELIAN ROOTS OF MODERN ANTHROPOCENTRICISM

Dr. Abdul Wahab SURI

ABSTRACT. The Kantian derivation of the categories of reason from Aristotelian logical form of judgment is one of the most remarkable shifts in Enlightenment epistemological discourse and consequently has substantive ontological implications that have radicalized the discourse over anthropocentricity. Kantian transcendental deduction of categories of reason provides an understanding of the human mind which can transcend history, culture, traditions and the matrix in which it has been situated. This implies that the human mind not only has the capacity to have absolute, certain and universal knowledge rather it implies that fixed categories of reason also provide the rational foundation of categorical imperative and its universal application. Thus it provides an anthropocentric foundation of universal values and rational civilization. Secondly and most importantly, Kant’s claim that it is the structure of the mind which gives structure to the reality rather than vice versa, has radically changed the theoretical dynamics of knowledge about reality. This new role of the human mind has turned the discovery of reality into a meaningless pursuit because there is no structure outside the mind. The intelligible reality is the result of the imposition of the structure of the human mind, over reality. Thus the only option left is to create reality rather than discover reality. This emancipatory and anthropocentric tendency of Enlightenment thought is the result of Kantian-Copernican Revolution which cannot be possible without Aristotle.
In this paper it will be argued that the contemporary search of scientific investigation is not a search to discover reality; rather a quest to create reality and it is the result of the Aristotelian roots of modern anthropocentricism

KEYWORDS: Aristotle, Kant, Anthropocentrism, Enlightenment

Contents

1. From the Priority of Ontology over Epistemology to that of Epistemology over Ontology
2. Kantian Transcendental Rationality and Aristotelian Root of Modern Anthropocentricity
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1. From the Priority of Ontology over Epistemology to that of Epistemology over Ontology

The history of ideas reveals a continuous struggle to seek legitimation of one’s knowledge claim. Sometimes, the epistemological legitimacy of the “subject of knowledge” i.e. the knower is under question; sometimes the ontological existence of the “object of knowledge” i.e. the “known” or external world or anything other than

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the subject is under question. Most of the time, the relation between the “knower and the known” is also under scrutiny. In the context of this process of legitimation, it is very difficult to segregate one’s ontological underpinning from its corresponding epistemological assertions, or vice versa. Secondly, the prioritization of epistemological question over ontological question, or the precedence of ontology over epistemology, is also one of the most important rather most controversial aspects of the history of ideas.

Classical philosophers usually begin with the resolution of the ontological question first and their epistemological position is derived from its corresponding metaphysical foundations. This pattern is consistent with the philosophical attitude of classical thinkers generally and Post-Socratic philosophers in particular i.e. Plato and Aristotle. Interestingly, the same philosophical pattern is followed by Christian and Muslim thinkers.

However, the modernist philosophical tradition has questioned the conventional pattern which presumes the precedence of ontology over epistemology i.e. the question concerning “what is the nature and origin of reality?” is prior to the question; “how do I know reality?” This traditional priority of metaphysics over epistemology has been delegitimized in Enlightenment epistemological discourse. The conventional hierarchy of the etiological questions and their corresponding responses has been reordered by modern thinkers. They assert the “priority of epistemology over ontology”.2 The rationale of this prioritization was initially defended by Descartes and eventually it became one of the most important tendencies of Enlightenment intellectual tradition. This Cartesian precedence “characterizes philosophy after the scientific revolution from Descartes to Kant”.3

Descartes believes that one should determine the limit of his knowing capacities before indulging oneself to resolve the etiological questions concerning the nature, origin and order of reality. The most important implication of this shift is that the limit of human knowing capacity will now determine the limits of one’s knowable reality. And if the issue of the holding of knowledge is raised for instance what Confucius asserts; “when you know a thing, to hold that you know it; and when you do not know a thing, to allow that you do not know it: this is knowledge”.4 Knowing the limits of one’s knowledge is in itself a state of awareness however most importantly, if something is unknowable then what will be the theoretical status of such ontological standing. Thus the modernist prioritization of epistemology over ontology has actually circumscribed one’s notion of reality, i.e. in the substantive sense; the limit of epistemology determines the limit of ontology. The distinction between knowable and unknowable reality, at first instance, has actually eliminated the unknowable reality from the discourse of metaphysics in general and ontology in particular.

3 Ibid. p. 38
Later on in this epistemological discourse, both the “object of knowledge” and the “source of knowledge” directly question the theoretical legitimacy of the reciprocating ontological positions.

For instance, the intellectual antagonism between Continental Rationalism and British Empiricism begins with the prioritization of the ultimate source of knowledge, eventually it has trapped into the ontological possibility of the legitimate and illegitimate object of knowledge, in other words, knowable and unknowable objects of knowledge. This reveals that neither ontological nor epistemological discourses are specific to their respective parameters; either there is an ontologically-grounded epistemological approach and its corresponding source of knowledge, or there is an epistemologically-driven ontological position and its corresponding subject of knowledge. Cartesian Dualism, Leibniz’s Monadology, Spinoza’s Theory of Attributes, Lockean Dichotomy of Primary and Secondary qualities, Berkeley’s Subjective Idealism and Hume’s Skepticism; all are fundamentally metaphysical and ontological positions emerged from their specific epistemological positions and its corresponding source of knowledge.

The logical implications of a given epistemological position are not specific to the issue, “how do we know?” Rather it is also fundamentally linked with the issue of “who we are?” and “what actually it is?” that we want to know. So the epistemological search has never been transcended from the ontological search.

The early modern thinkers, particularly the Continental Rationalists believe that reason and only reason alone can answer all the questions raised by the human consciousness in order the make sense of one’s existence. “We hold that there can be no fact real or existing, no statement true, unless there is a sufficient reason why it should be so and not otherwise.” This fundamental belief of rationalists regarding the non-contestable centrality of transcendental reason is rested upon the ontological assumptions of anthropocentric discourse of Enlightenment. There is no doubt that Cartesian “methodic doubt” is methodologically epistemological however its theoretical corollaries are intrinsically ontological.

According to Descartes “I am, I exist – that is certain: but for how long? For as long as I am thinking…As he put it elsewhere, It is a contradiction to suppose that what thinks does not at the very time when it is thinking exists”.

This reveals that it is not just the mythological derivation of a particular kind of ontological conclusion. Rather it eventually creates lot of philosophical problems in Descartes’ system of thought. For instance as identified by Husserl, according to Descartes, due to the misapplication of his own epistemological method, he derives a substantive conclusion regarding the determination of the ontological status of “ego”. In Cartesian Meditation, Husserl claims that “Descartes introduced the apparently

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6 In Husseralian words the result of the assumptions of dualistic realism.
insignificant but actually fateful change whereby the ego becomes a substantial
cognitions; a separate human mens sive animus [mind or soul]”⁸. This dualistic
realism is theoretically prior, or at least imbedded, in the epistemological framework
of Cartesian thought.

However right now we are not interested in the correct on incorrect application
of Cartesian methodic doubt for the derivation of the realm of apodictic evidence. For
now, we are just interested in identifying the organic link between epistemology and
its possible ontological implications; and consequently the false presumptions about
the derivation of one’s ontological position as if it is grounded in apodictic evidence.

The ontological derivation from particular epistemological conditions is not
specific to Continental Rationalism. This phenomenon has equally manifested itself
in Locke’s Representative Realism, Berkeley’s Subjective Idealism and Hume’s
Skepticism. In short, the whole British Empiricist tradition is not able to emancipate
itself from the realization of metaphysical impulse.

But unlike his Empiricist predecessors, Hume has actually questioned, on the
one hand the epistemological possibility of ontology in itself, and on the other hand
the certainties of one’s epistemological claim itself. Thus he actually left us at the
dead end of knowledge.

2. Kantian Transcendental Rationality and Aristotelian Root of Modern
Anthropocentricity

What we can learn from Hume’s analysis is that the prioritization of one specific
source of knowledge for the derivation of certain knowledge will eventually collapse
into a dead end of knowledge. This will consequently limit the scope of human
knowledge by restricting the knowable reality for the subject of knowledge. This
lacuna is the result of the prioritization of inappropriate source of knowledge. The
Kantian transition from positivist dichotomy of judgment (which was rested upon the
traditional distinction between analytical and synthetic propositions) towards the
“trichotomy of (1) analytic a-priori, (2) synthetic a-posteriori and (3) synthetic a-
priori judgment”⁹ which is empirical and logically necessary to provide a theoretical
and logically sound ground to resolve the epistemological deadlock between
rationalism and empiricism.¹⁰ This Kantian trichotomy ¹¹ is central in his distinction

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¹⁰ It is important to note that in this paper we are not interested to question and explore the validity of the Kantian trichotomy regarding the determination of legitimate epistemological claims about reality. Rather we are interested in his contribution in the overall history of ideas in general and the sustenance of modern epistemological tradition in particular. Secondly the Aristotelian roots in his derivation of the categories of reason.
¹¹ Kant did not explore the forth possibility of judgment i.e. Analytic a-posteriori judgment because logically speaking there can be no analytic a-posteriori judgment. Although it is beyond the scope of our article to critically evaluate the logical possibility of forth possibility of judgment however it is worth mentioning that lot of work have also been done in this regard for instance Saul Kripke and
between *judging* and *perceiving* which according to him represents two distinct faculties of mind i.e. sense and understanding. According to him, “by means of sense, objects are given to us and sense alone provides us with perceptions; by mean of understanding objects are thought and from it there arise concepts”\(^{12}\). The collaborating role of these faculties of mind makes knowledge possible. In this way, reason provides the form and sense experiences provide the content of knowledge. Although he acknowledges that, “directly or indirectly, all thinking must ultimately … refer to perceptions”\(^{13}\) which creates an illusion that he is essentially an empiricist, but he claims that perceptions are meaningless without being properly formalized. This implies that perceptions are not synonyms to knowledge. He claims that “perceptions without concepts are blind”\(^{14}\). The conceptualization cannot be possible without reason however in his framework, reason alone cannot function because sense experiences are the content of thought. “Thoughts without content, (that is to say concept which cannot be applied to anything perceivable) are empty”\(^{15}\). Thus the formalizing capacity of reason is central to make perceptions intelligible because the condition of being thinkable is equally important; rather it is necessary. This means that “no object of experience is possible if it be either unperceivable or unthinkable”\(^{16}\).

This implies that the formalizing capacity of the human mind in general and rational faculty in particular, not only make things understandable, it also makes perceptions thinkable.

The Kantian derivation of pure concept of understanding or categories of reason from logical form of judgment under the epistemological conditions set by Kant himself provide us with a theoretical justification to acknowledge the Aristotelian contribution in the resolution of the epistemological crisis faced by the Enlightenment epistemological tradition.\(^{17}\) It is an acknowledged fact that Kant’s selection of the term “*categories*” to refer to the pure concept of understanding, is semantically derived from Aristotle; “the categories itself applies to any object whatsoever. Concepts which apply to any object whatsoever were called ‘categories’ by Aristotle, which explains Kant’s adoption of the term for the elementary concept of pure understanding.”\(^{18}\) However it is also an acknowledged fact that Aristotle’s use of the term categories and its conceptual derivation are quite different from that of Kant’s.


13 Ibid., p. 27.
14 Ibid., p. 58.
15 Ibid., p. 58.
16 Korner S. *Kant*, op.cit p. 59.
17 The Crises is the result of the prioritization of epistemology over ontology.
18 Korner S. *Kant*, op.cit p. 54.
However we can find certain common denominator between them, for instance; Aristotle’s use of the word categories, is specific in the sense that categories are not determined by empirically derived classification rather they are determined by the very conditions that determine a philosophy.”

Same is the case with Kant as categories for Kant are also pure a-priori concepts of understanding rather than empirically schematized classifications of mind processes.

According to Thompson, the use of categories is different in Aristotle as compared with that of Kant. He claims that Aristotle’s approach towards categories is metaphysical whereas Kant’s approach is “epistemological” This actually is the core concern of this paper; to show how Aristotelian metaphysically-grounded logical form of judgment has provided an epistemological justification for the derivation of pure a-priori concept of understanding. It is important to note that without indulging into any ontological analysis, Kant has tried to methodologically explain the structure and process of the human mind. The method of determining the pure a-priori concept of understanding “is often called transcendental argument”

Kantian transcendental argument in general and derivation of categories in particular are dependent on Aristotelian metaphysical analysis (for instance In Metaphysics IV) which demands the logical condition of “something which signifies the substance.” This logical demand of Aristotle is predominantly discussed in the context of Aristotle’s distinction between category of substance and accident. But here we are interested in its role in identifying the clue of the logical form of judgment which makes significant utterances possible and even the functionality of the principle of contradiction.

Kant has used the thinking and judging capacities of the mind to make meaningful utterances about the empirical reality which the human mind is confronted by. Kant thinks that judging cannot be possible without the unification of the judgment and the a-priori concept. The objectivity and generality of objective empirical judgments (despite of their reliance on sense experiences which are intrinsically subjective and private) cannot be identified without a-priori concepts or categories. In his own words “if we resolve all our synthetic judgments, in so far as they are objectively valid, then we find that they never consist of mere perceptions… but that they would be impossible, had there not been added a pure concept of understanding to the concepts which were abstracted from perception.”

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20 Ibid., p. 336.
21 Ibid., p. 336.
22 The works of Aristotle, trans. and ed. by W.D. Ross quoted in ThompsonManley, Philosophical Approaches to Categories, in The Monist. It is also important to note that Thompson has used signifies instead of the word denotes, as it is mentioned in Oxford edition – translating Semainon the writer prefers the signifies which reveals more semantically appropriate, in his thinking, with over all semantic mood of Aristotelian linguistic jargon.
Kant believes that the logical form of judgment can be distinguished from the application of particular concepts and their integral relations with the utterances, or in other words, with judgments. This implies that the logical form of judgment has a specific relation with the structure of the mind. The Kantian transcendental argument is actually an attempt to derive the list of pure a-priori concepts of understanding (categories) from the list of all logical forms of objective empirical judgment. In this derivation of the categories of reason, without indulging into any speculative psychology, Kant has relied on the work of traditional logicians; primarily on the work of Aristotle. It is believed that each specific category of reason corresponds to specific logical forms of judgment. This shows Kant’s trust on Aristotelian logic because he considers it as “closed and complete.” It is due to this trust that the Kantian list of categories is also closed and completed. Secondly, his reliance on Newtonian physics is also unshakeable. “Kant’s twofold dependence on Aristotle’s logic and Newtonian science”, reveal that a comprehensive understanding of natural physical world is possible through the correct application of pure a-priori concept i.e. categories which are imbedded in the logical form of judgment expressed in traditional logic.

The core concern of this paper is not whether the list of categories identified by Kant is correctly corresponded by all the possible logical forms of judgments, for instance according to Korner, Kant believes that hypothetical judgment has only one form but even Stoics knew that “hypothetical judgments have grammatical similarity which disguises fundamental logical differences amongst them.” A lot of work has already been done to explore the weakness in the Kantian argument regarding the determination as well as the completion of the list of categories. However, it is a general consensus among the contemporary Aristotelians and Kantians that:

1) Kant derives the list of categories coherently or incoherently from Aristotelian logical form of judgment.
2) Aristotle’s approach towards categories is metaphysical.
3) Thompson’s argument regarding the Aristotelian distinction between the signification of substance from that of accident, is to establish that Aristotelian categories are actually ontological. This implies that the being of substance is

different than the being of accident. Thus the distinction is fundamentally ontological. Due to this ontological foundation of categorization, it is difficult to determine the exact list of categories related to accidental being.  

4) Kant’s approach towards categories is epistemological. 

5) Kantian use of categories due to its epistemological approach demands specific as well as exact list of categories in order to be presented as objective basis of knowing. If there is no exact list available, then it cannot be acknowledged as an objective basis of absolute knowledge because of its relativistic and contingent nature. On the “logical forms” and “categories”, see the scheme of Stephan Korner:

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32 See: Ibid., p. 344.
33 See: Stephan Korner, Kant, op.cit. 1954, pp. 73-74.
The Kantian derivation of the concept of pure understanding is a fundamental turning point in modern epistemological tradition and it provides a theoretical framework to reconcile the traditional epistemological antagonism between rationalism and empiricism. Secondly, it also provides an alternative framework to make an objective epistemological claim about the absolute understanding of external reality. The Kantian objective to derive a complete list of non-mathematical, a-priori concepts of understanding keeping his transcendental argument within the epistemological parameters he has set for the logical construction of his system of thought; without indulging into any intellectual adventure of speculative psychology, is one of the most important epistemological contributions of Kant.

But it is important to note that this transcendental analysis cannot be possible without Aristotelian metaphysically-grounded logical forms of judgments. The Kantian derivation of the logical form of judgment is central to acknowledge that:

1) The fundamental limit of Modern epistemological discourse is the result of the prioritization of epistemology over ontology regarding the determination of objective knowledge claims.

2) The Aristotelian logical form of judgments which is actually the result of his ontologically-grounded categories is central for Kantian derivation of pure a-priori concept of understanding. For instance, the Aristotelian ontological distinction between *substance and accident* is central in his epistemological distinction between the apprehension of essence (*nous*) from that of accident. “Without prior support from ontology this epistemological distinction has seemed ad hoc and arbitrary.”

3) The Kantian logical forms of judgment provide a theoretical justification for significant metaphysical claims that keep his argument within the limits of his epistemological parameters. For instance Kant’s distinction between Phenomena and Noumena is the result of the dichotomization of knowable and unknowable reality which cannot be theoretically justified without a-priori concept of understanding. In his transcendental argument, he acknowledges that the incapacity of sense and understanding to know things-in-themselves despite this fact that both, “perhaps spring from a common but to us unknown root”.

4) The transcendental Idealism of Kant cannot be sustained without his transcendental analytic which provides the theoretical foundation for the structure of objective experience from the derivation of the list of pure a-priori concepts. Transcendental dialectic also provides the theoretical justification to demonstrate metaphysical illusion through differentiation between correct and incorrect applications of pure a-priori concepts.

Unlike Empiricist epistemologists, for Kant the mind is not a passive tabula rasa which receives ideas from empirical reality; nor is it just a processing zone for innate

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a-priori ideas without having direct encounters with empirical reality as thought by Continental Rationalists.

The experience of the world cannot be epistemologically possible without systematic structuring of representation provided by mind. Unlike Kant, both Continental Rationalists and Empiricists primarily focus on the mind-world interaction. This dualistic realism under the conditions of their respective epistemological frameworks is both epistemologically and ontologically insufficient because they do not have any theoretical framework to explicate the nature of the mind and its corresponding structure. Thus it is not the experience of the world which makes ideas possible, rather it is the structure of the mind which makes experiences possible, according to Kant. On the basis of these pure a-priori concepts of understanding, Kant questions the epistemological legitimacy of the traditional search to discover the structure of reality as an objective standard of knowing. Kant claims that it is not the structure of reality to which the mind should correspond; rather it is the structure of the mind which actually structures reality. This revolutionary worldview which is commonly known as Kantian-Copernican Revolution cannot be possible without pure categories of reason. The Kantian epistemological certainty for having the complete list of the categories of reason without any speculative psychology provides an anthropocentric foundation to impose human will on external reality as per rational order of the mind which is independent of reality outside the human mind. Once again, referring to Stephan Korner\textsuperscript{36}:

The chart shows that it is not the structure of the proposition which is to be confirmed by the mind rather the structure of the mind gives structure to reality. In Kant’s words, “Hitherto it has been assumed that all our knowledge must conform to objects. But all attempts to extend our knowledge of objects by establishing something in regard to them a priori, by means of concepts, have, on this assumption, ended in failure. We must therefore make trial whether we may not have more success in the tasks of metaphysics, if we suppose that objects must conform to our knowledge.”

This actually a radical shift in the Enlightenment epistemological discourse because this active role of the mind has shifted the fundamental epistemological objective from the discovery of reality to the creation of reality. Since things in themselves are unknowable, and if there is any structure of reality in-it-self, it exists due to its noumenal nature beyond the comprehension of one’s active mind. However, as there is a structure of the human mind which is also logically demonstrable (thanks to Aristotelian logical form of judgment) then it is reasonable to imply from this Kantian framework that we have to impose this structure of the mind as per our rational will.

3. The Science of Self and The Creation of reality:

The spirit of Kantian thought demands that the future dynamics of philosophical investigation must be on the one hand to participate in the creation of a world that can be experienced and on the other hand, intrinsically anthropocentric.

The fundamental question which needs to be addressed is that how much Kant can rely on categories of reason for the sustenance of his anthropocentric world view without referring to any specific speculative psychology as provided by Fichte.

The theoretical possibility of the science of self on the basis of so-called pure reason i.e. independent of any specific empirical analysis or a-posteriori observational system of understanding was an intellectual fashion of Kantian times. The a-priori ontological claim about the objective knowledge of self is usually called, rational psychology. Rational psychology, according to Kant, is a mistake of the human mind or an illusion of metaphysics. The rational ontological analysis and its corresponding claims are not epistemologically demonstrable. Kant contends that the illusion of metaphysics is actually the result of the misuse of the categories of reason.

Although there is no doubt that Kant has extensively written on this subject, but he has made a clear distinction between the thinking self as a being in process which makes synthetic unity possible and the “empirical self-i.e. introspected, self which is itself the presentation.” Kant claims that it is actually the pure a-priori aspect of the self which was the subject matter of rational psychology but since pure self is not the object of experience therefore the application of the categories of reason is not possible without objective experience. This implies that although pure self is there which makes the synthetic unity possible it is not knowable.

38 Ibid., p. 112.
The Kantian contribution about the determination of anthropocentric foundation of Enlightenment humanist tradition is unquestionable. Kant’s commitment with the priority of an anthropocentric approach for the determination of a well-ordered society and universal morality is a fundamental cornerstone of his thought.

He provides the metaphysical foundation for liberalism in general and constitutional democracy in particular, from his anthropocentricism. There is no doubt that the Kantian distinction between empirically-determined reason and pure, practical reason is very significant for the absolute defense of liberal order, however this distinction cannot be possible without a particular kind of philosophy of the mind.

Kant’s explication of the defining features of Aufklärung (Enlightenment) is actually a departure from the state of immaturity to the state of awareness i.e. acknowledgment of Rational-self-determined-autonomous-self which is driven by reason and not by some inhuman authorities. Thus it is his notion of reason which enables him to establish “man as end in him-self rather than a mean to an end.” which is presumed to be the raison d’être of modern anthropocentricism.

The empirically determined reason guides our actions within a sphere of desires and instincts. The practical reason contains unconditional imperative i.e. it is not influenced or determined by our empirical awareness. Thus it deals with the formal aspect of the truth. Kant defends his idea of categorical imperative which is the fundamental idea to justify the anthropocentric foundation of his defense of universal morality on the basis of pure practical reason. Thereby the validity of categorical imperative is not determined by its content; rather it is determined by its form which is derived from a pure a-priori concept of understanding. Kant’s idea of categorical imperative provides the justification of “pure law”. This formal law of conduct provides the ultimate justification for the derivation of substantive moral principles. Categorical imperative is, in fact, the principle of universalizability. The ethical principles which can be passed through the test of universalizability are considered as substantive moral laws. The conditions of the universalization may be conceived as follows; firstly, the requirement to universalize rules out differential treatment between individuals on arbitrary grounds. Secondly, the truth value of the formal principle must not be determined by an individual’s personal preferences instead it must be true for all. Finally and most importantly, the formal principles chosen by an individual must be independent of his particular value system. This means that the individual chooses principle as if he is “anyone” (i.e. not a person having specific identity and possessing a specific value system).

Every ideology presumes a particular conception of the person. Kant provides the basic philosophical assumption underlying “right-based liberal”39 conception of the person in general while that of Rawls, in particular. Kant provides an epistemological argument for the justification of a transcendental subject. His

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39 The Rawlsian defense of liberalism is one of the forms of right based liberalism which provide a theoretical justification universalization of human rights frame work and its cross cultural application. See Rawls J. A Theory of Justice, Oxford University Press, 1971.
epistemological argument is grounded in the ontological incapacity of the subject regarding the possibility of self-knowledge. He believes that if the self is the sum total of desires, virtues and inclinations then it is not possible to apprehend a unified self in which all these desires, aims, dispositions etc. converge. And if there is a self, it is not empirically demonstrable. Introspective analysis cannot deliver self-awareness on the basis of these empirical appearances. Nevertheless Kant claims that we can presume the possibility of a unified self. He says; “…I can grasp the manifold of the representation in one consciousness, and do I call the one and all mine. For otherwise I should have as many – colored and diverse a self as I have representation of which, I am conscious to myself”\textsuperscript{40}.

This means that there is an antecedently individuated self that converges diverse perceptions and holds them together in a single consciousness or awareness. Kant believes that the experience of impressions and the object of experience are not the source of moral obligations. It is Reason which provides the basis of moral obligation (das Sollen). Kant acknowledges that external factors, natural causes and even sensory stimulations affect the individual’s drive to “will” something, however he claims that “they cannot produce (my state of) being under obligation…”\textsuperscript{41}. This rational sense of moral obligations helps us to unveil the conception of the self, presumed by Kant. The conception of reason presumed by Kant is two-dimensional. He believes that the individual can relate himself to the object, rationally “either by merely determining it and its concept… or making it real.”\textsuperscript{42} He considers the first function as theoretical and the second function as practical. Kant acknowledges that the conflict of desires is inevitable however the nature of conflict has been differentiated by him. He contrasts the conflict of desires with the conflict of desire with “duty”. The purpose of practical reason is to resolve this conflict between desire and duty. Korner believes that the Kantian linguistic expression presumes a particular structure of terminology and generally “the logical grammar of the term ‘duty’ is different from the grammar of desire and impulse.”\textsuperscript{43} Moreover in the Kantian paradigm, the conflict of desire and duty simply means the “conflict of one desire with the other.”\textsuperscript{44} It follows that the purpose of practical reason is to resolve this “conflict” with a sense of moral obligation. Thereby we consider Kantian ethics as rationality bound by desires.

The Kantian idea of the categorical imperative is helpful to understand a particular kind of “self” and the “ontological” possibility of individual autonomy. Kant believes that everything in nature is determined by the law. But “only rational being has the ability to act according to the presentation (Vorstellung) of the law i.e. according to principles”\textsuperscript{45}. This means that the individual’s capacity or autonomy to

\textsuperscript{41} Ibid., p. 371.
\textsuperscript{42} Ibid., p. 8.
\textsuperscript{43} Kornor S. \textit{Kant}, Penguin Book 1954, p 130.
\textsuperscript{44} Ibid., p. 130.
adopt maxims makes man’s existence moral or immoral. This reveals the inevitable link between the individual’s liberty and his morality. Kant’s emphasis on the practical necessity of the categorical imperative makes his claim vulnerable because in his framework, the choice of ends is governed by the order of desires of the individual. Thus in concrete life situations, people may have different ends because they may order their desires differently. So the difficulty arises that “our subjective qua-rational beings to the categorical imperative cannot be explained in terms of our seeking ends which depend on our desire.” In order to resolve this difficulty, Kant introduces a conception of the self, which is, an end in itself. Thus the transcendental “self” itself provides the grounds for the necessity of practical law. This notion of “end” is independent of any kind of desire. This emancipation of the self from the instrumental chain of means-end relationship holds the harmony of every rational “will” and binds them together in a coherent moral order.

The Kantian notion of “self” is that of a “rational self”. Being a rational self, it is an end in itself i.e. the “absolute end”. The theoretical corollary of this absolute end is that “man stands outside all causal chains and consequently outside every hierarchy of means and ends.” The Kantian commitment with the prioritization of the rational self as an absolute end compels him to reformulate the structure of the categorical imperative in a manner that “Act in such a way that you treat humanity, both in your own person and in the person of all others, never as a means only but always equally as an end.” Kant claims that this new formulation of the categorical imperative provides same result as what we were getting from the old formulation of categorical imperative. Korner believes that this new formulation reflects the moral intuitions of human being in general and Western man in particular. Therefore the postulate, “man as end in him-self”, corresponds to the “moral experiences at least to moral experience of our (Western) culture.” Kant adopts an anthropocentric approach and presumes that the individual has a capacity to “will” autonomously. By autonomy, Kant means individual’s ontological capacity to determine his ends and virtues independent of history and social determinism. The Kantian subject not only has the desire but also the capacity to determine his ends autonomously. His subject stands outside or independent of history and culture. In order to sustain the autonomy of the self, the value of non-interference has lexical priority over all other substantive values. The natural corollary of this precedence is that the right has priority over the good, i.e. “the subject is prior to his end”. The existence of the antecedently individuated self reveals that our voluntary actions are not determined by the

46 Korner S. Kant, op. cit p. 145.
47 Ibid., p. 147.
48 Kant I., Ground work of Metaphysics of moral, op. cit page 429.
49 Kornor S. Kant, op. cit p. 148.
50 Good-based liberalism (utilitarianism) has been rejected by Kantians like Rawls because, in it, the individual becomes a means to realize certain ends, as Kant considers the individual as an end-in-himself.
community or culture but there is an autonomous and self-determined agency functioning independently, of the world and standing outside history. This supersensible paradigm of the self legitimizes the possibility of the existence of a free and transcendental subject. This transcendental subject is actually independent of the causal determinism prevailing in this sensible world. The subject is free, autonomous and self-determined. The conception of self emerges from Kantian analysis is as follows: the self is rational, autonomous, and a-historical. The autonomy of the self emancipates it from the organic chain between means and ends, thus it is end in itself. This legitimizes the priority of right over the good. The rational self is not only subject to moral law (universal principle) but also the creator of it. This transcendentally rational, unencumbered and antecedently individuated self is ontologically capable to legislate. The nature of legislation is universalistic, because the "idea of the will of any rational being (is interpreted) as a universally legislative will".

Kant’s aim was to reconcile the antagonistic relationship between science and morality. He believes that the Newtonian world view provides the justification of universal determinism and the Rousseanian moral philosophy defends individual’s autonomy. He tries to resolve this paradoxical co-existence of natural determinism and moral freedom by differentiating phenomenal world from noumenal world. In Kantian framework “the world of phenomena is what science can know, the world of noumena is the realm which is opened up by morality”. In order to understand one of the most important metaphysical foundations of humanism this distinction between phenomena and noumena is central. It provides the basis of dualism in Kantian conception of self. Kant differentiates the lower self from that of upper one. The lower self is the phenomenal one, which is the part of empirical world. On the other hand, the upper self is the noumenal aspect of self which is the part of intellectual world (“the world of things in them-selves”). This noumenal world is unknowable. Kant insists that although noumenal world cannot be known it can be believed in. He introduces the concept of “rational belief”, the belief which leads us (beyond experience) to the idea of freedom. Thus as a noumenal being man is absolutely free. On the other hand in phenomenal world man is heteronomously determined. “This duality of human nature is over come in Kant’s kingdom of ends”. The Kingdom of Ends is a union of all rational individuals in a system of law.

In such sphere all the ends determined by pure rational will are harmonized in an organic whole. In Kingdom of Ends “each individual realizes his private ends by means of the other and regards the other as an end in himself”. Thus we can say that the Kingdom of Ends is a sphere in which the actions determined by pure reason and

52 Kant I., *Ground work of Metaphysics of morals*, op.cit page 43.
54 The distinction of upper and lower self is not standardized but for conceptual convenience we are using this distinction.
56 Ibid., p. 22.
actions determined by desires are completely harmonized with each other and the contradiction between reason and desire will be abolished. In the Kantian framework “Kingdom of Ends” is realized through a course of history. Thus the contradiction between desires and pure reason will be eliminated through the teleological process of self-development. Thus man as a rational being is teleologically destined to construct a perfect social arrangement i.e. Kingdom of Ends.

Concluding remarks
The relevance of Kantian anthropocentrism has consistently persevered in contemporary discourse and there is no disagreement between Modernists and Post-modernists regarding the precedence of human-centricity over any other kind or other spectacles to understand the contemporary life-world. There is no doubt that the Post-modern discourse has substantively extended the domain of “being” which has theoretically questioned the so-called intellectual colonization of anthropocentricty. For instance, Deleuzean substitution of “Logos” from “Nomos” to justify his notion of unstructured conception of being provide a theoretical possibility to transcend the anthropocentric spectacles, but this Deleuzean attempt to extend the intellectual horizon at the cost of identity. This novel conceptualization of pure difference has actually questioned the universality of the anthropocentric notion of becoming. However, the institutional conditionality of this pure notion of difference is actually the continuation of the already institutionalized capitalistic from of production and obsession with an unprecedented desire for autonomy of the will and there is no meaning of autonomy in absence of identity.

It is also important to note that the contemporary manifestation of Modern or Post-modern anthropocentricism is more concerned with “what is possible?” rather than “what is?” Both of its manifestations are more concerned with “becoming” rather than “being”. The impact of this predominantly futuristic orientation regarding the understanding of reality in general and the human being in particular that it is more concerned with the creation of reality rather than its discovery. Any attempt to understand reality is meaningless in this anthropocentricism if we are not interested to impose our will as per our desire. For instance, take the example of medical sciences and their corresponding methodological frameworks. They all are actually working on human becoming rather than human being. «The whole discourse of cloning, genetic mutation, stem-cell methodologies, innumerable possibilities of vaccinations, transplantation etc. are all predominantly futuristic and teleologically grand mechanism to engineer a super-human-being i.e. Ubermench.”

57 Nomos according to Deleuze distribute “people (or animal) in an open space, one that is indefinite and non-communicating …. nomad distribute himself in smooth space; he occupies, inhabits, holds that space; that is his territorial space. See Deleuze&Guttari, A thousand Plateaus (first South Asian ed.) R. Hurley, MussumiTrans. Chennai India Viva Books Pvt. Ltd. P. 420.
It means that the spirit of Kantian-Copernican Revolution is not just the acknowledgement of the limit of human rational capacity to know the reality of *things-in-themselves* rather it also opens up a gateway to determine the structure and nature reality by imposing our will as per our desire. It is due to this reason in the absence of the knowledge of thing-in-them-selves that the claim about normative rational formalism for the determination of absolute and universal imperative as claimed by Kant is just the adventure of rationality bound by desires. Secondly, and most importantly, the Aristotelian ontologically-determined logical forms of judgment are conceptual necessities for the understanding of Kantian transcendental idealism and rational morality.

References


ENTELECHEIA AS THE SYNTHETIC MULTIDIMENSIONAL CONCEPT OF THE INNER SPACE OF INDIVIDUAL, ARTISTIC, SPORTING AND EDUCATIONAL ACTIVITIES

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ABSTRACT. In this article the author extends the range of problems of educational technology in the field of art, sports and educational activities, considering the creative motor actions of man, not only in terms of the methods of traditional “catechismical pedagogy”, analytical biomechanics of movements (ontokineziology including somatopsyche mechanisms), but also on the basis of social and cultural transformations in the inner space of selfconsciousness and the existential world of the person. Reveals the essential meaning of existence as indicating the inner being of man, his feelings, something unknowable in the human “I”, as a result of which the person appears as a particular unique identity. Last seen in the context of internal diversity and multi-structured representation of the space of the individual. Scope of selfconsciousness, ideology, “a dialog box intersubjectively” are a very important means of transforming a person from within.

KEY WORDS: identity, the inner range of the individual, the educational environment, creativity
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Даже неверные взгляды оказывают больше влияния и вызывают больше уважения, чем отсутствие взглядов   

Д.Ньюмен

1. «Энтелехия» Аристотеля – необходимость в Биокосмологической (Органицистской) реабилитации фундаментального научного понятия

Для нас важно уяснить истинное значение ключевого понятия в Органицистской философии Аристотеля. Как это показано в работе К.С. Хруцкого [Khroutski, 2015, pp. 38-39], англоязычные авторы переводят “entelecheia” строго как “actuality”, таким образом, по сути, удаляя из текущей научной среды собственное значение этого термина в (супер)системе знаний (Биокосмологии) Аристотеля. Другими словами, фактически, вся современная англоязычная громада существующих переводов и интерпретаций Аристотеля трактует значение его ключевого понятия «ентелехии» в качестве «актуальности» (т.е. только лишь в понятии действительности и осуществленности, и нередко как синоним формы), тем самым, на фундаментальном уровне – извращая в целом суперсистему знаний (Биокосмологию) Аристотеля. Наша первейшая задача, поэтому, состоит в срочном восстановлении целостного и истинного значения и «ентелехии», и Аристотелевского Органицистского подхода в целом (кстати, положенного в основание всего здания современной науки – Аристотель является во всем мире признанным «Отцом науки»). Следует сразу иметь в виду, как это отмечает Валентин Фердинандович Асмус (видный отечественный историк философии и переводчик Аристотеля), что «греческое organon обозначало инструмент, т. е.

2 Важно отметить, что современное понимание «души» и «духов» имеет преимущественное значение Трансцендентного – Божественного, Сверхъестественного (в плане знаний, имеющего отношение в первую очередь к теологии). В этой связи, поскольку у Аристотеля «душа» тождественна «ентелехии», то прямой смысл заключается в использовании терминов «ентелехия» и «ентелехийный» (вместо «душа» и «духовный»), таким образом разграничивая оба (полярных) исследовательских типа: Натуралистский (Аристотелевский – Органицистский и Функционалистский); и Дуалистский (Платоновский – математико-физикалистский и антропоцентристский).
искусственно созданное орудие, и орган, т. е. «естественное орудие».
«Обладающее органом», или органическое, тело называлось так именно потому, что в отличие от неорганического оно не конгломерат частей, лишенных определенных функций, а целокупность, каждая часть которой выполняет отведенную ей функцию, составляющую сущность ее».

Напротив, таким образом, русскоязычные аристотелеведы сохраняли термин «ентелехия» в своих переводах. В переводе В.Ф. Асмуса, в трактате «О душе», мы читаем: «Материя есть возможность, форма же – энтелехия, и именно в двояком смысле – в таком, как знание, и в таком, как деятельность созерцания», и что «Сущность же [как форма] есть энтелехия; стало быть, душа есть энтелехия такого тела» [О душе II, 1, 412а 10–20]. Как мы видим, русскоязычные авторы как правило правильно переводят Аристелевскую энтелехию (ἐντελέχεια), но, в свою очередь, что также очевидно – они пользуются терминами «материя» (вместо Аристотевского «ύλη») и форма («μορφο»), что категорически не соответствует значению понятий в системе знаний Стагирита; в результате – существующие русскоязычные переводы в равной мере не могут дать нам полноценного значения той научной системы знаний (Биокосмологии) и Органицистского (Натуралистского) Типа рациональности, что представил миру (еще в Античное время) Аристотель.

Аристотель разъяснял:

Энтелехия же имеет двоякий смысл: или такой, как знание, или такой, как деятельность созерцания; совершенно очевидно, что душа есть энтелехия в таком смысле, как знание. Ведь в силу наличия души имеются и сон, и бодрствование, причем бодрствование сходно с деятельностью созерцания, сон же – с обладанием, но без действия. У одного и того же человека знание по своему происхождению предшествует деятельности созерцания4. Именно поэтому душа есть первая энтелехия естественного тела, обладающего в возможности жизнью. [О душе II 1, 412 а, 20–30].

Далее, Стагирит утверждает, что «хотя единое и бытие имеют разные значения, но энтелехия есть единое и бытие в собственном смысле» [О душе II 1, 412б 8–9]; а в другом произведении говорит об «ентелехиальности» как о «неуничтожимости» [О небе I 12, 283а 25–27]. Все это указывает на то, что энтелехия живого существа (человека, общества, цивилизации) представляет собой по сути ‘онтогенетическую энтелехию’, которая в полном значении (и

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4 Очевидным образом, здесь значение слова «созерцание» имеет не (общепринятое на сегодня, идеалистическое) «мечтательное настроение», но именно оригинальное значение процесса непосредственного восприятия действительности и реалистической целедвигательной активности.
попотенциалльно, и актуально) реализует весь онтогенез (жизнь) человека (общества, цивилизации) в присущем (естественном, благополучном) плане.

Аристотель объяснял:
Очевидно также, что душа есть причина и в значении цели. Ибо так же как ум действует ради чего-то, так и природа, а то, ради чего она действует, есть ее цель. А такая цель у живых существ по самой их природе есть душа. Ведь все естественные тела суть орудия души – как у животных, так и у растений, и существуют они ради души. Цель же понимается двояко: как то, ради чего, и как то, для кого. [О душе II 4, 415b 15-20].

Нельзя пройти мимо и других суждений Стагирита:

Итак, душа есть причина и начало живого тела. О причине говорится в различных значениях. Подобным же образом душа есть причина в трех смыслах, которые мы разобрали. А именно: душа есть причина как то, откуда движение, как цель и как сущность одушевленных тел. Что душа есть причина в смысле сущности – это ясно, так как сущность есть причина бытия каждой вещи, а у живых существ быть означает жить, причина же и начало этого – душа; кроме того, основание (logos) сущего в возможности – энтелехия. [О душе II 4, 415b 7–15].

Вывод из всего вышеизложенного очевиден: Нам следует активно и решительно пересматривать (реабилитировать) истинное значение Аристотелевской энтелехии (и других его ключевых понятий), в целом – в плане восстановления истинного и необходимого значения Аристотелевского типа Органицистского познания (определяемого Внутренней целедвижимой этиологией), для реализации в первую очередь Интегралистских форм познания (представителем которых является и данное исследование).

2. Энтелехия как «сетевой кластер понятий»

Ничто так сильно не напоминает научный текст «Метафизики» Аристотеля, по которому прошли сотни интерпретаторов с критическим характером мышления и полемическим темпераментом у каждого. Иногда кажется даже, что на страницах «Метафизики» запрограммированы на века оживленные дискуссии вокруг смысла Аристотелевых категорий. Одной из таких категорий является синтетическое понятие «энтелехия» (от греч. entelecheia – то, что содержит в себе актуальную возможность, функциональный процесс и завершение – тот или иной результат). Что это: 1) объяснительный принцип природной самоорганизации; 2) способ бытия «рукотворной вещи», сущность которой вполне реализована; 3) форма как упорядоченность содержания, осуществляющаяся в архитектонике материи; 4)
активное (движущее, преобразующее) начало, превращающее возможность в действительность; 5) актуальность, актуализация (целевая причина, поскольку конечный результат процесса актуализации есть его цель – греч. телос означает одновременно и «конец» и «цель» – то энтелехия соответствует целевой причине); 5) энергия (Аристотель употребляет термины энергия и энтелехия как синонимы); 6) душа человека, управляющая формированием, изменениями и функциями его сознания и тела? Ни один комментатор текстов Аристотеля не дает окончательных ответов.

В нашем исследовании вышеуказанные черты энтелехии берутся в качестве исходных и базовых. Однако, как представляется, они не являются исчерпывающими применительно к разрабатываемой теме нашей работы, связанной с построением «живых движений» в искусстве, спорте, системе специального образования, обучения и профессиональной деятельности. Энтелехия (от греческого – направление, “цель” и “имею”, обретают, т.е. буквально “обретение (себя) посредством самоактуализации и самореализации целеустребленной личности в ее деятельности”); законченная (завершенная) действительность; осуществленность бытия человека-деятеля в социуме. Одно из самых глубоких философских прозрений в единую сущность бытия, познания и деятельности, постепенно приобретающее также первостепенное значение для теории и истории культуры, профессионального образования, обучения и развития. Энтелехия осуществляется везде, где материя, физическая или духовная энергия (например, в балетном спектакле или художественной гимнастике) принимают «телесно-визуализированный облик» и форму, где актуализованная потенция становится воплощенной реальностью, а общие принципы построения художественно-эстетических движений человеческого тела обретают индивидуальность, где происходит осуществление или явление идеи, принципа, общих закономерностей построения движений индивиду.

3. Введение в предметно-проблемную область исследований

В современных научных и образовательных парадигмах понятие энтелехии легче всего можно понять при восприятии «рукотворного текста», которое

обязательно воплощается в какой-нибудь материи (письменном тексте, арт-пластических движениях балерины, хореографа, дирижера, спортсмена и других субъектов-творцов художственно-эстетического произведения), и обязательно выражает собою то или иное предметное содержание его сознания/самосознания (мысль, смысл, лингвистическое значение, соматоэкспрессию «живых движений»), и является самоцелью «деятельностного процесса» его творения. «Деятельностный процесс» мы рассматриваем не как «заданность мысли/смысла/замысла», указывавшие не на изолированное существование некой «идеи-протопроекта», но именно на ее всегдашнюю «векторную направленность» на тот или иной предмет реальности. Что это: противоборство двух миров или их гармония? Видят ли наука, искусство и образование в объективной реальности одно и то же, но лишь в разных формах, или же им соответствуют различные уровни бытия? Уметь в разных ипостасях увидеть едино целое – специфика философско-антропологического осмысления развивающегося мира.

Гармония, пропорция, симметрия, ритмопластика, темпоритм движений – все эти понятия, введенные еще в античные времена, отражают глубокие идеи самоорганизации в природе, обществе и искусстве. Позднее западноевропейская и российская философия унаследовала от античных философов идеи универсальности структурообразующих принципов, справедливых и для Биокосмоса и для художественной и спортивной культуры «живых движений» творческого человека. Основная цель статьи заключается в том, чтобы показать, что понятия и принципы теории сложных систем (кибернетика, синергетика, робототехника, трансверсальное программирование» живых движений» и т.п.), а также сформулированные в их концептуальных рамках универсальные типы поведения самоорганизующихся систем, справедливы в искусстве, художественной культуре, спорте и в образовательной логистике. Одной из важных задач необходимо было показать, что универсальные виды самоорганизации, свойственные любому уровню организации материи (неустойчивость структурной и функциональной организации, скачкообразные переходы imago, «созидающий хаос», фрактальность, «перекрестные переплетения» закономерностей из разных научных сфер и т.д.), принципиально важны во всех видах «рукотворных произведений».

Можно полагать, что противоречие между естественным и искусственным миром возникло вместе с человеком, в ходе зарождения, формирования и развития его социокультурной деятельности. Человек-деятель – существо естественно-искусственное, Homo sapiens – преобразованная природа. Человек окружен миром и сам несет его в себе. Наука, техника, культура, искусство, спорт – это тоже своего рода естественно-искусственный мир, созданный в деятельности человека. В его деятельности осуществляется единство и взаимопроникновение разных сущностей – естественных и искусственных, объективных и субъективных, телесно-чувственных и ментально-духовных. Континуальная реальность социокультурной деятельности человека представляет,
таким образом, в виде многомерного, внутренне разнородного, но единого целого.

Вместе с тем невозможность осуществления человеком себя в качестве индивидуального субъекта творчества (учитывая все классические, неклассические и постklassические характеристики человеческой субъективности) означает, что развёртывание сущности человека возможно только в социокультурной системе межиндивидуального и группового взаимодействия людей. Именно здесь индивид о-существляет-ся (grow older – является свою сущность, изменяясь и творя себя снова и снова) – не только усваивает культуру общества (интериоризует ее смыслы и ценности), но и реализует себя в этой культуре. Художественная и спортивная коммуникация как один из наиболее сложных видов «диалога наук», «диалога сознаний», диаログа левого и правого полушария человека избрана нами в качестве предметной области исследований в сфере образования. При этом онтотехнологии (как наука о «живых движениях») и искусство (как творческая способность человека-деяеля) рассматриваются в статье как сопряженные и взаимообратимые знания, имеющие единую онтологическую природу. Поэтому образовательные технологии-методологии-искусствоведы – теоретики и практики – могут найти в этой социокультурной сфере «рефлексивную модель» для формирования креативно-двигательных действий/деятельности человека. Наведение мостов между естественнонаучной и гуманитарной формами знания природы «живых движений» необходимо (и возможно) уже на данном этапе развития технологии образовательного обучения в любой сфере «креативно-двигательной педагогики».

Фундаментальные исследования Н.А.Бернштейна [2], Д.Д.Донского [9], В.Б.Коренберга [10], Ю.К.Гавердовского [4] в биомеханике человека, социокультурной теории двигательных действий (С.В.Дмитриев [5, 6–8]), а также работы ученых в сфере психологии и семантики искусства (Л.С.Выготский [3]), М.М.Бахтин [13]), Ю.М.Лотман [12]) требуют новых метатеоретических обобщений в сфере образования. В современных социально-педагогических и гуманитарных науках культура, искусство, спорт рассматриваются как процесс межличностной коммуникации, разновидность личностно-деятельностного общения между людьми. Известно, что в данных видах деятельности осуществляются непрерывные переходы от «материальных движений» тела (механизмов соматопсихики) к «идеальным движениям» души (семантическим механизмам интеллекта, сознания) и, конечно, в обратном направлении. На наш взгляд, данная предметная сфера знаний/мышлений и мыследействий быстро расширяется. Эта научная дисциплина взаимодействует со многими науками: культурологией, аксиологией, герменевтикой, семиотикой, семантикой. И каждая из этих наук помогает осветить определенную сторону человеческой деятельности, «живых движений» и сферу сознания человека.
Рис. 1. Гетерархическая система понятий "конструктивной педагогики" при построении "живых движений" человека в социокультурной деятельности

Примечание. Среди указанных на рисунке психических феноменов нельзя выделить какой-либо один, устойчиво находящийся "на вершине" иерархии регулятивной системы. Любой из функциональных процессов – в зависимости от конкретной ситуации – может становиться ведущим и организовывать в целях своей реализации все иные интегральные процессы, соподчинять их себе по гетерархическому принципу. Данный принцип, как известно, характеризуется возможностью гибкого и динамичного перераспределения, смены "управляющих центров" в зависимости от конкретной ситуации, а также – наличием нескольких паритетных управляющих центров одновременно. Таким образом, через становление системы саморегулятивных процессов психика обогащает arsenal функциональных принципов своей организации и предикторов человеческих достижений.

4. Методы, концептуальные установки и результаты исследования

Известно, что социокультурная деятельность формируется и реализуется в трех основных формах: познавательной (отражение действительности такой, какая она есть или представляется субъекту), прогностически-преобразовательной (отражение и преобразование действительности в плане ее возможных изменений или в соответствии с замыслом-проектом субъекта) и ценностно-смысловой (аксиологическая оценка действительности в соответствии с "нормо-творческими идеалами" и мировоззрением субъекта). Познание, преобразование и оценка – это не три сменяющие друг друга этапа человеческой деятельности, а аспекты, точнее говоря – "срезы" предметно организованной деятельности, которые в своем реальном внутреннем...

В современной деятельностной онтологии искусства, культуры, спорта необходимо развивать подходы, позволяющие преодолевать «моноконцептуальные установки». Здесь необходимо уточнение некоторых понятий. Так, известно, что психоаналитические концепции ориентированы на проблемы отношений человека с собой и «значимыми объектами» (relatedness). В основе когнитивно-бихевиористических концепций лежит анализ продуктивности деятельности и результативности действий человека (doing). Наука исследует объект. Искусство выражает его суть. Технология конструирует алгоритм его преобразования. Религия верит в сверхъестественные, трансцендентные (от лат. transcedo – переступать) феномены – принципиально недоступное опытному познанию или не основанное на опыте. Гуманистические концепции ориентированы на проблемах человеческого бытия (being) – «быть» (реализовать себя в мире) и «иметь» (потреблять мир). С современных позиций духовно-деятельностное начало человека (одно из свойств энтелехии Аристотеля), как правило, отождествляется с сознанием (направленным на реализацию собственной социальной и индивидуальной сущности), а личность предстает как совокупность интериоризированных общественных отношений, как набор социальных ролей и как носитель информации. В этой всеобъемной «информатизации бытия» духовное сводится к мыслительному и разумному (в пределе к формально-логическому), общение – к коммуникационным смыслам, интеллектуальное – к искусственному интеллекту. Указанные нами парадигмы задают противоположные точки отсчета – между ними всегда имеет место семантический разрыв между логосом, интеллектом и энтелехией Аристотеля. Так, в психоанализе во главу угла ставится внутренняя реальность индивида (осознающая свою индивидуальность), а внешняя чаще всего рассматривается через призму проекций-интроекций человека. В бихевиоризме, напротив, декларируется отход от внутренних факторов во имя внешней реальности (достижение позитивного контроля над предметной средой деятельности). В гуманистической психологии и педагогике внутренняя реальность рассматривается как один из механизмов творческой самореализации индивидуальности в социуме («интеллектуальное и духовное воспроизводство»). Вместе с тем следует иметь в виду, что энтелехия у Аристотеля как актуальный процесс, связанный с передачей энергии (а, возможно, информации и даже знания) вряд ли является, с нашей точки зрения, духовно-технологическим процессом. В современной науке и образовании духовные ценности не технологичны. Культура, искусство, духовность (в отличие от техники и технологии) никогда не транслируются хотя бы потому, что репрезентируют собой внутреннее состояние человеческого духа. Диалог человека с произведением культуры обязательно переходит в диалог с самим собой. В ходе такого диалога субъект актуализирует (и диалогизирует) свое сознание, – осваивает и творит самого себя, совершенствует не столько интеллектуальные действия (мы понимаем интеллект как способность к мышлению как к техническому процессу), сколько
человекосозидающие и культурообразующие действия. Самопознание, самореализация и самовыражение — важнейшие механизмы отношения человека к миру и с миром, возникающие в процессе и на основе социокультурной деятельности. Социокультурная деятельность есть такое проявление «ентелегении человеческого бытия», когда детерминация идет от человека/ суверенного субъекта деятельности — не замыслы детерминируются миром, но предметный мир доопределяется реализацией наших замыслов/ планов/ проектов/ программ, возникающих в ходе глубинного общения субъекта с реальностью. С нашей точки зрения, человеческая деятельность во многом детерминирована аристотелевской энтелехией — глубинными структурами сознания (самосознания, души), языка, культуры его мышления. В античные времена не существовали понятия «личность», «индивидуальность», «субъект». Человек как субъект деятельности еще не был введен в состав сущего, в состав бытия и в круг философских категорий. Однако можно полагать, что термин Аристотеля «энтелехия» представлял собой «сущность сущего» и воспроизводил, в свою очередь, человека как сознательного субъекта действия/ деятельности. Энтелехия коренным образом преобразует весь «онтологический план» человеческого бытия — ставится вопрос не только о человеке в его взаимоотношении с миром, но и о мире «в соотношении с человеком» (бытия человека в составе постоянно творимом им бытие). В современных концепциях «человеческого бытия», в понятии личности как важнейшей сущностной характеристике человека утверждается, например, своего рода «принудительная социализация» («создание внутреннего социума»): «личность существует во мне, но не мое» (W. Neubaner), мое — это индивидуальность, «самость» (по А.Маслоу, К.Роджерсу, — символ полноты человеческого потенциала и единства индивидуальности; она занимает центральное место в управлении психической жизнью и является высшей властью в судьбе индивида). Только стремление к развитию, росту индивидуальности, т. е. к самоактуализации, есть основа развития человека и общества. Отметим, однако, что процесс преодоления «моноконкурентности» (cross-curricular ismes), разработка современной антропно ориентированной парадигмы единого знания нелегко дается как в сфере искусства, так и в сфере образования.

Известно, что сущностью искусства, его квинтэссенцией является творение художника-автора для другой личности, для другого духовного субъекта, для другой души. При этом в системе межличностной коммуникации и общения важную роль играет художник-исполнитель, интерпретатор в широком смысле слова (режиссер, дирижер, актер, музыкант, переводчик, тренер). Художник-исполнитель является посредником между автором и аудиторией, зачастую интерпретатором авторских произведений. Но его главная задача — это все-таки адекватно передать и выразить художественное произведение.

Следует иметь в виду, что межличностная коммуникация является однонаправленным (преимущественно асимметричным) процессом передачи той или иной информации. В отличие от коммуникации «деятельность общения» заключается в процессе обмена семантическим пониманием объекта, предметно-личностным содержанием двух и более суверенных субъектов, наделенных сознанием. Безусловно, важнейшей проблемой «метаиндивидного существования» человека, «отраженности» его в других людях является связь,
общение, взаимопонимание с аудиторией. Люди «приобщаются» друг к другу, постигая «мир другого» (достигая резонанса взаимоотраженности) и вновь «возвращаясь к себе». Вполне понятно, что указанные нами психосемантические механизмы не являлись предметом обсуждения во времена Аристотеля, но они остаются пока еще недостаточно изученными и в системе современного образования.

С одной стороны, в содержании и структуре художественно-эстетического произведения прямо или косвенно выражается личность творца, его «духовно-ценностная энтелехия» (интеллектуальные установки, художественные интенции, «Я актуальное», «Я проспективное», связанные с самоактуализацией, самопроектированием и самореализацией). С другой стороны, содержание произведения, его ценностно-смысловые интенции, в свою очередь, опосредуются личностными особенностями (духовно-практическим опытом, потребностями и способностями, внутриличностным диалогом и др.) исполнителя и реципиента. В современных образовательных технологиях важны социальное окружение («значимые другие», референтные группы) и образовательно-обучающая среда, в которой происходит взаимодействие между Homo sapiens и Homo creasoficus. Рассмотрим, например, проблему понимания и интерпретации музыкального произведения с точки зрения социокультурной семантики и психомоторики исполнительских (вокальных, инструментальных, дирижерских) действий человека. Именно данные моторно-семантические механизмы передачи музыкальных мыследействий превращают зафиксированное в нотном тексте авторское произведение в воплощаемую исполнителем музыку и его индивидуальные мысленения. Указанный феномен — мысленния и мыследействия — возникает из положения об известном единстве структур внешних и внутренних действий человека, переходящих друг в друга подобно сторонам ленты Мебиуса. Музыка, как известно есть специфическая разновидность звуковой деятельности людей. С другими разновидностями (речь, инструментальная звуковая сигнализация и т.д.) музыку объединяет способность выражать мысли, эмоции и мыслительные действия в слышимой форме и служить средством общения людей и управления их поведением. При этом музыкант не столько «играет на инструментах» (посредством физических, звукоизвлекающих действий), сколько «играет на оркестре», звучащем у него «внутреннем пространстве» (в сфере музыкально-эстетического сознания).

Известно, что вокальная и программно-инструментальная музыка достаточно близко выражают понятийное содержание. Так, в музыке могут воплощаться «звуковые пейзажи», «портреты людей», «экспрессии», «артистические и ментально-двигательные эвристики человека». Отметим, что в музыке наряду с совершенствованием чисто инструментальных музыкальных форм, в частности полифонии, продолжают развиваться вокальные формы, в которых доминируют словесный текст и человеческий голос.
С точки зрения антропных образовательных технологий в «живых движениях» исполнителя можно выделить три системы «языковой семантики», которые являются средствами материализации содержания музыки, невербального общения и передачи художественно-эстетической информации: так называемая система семантического тактирования; язык эмоциональных жестов; язык «визуального понимания» движений. Отметим, что они не упоминаются у авторов текстов по античной антелехии как методы «манифестации энергии». Первая система характеризует преимущественно инструментальный аспект «художественного восприятия». Вторая система связана с «имплицитным пониманием» (термин А.Робера) и интерпретацией «образно-ассоциативного звукообраза» на аперцептивном уровне. Третья система построена на «асоциативном знании» (термин М.Полани) – «чтении текста движений образами, а не словами» (без помощи суждений). Подобная «языковая семантика» характерна для современных концепций искусствознания. Характерна она и для восприятия, понимания и интерпретации спортивной артисты и эстетики движений. Отметим, что они не упоминаются у авторов текстов по античной антелехии.


На наш взгляд, в современном образовании можно трактовать феномены энталекий, разработанные Аристотелем (в нашей интерпретации «ментально-двигательные эвристики и синтагмы»), как личностное творение (объективируя индивидуальное сознание творца), феноменологически (в контексте духовно-деятельностного бытия творческой личности), предметно (творчество как
результат экстериоризации художественно-эстетических способностей человека), технологически (творчество как «алгоритмизация неалгоритмизируемых экзистенций»), в парадигме знакотворческой деятельности. Далее рассматриваются более подробно некоторые аспекты «языкового творчества» личности в контексте теории тезаурусно-знакового моделирования музыкальных произведений и артпластики в спортивной деятельности.

Под тезаурусом музыканта нами понимается некоторое множество «смысловыражающих единиц» информации, заключенных в той или иной знаковой системе или хранящихся в памяти адресанта (адресата) и (или) предполагаемых «понятными» ему. К ним можно отнести способы визуального (зрительного) или «сонорного мышления» (связанного со сферой воображения), доминирующие эмоции, экспрессивные установки, «аппликатуру пальцев», меторитмический стиль, ладо-гармонические структуры, вербализованные или авербальные музыкальные переживания. Следует иметь в виду, что не только знаковый, но и весь предметный мир деятельности приобретает смысл и значение только через «тезаурусно организованное» сознание человека. В сущности, не знаки, а предметы культуры и их идеальное отражение в сфере сознания создают возможность социокультурного общения людей. Объектом такого общения являются не вещи (преобразуемые в предметы потребления), а человек, преобразование внутреннего предметного мира/ пространства которого является целью искусства. С точки зрения психолингвистики «мир музыки» является сложной семантической системой, выполняющей три основных функции: источника семантической информации; приемника семантической информации; посредника между семантическими объектами. Семантическим объектом-источником является композитор и созданное им музыкальное произведение, отображаемое в соответствующих текстах (партитура, нотная запись, магнитная фонограмма). Семантическим объектом-приемником, воспринимающим музыкальное произведение, являются слушатели музыки. «Семантический диалог» как форма социокультурного общения между композитором и слушателями осуществляется с помощью посредников – исполнителей музыкального произведения (дирижер, оркестр, солист и т.д.). Отметим, что полноценная аудиальная коммуникация (обмен и обогащение музыкальными образами) становится возможной, если тезаурусы семантических субъектов «трансверсально пересекаются». Идея трансверсальности (сложнопересекающегося по архитектонике и многообразного по функциям) объекта заслуживает самого пристального внимания со стороны исследователей современной культуры.

Отметим здесь, что нотные знаки (партитура музыкального произведения) сами по себе с другими материальными предметами не взаимодействуют, они способны воздействовать на личность исполнителя (или слушателя) только через призму его мировоззрения. При этом музыкант-исполнитель обозревает партитуру не только извне, «со стороны», но и изнутри – в соответствии с «мировоззренческой осью», проходящей через центр его художественно-

Становление (системосозидание и системоразвитие), а также расширенное воспроизводство в деятельности человека социокультурных норм представляет собой исключительно сложный процесс. Не вдаваясь в детали проблемы, отметим, что в ходе нормативного регулирования в социокультурной деятельности семантические тезаурусы адресанта и адресата должны пересекаться через общую духовную атмосферу, мировоззренческое восприятие мира, господствующий стиль художественно-эстетического мышления, «архетипы» музыкального сознания. К последним можно отнести так называемые «невидимые колледжи» (понятие, введенное Д.Берналом и развернутое Д.Прайсом для неформальных групп людей, являющихся профессионально гомогенными). В музыкальной культуре это могут быть «разведенные в пространстве» (и даже во времени) единомышленники, которые оказываются как бы настроенными на одну и ту же «эмоционально-музыкальную волну».

Известно, что нотно-знаковые системы, без интерпретирующих их смысловых значений (например, незнакомая для репиента партитура) не способны выполнять функцию отображения или воспроизведения музыкального произведения. Печатные, графические **знаки без значения не есть знаки** – это только типографская краска. Они **существуют материально, но не семиотически**. Значение существует не само по себе, но лишь при условии его интерпретации как смысла. Функцию отображения или воспроизведения любого объекта, в том числе музыкального текста, выполняют **трансляционно-знаковые модели** (например, художественно-эстетические образы-концепты/ конспекты) в сознании человека, знающего специфику дихотомии «язык-речь» в музыкальных системах (отметим в скобках, что поиск специалистов обших конститутивных черт между языком и речью музыкальной
во всем объеме до сих пор не завершен — «их разделяет непереходимая грань», — пишет в работе «Общая лингвистика» Эмиль Бенвенист [5]). По сути дела здесь мы обсуждаем проблемы идеального отражения мира с точки зрения психогносеологического отношения индивидуального сознания к языку и духовно-деятельностной культуре. В частности, нас интересует не «язык мозга» (нейрофизиологические коды), а «язык сознания» — соматоспиральные и ментальные образы как семантические регуляторы социокультурной деятельности человека. Отметим, что интроспективно-семантический анализ содержания собственного сознания (внутренний диалог в пространстве самосознания) важен для любой творческой деятельности человека, в том числе спортивно-педагогической. Лингводидактика спорта постоянно сталкивается с проблемой единства логических, психологических и языковедческих представлений в технологии проектирования и построения социокультурных двигательных действий. На рис.2 нами представлен сравнительный анализ внутренних действий музыканта и спортсмена.

На данной схеме, как легко видеть, переплетается ряд семантических отношений и связей в сфере сознания человека (будь то лингвист, музыкант или специалист по пластике движений), непрерывно сменяющих друг друга рефлексивно-личностных позиций исследователя и проектировщика, которые имеют общий информационный репертуар и сценарий своей социокультурной деятельности. Представим себе, что левый человечек — субъект познания и преобразования, «творящий действие». Правый человечек — тот же субъект, выступающий одновременно объектом познания, преобразования и оценки своих действий. По сути дела исследователь в некоторой степени совмещенный с объектом исследования — между ними отсутствует «демаркационная граница» (В.А.Лефевр [6]). Наш глаз видит предметно организованный мир. Но чем мы воспринимаем (рефлексируем, наблюдаем как бы «изнутри») деятельность «разумного глаза»? Самосознанием. Для понимания сферы своего деятельностно организованного самосознания исследователь должен «забраться внутрь» действия творения, посмотреть на него «внутренним глазом». Одновременно он должен сохранить другой «глаз» объективным (отчужденным от личности), чтобы можно было анализировать то, что видит глаз, совмещенный с креативно-двигательным субъектом. «Совмещенный глаз» может в той или иной степени смотреть сквозь «мысленную ткань» движений, видеть свой «рукотворный объект» с различных личностно-деятельностных позиций — исследователя, проектировщика, конструктора, эксперта и оператора двигательных действий. Таким образом, в отношениях человека с миром ведется непрерывный «экцентричный диалог». Автор данного термина (от лат. ex — вне + centrum — центр) Х.Плеснер утверждает, что человеческая субъективность экс-центрична — ее источник находится не только в глубинной сфере самосознания, но и вне его, в предметном мире деятельности. Следует подчеркнуть, что предметное членение мира осуществляется человеком в зависимости от стоящих перед ним задач.
Художник как субъект музыкального познания партитуры и проектирования исполнительских действий

Проектирует и программирует свои действия в соответствии с «мерой объекта» (знания de re – партитура, инструмент, акустика зала). Осуществляется субъектификация (антропоморфизация) инструмента, персонализация среды деятельности Художник как креативный исполнитель музыкального произведения

Контролирует и оценивает свои действия в соответствии с «мерой субъекта» (знания de se – мир собственного «Я»). Осуществляется транскрибирование себя в художественное произведение. Реализуется вопрошающая открытость» к другому человеку на основе собственных действий с учетом намерений партнеров

Спортсмен как субъект познания (исследователь), проектирования (технолог) и программирования (конструктор) креативных двигательных действий

Проектирует и программирует свои действия в соответствии с психосоматическим потенциалом и нейрофизиологическими свойствами (самость, метасознание, психогнозис, многомирная и многомерная «персоносфера», конструктивная и оценочная семантика движений) Спортсмен как оператор системы движений и телодвижений на основе программно-двигательного функционала


Ментально-семантическая организация «текста движений». Вербально-двигательные коннотации и психомоторные эвристики. Идеомоторное представление и конструирование системы движений на «языке моторики». Идентификация (субъективное отождествление) со спортивным снарядом или музыкальным инструментом – «вступая с ними в диалог». Данный диалог всегда протосоциален и является завуалированным диалогом человека с самим собой.

Рис. 2. «Диалог сознаний» – рефлексивно-смысловая архитектоника и полифункциональная структура внутренних действий музыканта и спортсмена (сравнительный анализ)
Их успешное решение – конечный критерий истинности наших представлений о мире. Важнейшим свойством сознания, как известно, является его интенциональность – «задающая направленность» (на предмет любой природы). Отметим, что предметный мир деятельности человека не обязательно материален, тем более вещественен (natura naturata – сотворенный мир, по Б.Спинозе), он может иметь и духовный модус (natura naturan’s – творящая субстанция). Идеальную субстанцию можно трактовать как бесличное начало (дых без его носителя, без субъекта), как некую сверхличность (Абсолютный Субъект, Демиург), как субъективную реальность человека – его духовно-ценостный мир, мировоззрение, экзистенция (unikальность человеческого существования), саморазвивающееся сознание. Сознание здесь – не только сфера осознанного, но синтоном всей интеллектуально-духовной, психической жизни в целом, человекомирных отношений (определяющих место, роль и предназначение человека в мире).

Дальнейший анализ «диалога самосознания» как одного из механизмов культуротворчества, продукты которого представлены в произведениях искусства и в других творениях людей, показывает, что в процессе творения языковая личность переводит мир объектов в идеальный план – создает мир значений и смыслов, позволяющий замещать объекты реальной действительности и моделировать их посредством оперирования этими значениями и «переживаемыми» чувственно-смысловыми образами в сфере деятельно организованного сознания человека.

Таким образом, в «семиосфере самосознания» обнаруживается и внутреннее «Я», и «Я» другого человека, и предметный образ действительности, и социокультурный эталон деятельности. Важно подчеркнуть, что тезаурусо-знаковые модели представляют собой единообразие знака (как выражающего средства), значения (как выражаемого предметного содержания, которое в то же время является отражением объекта) и смысла (порождаемого субъектом действия). Создавая ту или иную тезаурусо-знаковую модель объекта, ее автор означает, выражает в знаковой форме «мир идей», в котором он живет, и «мир вещей», в котором он действует.

Так, например, музыкальная партитура как знаковая система «существует на бумаге», но «готова» обратиться в «тезаурусо-знаковую коммуникативную модель» в сфере сознания человека, знающего ее алфавит (правила «оформления знаний в мысленации», по С.В.Дмитриеву [3, 4]). Отметим, что способность «оркестрового слышания» видимой партитуры (сонорно-зрительное мышление) является одной из главнейших составляющих деятельности дирижера. Музыкальный образ рождается в ходе воссоздающего воображения и интерпретации произведения в различных смысловых контекстах и ракурсах (помыслах, замыслах, «со-мыслах» с композитором).

Особую роль здесь играют факторы (условия) исполнительской деятельности – сольное (ансамблевое) исполнение или выступление с оркестром. Так, в опере, например, доминирует симфонический оркестр, дирижер которого создает

Музыка актуализирует поток сознания, «захватывает звуковой плотью», побуждает активно «работать» наш апперцептивный опыт, осмысливать и переживать его заново (со-переживать, «само-переживать») на основе продуцирования «здесь и сейчас» энтелеции звукового потока. Последний по природе своей является не столько матеральным, сколько реляционным — он фиксирует позиционно-личностное отношение исполнителя и слушателя к музыкальному произведению. «Музыкальный поток» состоит из различных...
структурных элементов одноголосного или многоголосного стиля, создавших тот или иной музыкальный образ. «Семантика музыкальной фактуры» (предмет и фон) неисчерпаемо содержательна. Музыка, в отличие от живописи, воссоздает не предмет реальности, но «видение вообразительным взором», имагинативное воображение «предмета»; потому она не изобразительна, а «вообразительна». Этот взгляд преобразует мир, делает его феноменом имагинативного воображения.

Музыкальное произведение – это безграничный, необъятный, незавершенный, становящийся источник. Он безграничен не в своей материальности, не физически – он безграничен в своем исходном или венчающем смысе, в смене аффективно-смысловых образований, в латентном тезаурусе нотного текста. Латентность любого рукотворного произведения это не раз навсегда «заданная фактура» – в различных ситуациях (в том числе в разные эпохи) произведение по-разному значимо, и значимость его кажется неисчерпаемой.

Стремление углубить, расширить семантику воспринимаемого мира – важнейшая задача искусства. Музыкальная деятельность, артпластика движений, как и любая другая, связана с эмоционально-чувственными переживаниями, сопровождается выразительными движениями, имеющими сигнально-знаковый, социокультурный характер. Эмоциональная экспрессия проявляется, как известно, во всех сферах общественной активности человека – особенно ярко в живописном и музыкальном искусстве.


В контексте проблематики наших исследований следует подчеркнуть, что носителем так называемого «художественного смысла» является не столько «способ существования» (mode of existence) структуры произведения, закрепленной в определенной форме (темпоритм, эвфония, тип, архетип, тема,


По сути дела смысловая организация «живых движений» в спорте – это поиск смысла (смыслополагание), понимание смысла (смыслопостигание) и
творение смысла (смыслотворчество) в деятельности спортсмена и тренера. Человек осмысливает двигательное действие (посредством понимания его основных механизмов) и понимает, интерпретирует его (посредством творческого мышления). Это две «дихотомические составляющие» так называемого дивергентного метода смысловой организации системы движений. Данный метод, предполагающий поиск множества дополняющих друг друга, в том числе альтернативных способов, объективирует способности и волю спортсмена к творческому действию, а творчество – к самоизменению, «построению себя изнутри», утверждению себя в социуме. Дивергентный метод в образовательной логистике – это предпосылка выработки проблемно-творческого мышления, когда вопросы становятся важнее ответов. Подчеркнем, что «режиссерская партитура», «программный коридор» дивергентного обучения должен быть изложен языком проблемной логики, а не только с помощью традиционных инструктивно-программирующих методик. Здесь нужны не столько «жесткие модели» программного обучения (образовательные стандарты, содержащие алгоритмические предложения для исполнителя), сколько антропные дидактические технологии, создающие образовательное пространство личности с функциями обучающей и развивающей среды. «Живое знание» не усваивается (усваивается та или иная информация), а строится и производится – так, как строится и производится «живой образ», «живое действие», «живое тело», «живое слово».

Интересно отметить, что творчество как процесс и творчество как результат деятельности субъекта совпадают в одном понятии – творение. Здесь требуется расширение (диверсификация) и углубление смысла, а не просто его транспозиция (перенос из одной системы в другую, переложение с одного языка на другой). Становление смысла следует рассматривать, на наш взгляд, как вечное становление истины, выраженной в слове и посредством «живого слова». Последнее представляет так называемый информационно-психический репликатор, т.е. структуру, способную создавать себе подобную в новом цикле своего действия (развития) и тем самым осуществлять расширенное воспроизводство социокультурной реальности. Еще Л.С.Выготский подчеркнул, что «мысль совершается в слове», а не выражает «готовое к передаче» содержание.

Известно, что для развития духовно-деятельностной личности необходимы соответствующее образовательное пространство, социокультурная среда профессиональной деятельности. Пространство внутреннего самобытия человека задается всей сферой культуры. Близкие по духу мысли имеются у А.Пушкина: «Любви нас не природа учит, а Сталь и Шатобриан». Мир человека представлен миром объектов материальных, и «объектами идеальными» – чувствами, мыслями, идеями. И те, и другие объекты способны активизировать кататимное-эмоциональную (экспрессивный отклик в душе), интеллектуальную (языково-оценочный отклик в разуме), телопсихическую (leibbewustsein) сферы личности.
Тезаурурное моделирование музыкальных произведений предполагает так называемую техническую тесситуру (от ит. tessitura – адекватный, соответствующий) – соответствие партитуры акустике инструмента, концертного зала, технике аккомпанемента, диапазону певческого голоса. С точки зрения криптофизики (от греч. kryptos – тайнопись, шифр) существуют некие психосоматические механизмы вибрационного воздействия музыки (в том числе лечебного) на базальные структуры головного мозга, гормональные системы организма, мышечный тонус, системы экстero- и интерорецепторов. Данные механизмы могут актуализировать восприятие собственного тела (образ тела, схему тела, телесное «Я») и его функционального состояния. Многие психологи (Э.Хилгард, Г.Мерфи, В.Шонфельд) полагают, что терапевтическая музыка активизирует больше зон головного мозга, чем речь. Отметим, что техническая тесситура терапевтического музыкального произведения (шаманские бубны, «колыбельные» для ребенка, музыка для медитации, цветомузыка) должна быть адекватна не только слухо-двигательной координации (синестезии) – механизмам «тело–сознания» того или иного человека, но и его художественным ассоциациям и эстетическим коннотациям. Психосоматический модус слушателя, его праксические состояния (от гр. praksis – практика, действие) всегда опосредованы личностными особенностями человека, его когнитивно-моторными ассоциациями, структурой телесного самосознания. Функционально-личностные интенции, личностный смысл деятельности может быть высказан в семантике тезаурурно–знаковой модели либо в виде открытой репрезентации (в партитуре), либо в скрытых, замаскированных «музыкальных мыслях» (в подтексте) композитора либо исполнителя. Подтекст «музыкального логоса», понимаемый нами как семантическое воздействие индуктора через творческую информативность «чувствуемых смыслов» рецептиента, позволяет осуществить музыкальную или артпластическую трансгрессию (преодоление границ) в системе «диалогического контакта» между автором исполнителем и адресантом. Как правило, может возникать сценическое «переживание в образе» (адресат возволен чувствами и мыслями, рожденными ментально–семантическим образом) и «переживание вне образа» (эстетическая оценка техники исполнителя).

Вместе с тем сознание адресата может не только рождать и присутствовать во всех указанных нами сферах, но и «метаться» между ними (контрастное и контрадикторное восприятие, погружаться в какую–либо из них, подниматься над всеми ними – сравнивать, оценивать, судить их (и, следовательно, самого себя). Здесь человек, если он еще не становится творцом культуры, несомненно, становится ее субъектом. Одновременно может рождать (возрождаться) и субъект духа. Речь идет именно о порождении, а не усвоении той или иной информации. В соответствии с принципом единства аффекта, интеллекта, тела и действия (С.В.Дмитриев) совершенствуется «музыкальное ухо», и одновременно «око души», а также «телесно-двигательное Я» как адресанта, так и адресата.

Музыкант-исполнитель должен воссоздать по нотной записи образ музыкального произведения и воплотить его в концертном звучании. Психосемантические регуляторы деятельности (такие, как эстетический катарсис, кататимно-двигательная вербализация смысла, сонорно-образное мышление, музыкальная проекция и интроекция) обеспечивают более высокий уровень овладения своей собственной деятельностью. Можно сказать, что не
только творец создает произведение, но **произведение создает творца.** Известно, что многие композиторы (А.Рубинштейн, С.Рахманинов, С.Прокофьев) при исполнении своих произведений вносили в них существенные поправки, отступали от собственноручно написанного нотного текста.

Важно умение смотреть «сквозь текст» произведения, осуществлять глубинный диалог с личностью автора. Возникает «смысловая форма репрезентации одного человека другому» (по В.А.Петровскому), переживание присутствия автора музыки «внутри себя». Воспринимается мир, пропущенный через другую личность. Художественное переживание может завершиться эффектом катарсиса, глубинной личностной перестройкой, преодолением исходной этцентрической смысловой перспективы. Отметим, что музыкант может субъектифицировать (одушевлять, антропоморфизировать, олицетворять) не только нотный текст, но и свой инструмент. Программист персонифицирует компьютер, теннисист – ракетку.

**На этапе предварительной подготовки** и воплощения композиторского замысла, как правило, существует определенная недосказанность (дефицит информации нотного текста). Это дает музыканту свободу для интерпретации партитуры и побуждает не ограничиваться единственной точкой зрения на музыкальное произведение, а искать новые позиции и диспозиции, вносить творческие конструкты (концертные транскрипции и парафrazы) – постоянно приближаться к более точному воплощению «дразнящего образа» (Б.В.Асафьев). **На этапе реализации** музыкант должен уметь «исполнительно» («телесно», пластически, эмоционально) переживать и выражать музыкальное произведение. Так, известная оперная певица Л.Казарновская считает, что «тело певицы должно петь вместе с ее голосом». Современный итальянский тенор Хуан Диего Флорес полагает, что body experience его бельканто (итал. bel canto – совершенство вокальных орнаментов) в значительной мере выражается через артпластику тела, «становится зримым, воспринимается подобным ренессансному sfumato» (итал. sfumato буквально – исчезнувший как дым). Данный прием в живописи разработан Леонардо да Винчи. Здесь доминируют мотивы, связанные с отношением исполнителя к публике (слушателям данной аудитории), а также стимулы его профессионального совершенствования. Большое значение имеет желание самоутвердиться, подтвердить свою компетентность интерпретатора, обогатить палитру переживаний «осознанного авторства» и «образного перевоплощения».

Как отмечал В.Мейерхольд, «искусство замечательно еще и тем, что на каждом его этапе художник чувствует себя учеником». Возникающий у адресата музыкально-смысловой образ может включать веер «незапrogramмированных» ассоциаций – поэтических, художественных, жизненных, связанных с произведением. Чтобы «понять недосказанное и недопонятое», весьма важны свойства личности слушателя – высокий эмпирический ум (любознательность, здравый смысл) и музыкальный (аналитико-синтезирующий) стиль мышления, эстетическая неконформность («сопротивление» традиционной трактовке исполнителем нотного материала), личностно значимые потребности, ценностно-смысловые ориентации и в целом – музыкальная образованность.
Художественная реальность музыканта, таким образом, возникает из столкновения («эстетической контроверзы») двух противоположных процессов: творения в звуках на основе новых идей, установок и ценностей внутреннего (экзистенционального) предметного мира и соотнесения этого мира с миром реальным, с природой вне человека и отчасти внутри него. В музыке потенциально заложена сила/ энергия/ энтелехия, разрушающая (раздвигающая) грани невозможного, способная «приблизить далекое» и «возвысить объединенное», рассказать о нем на языке эмоционально-образных представлений. Можно полагать, что в антропных образовательных технологиях, разрабатываемых нами, создается художественно-эстетическое (не имеющее разрывов) внутреннее пространство, «трансфинитная» (бесконечная) сфера, онтософийный логос творческой личности.

Можно полагать, что в антропных образовательных технологиях, разрабатываемых нами, создается художественно-эстетическое (не имеющее разрывов) внешнее и внутреннее (экзистенциальное) пространство, «трансфинитная» (бесконечная) сфера, онтософийный логос творческой личности (см. рис3).

Рис. 3. Феномены, выступающие в качестве императивов оценки и семантической регуляции действий человека в образовательном пространстве культуры


**Бытие-в-себе,** обладающее объективным существованием (объективная реальность – деперсонализированное «Я»). Мир же в целом есть «единство бытия и
небытия». Система, как известно, трансцендентна своим элементам, т.е. обладает такими системными свойствами, которых не только нет ни в одном из её элементов, но которые не могут быть вне системы или из них выведены, например, – социокультурные функции «живых движений» человека. В системах «живых движений» объективные и субъективные феномены не разделены, а существуют в своём единстве, и существовать иначе не могут.


Личностно-сверхличностное Бытие человека, соединяющее все области человеческого существования (включая экзистенцию, трансцендентную и транссубъективную реальность). Трансличностное сознание (метасознание) позволяет человеку выходить за пределы своих видовых потребностей (ведь латинское слово transcendere означает переступать) и становиться Субъектом Мира. Системные свойства Мира как всеобщего единства элементов являются его сущностью – она по своей природе бесконечна, так как не противостоит конечному, а содержит его в себе в качестве своего элемента.

В совместной социокультурной деятельности люди приобщаются друг к другу (резонанс сопричастности) и в то же время они постигают мир, лишь приобщающаяся друг к другу (резонанс персонализации). Это – самодвижение личности в пространстве своей самобытиности (самости), а не управление человеком извне. Все зависит от того, во имя чего используются эти мощные средства и каков путь, метод, стратегия их применения.

Следует, однако, иметь в виду, что креативные личности ориентированы в первую очередь на процесс творчества, а не на результат. В образовательных технологиях должен действовать разработанный нами принцип абсолютности процесса и относительности результата. Акт творчества во многих профессиях должен преобладать над результатом. Человек «вкладывает» (invests) себя в процесс деятельности. Сам процесс созидания привлекает и поглощает его (результат только триггер – «переключатель» на следующее действие). Характерно, что результат творится в процессе самого действия (особенно в действиях художников, поэтов, композиторов, артистов, спортсменов и педагогов) – продукты их труда не могут быть отделены от своего создателя. Они существуют в самом процессе деятельности и входят в структуру «развивающейся личности». Под развитием человека понимается расширение спектра интеллектуальных, соматофизических и

Заключение

Можно полагать, что сделанная в статье попытка онтологического анализа пространства сознания, мышления и социокультурной деятельности открывает «путь к себе» любому человеку-деятелю, – ведь он это homo creacoficus («творящий мудрость»), целая вселенная, а значит, границ для его самосовершенствования не существует. При этом субъекту творчества следует самостоятельно открыть и осознать свою природную связь с собственной (естественной) энтелехией, таким образом как самораскрываться – открываться для себя, так становиться «распахнутым» для всего мира, «вызревать из собственного будущего». Поистине прав был российский поэт серебряного века, утверждая что «счастлив тот, кто точку Архимеда умело скинуть в себе самом» (Ф. Тютчев).

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БИПОЛЯРНОСТЬ И ТРИАДИЧНОСТЬ: КИБЕРНЕТИЧЕСКИЙ ВЗГЛЯД НА ПРОБЛЕМУ

Сергей Николаевич ГРИНЧЕНКО

АННОТАЦИЯ. Констатируется, что термин «биполярность» — семантически внутренне-противоречивая декларация; в действительности мы всегда по умолчанию имеем дело с триадичностью, включающей, помимо «биполярных» оппозиций, ещё и их имmanentную взаимосвязь. Использование термина «биполярность» требует использования расширенной трактовки, в обязательном соотнесении с термином «триадичность».

КЛЮЧЕВЫЕ СЛОВА: биполярность, триадичность, принцип дополнительности, права человека в социуме, обязанности человека в социуме, многомерное самоуправление, эффективность, устойчивость, балансировка

KEYWORDS: bipolar, triadicity, multidimensional self-control, efficiency, stability, balance, sustainable development

SYNOPSIS

The term bipolarity, or opposition, are determined as confrontation and simultaneously interconnection, which contains the inner potential of contradiction, but itself on yourself do not mean encounters or fighting. Already in this explanation easy to reveal the inaccuracy in denomination of itself term bipolarity: are listed not only the contradiction sides, but as well the relationships between them (“interconnection”), that is appear not two (“bi-”) substances, but “tri-”, and speak follows namely about “triplicity” of given object. “Poles” does not exist without connecting them “meridians”!

It is true that “a bipolar system can be immediately extended to a triadic system by considering the intermediate zone” (Kratky 2015: 149).

Another matter, that the substance of two “contradictory” figurants-oppositions” is distinctly different from substance of connecting their third figurant: 1st usually material and relatively easy are observable (computable), but third generally is ideal and directly practically unobservable, because represents cybernetic, or managerial, relationship between two first. Especially informative this

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can be demonstrated by the example of opposition “efficiency – stability” of adequate nature system of hierarchic adaptive search optimization (in engineering terms – extremal control) process of energetic character goal criteria (Grinchenko 2007).

Will lead to several examples of declared bipolarity, but actually triadicity.

Triad 1: “Gold rule” of mechanics, or “lever rule”: a) lose by force – b) win in distance – c) balancing of these phenomena (bi-dimensional regulation: is being implemented proper lever as such).

Triad 2: a) to make something rapidly – b) to make something well – c) balancing (bi-dimensional self-control).

Triad 3: a) live long, but dull – b) live shortly, but interesting – c) balancing (multidimensional self-control).

Triad 4: a) human rights (in society) – b) human responsibilities (in society) – c) balancing (multidimensional self-control in society).

Triad 5: a) efficiency – b) stability – c) balancing (multivariable control).

Easy one can see that all triads, except triad № 1, relate to very complicated objects, within frameworks of which answering "complementarity principle" relationships between "oppositions" weakly formalized and in the best case approximate, and more often just no one knows. The triad № 1 can be seen as extremely simplified model of by such complicated objects. In they the relationship between force and distance is extremely simple, because merges the interconnection “oppositions” – lever ends to proper lever as such.

This already is not telling about triad № 4, which puts in prosenium of analysis triposy of propping problem consisting of bipolarity of rights and responsibilities of human in society plus inseparable interconnection between them. From analysis of this triad clearly one can see that strong unbalance – in that or other side – eliminate the self-control process in society as such. This is dangerous, unless critically, for itself existence last. However, some merge this problem to monopolar problem of "human rights", the inadequacy of what translates the problem from area of scientific knowledge in the field of political propaganda. The alternative pathway evident: they is necessary to generalize the bipolarity, the polar interconnection implying default, up to triadicity, declared obviously. It is clear that this is requesting of research intensification of interconnection peculiarities of oppositions "human rights in society" and "human responsibilities in society" in these or those situations of the civilizations development and evolution.

The triad № 5 it is possible to state and in other edition: a) efficiency (optimality) of development – b) stability – c) permanent balancing of multivariable control into a form of sustainable development. Such version reminds and underlines that the efficiency of one or another control decision does not ensues by the unique determining factor in evaluating of its results: not is less important the coordination of efficiency with stability of newly raised as a result of such decision of structure within frameworks of Humankind's system. Unfortunately, in the practice of management sphere of politic-economic systems, in representing of multiple experts the connective "efficiency-stability" essentially asymmetric. The lion's share of attention is channeled into problematics of improving efficiency, and the stability
problematics of such systems is in, at best, in second plan, during full ignoring their interrelation. Mentioned above theoretical considerations dictate the necessity of cardinal revision of this situation.

Conclusions:
1) term “bipolarity” – semantically internally contradictory declaration; in reality we always default one is dealing with triadicity, including, besides “bipolar” oppositions, also their immanent interconnection;
2) use of term “bipolarity”, clearly, causes misunderstandings, in relation to than is presented to the advisable to recommend to avoid its application, substituting by term "triadicity".

References

РЕФЕРАТ СТАТЬИ
Термин биполярность, или оппозицию, определяют как противостояние и одновременно взаимосвязанность, которая содержит в себе внутренний потенциал противоречия, но сама по себе не означает столкновения или борьбы. Уже в этом пояснении легко выявить неточность в наименовании самого термина биполярность: перечислены не только стороны противоречия, но и связь между ними («взаимосвязанность»), т.е. фигурируют не две сущности («би-»), а «три-», и говорить следует именно о «триадичности» данного объекта. «Полоса» не существуют без связывающих их «меридианов»!
Биполярность не существует без взаимодополняемости, а введение в рассмотрение «зоны между полосами» позволяет расширить биполярную систему до триадической (Kratky 2015: 149).
Другое дело, что сущность двух «противоречивых» фигурантов-«оппозиций» сильно отличается от сущности связующего их третьего фигуранта: первые обычно материальны и относительно легко наблюдаемы (вычислим), а третий обычно идеален и непосредственно практически ненаблюдаем, ибо представляет собой кибернетическую, или управленческую, взаимосвязь между двумя первыми. Особенно наглядно это можно продемонстрировать на примере оппозиции «эффективность – устойчивость» адекватного системе природы процесса иерархической адаптивной поисковой оптимизации (в инженерных терминах – экстремального управления) целевых критериев энергетического характера (Гринченко 2007).
Приведу несколько примеров декларируемой биполярности, а фактически триадичности.
Триада 2: а) сделать нечто быстро – б) сделать нечто хорошо – в) балансировка (двумерное самоуправление).

Триада 3: а) жить долго, но скучно – б) жить коротко, но интересно – в) балансировка (многомерное самоуправление).

Триада 4: а) права человека (в социуме) – б) обязанности человека (в социуме) – в) балансировка (многомерное самоуправление в социуме).

Триада 5: а) эффективность – б) устойчивость – в) балансировка (многомерное управление).

Легко видно, что все триады, кроме триады № 1, относятся к весьма сложным объектам, в рамках которых отвечающие «принципу дополнительности» взаимосвязи между «оппозициями» слабо формализуемы и в лучшем случае приблизительны, а чаще просто неизвестны. Триаду же № 1 можно рассматривать как предельно упрощённую модель таких сложных объектов. В ней взаимосвязь между силой и расстоянием предельно проста, поскольку сводит взаимосвязь «оппозиций»-концов рычага к собственно рычагу как таковому.

Этого уже не скажешь о триаде № 4, которая выводит на авансцену анализа проблему триадичности в составе биполярности прав и обязанностей человека в социуме плюс неразрывной взаимосвязи между ними. Из анализа этой триады ясно видно, что сильные разбалансировки – в ту или другую сторону – элиминируют процесс самоуправления в социуме как таковой. Это опасно, если не критично, для самого существования последнего. Тем не менее, некоторые сводят эту проблему к монополярной проблеме «прав человека», неадекватность чего переводит проблему из области научного познания в область политической пропаганды. Альтернативный путь очевиден: необходимо обобщить биполярность, взаимосвязь полюсов подразумевающую по умолчанию, до триадичности, задекларированной явно. Понятно, что это требует интенсификации исследований особенностей взаимосвязи оппозиций «прав человека в социуме» и «обязанностей человека в социуме» в тех или иных ситуациях развития и эволюции цивилизаций.

Триаду № 5 можно изложить и в иной редакции: а) эффективность (оптимальность) развития – б) устойчивость – в) перманентная балансировка многомерного управления в форме устойчивого развития. Такая редакция напоминает и подчёркивает, что эффективность того или иного управленческого решения не является единственным определяющим фактором при оценке его результатов: не менее важна увязка эффективности с устойчивостью вновь сформированной в результате такого решения структуры в рамках системы Человечества. К сожалению, в практике сферы управления политико-экономическими системами, в представлении многих экспертов связка «эффективность-устойчивость» существенно асимметрична. Львиная доля внимания направляется на проблематику повышения эффективности, а проблематика устойчивости таких систем находится, в лучшем случае, на втором плане, при полном игнорировании их взаимосвязи. Упомянутые выше
теоретические соображения диктуют необходимость кардинального пересмотра этой ситуации.

Выводы:

1) термин «биполярность» – семантически внутренне-противоречивая декларация; в действительности мы всегда по умолчанию имеем дело с триадичностью, включающей, помимо «биполярных» оппозиций, ещё и их имманентную взаимосвязь;

2) использование термина «биполярность», очевидно, приводит к недоразумениям, в связи с чем представляется целесообразным рекомендовать избегать его применения, замения термином «триадичность».

Литература


ОСНОВНОЙ ТЕКСТ СТТЬБИ

В публикации «Биполярность и триадичность в различных контекстах» её автор К.Кратки отмечает, что биполярность не существует без взаимодополняемости, а введение в рассмотрение «зоны между полюсами» позволяет расширить биполярную систему до триадической (“a bipolar system can be immediately extended to a triadic system by considering the intermediate zone”; [Kratky 2015: 149]). Откликаясь на призыв главного редактора журнала “Biocosmology – neo-Aristotelism” продолжить обсуждение данной, насущной для БКА, темы [Хруцкий, 2015], хочу привести дополнительные соображения в поддержку такой позиции, базирующиеся в первую очередь на формализованном информатико-кибернетическом взгляде на Мироздание [Гринченко 2007, 2010].

Предварительно стоит указать, что расширенная трактовка биполярности не нова, и термин биполярность, или оппозицию, именно так и определяют: «противостояние и одновременно взаимосвязанность, которая содержит в себе внутренний потенциал противоречия, но сама по себе не означает столкновения или борьбы» (Wikipedia). Уже в этом пояснении легко выявить существенные особенности в определении термина биполярность: здесь перечислены не только стороны противоречия, но и связь между ними («взаимосвязанность»), т.е. фигурируют не две сущности («би-»), а «три-», и говорить следует именно о «триадичности» данного объекта. «Полюса» не существуют без связывающих их «меридианов»! В свою очередь, как можно сразу отметить – «экватор» между полюсами, осуществляя свое срединное равновесие, равным образом в состоянии достигать равновесной гармонии («золотой середины») только за счет одновременного (равноценного) использования средств с обоих полюсов. Другими словами, «экватор» («золотая середина» – любой актор,
устанавливающий параметры существования данного субъекта жизни) – в принципе не может обходиться (невозможен) без полюсов, т.е. биполярности в чистом виде, выражающейся в автономном самодостаточном существовании полюсов.

Принципиально, что сущности двух «противоречивых» фигурантов-оппозиций и сущность связующего их третьего фигуранта являются, с одной стороны, автономными и независимыми (в своей организации) друг от друга; но с другой стороны – они (все три) равнозначны в своем существовании (в своей отдельной сущности), т.е. «триедины» – каждый невозможен в своем (динамичном) существовании без одновременной активности двух других. Таким образом, они (все три) в равной мере обладают (но различной) материальной и нематериальной, наблюдаемой и вычислимой, а также возможностями к эмпирическому наблюдению и исследованию, и к теоретическим концептуально-конструктивным построениям. Триадические характеристики анализируемых трех типов в организации как любых жизненных процессов, так и любых процессов познания приведены в работах К.С. Хруцкого [2014, С. 507–509; Khroutski, 2013, pp. 43–45].


Более того, следует иметь в виду, что в любой достаточно сложной природной (самоуправляющейся) системе её биполярные «оппозиции» находятся в антагонистических отношениях, фактически в состоянии «единства и борьбы противоположностей». Указанное свойство называют «принципом дополнительности» (“principle of complementarity”): «Дополнительность – это когда две или несколько величин (множеств) вместе составляют одно целое... Двойственность противоположностей, или антиномичность неразделимых вещей, событий и мыслей, действительно пронизывает всю нашу жизнь» [Арманд, 2007: 477–478]; «Адекватным является такое представление о мире, согласно которому материя и сознание (материя и дух, материальное и идеальное) сосуществуют по принципу дополнительности и несводимы друг к другу. Последнее обеспечивает не только единство бытия, но и единство познания и существования» [Лисин 1999: 796]; «И принцип дополнительности, и соотношение неопределённостей, и вероятность, выполняют различные

2 В данном контексте, термин «субъект» используется в классическом (античном, Аристотелевском значении), т.е. означает не сознание мыслящего индивида (как это принято в модерне), которому противостоят мир всех других существующих материальных предметов, включая и всех других мыслящих субъектов; но как раз мир всех реально существующих (органических) вещей, имеющих собственное «подлежащее» – движущие основания каждого данного реально существующего индивидуального образования (от молекулы до организма, человека, общества, био- и ноосферы).
функции, представляют собой специфические проявления идеального свойства материи (т.е. являются различными видами идеального)» [Лисин, 2012: 374].

Приведу несколько примеров декларируемой биполярности, а фактически триадичности.

Триада 1: «Золотое правило» механики, или «правило рычага»: а) проигрываешь в силе — б) выигрываешь в расстоянии — в) балансировка этих явлений (двумерная регулировка: реализуется собственно рычагом как таковым).

Триада 2: а) сделать нечто быстро — б) сделать нечто хорошо — в) балансировка (двумерное самоуправление).

Триада 3: а) жить долго, но скучно — б) жить коротко, но интересно — в) балансировка (многомерное самоуправление).

Триада 4: а) права человека (в социуме) — б) обязанности человека (в социуме) — в) балансировка (многомерное самоуправление в социуме).

Триада 5: а) эффективность — б) устойчивость — в) балансировка (многомерное управление).

Легко видно, что все триады, кроме тирады № 1, относятся к весьма сложным объектам, в рамках которых отвечающие «принципу дополнительности» взаимосвязи между «оппозициями» слабо формализуемы и в лучшем случае приблизительны, а чаще просто неизвестны. Триаду же № 1 можно рассматривать как предельно упрощённую модель таких сложных объектов, в которой взаимосвязь между силой и расстоянием предельно проста, поскольку сводит взаимосвязь «оппозиций» — концов рычага к собственно рычагу как таковому. Эту триаду приведена здесь лишь для иллюстрации самой идеи явления.


Этого уже не скажешь о триаде № 4, которая выводит на авансцену анализ проблему триадичности в составе биполярности прав и обязанностей человека в социуме плюс неразрывной взаимосвязи между ними. Из анализа этой триады ясно видно, что сильные разбалансировки — в ту или другую сторону — элиминируют процесс самоуправления в социуме как таковой, что опасно, если не критично, для самого существования последнего. Тем не менее, большинство западных (и примкнувших к ним) деятелей сводят эту проблему к монополярной проблеме «прав человека», неадекватность чего переводит проблему из области научного познания в область политической пропаганды. Альтернативный путь очевиден: необходимо обобщить биполярность,
взаимосвязь полюсов подразумевающую по умолчанию, до триадичности, задекларированной явно. Понятно, что это требует интенсификации исследований особенностей взаимосвязи оппозиций «прав человека в социуме» и «обязанностей человека в социуме» в тех или иных ситуациях развития и эволюции цивилизаций.

Особый интерес представляет триада № 5, которую можно изложить и в следующей редакции: а) эффективность (оптимальность) развития – б) устойчивость – в) перманентная балансировка многомерного управления в форме устойчивого развития.


Как указывалось выше, в любой достаточно сложной самоуправляющейся системе её эффективность (оцениваемая в объективном энергетическом смысле) и устойчивость (способность системы сохранять текущее состояние при наличии внешних воздействий) находятся, следуя «принципу дополнительности», в антагонистических отношениях, фактически в состоянии «противоборствующего единства». Как указывает Н.Н.Моисеев, «…устойчивость, доведенная до своего предела, прекращает любое развитие» [Моисеев 1987: 43]. То есть оптимальное состояние любой такой системы является – точнее, должно являться в тенденции! – гармоничным компромиссом между проявлениями её эффективности и устойчивости.

Кибернетический подход к проблеме дополнительности известен. Так, Л.А.Растригин и В.А.Марков указывают, что «... противоположности переходят друг в друга. За случайностью скрывается необходимость. Но этого мало. Оказывается, чем больше случайностей, тем ближе мы подходим к объективной истине, к необходимости... Блестящий урок диалектики даёт кибернетика!»

³ См.: Википедия – https://ru.wikipedia.org/

Здесь уместно пояснить, что экстремальное управление осуществляют в условиях неопределенности в отношении поведения объекта управления, решая в общем случае как задачу «поиска» – реализации перемещения к области экстремума в пространстве регулируемых координат (при наличии помех, возмущений и инерционности объекта оптимизации), так и задачу организации устойчивого движения («рысканий») системы вблизи точки экстремума. В наглядных образах: повышение точности определения точки экстремума – т.е. повышение эффективности поиска – приводит к уменьшению размера области экстремума, что увеличивает возможность внешним воздействиям «выбить» систему за пределы этой области, т.е. уменьшает системную устойчивость.

Таким образом, триада № 5 напоминает и подчёркивает, что эффективность того или иного управленческого решения не является единственным определяющим фактором при оценке его результатов: не менее важна увязка эффективности устойчивостью вновь сформированной в результате такого решения структуры в рамках системы Человечества (или соответствующих её подсистем).

К большому сожалению, в практике сферы управления политико-экономическими системами, в представлении многих экспертов связка «эффективность-устойчивость» существенно асимметрична. Львиная доля внимания направляется на проблематику повышения эффективности, а проблематика устойчивости таких систем находится, в лучшем случае, на втором плане, при полном игнорировании их взаимосвязи. Упомянутые выше теоретические соображения диктуют необходимость кардинального пересмотра этой ситуации.

**Выводы**

1) термин «биполярность» – семантически внутренне-противоречивая декларация; в действительности мы всегда по умолчанию имеем дело с триадичностью, включающей, помимо «биполярных» оппозиций, ещё и их имманентную взаимосвязь;

2) использование термина «биполярность», очевидно, приводит к недоразумениям, в связи с чем представляется целесообразным рекомендовать избегать его применения, заменяя термином «триадичность».
Благодарности
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Литература
RESEARCH ON MARX’S THEORY OF RELATIONSHIP BETWEEN HUMAN AND NATURE

Shang Li

ABSTRACT. The relationship between human being and nature has long been an important problem, which has drawn a lot of attention. Currently, with the rampancy of the capital and the rapid development of economics, contradiction between human being and nature has risen to a prominent position. Absorbing the essence of Aristotle’s teleological Naturalism, Hegel’s objective idealist view of nature and Feuerbach’s humanist view of nature, Marx systematically discussed his theory of the relationship between human being and nature in German ideology and Manuscript of Economics and Philosophy in 1844. In Marx’s theory, nature, as an inorganic body of human being, is unified with human’s practice. However, in capitalist society, alienation has alienated the harmony relationship. This is an undeniable fact, which has been testified by environmental reality and ecological practice. Marx believes that communism and a way of existence that follows aesthetic law could be the solution to the problems mentioned above. Nevertheless, facing with the quickly changing social reality, we cannot solve the urgent problem of environment by the design of regime. Thus, post-modern thinkers add critique of modernity to Marx’s theory and emphasize that organic agriculture and education can serve as a new way to solve the problem. Therefore, this research focuses on the relationship between human being and its development in current society. The present author believes it has necessity and significance.

KEYWORDS: Marx; Human Being and Nature; Organic, Organic philosophy, Marxism

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1. Theoretical Resource of Marx’s theory of Relationship between Human and Nature
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1. THEORETICAL RESOURCE OF MARX’S THEORY OF RELATIONSHIP BETWEEN HUMAN AND NATURE

Marx’s theory of nature is an important part of Marx’s philosophy. Its formation is not only the production of practice of proletarians, but also the achievement of human culture. Marx critically inherits teleological naturalism of Aristotle and German ideology. He rectified the reversed relationship between human, nature and reality in Hegel’s philosophy. Thus a philosophical revolution happened on the view of nature.

1.1. Teleological Naturalism of Aristotle

Aristotle's influence on Marx's view of nature is very profound. But it is seldom mentioned in the study of Marx's theory. Ancient Greek culture occupies an indisputably important position of German humanism in the 18th century. Mewes says, “As the key ingredient preserved in Marx’s theory, there are reasons to do further research on the relationship between Marx and the Greeks.”\(^2\) Marx admires Aristotle most among numerous ancient Greek philosophers. In the very beginning of his doctoral dissertation, Marx honored Aristotle as “King Alexander in Greek philosophy”. Meanwhile, he wrote to Lassalle in a letter in 1857: “thanks to your Heraclitus, I have a long interest in this philosopher, and I think he is second only to Aristotle in terms of importance”\(^3\) Thus, we can speculate that the formation of Marx's thought is deeply influenced by Aristotle.

Specifically, Marx’s theory of nature mainly benefits from Aristotle in two aspects. One is his adherence to Aristotelian inductive-deductive methodology by following Grosseteste. Professor Mike Neary discussed it in his article *Student as Producer*. He quoted McEvoy’s words: “Following Aristotle, the basis of Grosseteste’s method is in making a connection between the powers of observation-induction to discover the real substance of things in response to practical matters and the deductive powers of metaphysics: imagination and intuition.”\(^4\) It makes Marx form an integralism ontology, which gives Marx’s conception of nature both in metaphysics and practice. Professor Konstantin Khroutski believes that Marx equally takes the means from both Plato’s pole and Aristotle’s for his ‘uniting the opposites’ in realizing specific conceptual constructions. Two basic conceptions of Marx can directly prove the conclusion. Matter is a metaphysical conception, which is reduced to Plato’s pole of rationality. However, when it comes to reality, confronting with human, it changes to humanized nature in Marx’s conception system. Thus, Matter in metaphysical dimension is given a practical dimension, which relies mainly on the methodology of Aristotle.

The other one is teleological naturalism of Aristotle. Aristotle views nature, which drives the internal changes in natural substance, as the origin of natural

substance. In a bio-cosmological perspective, it can also be viewed as a burgeoning seed inside of the nature. In Aristotle’s view of nature, there are four causes: material cause, formal cause, efficient cause and purpose cause which make nature exist and transform. This theory also influenced Marx greatly. He regards nature as inorganic body of human. That is to say, nature is not only the material, which can be used to benefit human practice, but also the inorganic form of human, and the intention of our existence. Moreover, nature definitely promotes the development of human being. This topic will be discussed in the following section of this paper.

1.2. Hegel’s Objective Idealist view of nature
Marx critically inherits Hegel’s view of nature. Hegel is the synthesizer of classical German philosophy. He points out in *Philosophy of Nature*:

*Nature has presented itself as the idea in the form of otherness. Since in nature the idea is as the negative of itself or is external to itself, nature is not merely external in relation to this idea, but the externality constitutes the determination in which nature as nature exists.*

Marx acutely criticized the essence of Hegel’s philosophy and his idealist view of nature. He thinks that Hegel views nature as the externalization of transcendent spirit. Marx argues in *Manuscript of Economics and Philosophy in 1844*: “As for him, the whole natural world is just the abstraction of logic under the appearance of perception.” In Marx’s perspective, Hegel only unified human and nature in conceptual system. He points out it would lead to a degradation that realistic human and nature behave as the predicate and symbol of unrealistic human and nature. Although Marx criticized Hegel’s view of nature, he absorbed positive factors from it. The reasonable core of Hegel’s view of nature is that he regards nature as an organic entity, which changes continuously. Marx follows the dialectics of Hegel but starts with material world and human practice, overcoming the top-heavy drawbacks of Hegel’s philosophy.

1.3. Feuerbach’s humanist view of nature
Feuerbach admitted the existence of nature and its objectivity. He thinks that nature can exist without any spirit. Human being is the production of nature. They live on nature with perceptive practice. It breaks the hedge of German Idealism, and provides a humanistic base to Marx’s theory. Marx’s conception of unrestrained nature and humanized nature directly derives from Feuerbach. He highly praised Feuerbach’s work. According to Marx, “Feuerbach creates practical humanism and natural critique. The fewer response his works get, the deeper he influences us.”

However, Marx criticized that Feuerbach separated social history with nature. In

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Feuerbach’s theory, nature only has its biological significance and lost its historical meaning. He said, “As a materialist, Feuerbach throws history out of his vision. When he discusses history, he is not a materialist. In his theory, materialism and history separate with each other.”

2. HUMAN AND NATURE ARE UNIFIED

2.1. Human and Nature Are Unified Essentially

Marx first elaborates his theory of relationship between human and nature in his *Manuscript of Economics and Philosophy in 1844*. In his opinion, since nature comes into being before human being, human being is born in the nature. He states:

“Nature, which is not human's organic body, is the inorganic body of human. People depend on nature. That is to say, nature is the body of human that maintains his existence. It also contains the interaction between human and nature.”

Marx views the organic body of human as the sublimation of inorganic body. This process is gradually completed in the interaction between human and nature, which is also an organic one that human and nature coexist in ecological community. Among them, nature as human's inorganic body is the material basis of human's reproduction. On the other hand, human beings develop and perfect themselves in the process mentioned above. From a metaphysical point of view, nature is a process of organic connection in essence; both human and nature occupy a certain period of time and a square of space, whether human history or natural history is a four-dimensional manifold, because the abstract nature is nothingness. From the perspective of human practice, the history of evolution from Australopithecus to Homo sapiens is a process starting from scratch, developing into junior and senior stage gradually. Additionally, with the growth of human capacity and ever increasing productivity, small settlement in early centuries of human being has developed into a large society with numerous villages, cities and metropolises in it. However, human’s achievements are not the results of the natural evolution of human being itself. Its life, culture, technology and art are imitation of the natural phenomena or other species. Ancient Greek philosopher Democritus also said:

“Human learned weaving from spider, studied singing from swan and the nightingale, emulated building house from swallow. We are the students of other species, and this is a very important fact.”

Therefore, in the interaction with the myriad kinds of plants and animals, human beings formed their own body shape, thinking mode and cultural direction, all of

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which are characteristics distinct from other animals. This is what Marx called the inorganic body: nature has a generative effect on human being. In other words, through practical activities with other animals and plants, it formed a harmonious ecosystem and ecological relationship. Marx believes that without nature and emotional world, workers cannot create anything. It is the material that workers use to achieve their own labor. In the nature, workers work out their own product. As a result, human beings have constructed a historical connection with the production of consumption goods, and the nature appears to have added the meaning of the human practice. In Marx's theory, the basis of the unity and contradiction between human and nature is practice. But human and nature are not directly the same. The existence of human is different from that of animal in that it is the intrinsic power of human being with an aim of human itself. Since the nature is a flawed existence, it cannot recommend itself to people. Human's survival and development can only depend on the productive practice. Therefore, the relationship between human and nature in Marx's theory is unified and harmonious. Human and nature share the same breath. They have a common destiny, which is included in a developing community. Besides, only for the commonwealth of human and nature can we create a harmonious ecological system and environment by human practice.

### 2.2. Human and Humanized Nature Are Unified since Human Was Born

Marx develops the theory of the relationship between human and nature in another important book “German Ideology”. And he examined the relationship between human and nature from the perspective of historical materialism and practical theory. He takes the human's emergence as the boundary and human practice as the standard, and divides the nature into unrestraint nature and humanized nature. Marx thinks that humanized nature is occupying an absolute position in the current world.

> “The perceptual world around us is not a consistent thing existing since dawn, but a production of industrial and social condition, a production of history and a result of generations of industrial activities.”

At the same time, he does not deny that unrestraint nature exists, because the nature prior to the human history is not the nature, which Feuerbach experienced. Except for new coral island in Australia, we can no longer find any unrestraint nature in the world. Thus, to Feuerbach, there is no nature. Therefore, the humanized nature is regarded as all practical activities and the whole world and the whole history which human creates. It is the actual state since human being emerges. Meanwhile, Marx also admits the existence of unrestraint nature though people in current world

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cannot experience it.

Marx does not simply separate nature into the two disjunctive stages, but regards the development of nature as an organic conjunctive process, which is brunched by human and its practical activity. In Form, it is emphasized that human being comes from nature:

“The first thing needs to be confirmed is the fact that these individuals' physical organization and the relations between individual and other nature... (it) not only determines the initial structure of the body that developed naturally, especially the racial difference between them, but also decides whether the whole body should further develop or not.”16

At the same time, Marx also points out that under the basis of human knowledge and practice, unrestraint nature can transfer into humanized nature. That is to say, nature is the material basis of human knowledge and Practice. In Form, Marx stresses the importance of human practice and the practical significance of humanized nature. He considers the real nature as humanized nature. It is the nature that generated in the history of human society. Without the relationship which has rendered human activity as an intermediary between human and nature, nature will lose its meaning of existence under the value of human life. “The first historical activity of the human being is material production itself.”17 Material production is the basis of all history, and it is also a symbol of human being, “human begins to distinguish himself from animals as he begins to produce his own material, which is determined by their physical body.”18 With the deepening of the process of human history and the development of human material production, nature is increasingly penetrated by the factor of human being, imprinted with human activities and becomes associated with human being. Therefore, the relationship between human and nature has its sociality and historicity, human and nature are united in the mutual restriction between human's natural relations and social relations. These two kinds of relations also contain each other. If one leaves, the other will no longer exist.

3. ALIENATION BETWEEN HUMAN AND NATURE
3.1. Alienation in Capitalism Broke the Unity of Human and Nature
Marx thinks that alienated labor makes the body of human, the nature, the spiritual essence and the human nature alienated with human itself.19 Labor is a confirmation of the objectification of human nature. He points out:

“It is in the transformation human beings prove that they are kind of existence. This kind of production is a kind of human activity.”20

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However, under the condition of capitalism, the expression of human nature is alienated labor, which is out of human’s control and in turn controls him. When human activities and work products have become the alienated nature of human, it shows that when human alienate from his human nature, he has been alienated from nature. Therefore, alienated labor is the source of disharmony between human and nature. Thus, alienated labor seized the production of workers and captured their kind of life. A person who lost his kind of life cannot be called a real person. Originally, laborer as human is an important composition of nature. However, the emergence of alienated labor separated human from his production. As a result, the relationship between human and nature is also alienated. In this case, the more human changes the nature through his power, the more he will be restraint by the nature.

“The direct result of the human's alienation with his production, his living activities and his kind of nature is that human alienates with human.” Therefore, under the condition of capitalism, the alienation among humans interacts with the alienation between human and nature. As professor Zhang Shuguang pointed out:

“Alienation of private ownership society appears to the alienation of labor and alienation between the laborer and the capitalist. It also reflects the alienation of society and civilization. In a society based on the natural formed specialization of labor, society divides itself. Human is hostile to each other. Nature is regarded as a useful objection which has no sense of beauty given by aesthetic activities of human. It also reflects the fundamental defect of the 'culture' of the private ownership.”

3.2. Example

When Marx was still alive, the environmental problem had been severe. London is a typical example. New energy like coal and gas provided a large portion of power to Industrial Revolution in Victoria ages. According to statistics, in the 19th century, London held the largest number of workers who were working in productive industry. GDP doubled during that period. Average growth rate reached a record high at 2.5%. However, behind the flourishing of economics, it was companied by the deterioration of relationship between human and nature. Ecological system was severely destroyed. This can be viewed as a counterattack of destructive human practice. London suffered a lot from the frog at that time because the city is constructed at the downstream of river. It was the smog and chemistry, which discharged by the factories in London, polluted the air in the city. As a result, the stinking yellow smog shrouded the city. According to another statistic, it emerged a 4 days’ frog in January 1880. The frog led to the death of 700 people. Engels

described the miserable living standard after Industrial Revolution in his early work, *The Condition of Working Class in England*. He said that there was a lot of rubbish in the street.

"Without drains, polluted water converged at the pit on the street. Even worse, disorderly buildings without reasonable planning hindered the flow of wind. Thus the living condition in worker’s region could be imagined."26

Meanwhile, alienation between human and the nature appeared more obvious, which can be seen clearly from the shortage of nature resources. The rampancy of capital expanded human’s ambition. Numerous forest and animal were forced to devote their lives to the development of capitalism. Owing to the great demand from the industries, such as furniture and architecture, three blocks of forest were cut down in the first two decades of the 20th century. Besides, local timber resources could not support the growth of British economics. Capitalists of England started to invade into other economic entities. Take India as an example, until 1866 coastal region of India were set up hundreds of plantations while local forest had almost disappeared. A lot of species died out in these areas.

4. RETURN TO THE HARMONIOUS RELATIONSHIP BETWEEN HUMAN AND NATURE
4.1. Utopia of Marx
a. Communism

Marx believes that the contradiction between human and nature cannot be solved in the era of private ownership. From the perspective of capitalism, in order to make profit, capitalists took all the advantages of industrial and technical elements to exploit and occupy the nature. In this historical condition, relationship between human and nature was destructed in a considerable degree.

How to deal with the problem of alienation? Marx shifts his hope to the communism. What is the communism? Marx believes that communism is to sublate private property, which represents the alienation of human. Once the private property and alienated labor are discarded, the unity of human and nature could be more likely to achieve. He further explains that this type of communism is the unity of completed naturalism and humanism. This is the utmost solution to the contradiction between human and nature.27 Engels also certified this opinion in *Dialectics of Nature*. He said that relying on knowledge is far from enough; we need to change our mode of production as well as the whole social system.28 Marx and Engels aim at revolutionizing the capitalism society. They believe the above-mentioned way is the fundamental method to promote the compromise of human and nature.

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b. A Way of Existence, Forming Objects in Accordance with The Laws of Beauty

Marx points out in *Manuscript* that admittedly animals also are capable of producing things. They build nests, dwellings for themselves, like the bees, beavers, ants, etc. But animals only produce what they need immediately for themselves or their offspring. They produce one-sidedly, whilst human produce universally. Animal produce only out of immediate physical need, whilst human produce even when he is free from physical need and only truly produces in freedom therefrom. An animal produces only for itself, whilst human can reproduce the whole of nature. An animal’s product belongs directly to its physical body, whilst human confronts his product freely. The form an animal produces only in accordance with the standard and the need of the species to which it belongs, whilst human knows how to produce in accordance with the standard of every species, and knows how to apply the inherent standard to the object at its will. Human, however, can design objects in accordance with the laws of beauty.  

Professor Zhang Xiuhua believes that forming objects in accordance with the law of beauty is a way of existence, which calls on the construction of ecological civilization. It also provides a basis to the construction of ecological civilization under the perspective of survivalism. Professor Zhang views the activity of forming objects as engineering. She believes that engineering is an existing way, which promotes the transforming from unrestraint nature to humanized nature. Therefore, engineering, nature and human being can reinforce each other and make the construction of ecological civilization possible. Hence ecological construction is an important way of solving the alienation between human and nature. In other words, forming objects in accordance with the law of beauty can promote the harmonious development of human, engineering and nature.

4.2. New Solution to Current Circumstance-Organic Marxism

Organic Marxism can also be referred to as Process Marxism. Considering current environmental problems presented in newly developing non-capitalism country such as China and India cannot be solved only by the explanation of alienated labor in the capitalism condition, contemporary post-modern thinkers combined Marx’s theory and organic philosophy, made a new interpretation of Marx’s theory of nature. The author holds the opinion that Organic Marxism has a far-reaching meaning on reshaping the harmonious relationship between human and nature.

A. Fundamental Theory

a. Critique of Capitalism

Organic Marxism believes that what divided capitalism society are not only the unjust treatment to laborer, but also the widening gap between the rich and poor. Moreover, it also endangered the existence of the earth. Philip Clayton, the executive

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president of process study center in America, thought that capitalism, as a social economic institution produced a lot of unfairness and injustice. It also destroyed the environment of the earth.\textsuperscript{31} According to Marx’s theory, the development of capitalism economy embodies the huge accumulation of commodity, which has a cost of sacrificing the environment. More significantly, developed counties usually plunder the natural resources in southern countries other than that of theirs, it just like the situation India faced as mentioned above.

\textbf{b. Critique of Modernity}

Organic Marxism’s critique of modernity has inherited the critical tradition of Marx. It is argued that only the criticism of capitalism system cannot explain the new situation, which is the also the fundamental reason for the crisis of modern civilization and the alienation between human and nature. David Griffin, a famous American scholar, regarded technology as the core of modernity.

\textit{“Technology has produced tens of thousands of nuclear warheads that can destroy the earth. The distribution of wealth and the billions of poverty population are in danger.”}

He stressed that we must abandon the modernity; otherwise most lives on the earth will not be able to escape the fate of destruction.\textsuperscript{32} What worth mentioning is that most livings Griffin mentioned here, not only confines to human beings, it also includes all other living forms on the earth. The purpose of Organic Marx is to achieve the common wealth of human. They emphasize the organic connection between all livings and care about the development of all individuals in the community.

\textbf{c. Advocate the Organic Holism}

Anthropocentrism and environmentalism are two opposite theories, which discussing the relationship between human and nature. Organic Marxism reckons universe as an organic entirety, which is undergoing dynamically development. Human and nature mutually rely on each other. Only when human starts to cooperate with other species, is it possible to develop a harmonious relationship between human and nature.\textsuperscript{33} At the same time, the organic holism emphasizes the equality, which takes the value of each species into account. This equality is not absolute, but the equality is shared in terms of status. The author believes this theory can promote the compromising between unrestraint nature and humanized nature, and dispel the alienation between human and nature from capitalism and modernity. Moreover, it can provide an ideological basis to the construction of a new relationship between human and nature.

\textsuperscript{33} Wang Zhihe,Yang Tao. \textit{Organic Marxism and Its Contemporary Significance.} Marxism and Reality. 2015(1)
d. Emphasize Organic Education and Agriculture

Organic Marxism thinks highly of agricultural civilization. They regard countryside as a fertile soil, which can cultivate the ecological civilization. John Cobb, a famous American thinker, thought that ecological civilization is connected by the sustainability of environment. It can protect the residents living in the society from suffering from hazards. Nevertheless, the basic factor of security is food safety. Therefore, civilization should be built on the basis of the development of agriculture.\(^{34}\) That is to say concerning agricultural society first. Specifically, Organic Marxism puts forward some feasible methods. They call on implementing Eco-Agriculture in small community and construct several organic family farms with high efficiency and diversity.\(^{35}\) Finally, a post-modern New Countryside, which is environment-friendly and resources saving could be constructed. Traditional Chinese philosophy is also taken into account. Learning from Mencius, they stressed that one should follow the rule of nature. Mencius once said that if farmers do things according to the change of nature, a harvest would come in the end. When fishing, if one can put away his greed and use a relatively sparse fishing net, fishes cannot be killed out.

Besides, the organic education is another key point of Organic Marxism. Professor Philip Clayton believes that only education can make a perfect fusion of personal and public interests. The function of education must be taken into consideration, namely the students should set up a value that all life is symbiotic. They share the distribution of resources and opportunities collectively and equally. He said,

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\text{“The idea of ecological civilization must be rooted in teenage, otherwise, this idea will not be possible to establish and develop in the future, or cultivate profound value reflection and positive spirit of education reform which will help to shape the common values of future citizens”}.\(^{36}\)
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Therefore, the author believes that organic education can establish the concept of harmony between human and nature and correct the inherent ideology of Binary Opposition of human and nature. Only by opening our mind, can we save the nature from the extreme value of Anthropocentrism and mechanism.

B. Advantages and Disadvantages

In conclusion, Organic Marxism inherited Marx’s critique of capitalism. It absorbed the basic ideas of contemporary ecologic theories such as Gaia doctrine, doctrine of a new era and theory of rich corner, transferred the object of criticism to modernity which opens up a new way for understanding the nature under the perspective of process. In addition, it also has made outstanding contribution to


Marxism. In practice, ecological agriculture and organic education have been built in Claremont, a post-modern ecological agricultural town, which provides experience and lesson to the subsequent construction of ecological civilization.

However, it is still too early to apply Organic Marx to the construction of ecological civilization in China.

First of all, Organic Marxism is idealism. Its critique of modernity is based on the criticism of modern technology. The rebellion of science and technology will subject to strong resistance from many aspects, such as politics, economy, culture, etc. At the same time, Organic Marxism emphasizes poetic dwelling, however, driven by the individual value and life style, social reform will encounter failure in face of the problems put forward by the strong enterprise controlled by the government and capitalists. It is decided by the present stage of the complex social environment, also it stands at the contrary of the famous words of Marx, “science and technology are the first productivity.” Therefore, whether in China, the United States or other developed capitalist countries, the goal is difficult to be achieved in a short term.

Secondly, China has a large territory. Its terrain is rather complicated. The agricultural model differs from village to village. Large-scale mechanized agriculture in Northeast China Plain and North China Plain is obviously different from the small-scale family farming in southwest mountainous area. Agriculture in the oasis in Xinjiang Autonomous Region is also distinct from coastal aquaculture industry. What's more, crop farming in mainland area differs from animal husbandry in minority concentrated region. Obviously, there is a huge difference between these areas. The ecological agriculture, which is advocated by Organic Marxism scholars, is based on the experience of the agricultural practices of small communities in the United States. It is not generally feasible to a wide variety of agricultural models in China.

Finally, the economic development situation of China is not the same as that of the U.S., China is still growing rapidly, the value orientation of people affected by the capital and market has been changing towards consumerism and materialism. The changing of the state of mind of people would not finish in a short period of time. Whether organic education can make the Chinese people understand the harmonious relationship between human and nature also need to be further examined. Therefore, although Organic Marxism is a new theory advocated to solve the alienation between human and nature, it has incomparable advantages. But there are still many problems and limitations, which still need to be developed through continuing practice.

5. CONTEMPORARY SIGNIFICANCE OF RE-THINKING THE RELATIONSHIP BETWEEN HUMAN AND NATURE

a. Help to Deal with Environmental Problems and Ecological Destruction

Re-thinking the relationship between human and nature is helpful for people to return nature. Recognizing the value of nature is the premise of protecting nature. Dealing with the environmental problems is closely linked with the interests of human being, which is one of the major causes of environmental problems. Marx clearly points out the harmonious unity between human and nature in Manuscript. He
emphasizes that human is a part of the nature. Therefore, it is necessary to realize the necessity of environmental protection, and then follow the laws of nature to protect the natural environment for human being to survive. Natural protection can not only conserve soil and water, but also provide habitats to wildlife. Besides, it has a very high practical significance in maintaining ecological balance and species diversity. What should be noticed is that the relationship between human and nature advocated by Marx is not to deny the right of human beings. Protecting the environment not only can make people receive the aesthetic enjoyment, but also can improve the production efficiency.

**b. Benefit to the Solving of the Problems Caused by Urbanization**

City is one of the main forms of human settlement. The development of human settlement has experienced the process from nature to the countryside, then to the city. In primitive society, human and nature enjoy a close relationship. Hunting and fishing did not cause damage to the environment where ecological balance was well maintained. However, with the development of productivity, human settlements become much more complex. Air pollution, wasting of resources and tension of housing conditions, as well as the deterioration of human living conditions, are all closely linked to the process of urbanization. Therefore, a rational understanding of the relationship between human and nature and the recognition of the value of nature, are conducive to the prevention of the nature, which would consequently not be totally occupied by cities.

**c. Provide Theoretical Basis for the Construction of Ecological Civilization**

Differing from the value of traditional industrial civilization, ecological civilization is based on the harmonious relationship between human and nature. Harmony is the fundamental principle of the civilization, which advocates moderate consumption and spiritual enjoyment. It has a prime principle of transforming people’s values and modes of thought. It requires human beings to form objects in accordance with the law of beauty, which is a reasonable lifestyle of connecting human, nature and engineering. Therefore, it can be said that Marx's theory of relationship between human and nature provides a solid theoretical foundation for the construction of ecological civilization.

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ОТЗЫВ НА СТАТЬЮ К.С. ХРУЦКОГО
ПЕРЕЧИТЫВАЯ «ОТВЕТ МОИМ КРИТИКАМ»
П.А. СОРОКИНА: К ВОПРОСУ О РЕАБИЛИТАЦИИ
ТРИАДОЛОГИЧЕСКОГО МЕТОДА В ДИНАМИЧЕСКОЙ
ЦИКЛИЧЕСКОЙ ТЕОРИИ ВЕЛИКОГО УЧЕНОГО

Владимир Н. АЛАЛЫКИН-ИЗВЕКОВ

Автор обозревает социокультурную вселенную «Ломоносова двадцатого века»
и ставит своевременную задачу как восстановления истинного смысла его
оригинальных концепций, так и привлечения внимания к произошедшему с
течением времени, а потому оказавшимся как бы «вне поля зрения»
изменениям в базовых исследовательских установках учёного.

На основе тщательного анализа как известных работ, так и новейших
переводов избранных трудов российско-американского мыслителя, автор
совершенно обоснованно выдвигает тезис о том, что, с точки зрения
Биокосмологического подхода, П.А. Сорокин является (в полном соответствии
с отечественной культурной традицией) — ярким представителем
Аристотелевского телеологического натурализма — как всеохватывающей
(супер)системы знаний (Биокосмологии) и существующего во все времена Типа
рациональности (научного Органицизма).

Продолжающей предыдущую и совершенно справедливой является и
мысль о том, что П.А. Сорокин является видным представителем русской
культурной традиции (с ее школами русского космизма, органицизма,
функционализма, циклизма, пульсационизма) — являясь современным (новым
ярким) проявлением этого (РеалКосмистского) Типа рациональности.

В работе подробно и критически анализируются сделанные П.А.
Сорокиным в «Ответе моим критикам» выводы и даётся оценка его
dинамической циклической теории в целом, в первую очередь акцентируя
внимание на фундаментальной (прорывной, революционного значения)
Триадологической концепции П.А. Сорокина, раскрытой им главным образом в
«Социальной и культурной динамике» (1937–1941 гг.).

Прозорливо и смело расширяя горизонты общепринятых социокультурных
представлений, автор говорит о том, что современный человек и общество
давно уже фактически находятся в эпохе Интегрализма.

Позитивно и смело расширяя горизонты общепринятых социокультурных
представлений, автор говорит о том, что современный человек и общество
давно уже фактически находятся в эпохе Интегрализма.

Поэтому закономерен и следующий далее тезис о том, что, даже находясь
на вершине современного технологического прогресса — современные человек
и общество страдают от сложившейся в ходе исторического развития
‘космологической недостаточности’ — научно-философской неразвитости и
непроработанности новой Интегралистской эпохи, продолжая полагаться лишь
на принципы Чувственного мировосприятия — антропоцентрического
гуманизма — разработанные и принятые за основу еще в XVII веке. Как
результат, современное социокультурное развитие закономерно обнаруживает себя в условиях (тисках) тяжелого глобального кризиса.

Принимая во внимание чрезвычайно острую актуальность фундаментальных исследований, рассматриваемая статья представляет собой ценный вклад как в изучение научного наследства П.А. Сорокина, так и в изучение социокulturalной вселенной в целом.
Dr Ladislav Kovàc has had a very rich intellectual life. After initial studies in biochemistry, his fate in Czechoslovakia in the post-Stalin era led him to study psychiatry and ethology, and to develop a friendship with Konrad Lorenz. This varied career in biology plus senior positions of responsibility in science and diplomacy placed him in an ideal situation to carry out in-depth investigations and reflections on biology and evolution, the evolution of life in general and of the human species in particular, addressing questions on the future of mankind, which forms a central issue the present book.

Kovàc has adopted a stance focusing on three approaches that can be expressed as questions: What is life? What is human nature? What future are we likely to see?

Addressing the first question, Kovàc presents the views of contemporary “philosophers of life” on the current state of evolution. While there is no scientific answer to his basic question “Why is there something rather than nothing?” (p. 1), there is a better interpretation of the second law of thermodynamics causing an increase in entropy. A number of authors (e.g. Prigogine, or the late Jacques Tonnellat, a specialist in thermodynamics (Tonnellat, 1995) have presented evidence showing that the general law allowing for an increase in entropy can, in non-equilibrium situations, include specific developments where entropy is reduced locally. This is specifically the case of life processes on Earth, and may even occur elsewhere in the universe, perhaps making them universal phenomena and part of a continuum between non-life and life forms. Seen from this angle, the appearance of life stands as a correlate of the second law of thermodynamics when applying locally in non-equilibrium situations, allowing living structures “not only to maintain their onticity but also to grow in size, to break up to give rise to self-similar structures.” (p. 13). Darwinian theory, in its broad lines, can thus be seen as the reverse side of the second law of thermodynamics, as a permanent opening towards structures not governed locally by entropy, as “a dynamic process of generation of structures and of massive self-organisation” (p. 20). Such evolution moving in a given direction can give rise to more complex structures than those previously existing, with adaptation gradually advancing towards greater mental capacities and with more complex structures, e.g. as vertebrates, bees and octopuses, developing greater cognition which, in turn, provides acceleration, “speeding up biological evolution” (p. 26): “the growth of knowledge, epistemogenesis, has a character of snowballing.” (p. 27)
The second issue in the book, focusing on the specific status of human knowledge, is devoted to mankind. Human intelligence, while often producing non-rational or misleading behaviour (described by Kováč as “beetle-like”, p. 38), brings something quite new and different from animal intelligence, producing new and original cultural developments and artefacts. A form of continuity may be seen, the emergence of human uniqueness (on Earth) being the consequence of several earlier biological attempts by our animal ancestors to develop technical and cultural skills (Chapouthier, 2009). It is therefore important to note that the unique nature of humans – on Earth – is not the absurd belief that human beings are unique in the universe. The aberrant “anthropic principle” (Carter, 1974) according to which the entire universe was designed in preparation for the advent of humans on Earth must obviously be dismissed. While the human species is the most intelligent on Earth (intelligent apes), it is likely that millions of similar evolutions have been developing elsewhere in the universe and that our planet should clearly not be considered to be the centre of the universe. Human intelligence and uniqueness stand as evidence of wider evolution of the universe, with the switch from the first point in Kováč’s book (the evolution of life) to the second point (the evolution of thought). I am therefore bound to disagree with dubious statements by Kováč such as “the human brain appears to be the most complex compact construction in the universe.” (p. 71) It would have been more convincing to say “on Earth” or “in the solar system” or “in the small part of the universe that we can observe”. This statement by Kováč may very well be a “slip of the pen”, for later in the book he clearly refers to the possibility of extraterrestrial and intelligent civilisations.

Kováč astutely observes that emotions, within the bounds of intelligence, are a decisive stage: “emotions are the driving forces of life.” (p. 54) Once again the preliminary development of human identity came through the evolution of animal ancestors and cousins, e.g. vertebrates and octopuses, animals possessing emotional processes. In the human brain, these abilities achieve a new dimension of self-awareness, consciously experiencing emotions, giving clear evidence to show that something new had emerged from life processes in developing brains, producing “hedonic fitness” (p. 65) with highly social behaviour, provided, of course, that consumer society does not lead to excesses in hedonism and the quest for immediate pleasure: “chasing instantaneous gratification is a process of continuous ‘de-cortication’ of humans” (p. 79). The reader may regret that Kováč has not mentioned neotenic (juvenile) characteristics of the human brain (Morris, 1967), features which probably also explain its high specificity.

Despite occasional minor points of disagreement as mentioned, Kováč’s book is extremely interesting. Of particular interest is the modern feature of Kováč’s analysis where the author develops a gradual evolutionary model of the universe moving in a clear direction, a model in line with modern physics and chemistry and not requiring a religious argument such as the existence of a conscious architect of the universe, i.e. God. In other words, the *causa finalis* of the universe is basically its own construction, a line of reasoning which I presented in a previous publication (Chapouthier, 1995), arguing that the philosophical finality of
the universe was its own construction. Such a hypothesis does not preclude religious beliefs and can also accept non-religious stances; it fits a materialistic or idealistic philosophical stance, in either a religious or non-religious approach, as it is restricted simply to scientific arguments without embarking on the domain of metaphysics. Discussion is within the bounds of purely scientific knowledge and reasonable consequences thereof: the emergence of life processes and the subsequent emergence of conscious processes.

Let us move to Kovàc’s third question asking what might be predicted from these two emergence processes? Kovàc expresses interest as well as doubts about reaming “techno-optimists” (such as Ray Kurzweil) who see the future of mankind in a purely technological (and positive) perspective. Kovàc also looks at the opposite type of dreamers, “gloomy doomsayers” (p. 96) predicting the death of human civilisation and the human species. What can be done in the current and specific situation of human history when biological evolution is too slow and “has no chance to keep up and cultural evolution runs at a stupendous speed, almost crazy” (p. 98)? What can be done when confronted with what Kovàc calls “the uncertainty of the ultimate age” (p. 107) and when taking into account today’s vast accumulation of technology? Kovàc warns that “extrapolations should be taken with (...) reservation.” (p. 98). He does, however, suggest a number of ways of improving life and the human race in the modern world of uncertainty, adopting Konrad Lorenz’s idea of countering aggressive behaviour by “highly ritualized non-hostile combat” (p. 108), and suggests this approach be extended to include virtual worlds. (He also notes a number of reservations that cannot be presented in detail here.) The idyllic or Utopian techno-optimistic vision assumes the existence of “a world in which all problems of humankind would be simply solved by transferring them from the real world into a virtual world” (p. 109); it also assumes that “human society will be running smoothly in the parallel real world” (p. 109), thus offering only a limited, partial answer.

Kovàc stresses the biological and animal nature of human beings, citing examples in the history of life and the emergence of life as covered in the book, with emotionally-driven self-awareness developing in animals and humans. As humans now have powerful technological capabilities, they can focus on what they really are and the way they live their lives as humans, the way they “operate” as humans – an Aristotelian approach. If self-awareness could offer humans a glimpse or dream of life with no end, this would be found in the way humans exercise their human nature, and, it is to be hoped, in a move where emotional responses would lead to altruistic societies.

Kovàc’s excellent book shows us that the future of the human race can only be seen when explored through its deep roots in the evolutionary past and the distinctive emotional and individual awareness of living beings.


Nature confronts us with structures on many scales. From the largest, with the super-clusters and clusters of galaxies, the galaxies, the planetary systems, planets structured by their geology, to the smallest with biological systems, cells, molecules, atoms to elementary particles. One of the goals of science is to describe these structures but first of all to understand why the laws on nature allow for the existence of such diversity and the complexity that comes with it. This is a difficult question, very lively debated and controversial, mostly because it goes beyond the boundaries and scopes of each discipline. The reductionist view tries to find the properties of any object in those of its constituents. While it had some successes, in particular in fundamental physics and the dream of a «final theory», it was understood that the existence of emergent phenomena sets a strong limit to such a thesis.

The quartet of authors of the book «Le Monde mosaïque» addresses the question of complexity and diversity through the thesis of the Mosaic proposed by Georges Chapouthier. They focus on four systems. The universe is described by Jean Audouze, astrophysicist and former director of the Institut d’Astrophysique de Paris. The structure and dynamics of cities is described the architect Denis Laming. The biologist and philosopher Georges Chapouthier introduces us to the properties of complexity of the living world and animals. This is echoed by the description of how machine can generate their own complexity by Pierre-Yves Oudeyer, a world specialist in robotics and artificial intelligence working for Inria. The four parts of the books compare the structure and the complexity of the universe, cities, animals and robots. Their dialog echoes to highlight similar structures in these systems which, a priori, may appear very different. This is indeed one of the goals of science to discover mechanisms that are universal enough to apply to many different systems.

An astrophysicist, as illustrated by Jean Audouze, would like to understand how the structure of the universe appeared during the history of the universe, since a fraction of second after the big-bang the universe was in a structureless state of a hot and dense, almost homogeneous, gas containing only protons, neutrons, electrons, neutrinos and photons. No structure can form since it would be immediately destroyed. The first nuclei are synthetized only a couple of minutes later and the first atoms about 400.000 years later. At that stage, no complex molecules, no possible life and obviously no consciousness. Information, life and conscience are emergent phenomena that we cannot relate to the laws of fundamental physics and of the state of the early universe.

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A physicist, as myself, would like to understand why the fundamental laws of physics allows for the existence of complexity, why they contain it in their space of possibilities. One can trivially observe that our knowledge about nature is structured in fields: physics, chemistry biology, physiology, sociology, economy, politics to name a few. Each of them focuses on a part of reality. They have been developed independently with some interactions with close fields. It follows that each has developed its own ontology. The fact that we can understand the world has a deep implication: these theories form a hierarchical structure organized in modules in interaction but that decouple enough so that they can be studied independently. For instance, describing a proton, one has two levels of description, one microscopic that is needed to understand its internal structure and a more macroscopic one in which the microphysics can be forgotten. This separation of scales is crucial. For instance, the properties and our understanding of DNA do not rely on our ability to understand the structure of neutrons and protons. This is fortunate since otherwise it would have been impossible to start biology before having understood nuclear physics!

The relations between the different theoretical layers are in itself very complex and this is a reason why reductionism cannot be defended. It exist emergent phenomena that cannot be reduced to properties of lower (more fundamental) levels. They simply do not exist in these levels of description; think about temperature and pressure of a single particle! More important, higher (more complex) levels can act on lower levels by changing the environment and context. Physics rely on the idea of isolated systems, which do not exist in the real world. One thus needs to understand the dynamics of one level of complexity in terms of itself but also in terms of lower and higher levels. This enriched all the discussion on causality. For a reductionist, causality is bottom-up: what happens in a higher level can, in principle, be described by what happens in a more fundamental level. But, when one takes into account the effects of the higher levels, one needs to include top-down action such as algorithmic causality, action by non-adaptative information control (e.g. a thermostat), action by adaptative selection (e.g. Darwinian evolution), action by adaptative selection of information (e.g. Pavlovian conditioning), intelligent action.

It follows that the conditions for complexity, and the actual nature of this complexity, depends on (1) the space of possibility set by the lower level, (2) information selection and (3) modularity. This is what is examplified in the cases of cities, animals and robots. For instance, let us consider cities. To describe the structure of a city, one needs to take into considerations many levels. At a «fundamental» level, the architectural character is determined by the matter that can be used to build (wood, type of rocks and stone) but also by the environment (here the local geology and climate, whether it is in a plain, seaside or mountain). But indeed, that would be the reductionist explanation. One needs to take into account a series of explanations coming from higher levels: the population, its history, its myths and legends, which is sociology, psychology, history, economics, politics. The beliefs and ideas of people designing, financing and living in the town. A city is thus simply not a collection of buildings, monuments, streets and parks. Ignoring one of these dimensions, one would fail to understand the structure and dynamics of a city. Many
beautiful examples are given by Denis Laming. It highlights why understanding the forces at stake in the structuration is crucial, in particular to act at a more political level to increase happiness of the inhabitants but also to better protect the environment and biodiversity.

Georges Chapouthier describes how Darwinian evolution leads to a (bio)diversity of the world. His description in terms of a mosaic is based on the fact that any (complex enough) living bodies have different levels of description: the genes, the cells, the organs, and the body. And indeed, Darwinian evolution takes place on each level with different time scales. It follows a description of an animal as a mosaic of these structures interacting together. Again, this illustrated the fact that the properties of the more fundamental objects (e.g. the genes) define the space of possibility of more complex structures but that these latter sets the context in which the dynamics of the former takes place. Georges Chapouthier then scales this up to address the question of the brain and consciousness, of language and of human populations. This offers a vertiginous description of the living.

When it comes to machine, we, as human, like to consider them as product of our intelligence, to think them as automata that can only execute rules and algorithms that we have thought and designed, indeed faster than our own brain could. But is it so? Or can machines crate their own forms or behaviors, beyond their own program. This is a crucial question in many respects. First, our world relies on computer and machines. The recent example of IBM Watson and its use of big data led to the idea of a «computer that can learn» and maybe have creativity. Second, the reductionist approach of the human brain project hopes to lead to a purely mechanistic understanding of the brain. Is there any chance it may work and reveal the nature of conscience? Or is it doomed to fail, as I personally think? And if machine can innovate, what is it to be human?

As you can see, this loops to the chapters on cities and animals. In all cases, we learn that one cannot explain a complex phenomenon by a reductive approach or by considering a single level. One needs a global approach. And if you doubt it, just ask yourself if you can explain the book in your hand from the fundamental laws of physics (the four fundamental interactions and all the elementary particles) and the initial conditions one microsecond after the big-bang. Clearly not! This just offers the possibility for such a book to exist not an explanation for the actual existence of this book, which requires to consider many top-down actions from higher levels of complexity, such as machines, living animals etc.

I may however have a point on which I tend not to agree with the authors and it concerns cosmology. Maybe this is just because I am more specialist of this field and thus more critical. Indeed, the universe has been demonstrated to have a history and to evolve in terms of the structures it can contain. Jean Audouze describes this beautifully. But in this evolution, in the formation of stars, galaxies and planets, no Darwinian selection is at work. There is even no top-down action from higher levels because they simply do not exist in these stages, and when they do causal limitations forbid them to do so (for instance, once one understands what fixes the lifetime of a start like the Sun, it is easy to increase it by homogenizing the fuel of the star. While
easy on the paper, it turns out to be impossible in practice). The universe offers a large diversity (type of stars and galaxies) but it can be explained from the gravitational dynamics and variation in the initial conditions, which is a huge success of cosmology as a physical theory. While there is no complexity (at least like in the other systems), our universe offers the possibility for complexity to emerge. And that is surprising. In particular changing slightly the laws of nature, or the fundamental constants by a fraction of a percent, would result in a dull structureless universe. No stable nuclei, so no chemistry and no biology. In this sense the apparent fine-tuning of the universe, as a condition for complexity and life to exist, calls for an explanation. Among them, the idea of a multiverse with all possible universes with all possible laws of physics realized has been considered. There, one can identify a mechanism similar to Darwinian selection based on the anthropic principle. But this is highly speculative as I write. So I agree the structure of the universe can be described as a hierarchy, more than a mosaic, but it does not contain the same notion of complexity. It is lower important to understand its history as it sets the stage for complexity to develop.

In conclusion, if you think that the questions «why the nature allows for complexity?», «why is the world understandable?», «what is it to be human in such a universe?» then I think this book will give you matter, examples and thesis to think about. I recommend the reading of this book which explores science beyond its disciplinary boundaries. It casts some new light on common objects and shows that many connections and similarities exist between them. Some may reveal the fact that similar mechanisms are at work. Some may just be coincidences. I think the reader will have a good time trying to make his mind and disentangle the puzzle.
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  □ Page format is A4;
  □ Font – Times New Roman, font size – 14; line spacing – unary; indentation – 1,0;
  □ Footnotes – pagina;
  □ Tables (figures, graphics, etc.) are fully embedded in the Word document (are positioned in the corresponding place of an article) and supplied as separate files where possible. The list of figures
(etc.) and the signature to them are supplied separately and are not placed in the main text. However, there must be a reference to the figure in the corresponding place of an article. Tables should be numbered serially and referred to in the text by number (table 1, etc.). Each table should have an explanatory caption placed over a tabular field, and figures – caption signatures.

4. Exclusively the accepted (in the International System of Units) abbreviations and acronyms are permitted to be used - abbreviations of measures, physical, chemical and mathematical symbols and terms, etc. All acronyms and abbreviations should be clearly explained when they first appear in the text, and all units used should be consistent throughout the article.

5. References: the alphabetic (Harvard) system is used - the name of the author appears in the text together with a year of the publication, e.g. [Ivanov, 2001] or Ivanov [2001] (as appropriate). Where there are only two authors both names should be given in the text [Ivanov and Pavlov, 2001] or Ivanov and Pavlov [2001]. However, if there are more than two authors only the first name should appear followed by et al, [Ivanov et al, 2001] or Ivanov et al [2001]. If a reference is given to different works by one author or group of authors in the same year they should be differentiated by including a, b, etc, after the date (e.g. 2001a). If you refer to different pages of the same article, the page number may be given in the text (using the two-spot), e.g. [Ivanov, 2001, p. 100]. The reference list at the end of the article should be given in alphabetic order. A complete reference should consist of: name(s) - surname and first name (separated by a comma), date published (in parentheses), title of the article or book (in italics), name of the journal (in italics), volume and number (in parentheses), for books – editors (if any), town of publication and publisher, and finally the page number(s), e.g.: Ivanov, Ivan A. [1979]. New approaches to treatment of diseases. Therapeutic archive, Vol. 5, No 3, pp. 4–10. The name of a journal or book is given in full.

6. Illustrations: the article is supplied by the adequate number of figures (schemes, graphics, tables). Color illustrations are accepted. Designations in the figures are given in numerals. Figures can be reduced by 1.5-2 times without compromising their quality.

7. Authors are expected to realize the style of their articles in the manner that corresponds to criterion “clear and laconic”.

8. In the case of rejection the submitted article, editors send to the author a corresponding notice with the explanation of reasons (for the refusal of publication).

9. Authors are responsible for ensuring the accuracy of the submitted (published) article.