

THE BIOCOSMOLOGICAL CATEGORIES¹

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ABSTRACT. A cyclic model for the formation of matter is briefly described. According to this model, matter in its three forms (inert, living and consciousness) is originated from promatter as a result of transformation from laminar course of energy to vortical cyclic course. About two dozens of conceptions of science, philosophy, religion, and art, relevant to the formation of Weltanschauung are considered. They include: beginning, end, infinity, cause, consequence, purpose, evolution, progress, information, bipolarity, triadicity, number, welt constants (π , e , ε_0 , h , c , Φ), symmetry, metaphor, among others. The gist is that all the advanced categories have their origination in circular motion. It is suggested to consider these conceptions as categories of biocosmology.

KEYWORDS: philosophy, science, religion, art, matter, consciousness, movement, energy, cycle.

Heraclitus, early Greek philosopher believed that everything is in eternal flux, and in a continuously changing condition. His doctrine remained unquestionable to the present day. Can we add something to it?

– Yes, we can.

“Everything flows and moves along a cyclical or quasicyclical trajectory”. Here is a new Cosmic formulation (Chadov, 2009). I arrived at this proposition as a result of genetic research. Much has been said about cyclicity and by many. I speak about cyclicity emphatically. I state that matter exists only owing to its cyclical movement. Without it matter cannot be.

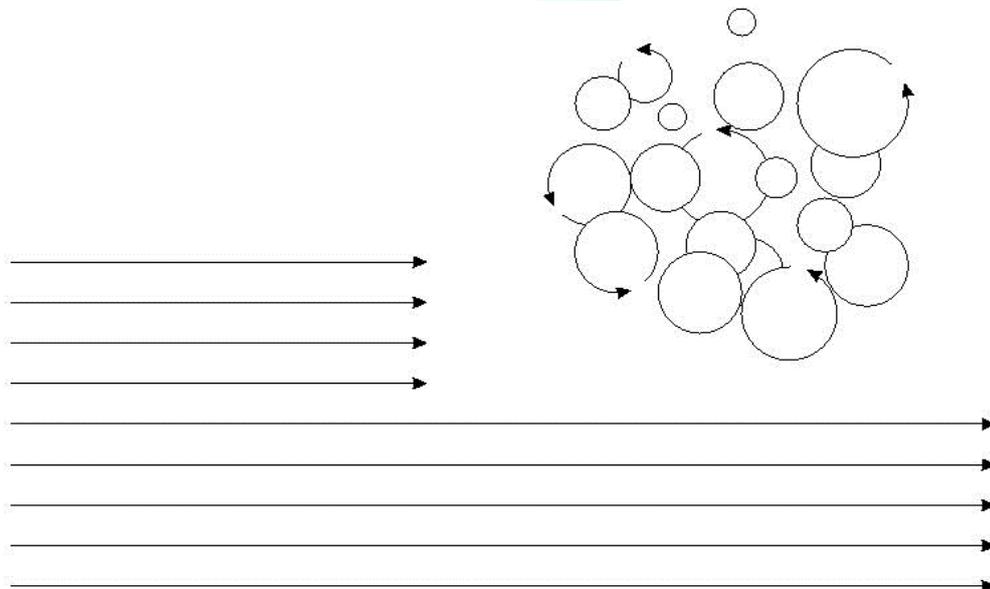
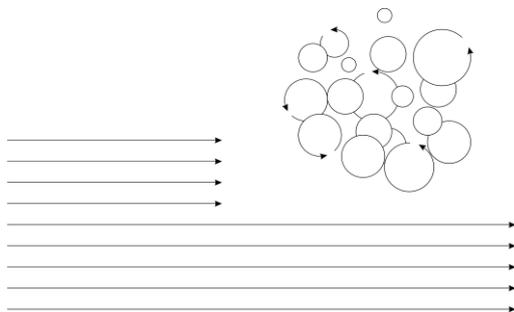


Fig. 1. Formation of matter from promatter

¹ The paper is based on the author's presentation at the 3rd International Seminar on Biocosmology and 1st International Witten Seminar on Philosophy and Medicine (June 30th–July 1st, 2012, Witten/Herdecke University, Germany).

The figure 1 presents a model for the formation of matter. Energy is the beginning of everything. It is represented by a current with a laminar flow (parallel lines). At a stage of the existence of the Cosmos laminar flow converts into vortical. Cycles or quasicycles (helices) arise. This is a birthday of the matter. What happened? Why energy acquired form of matter?



1. Repetitivity

Cyclicity implies repetitivity, repetitivity makes possible reflection, reflection generates integrity, reality, matter, solidness.

2. Delimitation

Circle or quasicircle (coil) delimits a part of space from entire space. It breaks space down into things. Thus emerges structural organization of the world.

Fig. 2. How circlic movement creates matter

Movement in a circle has two important properties (Fig.2). One is repeatability, the other is delimitation. Repeatability makes reflection possible. Reflection of a set of cycles generates a new state under the name “matter”. Due to delimitation from the infinite space its parts are singled out. These are objects of the material world. The substance preceding matter was called promatter.

Here is what the Cosmos looked like, in my view (Fig.3). Energy underlies the Cosmos and its effective (of producing work) capability. Energy is associated with movement. There are three forms of movement: 1) chaotic, 2) laminar, and 3) cyclical (vortical). In compliance with the three forms of movement there exist three states of the Cosmos: chaos, flow, and matter. One state passes to another. Due to movement in close orbits matter exists as a condensed clot. It does not scatter dissipate in the Cosmic space.

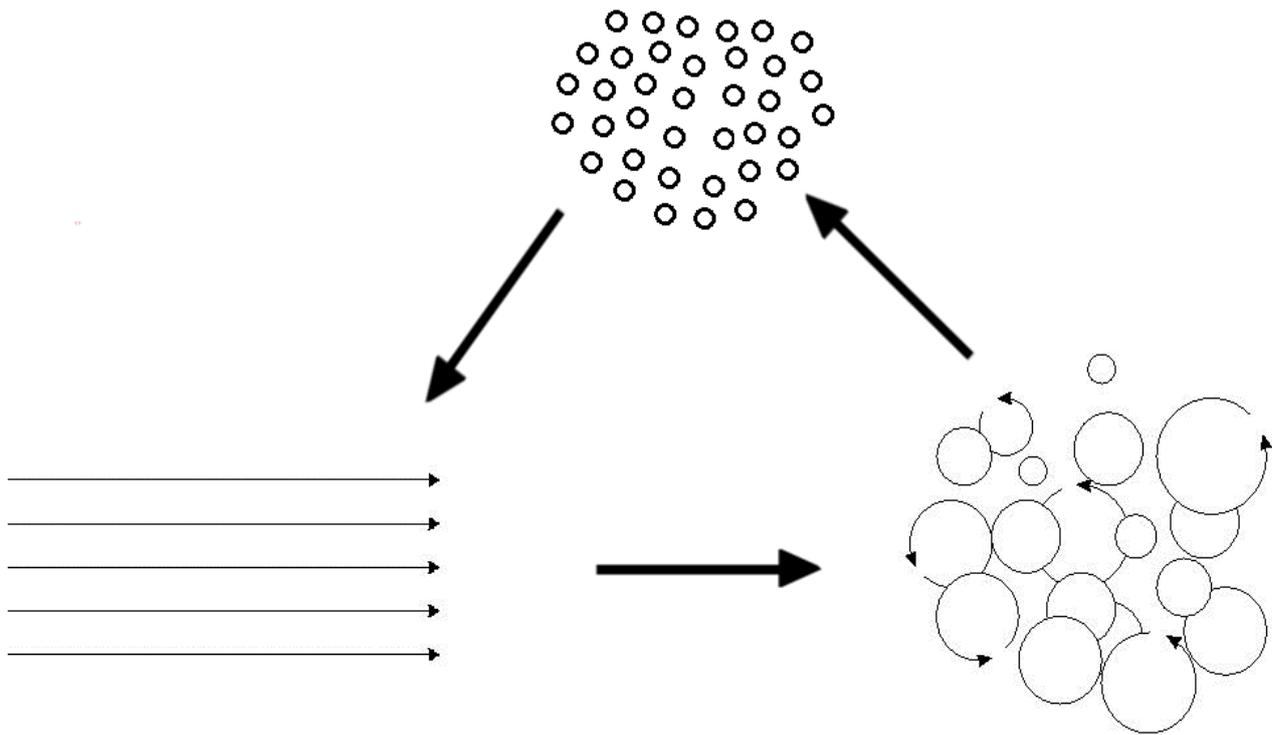


Fig. 3. Supercycle: «– flow – matter – chaos –» in the Universe

An energy quasicycle is the central pivot around which material world emerges. The figure 4 presents the result of this process. Materialization of a portion of the world energy passes three stages. At the first stage, at maximally high store of energy, inert (nonliving) matter is formed. Then, at the stage of decreased energy store, living matter is formed. Consciousness is formed at the lowest energy store. As you see, at the first stage A, inert matter only exists (black). At the second stage B, living matter (black points on a white background) including inert matter appears. Consciousness including inert and living matter, forms last at the third stage C (black, white with black points, and simple white). There are clear-cut boundaries between three forms of matter. These boundaries are levels of energy.

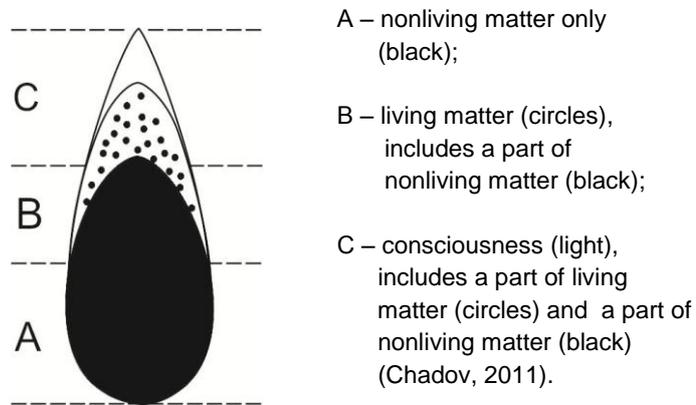


Fig. 4. Three forms of matter

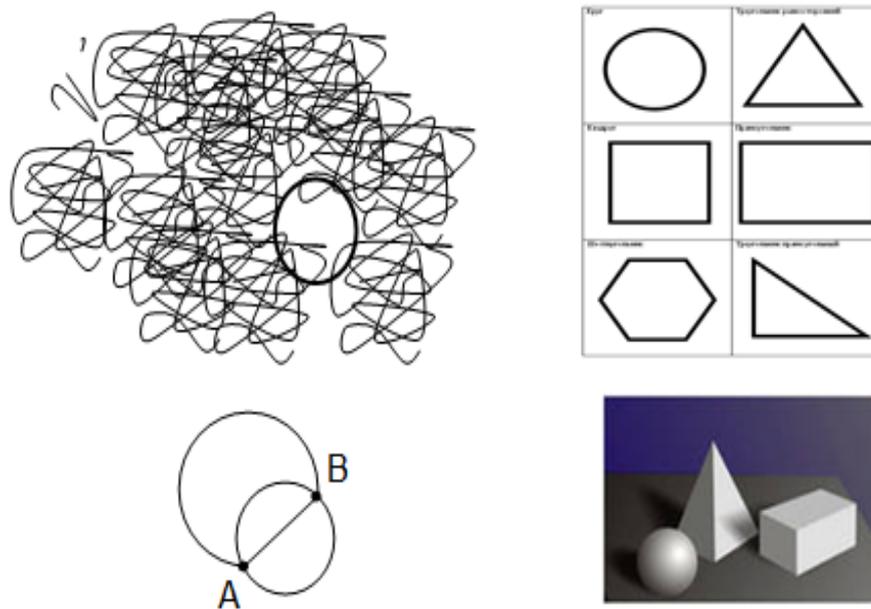


Fig.5. Movement in a close trajectory (boundary, point, straight line, figure)

Now, I proceed to the presentation of the major topic. I demonstrate that the set of concepts in modern science, philosophy, religion, and arts originate from movement in cyclic orbits. How is the world consisting of things formed? This figure (Fig. 5) shows the assumed path to object.

At first, chaos or laminar flow is. Both are homogeneous. On the left (on top), the chaotically scattered trajectories are shown. Trajectories appear and disappear.

Trajectories become fixed when their beginning and end close. Stable movement in a cyclical orbit is the emergence of a heterogeneity with new quality. Intersection of two orbits generates such element of heterogeneity, as a point. These are points A and B (left, bottom). Two points can be connected by straight line AB. This is another element of heterogeneity. From the three elements: circumference, point, straight line figures can be built. Flat figures (right, top) and volume figures (right, bottom). Delimitation from the rest of the world is a characteristic feature of things (objects). Thus, the concepts of boundary, point, straight line, figure, thing – they all (our intellectual notions) have their origination from the movement in circlical trajectories.

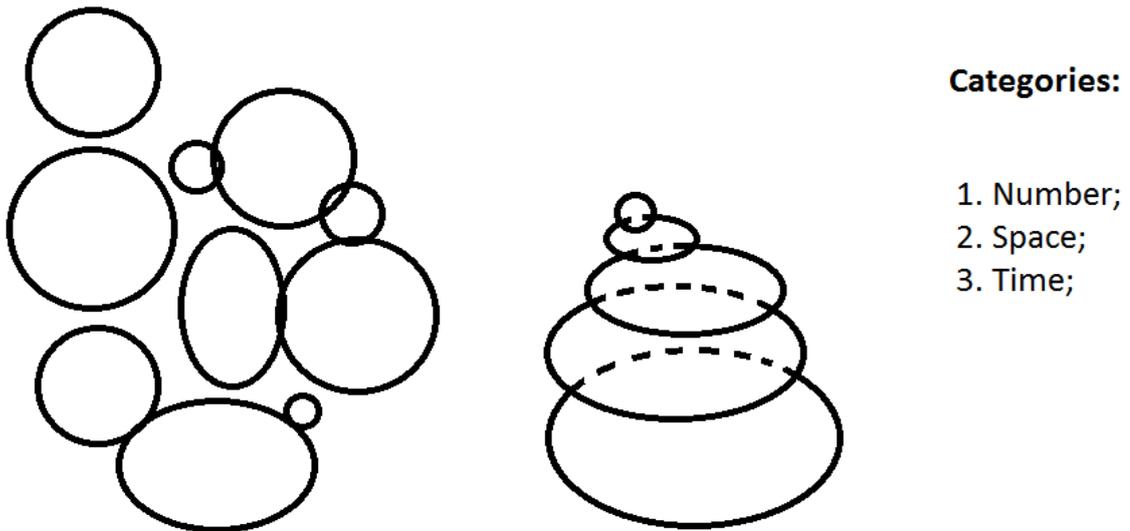


Fig. 6. Multiplication of circles (things)

The multiplication of objects resulting from cyclical movement entails the appearance of the “*number*” category (Fig. 6). A set of objects located side by side form volume is called “*space*”. The process of accumulation of objects in space is called «*time*».

Movement in a circle is repeated in space and in time. Concepts that correlate with *repeatability in space* are: symmetry, fractality, segmentality; that are relevant to *repeatability in time*: oscillation, resonance, wave, reflection. The concept of metaphor is relevant both to repeatability in time and space. Some of them will be considered in a brief form.

The concept of symmetry is one of the most frequently used. The nonliving, living matter, the artificial world of culture and arts are full of symmetry. Here are some examples of bilateral symmetry in animals (butterflies, man, plants (*Tradescantia*) (Fig. 7). The flower of a plant – is an example of radial symmetry. The laws of conservation in nature (conservation of: energy, pulse, movement pulse, charge, conservation of evenness and entropy) are based on symmetry. Symmetry has aroused wide interest. There is the international society for study of symmetry, the ISIS of symmetry, found in 1982.



Bilateral symmetry:
animal (butterfly), man,
plant (leaf rosette of
spiderwort).

Radial symmetry:
flower of plant

Fig. 7. Category: symmetry

Repetition of the whole in parts is termed fractal. Fractality is consistent with the grand principle of the Universe similarity formulated by Hermes Trismegistus – as follows: *“The external – is similar to the internal; the small – is the same as the big, the law is the same – for everything. There is nothing – that is small, and nothing – that is great – in divine economy”* (Dragavzeva, 2011). The figure 8 gives examples of fractals.

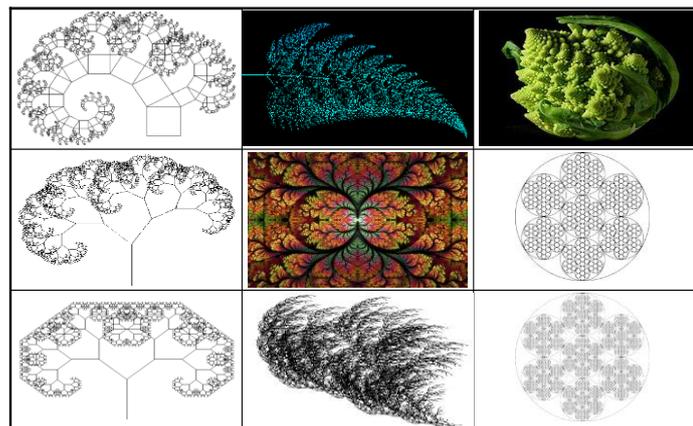
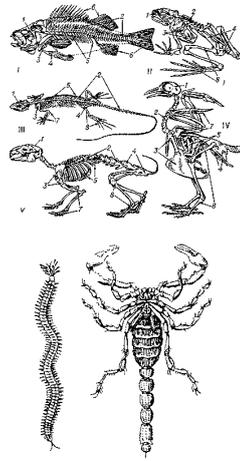


Fig. 8. Category: fractal. Examples of fractal structures



Segmentality in vertebrates :

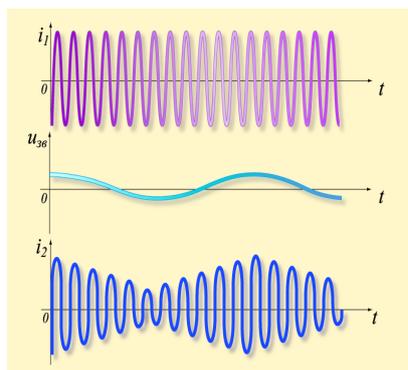
(fishes, amphibia, reptiles, mammals, birds).

Segmentality in arthropods:

(worms, polypods).

Fig. 9. Category: segmentality

Segmentation is yet another type of repeats (Fig.9). It occurs widely in nature. Segment is a structural unit. The skeletons of different vertebrate classes are shown in this figure. The segmentation is clearly seen. Segmented body is characteristic of arthropods.



Categories:

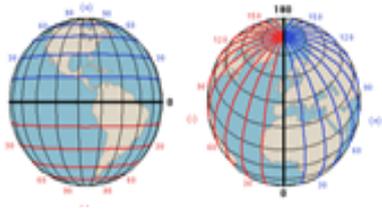
1. Oscillation;
2. Wave;
3. Resonance;
4. Reflection.

Fig.10. Movement in circle: repetition in time

Movement in a circle is repetition in time (Fig. 10). Processes during which movements or states repeat regularly in time are called oscillations. The simplest example of the oscillatory process is a swing of the pendulum. Circular and cyclical processes are referred also – to oscillatory processes. For these processes, “the

oscillation frequency” is substituted by “circular frequency”. Oscillation has much in common with wave. The wave is a disturbance of the environmental state. A sharp increase in the amplitude – of forced oscillation is called resonance.

Reflection is category already talked about. It is a physical process of interaction between waves or surface particles. I propose that the total reflection generates the state called matter.



Categories:

1. Bipolarity;
2. Quantity and quality;
3. Triadicity.

Fig. 11. Categories related to the circular shape

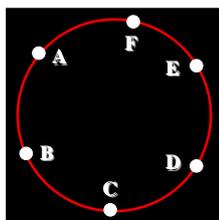
For the figure “circle”, the presence of two points maximally remote from each other is characteristic. These are two poles, two extremes (Fig.11). The point during movement starts to move away from the initial pole, becomes most remote from this pole, and then it starts to approach closed to the initial pole.

The “Bipolarity” conception reflects the maximum remoteness of the poles. Many notions are organized by the principle of contrast (bipolarity): good – evil; good – bad, much – little, left – right and so on.

The concepts of “Quantity and quality” form within the system of bipolar circle. The maximum differences between the poles are qualitative, the differences between the points lying between the poles are quantitative. The qualitative relation are absolute, they are the maximum differences.

The category “triadicity” reflects the process itself by which “bipolarity” emerges. It indicates the path along which this is reached by passage through the equator. Triadicity as a term is not less used than bipolarity. In Russia, there is a public organization “Academy of trinitarism”.

Categories:



1. Beginning, end;
2. Infinity;
3. Cause and effect;
4. Purpose.

Fig.12. Sequence of movement in circle

The categories that are relevant to the movement in circle are: beginning, end, cause, consequence (effect), aim (Fig. 12).

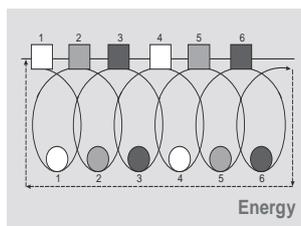
One event precedes another in the cycle, and this order is constantly reproduced. These events are called the cause effect relationships. The preceding event is called the cause and the next event is the effect. By instance, moving clockwise at figure 12 “A” is the cause of the “F” and the “F” is the cause of the “E”.

The cause-effect relationships in the cycle are observed with probability close to unity, thereby providing constancies, “eternity” of nature. The foundation of nature are event’s of: day-night shifts, – birth and death of the living organism, transitions in the Krebs’s cycle and so on.

Besides the categories of cause and effect, that reflect the formation of the world order, classics of philosophy noted the category of purpose (aim). This is the causality of a special kind. In this figure, for instance, the purpose is the whole cycle from “A” to “A”.

Any genetic program implies the achievement of an ultimate aim. Living matter has a general aim. In turn, the aim conforms with its engendering primary source. Here, ‘to conform’ means: to obey cyclicity in the formation of structures and function, to table the energy reserve limitations, energy dissipation and so on. In a cyclical trajectory Aristotle’s teleonomy with Galileo’s causality dialectically combines.

Categories:



1. *Complexity;*
2. *Evolution;*
3. *Hierarchy;*
4. *Progress;*
5. *Transgression;*
6. *New.*

Fig 13. Transition of a circle into a quasicircle (coil)

Transition of a cycle into a quasicycle (coil) is possible (Fig. 13). Movement in a circle allows to trespass the limits of an orbits under the effect of centrifugal force. The exit leads to: 1) unlimited movement of energy pulse with energy dissipation and 2) transit of the movement along a new circular orbit. In the latter case, the old and new orbits together make up two turns in one helix.

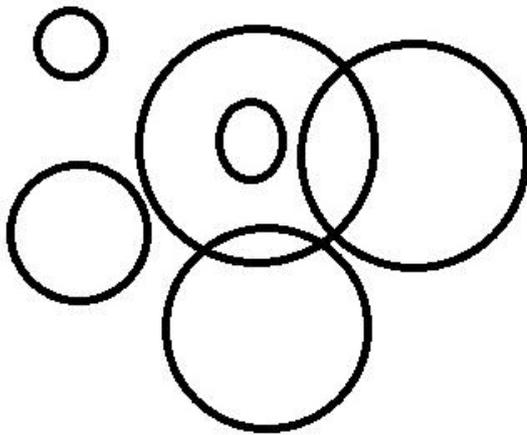
The “*complexity*” category reflects the existence of a set of subcycles and

quasicycles connected by a continuous trajectory. Transition from simple to complex can occur only in such way. This provides movement and infinite lengthening of the movement trajectory.

“*Evolution*”. In considering the evolution of living matter in the cyclical model, we can distinguish separate cycles as separate ontogeneses (developments), and their transitions from cycle to cycle as speciation acts.

Progress will be called the formation of new energy cycles with smaller energy consumption. Progress will be expressed as the appearance of new structures with smaller energy consumption.

Transgression means the overcoming of an impassable barrier. This transition is expressed by modern synergetics as “bifurcation”. A point leaving the confines of a circular trajectory illustrates the idea of transgression. Transgressive transitions in full measure correspond to widespread concept “new”.



Categories:

1. Reflection;
2. Information;
3. Information transfer;

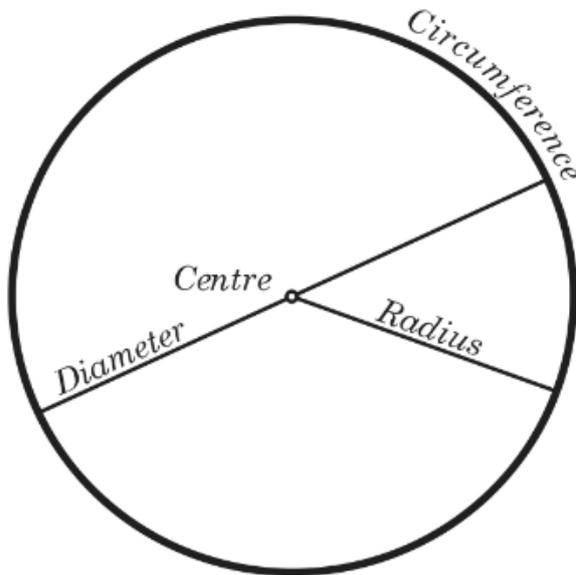
Fig. 14. Interaction of circles

Interactions of cycles are resulted and reflected in the categories: reflection, information, information transfer. The repetitive movement of condensed energy in a cycle interacts with the same movement of energy in the other cycles. This interaction is the reflection, and it forms structures.

Each structure contains “conserved” energy and information. Information is a description of the path along which energy passed to become a structure. It is a trace left after passage of energy flow. Information is a material event. In essence, it is close to the definition given by Kastler: “*Information is a remembered choice of one variant of the several possible with their equal rights*” (Kastler, 1967).

I suggest that circumference is connected with world constants (Fig.15). The irrational number “ π ” is a characteristic of a circle. It is the relation between the circumference length and its diameter. This number is basic in trigonometry and is a most significant mathematical constant. Another mathematical constant is the number “ e ”, the basis of natural logarithms (2.718...). The number “ e ” is resulted to Pi (Euler formula, Gauss function). A.Sommerfield has introduced a constant “fine structure” related Four constants. It proved that the fine structure is related to the “ π ” and to the

Golden section (Φ). It is Dragavzeva's view that the formula for world development proceed along a logarithmic helix, with base " π " for nonliving matter and " Φ " for living matter (Dragavzeva, 2011). In this way, new support was provided for the idea that movement along a circular orbit underlies the creation and existence of matter.



$\pi = 3.141\dots$ (relation of the circumference to diameter).

$\alpha = e^2 / 2 \epsilon_0 h c$ - the fine structure constant (A.Sommerfeld).

e - natural logarithm base; ϵ_0 - vacuum dielectric permeability; h - Plank's constant; c - light rate in vacuum.

$\alpha^{-1} = \Phi / \pi^4 \sqrt{\pi^4} \sqrt{e}$ (development of the world along logarithmic coil at logarithm base « e » for nonliving matter and « Φ » - for living matter (Dragavzeva, 2011). Φ - Golden Section (= 1.618...).

Fig.15. Number π and world constants

In conclusion:

1. Movement in circle is the starting-point for many conceptions of modern science, philosophy, religion and arts;
2. The conceptions (given in the paper) may be considered as categories of biocosmology;
3. The given conceptions of cyclical nature are world wide spread and this is the indirect support of the idea that the cyclic model for matter formation holds true.

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