

## Return of Logos: Ontological Memory → Information → Time

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Total ontological unification of matter at all levels of reality as a whole, its “grasp” of its dialectical structure, space dimensionality and structure of the language of nature – “house of Being” [1], gives the opportunity to see the “place” and to understand the nature of information as a phenomenon of *Ontological (structural) Memory (OntoMemory)*, the measure of being of the whole, “the soul of matter”, qualitative quantity of the absolute forms of existence of matter (absolute states). “Information” and “time” are multivalent phenomena of *Ontological Memory* substantiating the essential unity of the world on the “horizontal” and “vertical”. Ontological constructing of dialectics of Logos self-motion, total unification of matter, “grasp” of the nature of information leads to the necessity of introducing a new unit of information showing the ideas of dialectical formation and generation of new structures and meanings, namely Delta-Logit ( $\Delta$ -Logit), *qualitative quantum-prototecton*, fundamental organizing, absolute existential-extreme. The simplest mathematical symbol represents the dialectical microprocessor of the Nature. Ontological formula of John A. Wheeler «It from Bit» [2] is “grasped” as the *first* dialectic link in the chain of ontological formulas → “It from  $\Delta$ -Logit” → “It from OntoMemory” → “It from Logos, Logos into It”. *Ontological Memory - core, semantic attractor of the new conceptual structure of the world* of the Information Age, which is based on *Absolute generating structure* («general framework structure»), the representant of onto-genetic code and algorithm of the Universe.

*We can well believe that we will first understand*

*how simple the universe is when we will recognise how strange it is.*[3]

John Archibald Wheeler

### **About the “Crisis of interpretation and representation”, Understanding, the Structure of Reality and the Language of Nature**

Transitional stage from one era to another, information revolution in all spheres of human existence necessarily promotes fundamental science, especially physics experiencing, like all science, “the crisis of interpretation and representation” [4] to a deeper study of the phenomenon of information, definition of its nature, introduction of new concepts, new logic and new structuring of reality “*sub specie aeternitatis*”, and as a result, understanding of the world as a whole, in which the information appears in a variety of hypostasis. The problem of understanding the nature of the information is *the problem of ontological justification of fundamental knowledge*, namely, physics and mathematics *as the utmost deep sign systems*. For more than one hundred years, these two fundamental sign systems have “loss the certainty”. [5, 6, 7] In mathematics, the process of “loss of certainty” began with discovery of “non-Euclidean” geometries and lasted about 100 years, when the G. Weyl in 1946, said sadly: “We are now less than ever confident in primary fundamentals of mathematics and logic. We are going through our own “crisis” just like all and everything goes through it in the modern world”. [8] The peak of

the crisis – mathematical "counter-revolution" of the late 19th century [9] and the epic of unsuccessful justification of mathematics in the first half of the 20th century [10]. Now the problem of justification of mathematics for some strange reason is diligently "swept under the rug". It is not even included by the mathematicians in the "millennium problems". In the early 21st century, as the mathematician Yu.A. Neretin notes, "The situation in mathematics and mathematical physics of the last 10-15 years is quickly becoming more sinister... In particular, there is a crisis of the ability (and desire!) of mathematicians to understand each other" [11].

In physics, "loss of certainty" also took place gradually, over about a hundred years since the beginning of the study of the phenomenon of electromagnetism, the peak is the theory of relativity with its paradoxes and curvature of ideal reality and quantum mechanics, with its multiplicity of interpretations. The attempt of "*ontological revolution*" of Einstein-Planck remained unfinished. Empiricism helps physicists, mathematicians are helped by going to the highest floors of abstraction. The peak of the age of "loss of certainty" in physics is "string" epic going on for more than forty years. Physicists have only recently started to delve into the essential foundations of their science – and very carefully. But whether mathematicians manage to "close physics?" [12].

And mathematics and physics have one foundation – essential primary structure of Nature. In his work "The Assayer", Galileo Galilei wrote "Philosophy [i.e. physics] is written in this grand book — I mean the universe — which stands continually open to our gaze, but it cannot be understood unless one first learns to comprehend the language and interpret the characters in which it is written. It is written in the language of mathematics, and its characters are triangles, circles, and other geometrical figures, without which it is humanly impossible to understand a single word of it; without these, one is wandering around in a dark labyrinth" [13].

How to extend the interpretation of "*Signs of Nature*" and thus overcome the crisis in the basic sciences, which is essentially a crisis of understanding of nature and its language? Turn of physics to the phenomenon of information is the evidence of the right way. This turn from "Science of formulas" to "Science of forms", from the principle of "shut up and count" to the principle "understanding and count fast". Creation of the "new physics" is contributed by modern information revolution.

L. Wittgenstein in "Tractatus Logico-Philosophicus" noted an increasing tend to merge, identify language with the world. "Logic fills the world; the boundaries of the world are its boundaries". [14] According to Wittgenstein, logical symbolism is identical to the *ontological structure of the world*. While L. Wittgenstein considered his formula "language is a form of life" unsuccessful, the phenomenon of the information, and our studies suggest that the formula of Wittgenstein is semantically correct, since it refers to the "first essence" – the form.

In the previous essay, "Paradigm of the Part Vs. Paradigm of the Whole...The Absolute Generative Structure" [15], it was shown how using the "goddess of forms" – Eidotea on the way towards total unification of matter and *on the basis of ontological constructing* of a "network of eternity" with the smallest semantic "cells" of *triangular shape* you can "grasp" "the Proteus of nature", imaginative matter metaphor, and as a result – to "grasp" the structure of the language in which the Nature speaks to us.

Using the idea of N. Burbaki on "*generating structures*" of mathematics («*mother structure*», «*les structures-mères*») [16], and the idea of total unification of matter, namely the idea of absolute forms of existence of matter (absolute states), Superaxiom and Superprinciple, *the ontological structure of the world* was built in the form of "*Absolute generative structure*" represented in the simplest mathematical symbol. As a result it was determined that the structure of language as a "house of Being" is "linear-wave-vortex". [15] As a result, the extensive materialistic interpretation of nature and meaning was offered ("the meaning is in the direction of what..." M. Heidegger) of one of the basic concepts of quantum mechanics – "*state vector*" as

a mathematical representant, “carrier” (representing) *the fundamental state of matter in the sign: absolute rest + absolute motion + absolute formation in their dialectic generating trinity.*

Not for nothing in the philosophy of Pythagorean numbers, the first of the thinkers of the ancient world, who started using the term “philosophy”, “three” (Greek TRIA) was the first number beginning the series of numbers stretching into infinity representing the *lameness* of two major *generative* forces in this series. Pythagoras was a good dialectician, but what is interesting to note, he learned the basics of cosmogonic theory of numbers from hierophants of the country of pyramids – the Ancient Egypt.

One of the greatest ideas in the history of mathematics was the idea of “*increment*” and its representation in the mathematical symbol  $\Delta$  - “Delta”. *Extended ontology* of “Heavenly Triangle” (Plato) of *three carrier vectors* ( $\Delta$  - “Delta”) represents *a basic dialectical action – Qualitative quantum, Quantum-prototecton, Primary Increment.* It is a symbol, primary matrix of *limit field of absolute states of matter.* “Heavenly Triangle” or the *Absolute transcendental figure*, which was the basis of constructing a “network” to catch Proteus is *eidos* (limiting image), *gnosis* (the sum of limit transitions), *measure* (“qualitative quantity”), *matrix* (“frame” – limit of the process), and the *law* (“fundamental cycle”) [15]. And as a result, three simplest mathematical symbols formed and essentially justified the “cell” of primary process of the nature, *ontological scheme of nature microprocess.* The question remains – what this *natural microprocessor* keeps and what *Absolute generating structure* creates?

### **About the “Form” and the nature of “Information”. Ontological Memory**

Protagoras of Abdera offered his “anthropic key” to unlocking the mysteries of the World as a Whole, establishing the principle of *Homomensura*: “A Man is a measure of all things: existing in their existence, not existing in their non-existence”. For all 2.5 thousand years, philosophers tried to decipher this principle. But “decipher” a Man as the *measure* means to “understand” him, to understand is to “grasp the structure”. [17] To “grasp the structure” is to “grasp” the “*absolute forms of existence*” (“extremes of existence” – “*absolute modus*”) of a *thing (process)*. Because the form of any thing including “thinking”, according to Aristotle, is the essence of its being, “the primary essence”. The form is the *minimum common origin*, which corresponds to the self-existing things and represents that *properties of things* that are unique to it “on their own”, *in a necessary and constant manner, i.e. fundamental.*

Aristotle’s teaching about the form in the 20th century most systematically was developed by a philosopher V.N. Ilyin in “Statics and dynamics of pure form or Essay on General Morphology”. [18] V.N. Ilyin considered his “General Morphology” as “a science which task is to methodologically promote and justify modern science – exact and humanitarian”. “General Morphology” of N. Ilyin is a system of philosophical knowledge, a kind of matter *science of being* which in its foundation is based on the general concept of *the form* and notion of *the border* related to it. In the beginnings of “General Morphology” of V.N. Ilyin there is a philosophy of Plato, Aristotle, the Neoplatonists, and especially the philosophy of medieval philosopher Robert Grosseteste (1175 – 1253), Chancellor of Oxford University, founder of the Oxford school of philosophy and natural science, theorist and practitioner of experimental natural science. In his cosmogonic treatise “About the light or about the beginning of the forms” (*De luce seu de inchoatione formarum*), R. Grosseteste noted that “...a sensual knowledge is not a knowledge, but the path to it. Because human knowledge is more likely to occur on the relationship of sensual knowledge with understanding”. [19]. That is, knowledge of the existence of the phenomenon is incomplete without knowledge of its causes (*propterquid*). Developing and deepening the ideas of “General Morphology” and the underlying ideas of “beginning of the forms” as a theory of form and morphological variationism gains fundamental importance in the information age for further development, justification and *establishing the essential foundation, framework and frames for the whole system of knowledge and primarily all physical.*

Physics in its development went on the way of “geometrization”. [20] However, to date “*the beginning of geometry*” remains unclear itself. [21] To clarify the “beginning” it is necessary following *Protogeometr*, go all his millennia way of ups and downs, the path of development (understanding) of primary forms – “point”, “line”, “circle”, “wave” and then – to the generation of such concepts as “quantum” and “string”. And only *clarifying the dialectic of generation of primary forms of being and thinking*, through building the structure of “beginning” you can “grasp” (understand) the nature of the information that is multivalent in its manifestations at every level of existence of the matter as a whole. Hence the difficulty of “grasping” of its nature and several dozens of its “definitions” that do not clarify its nature, and reflect different approaches. [22]

Understanding the nature of the information, its essence was undertaken over several decades, from the mid-20th century. [22]. However, there is still no generally accepted view of the nature of the information. Study of the structure of matter and space, total unification of matter on all floors of existence allows us to express and define by the simple concept the essence of information, establish its dialectical, essential relationship with matter and energy, with fundamental structure of reality and structure of language in which Nature speaks to man. So, in the first chapter the structure of reality is considered, essential, dialectical relationship of ideal and material, the unity of physical (material) and ideal reality is shown in a single *eidōs*, represented by a simple mathematical object and representing the fundamental physical principles. The nature is consistent – and it determines such unity. The problem was only in the construction of the fundamental structure of consistent reality. The main way to the final grasp of the essence of the information is understanding of the language spoken by nature. And understanding, how G. Gutner said is “the event that consists in grasping the structure”. [17].

Physical reality is formed of all the world’s material objects, both substantial and non-substantial (e.g., electromagnetic, gravitational and other fields), as well as all motion processes and internal changes that happen with these objects. Ideal reality objectively exists and it is manifested in fundamental constants and laws, its sustainability. As was noted by philosopher M. Mamardashvili, “the understanding of the laws of the world is at the same time an element of the world, the laws of which are understood”. [23]

That is, consciousness is included in the world as a whole through the phenomenon of understanding (“grasp”) of objective laws of nature, its conformity to law, through the sign (*eidōs-attractor*) constricting meanings, namely “*vector of consciousness*”: *consciousness is a vector value*. Vector in Latin means “carrier” that carries not only the idea of directivity, but the limit attraction.

And as a result, total unification of matter at all levels of reality, “grasp” of its fundamental structure, the structure and dimensionality of space, the structure of the language of Nature – “the house of Being”, provides in-depth understanding of the nature of information as a phenomenon of *Ontological memory* – “*soul of matter*”, measure of being as a whole – qualitative quantity of absolute forms of existence of matter (absolute states), as a phenomenon of orderly self-motion of logos (absolute idea) and absolute forms of existence of matter. “Information” and “time” are multivalent phenomena of *Ontological memory* substantiating the unity of reality at all its levels. Here we see that the nature of *the information time is single – ontological memory* of material structure at a certain level of its being as a whole. The first concept shows the phenomenon of transmission, accumulation of ontological structuring of matter, the interaction of elements at all levels of reality as a whole, the second – the phenomenon of genesis of new generating structures, formation of levels of reality. *Ontological memory* provides the integrity and unity of reality, “*holds*” its structure, sets the “frames” and the “framework”, generates new levels of reality.

Ontological structuring of dialectic of self-motion of logos and matter, “grasp” of the nature of the information, its generation and “storage”, natural ways of transmission, leads to the conclusion that in addition to parametric information units «bit», «qubit», «qutrit» one shall introduce new information unit representing the idea of generating new structures and meanings,

namely *Delta-Logit* ( $\Delta$ -Logit), *qualitative quantum or prototecton*, *primary organizing*, *absolute existential-extreme*. The unit reflects the essence of the information and its fundamental properties and manifestations: substantiality, attributivity, functionality, structural properties, consistency, attractiveness, emergence, vector properties. Understanding and technological development of the dialectical concept of “prototecton” directs the mind to the way a qualitative leap in the development of information technology.

So, thanks to the information we have received from the “goddess of forms” Eidotea, through primary sign or *protecton*, i.e. language – “the house of Being”, we have constructed the “network”, *ideal structure* – Absolute generating structure, representant of *onto-genetic code* and algorithm of the Universe. What is the reason for success of such a “grasp”? It is a qualitative structure of the “cells” of the network, its primary forms as a “storage” of *Ontological memory*. “Grasping” the Proteus of nature took a lot of “time”, but we acquired the main thing that the Proteus had – increment of “memory” or knowledge expressed in the signs of primary forms of “elusive” matter.

Today, for edifying the physics of information age, actual as never before becomes the philosophic legacy of A. Einstein: “At the present time, a physicist has to deal with philosophic problems to a much greater extent than physicists of the previous generations” and the philosophic legacy of J. Wheeler “Philosophy is too important to be left to the philosophers”. [24,25]

### Conclusions

1. Overcoming the “crisis of representation and interpretation” of the fundamental sciences is only possible in the way of *total ontological unification of matter at all levels of reality*, the ultimate compression and restructuring of information accumulated by mankind, its essential analysis and dialectical synthesis, as a result, ontological justification of underlying sign systems – physics and mathematics. Addressing the problem of justification of fundamental sign systems is the way to understanding the essence of being, nature and the “place” of information in the foundation and levels of reality.
2. Reality and its phenomena at all levels of existence is the dialectic of “coincidence of opposites”.
3. *Ontological (structural) memory as a measure of being of a whole (reality) – semantic attractor*, central category of a new conceptual structure of the world of the Information Age, which is based on *Absolute generating structure* ((«general framework structure» “super structure”, “hyper structure”). Ontological formula of John A. Wheeler «*It from Bit*» is the first link in the chain of ontological formulas → «*It from  $\Delta$ -Logit*» → «*It from Ontomemory*» → «*It from Logos, Logos into It*».
4. Information as a phenomenon of *Ontological Memory* in nature is multivalent in its manifestations at different levels of reality.
5. Understanding of the “place” of the information in conceptual structure of reality and its nature provides a new opportunity, ability and directivity to calculate the Nature: “*understand and count fast*”.
6. Development of “Physics of Information” requires further development of ideas of “General Morphology”, “General Theory of measure”, “General Theory of Interactions”, “General Framework Theory”, “General Theory of Structures” [26], “General Theory of Information” [27,28] as fundamental to expanding the scope of fundamental sign systems.
7. New physics of the information age is a New natural philosophy with the new “mathematics principia”, new fundamental “*la structure – mère*”. Understanding mind overcomes *the ontological gaps in the grounds of basic sign systems* – mathematics and physics.

8. Kant's categorical imperative moves into the area of practical ontology in the theorem of N.A. Umov: "Confrontation of humanity to entropy ruining and/or stopping its rush to eternity, is a "slenderness", a kind of expression of negentropy potential of creative, organizational activities of mankind". [29, 30] Confrontation of humanity to entropy is the understanding of Logos. Logos returns → its understanding "*Observers are necessary to bring the Universe into being.*" [31]

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