

INSTITUTUL DE CERCETĂRI PENTRU
INTELIGENȚĂ ARTIFICIALĂ AL ACADEMIEI
ROMÂNE

(The Research Institute for Artificial Intelligence of
the Romanian Academy)

Mihai Drăgănescu

**THE FUNDAMENTAL PHENOMENOLOGICAL
INFORMATION OF THE UNIVERSE**

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THE FUNDAMENTAL PHENOMENOLOGICAL INFORMATION OF THE UNIVERSE

[Mihai DRĂGĂNESCU](#)

[Research Institute for Artificial Intelligence of the Romanian Academy](#)

E-mail: dragam@racai.ro

The birth of a universe is described as having two main stages: a) a phenomenological informational process that generates the fundamental phenomenological information of the universe; b) an informational - energetic process which produces the structural universe. It is shown that the laws of the universe have a semantic origin, producing a cellular universe, both at the phenomenological and structural levels.

Key words: phenomenological information, autofunctors, integrative science, semantic laws of the universe, cellular universe.

1. INTRODUCTION

The phenomenological information was defined in the years 1984-1985 [1,2,3] following a previous ontological model of existence of the author [4]. The phenomenological information or the phenomenological sense, in itself, is a phenomenon outside the field of structural science. But the phenomenological senses as elements, when they interact are forming a structure, a phenomenological structure [5]. Still and all, this structure has not, in most cases, a systemic formal behavior, because in phenomenological realms, when the phenomenological information is not coupled with orthoenergy [3], non-formal processes may take place which generate new phenomenological senses (information). This may happen when a new universe is born or in the usual activity of minds. In such cases, the phenomenological structures defined above are not submitted to the structural science. This is one more reason why the structural science is insufficient and incomplete [6].

2. THE PLACE OF PHENOMENOLOGICAL INFORMATION

The ontological frame of the phenomenological information was presented previously [7] in a synthetic manner as shown in fig.1, 2 and 3.

"In fig. 1 are presented the main four levels of existence. The first two levels constitute the orthoexistence.

First level:	Orthoenergy, Primordial information(informatter), Cronos, Fundamental Consciousness
Second level:	Phenomenological categories (Clusters of orthosenses)
Third level:	Universes quanta (of space and particles) time, arrow of time energy, information, bodies and minds
Fourth level:	Group, community and social networks

Fig.1

In fig.2 are shown the elements that generate a phenomenological category, for instance of a universe. The dynamic of the primordial information together with the action of the cronos are working together to produce the phenomenological information (orthosenses) of a universe or for other entities. The phenomenological information is playing an important

role at all levels. The physics of today dealing with the universe neglects the phenomenological information [...]. In fig. 3 it is shown how by the

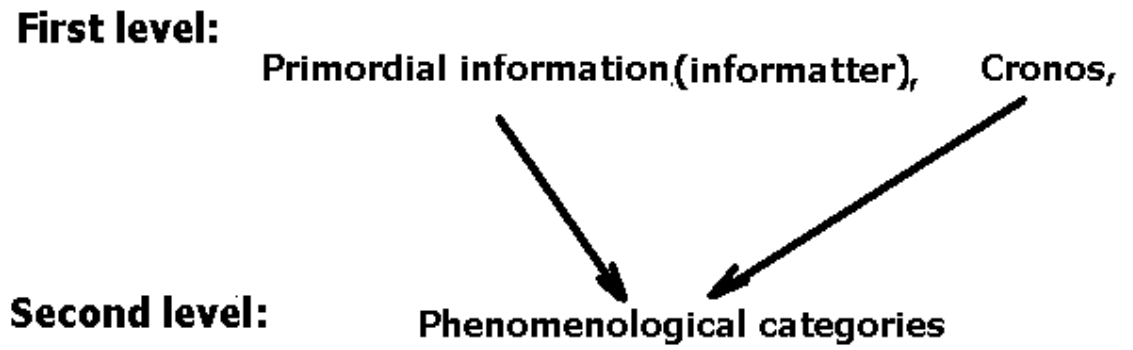


Fig. 2

coupling of the phenomenological information of a universe

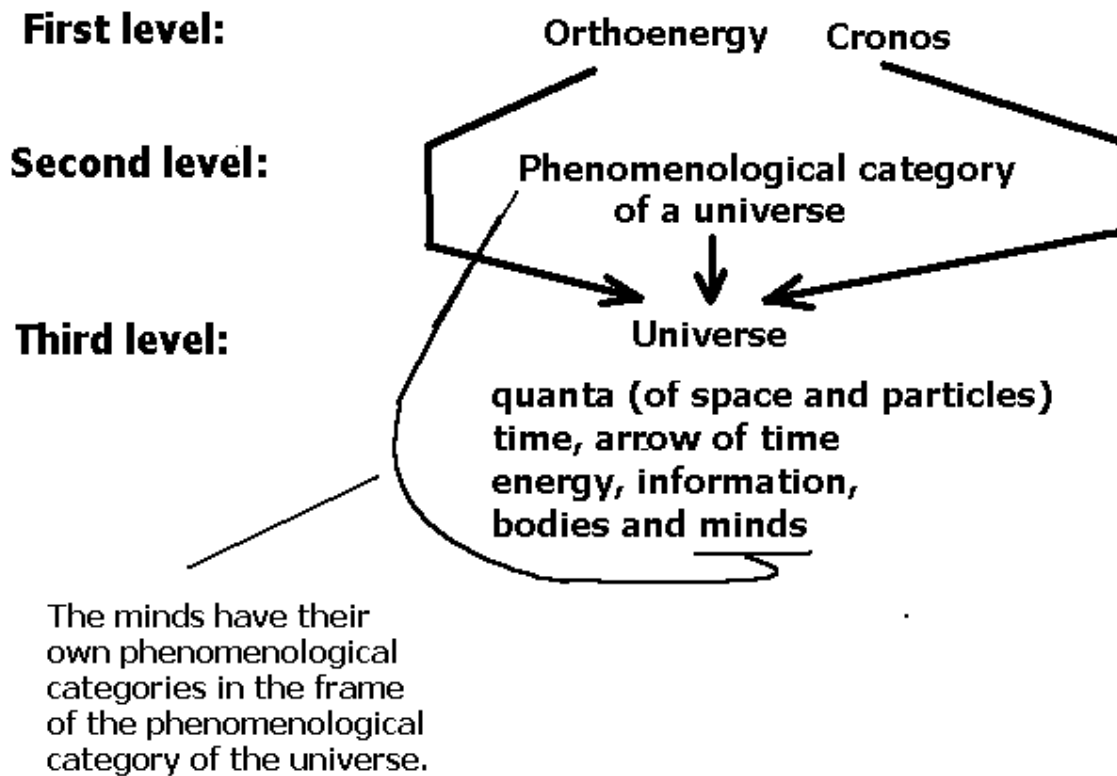


Fig. 3

with orthoenergy, a complete structural-phenomenological universe may be born. A special situation in a universe has, indeed, a mind. It has both a part of the structural universe and another part as a phenomenological category of its own, not coupled with orthoenergy, although in the frame of the phenomenological universe.

The fourth level (fig.1) of group, community and social networks is an unequivocal and a new level to be taken into consideration by science. This level embraces network phenomena of the second and third main levels of existence mentioned above. An integrative science has to consider network phenomena [8] both at the phenomenological and structural-phenomenological levels, and not only at structural level" [7].

3. THE BIRTH OF AN UNIVERSE

We shall now consider the generation of a universe. The autofunctor F_A generates first (fig.4) from the fundamental monoid of existence the phenomenological category of a universe [9].

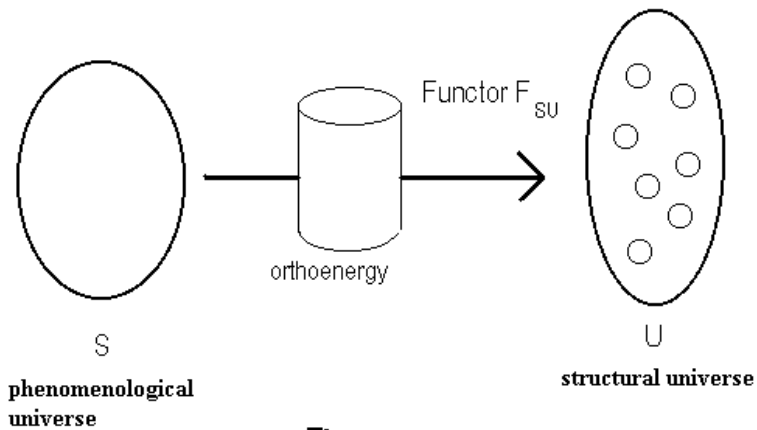


Fig. 5

The following big step in the generation of a universe is the coupling with orthoenergy [9]. That coupling is realized (fig.5) by a functor F_{SU} . I observed: "The functor F_{SU} is between a phenomenological category S and a structural category U . It is not a simple phenomenological-structural functor because it involves in its action the deep energy" [9]. F_{SU} does not generate something new, it only couple existing elements. For this reason it is not an autofunctor.

In detail, from $\langle 1 \rangle$ to S , there are some intermediary stages [10] as shown in fig.6.

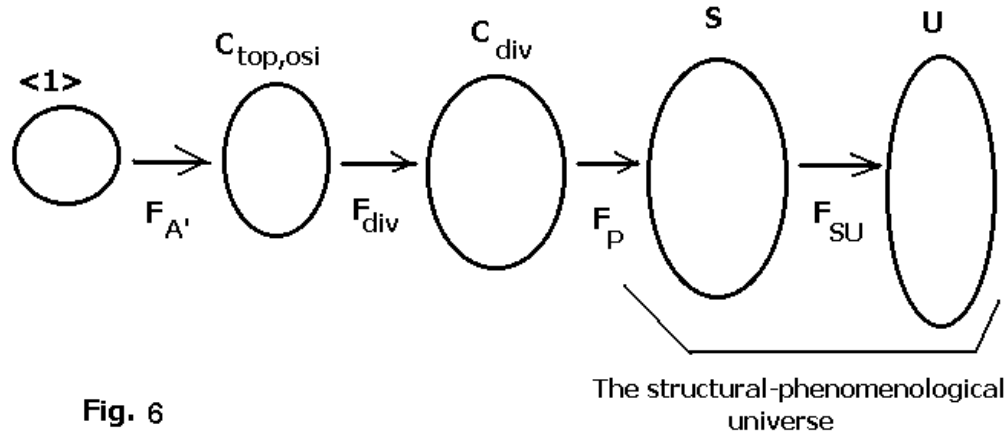


Fig. 6

The autofunctor F_A from fig.4 is the product of the autofunctors $F_{A'}$, F_{div} and F_P from the fig.6:

$$F_A = F_P \times F_{div} \times F_{A'} \quad (1)$$

where $F_{A'}$, F_{div} , F_P are acting in sequence, each in a tact of the cronos. After the first tact $F_{A'}$ is acting no more, it is no more present in the process. The same type of behavior under the cronos is valid for F_{div} and F_P .

$F_{A'}$ generates a number of fundamental phenomenological orthosenses (senses depending only of deep reality processes),

$$\langle \text{otop}, \text{os}_1, \text{os}_2, \dots, \text{os}_n \rangle \quad (2)$$

which are forming, every of them, a phenomenological category with one object, the respective phenomenological sense (information). The first of these, otop , is the phenomenological topological information, that will determine the arrangement, as neighborhoods, of the final phenomenological cells (objects) of the phenomenological category of the universe. The other orthosenses determine specific properties for various types of interaction among the same cells mentioned above.

F_{div} , as it was observed [10], produces a division of the orthosenses of (2). "The orthosense $\langle \text{otop} \rangle$ is divided by) F_{div0} (a component of F_{div})

giving the phenomenological category $\langle \text{otop} \rangle_{\text{div}}$. *This is not a process of multiplication* of the category $\langle \text{otop} \rangle$ with itself for a great number of times, because in the category $\langle \text{otop} \rangle_{\text{div}}$ are generated morphisms among the topological orthosenses which introduces some order for the orthosenses to be able to form later an ordered structural space of n dimensions. On this depends the actual number n of dimensions, as the possibility to form a future 3 dimensional structural space, complemented with a $n-3$ subjacent space, or of any possible configuration of the n dimensions.

The morphisms created among the objects of $\langle \text{otop} \rangle_{\text{div}}$ are assuring the ordered neighborhoods of the orthophysical points (or cells) of the space and finally of the quanta of the structural space. These morphisms will be named *neighboring morphisms* and they represent, in this model, physical and informational realities. This type of morphism may be added to those already considered in a previous paper" [11].

The autofunctor F_{div} produces the phenomenological categories

$$\langle \text{otop} \rangle_{\text{div}}, \langle \text{os}_1 \rangle_{\text{div}}, \langle \text{os}_2 \rangle_{\text{div}} \dots \langle \text{os}_n \rangle_{\text{div}} \quad (3)$$

where

- $\langle \text{otop} \rangle_{\text{div}}$ is a category which has a multitude of objects (phenomenological cells) $\langle \text{otop} \rangle$ which represent the phenomenological information of the future structural space of the universe, and
- $\langle \text{os}_j \rangle_{\text{div}}$ is a phenomenological category, which has two types of objects, a multitude of phenomenological senses of interaction $\langle \text{os}_j \rangle$ and a multitude of zero-objects and corresponding morphisms.

"The autofunctor F_{div} , besides $F_{\text{div}0}$ discussed above, has also the components $F_{\text{div}1}$, $F_{\text{div}2}$, $F_{\text{div}n}$, each of these components being an autofunctor.

The effect of an autofunctor $F_{\text{div}j}$, where $j = 1, 2, \dots, n$ is to generate a number of identical orthosenses of type j , and a number of phenomenol-

ological zero-objects (fig.7), and corresponding morphisms. This is necessary for the final constitution of the phenomenological category S of a universe. A phenomenological zero-object is a cell (point) of informatter without any topological or charge (interaction) orthosense. There is no category of only zero-objects, such objects are only in the categories $\langle OS_1 \rangle_{div}$, $\langle OS_2 \rangle_{div}$, ..., $\langle OS_n \rangle_{div}$. Still the zero-object has the general orthosense $\langle 1 \rangle$ which is preset, by definition, in all informatter, in all points (cells). The phenomenological zero-object has no orthosense except the orthosense $\langle 1 \rangle$.

In fact, a category $\langle OS_j \rangle$ has two types of objects, one orthosense, named also $\langle OS_j \rangle$, and the zero-object which has the complex orthosense $\langle 1 \rangle$. The division applies to both these orthosenses, and that is why $\langle OS_j \rangle_{div}$ has many orthosenses of both types.

The $\langle OS_j \rangle_{div}$ category has perhaps morphisms among all $\langle OS_j \rangle$ orthosenses (for instance if to such an orthosense corresponds in the structural realm an electric charge, these will interact). The morphisms of $\langle OS_j \rangle$ will be *morphisms of interactions* among the same type of orthosenses, after the type of charge they represent in the structural realm" [10].

All these $\langle Otop \rangle$ and $\langle OS_j \rangle$ categories are forming together a category C_{div} of which objects are of course categories.

At last, the autofunctor F_P (fig. 6) was shown [10] to produce the product of phenomenological categories of C_{div} . Then,

$$S = \prod C_{div} \quad (4)$$

This is the fundamental phenomenological information S of a universe at its birth. This is a phenomenological category. The objects of this category represent the phenomenological information content of every quantum of the universe (of space and matter). The morphisms of it

represent the neighborhood arrangements, the interactions, changes of neighborhood and the transformations of the phenomenological objects in interactions.

Most of the objects of S are of the form shown in fig. 7. Those objects with the content of the type of fig.7.a have only topological orthosenses and become *quanta of space*. And further: "In fig.7.b, 7.c, 7.d etc there are objects of S with only one interaction orthosense and a topological orthosense. Other objects are shown in fig.7.e and 7.f with two interaction orthosenses and a topological orthosense etc. These will become later *quanta of matter*, positioned in space mainly corresponding to their topological orthosenses.

The morphisms among the objects of S are determined by the morphisms in the categories participating at the product (see part 2 of [10]).

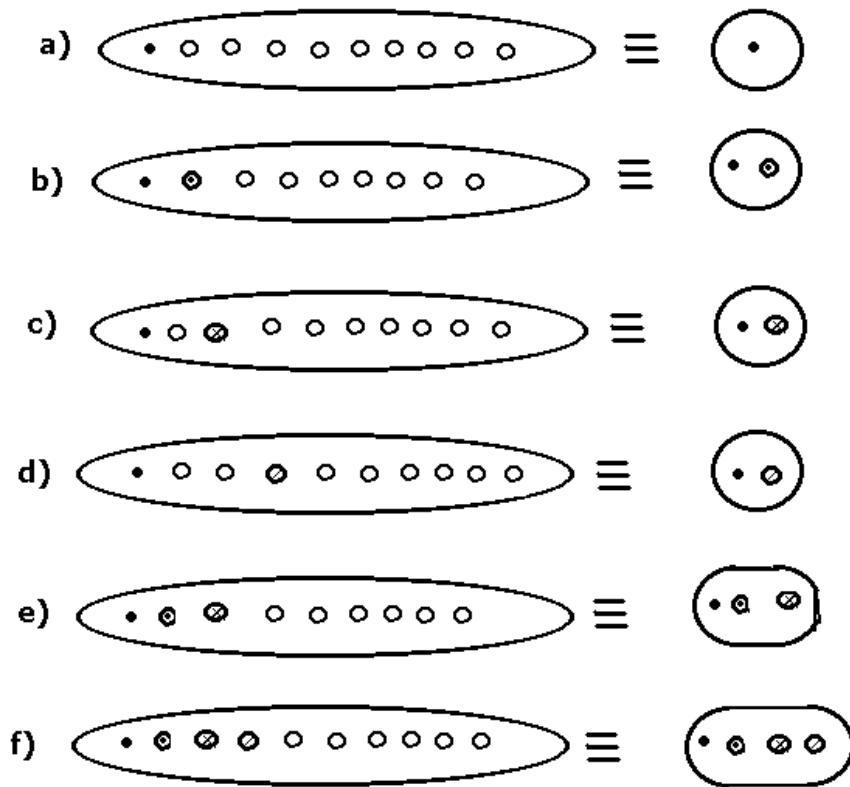


Fig.7

Only the categories S and U remain to form the real, integrative universe U. Some preliminary considerations on U are presented in [9]. Once established, S and U remain in permanent interaction (fig. 8).

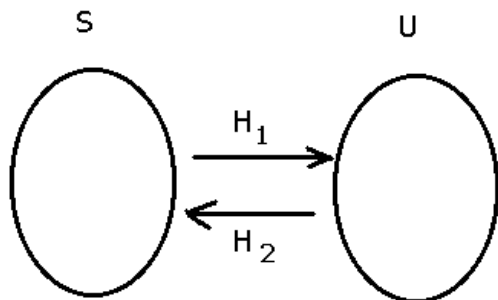


Fig.8

$$U = \langle S, U, H_1, H_2 \rangle$$

We will observe that the product of the categories S and U, one phenomenological, the other structural gives, under certain conditions [12], a

structural-phenomenological category U , defined in principle in [12], of which objects are formed by both phenomenological and structural objects of S and U , but only those objects under the effects of F_{SU} and related by the functors H_1 and H_2 (fig.8).

4. CONCLUSIONS

The fundamental phenomenological information S of a universe at its birth, $S = \prod C_{div}$, represents the result of a phenomenological process in which an important role played the autofunctors $F_{A'}$, F_{div} , F_P . As I observed previously [9], "the essence of an autofunctor for a phenomenological category is to give birth to a physical and informational process, which is non-computable, non-formal, unpredictable for an observer from a universe".

The autofunctors are phenomenological informational commands of $\langle 1 \rangle$, acting in the tact of cronos \mathbf{R} . The cronos is a 'permanent' presence in the activity of S . If in the universe there are minds, their phenomenological categories $\sum C_{phemind}$ are part of the phenomenological information of the universe. It remains to take into account the possible phenomenological influence of the Fundamental Consciousness, which is also a phenomenological information. Then *the phenomenological information of the universe* may be

$$S_{\text{phenomenological.univ}} = \{ \langle 1 \rangle, \mathbf{R}, F_{A'}, F_{div}, F_P, S = \prod C_{div}, \mathbf{Z}, \sum C_{phemind} \} \quad (5)$$

where \mathbf{Z} is the Fundamental Consciousness (or the part implicated in the universe).

$S_{\text{phenomenological.univ}}$ represents all the phenomenological information of a universe, and this is not a category, although it contains categories like $S = \prod C_{\text{div}}$ and $\sum C_{\text{phemind}}$, and may be \mathbf{Z} .

It remains to study the networks that are formed by self-organizations or by organization, or by organization due to subcategories of $\sum C_{\text{phemind}}$, in the frame of (4) or (5).

The phenomenological categories are categories with phenomenological information. The phenomenological information is always a semantic information. The fundamental phenomenological information of a universe (4) is a semantic information. The phenomenological information of the universe (5) is also a semantic information.

The laws of a phenomenological universe without minds and without the influence of \mathbf{Z} are contained in (4) and they are of semantic nature.

The semantic nature of these laws becomes the physical structural laws of the universe, after the coupling with orthoenergy, as shown before.

The semantics of the phenomenological information is a semantics of meaning (sense, phenomenological sense) [1,2,3]. This is different from the semantics of signification (of reference and context) [1,2,3], which does not imply the meaning (as a phenomenological information), but only the structures of information, as it is case of artificial intelligence, and also of the structural information of the brain.

It may be observed that the fundamental phenomenological information of the universe contains cells (phenomenological objects of the category S), which become quanta of space and matter of the structural universe. If nothing happens from the part of $\sum C_{\text{phemind}}$ and \mathbf{Z} , the structural universe becomes a cellular automaton that might obey the physics envisaged by Wolfram [13]. The physics of Wolfram neglects completely

the informational phenomenological origins of the universe, exactly the sources of the rules followed by the universe as an automaton. and, being too structural, wolfram's physics of the universe can not accommodate $\Sigma C_{\text{phemind}}$ and \mathbf{Z} . But these are sources of new phenomenological information that influence a real and a complete integrative universe.

What Wolfram has also shown is the fact that the description of the universe as a cellular automaton is perhaps better in comparison with that which may be obtained by classical mathematics of physics. The classical mathematics is good only for some aspects of the behavior of a universe, perhaps only for a small part of the reality of the entire universe. Wolfram demonstrated indeed that mathematics is limited in its capacity to describe all the structural reality at such a scale. This may be corroborated with the efforts to describe reality under the Planck scale, where the usual mathematics fails and efforts are done to find new mathematical ways [14].

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