

# Two Methodological Comments

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## **Abstract**

In the first part, we raise the question of the philosophical setting up by non-professional philosophers, and of the scientific concepts posited as starting point of their philosophical interpretation. In the second, we outline some significances of the concept of architecture, as *telos* in relation with information.

**Keywords:** Mihai Drăgănescu, information, system, open and intro-open systems, architecture, telos, phenomenology, Ludwig von Bertalanffy, holism, computer, living systems, man and consciousness.

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## **Introduction**

From the standpoint of knowledge, a paper is valuable when it is positive towards two requirements: to be consonant with the latest acquisitions in the field of research in that moment and to be daring in front of them – for this reason being worthwhile in actuality or potentially for the field as such – and to be heuristic, i.e. to allow or even induce new developments of the proposed

theses. Mihai Drăgănescu's early sketch answers to these criteria. Clearer, even though his later philosophical construction was not (yet) promoted by the Romanian philosophers, in the scientific approach the suggestions to go deeper than the structures of existence were and are fruitful. And this – despite the not yet elaborated and even understood phenomenological approach in ontology. As it is known, the increase of information sciences and the interdisciplinary approach in physics, chemistry, biology, linked to the mentioned sciences, have used just the concepts and “openness” of Mihai Drăgănescu.

### **Concerning the degrees of openness of systems**

Mihai Drăgănescu's paper presented here once more suggests the *historical* character of philosophy's precedence towards science. This precedence, commonly illustrated by the ancient Greek philosophy as a nursery for many scientific theories developed later, means both that it was determined by complex intellectual causes and that it was temporary. Once a scientific theory related to a domain or problem emerged, the research in that domain or relative to that problem must refer, for information and tackling, to that scientific theory. The reference to previous philosophical records *as a basis* for that concrete research eventually helps only if they have richer ideas and correlations which thus may constitute new directions of the study.

Approaching our problem, we can observe that the fact that philosophy has focused on the relationships between the external object and the contemplative and acting subject does not mean at all that it would have frozen them in absolute mutually external ones between two impenetrable realms. On the contrary, the history of philosophy shows the same evolutionary path as science does, revealing the complexification of philosophical ideas, in the framework of dialogue of different philosophical standpoints

The paper's reference to Heidegger's “stopping in the middle of the road”, namely, before emphasising that matter and consciousness are not separated and that the consciousness is able to see the depth of the material world, is a little childish. Of course Heidegger stopped: because his philosophical purpose was *different* from that of some of the latter philosophy's interest in the bivalence of information in the structuring of the material world. As an existentialist, he obviously insisted on the strong influence of the material world

on the subject, even on the relative autonomy of the artificial part of the material world, considered as a *Gestell* of man's vulnerability. As well as – on the creative power of man's psyche: analysed not psychologically, but as a result of man's essence "in proximity of the Being", and unfortunately only in a *solipsisti manner* (in a sophisticated philosophical language, in the frame of *methodological individualism*; but Heidegger transcended the simple methodological individualism in the *practical* realm, i.e. in the practical philosophy). Not the idea of perspicacity of the human consciousness to be open to invisible forces and structures of the material world missed to Heidegger, but that of the neglect of the Other: the exclusion of the social generated au fond an insurmountable contradiction between the time marked evolution of the human being and its irrepressible essential pattern. Or, put in other way, as a phenomenologist, Heidegger developed an *ontology* of man as a constitution of his essences<sup>1</sup> (which are objects of the ideal nature of consciousness, and not objects in themselves), that was on the one hand closed, but on the other hand, open because its content was given by the experience of consciousness and its internal – external conditionality.

In its turn, according to the Husserlian tradition, philosophy as phenomenology is the philosophy which sees the entire external conditioning of thought, that is to say of the existence of man *qua* man, but which precisely pursues the way in which thought becomes aware of all these, but also of the way in which universals are constituted. Opposed to the paper's idea that Husserl would have reduced phenomenology to psychology, we can underline again the idea that whereas psychology is a science of fact, phenomenology "is a universal reflection, which tends to clarify and fix conceptually all the intentional objects that my consciousness can aim at"<sup>2</sup>. So the two disciplines have different terrains. Husserl linked in a more rigorous way the essence, grasped by philosophy, to the existence, than some of his successors (Heidegger and Max Sheler). But all of them were interested not in the ability of the consciousness to grasp its internal meanings (studied by psychology), not in its power to "sense" the depth of matter, but in the experience of the consciousness in relation with the experience of man and the forging of the universals. (Continuing the radical reflection of Husserl – and surpassing some "dogmatism" presented by Heidegger, Merleau-Ponty, as a great phenomenologist, opposed both to idealism "which

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<sup>1</sup> [Sartre '36], p. 140: the phenomenological reflection "seeks to grasp the essences. That is to say, it begins by placing itself from the outset on the terrain of the universal".

<sup>2</sup> [Merleau-Ponty '20], p70.

make the exterior immanent to me” and to realism, which submits me “to a causal action”, both positions “falsifying the motivational relations between the interior and the exterior”<sup>3</sup>).

Letting aside the directions they arrived at, the phenomenologist mentioned by the paper considered the consciousness as Hegel had shown, thought characterized by the distinction between the subject who thinks and, on the other hand, the object external to him (this being even the body of the subject, and even the consciousness, that is to say the nearest existence towards and toward which thought inclines). Consequently, consciousness is the *structure of the opposition in the coexistence* (the chiasmus, as Merleau-Ponty later showed) *of the subject and the object*. Interiority oriented outwards; and becoming richer or more specific just following its multi directional relationships with the “outside”. The phenomena as they present to the consciousness (this is the object of phenomenology) are the “interface” of the subject and the object: an interface that includes other interfaces (language, for instance), better emphasising the internal (consciousness / subject) and external (object) conditionality.

This critical pointing to the paper’s image about the philosophical poles it considers does not aim to criticise the author’s limits in the philosophical knowledge. What is at stake is to understand that science may begin from philosophical suggestions but at the same time it must *autonomise* itself from them and surpass them. As an engineer fully preoccupied by the meanings of the special domain of artificial creation of which he was a creator – microelectronics, thus information generation, transmission and control – Mihai Drăgănescu endeavoured to develop a coherent image of these meanings. He relied, obviously, on professional papers. But the richness of the domain of information and the beginning time of the information science itself led him to go further, projecting *hypotheses* beyond the existent results of scientific theories: in philosophical papers like that presented in this issue of Noema, and like the next *The Depth of Existence*, published a year later. The paper of 1978 signalled some of these hypotheses as they emerged as a philosophical theory in the book of 1979 and the following.

And since Mihai Drăgănescu knew that he was adventuring beyond his specialty

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<sup>3</sup> [Merleau-Ponty '45], p. 417. See also “the question is always to know how I can be open to phenomena which are beyond me and which, however, only exist insofar as I take them up and live them”, *ibidem*.

– itself at the beginning – he immersed in philosophy and believed he found landmarks and poles for his construction.

However, he used already scientifically worked concepts: like that of *system*, and of *open system*. But instead of building on these concepts, he remained at the philosophical outlines of Heidegger and Husserl, and of the Romanian philosopher Constantin Noica. Of course, we discuss only a *working paper* that rather advances some ideas without much elaboration. But – and not because the paper was presented to fellow engineers – as always it did, the philosophy deserving its name should have considered also the scientific views and concepts. Ludwig von Bertalanffy who wrote in English the *General System Theory: Foundations, Development, Applications* (New York: George Braziller, 1968) was never mentioned, though this book scientifically explained the systems and open systems. If the General System Theory would have been mentioned, then the *intro-openness* – philosophically borrowed from Noica and described as the ability of consciousness to resonate with the depth of matter and this because it has a material support “of a new physical nature, deeper nature”, *meaning* information – about the depth of the material world and its resonance in the consciousness not only would not have been controversial but would have gained ground.

Of course, we have to see not only what was the stage of understanding the information – matter problem in the 70s-80s (and what is nowadays<sup>4</sup>), including the problems of the consciousness, but also Mihai Drăgănescu’s goal: to understand information beyond its “taming” through mathematics and IT. He was interested in the essence of information, still an open issue<sup>5</sup>. Anyway, he

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<sup>4</sup> Let mention that if “correlations between brain activities of two separated subjects may occur, although no biophysical mechanism is known” [Wackermann '03] Jiří the progress is so accelerated that a deep learning “realizes computations with deep neural networks made from layers of mathematical functions” and that “to train deep physical neural networks made from layers of controllable physical systems, even when the physical layers lack any mathematical isomorphism to conventional artificial neural network layers”, [Wright '22]

<sup>5</sup> Though here is not the place, it’s difficult to not mention not only the quantum, atomic and molecular bearers of information in the living (already Maupertuis spoke about intelligent molecules), but also its semiotic and intentional functions: which once more converge with Mihai Drăgănescu’s idea of intentionality seen as phenomenological structure of meanings. For the enlargement of the notion of information as semiosis see [Deacon '12], but also [Bruni '12].

A result is not the neglect of mathematical approach of the algorithms of the logic of information, but on the contrary (and not because of practical reasons), see [Emmeche '94];

gave – in this paper and the following – the example of *consciousness* and *man as a whole* (including the social coagulations of different types and *in toto*) as *intro-open* systems where information acted in at least two types of ways: by directly formatting the material of structures – it being interdependent, at least ultimately, with matter – and by assuring their interfaces, the connections and integration of structures<sup>6</sup>.

## Concerning the architecture of systems

This comment has no atom of criticism. It only interprets the notion of architecture as it was supplied by the paper.

As it is known, the concept was borrowed by the IT because it links the *structures* and their *functions* or, philosophically expressed, *reasons to be*. Historically, Mihai Drăgănescu started from the possibilities of the hardware – micro-electronic structures as circuits and memory cards, semiconductor materials, chips and microprocessors – to manipulate signs, and those of the software, the use of signs in programming<sup>7</sup>. From this last face, the idea of appearance of the whole machine – as a connection of the hardware and the software – involved the principle of logical priority of the *functions* over the construction of the whole. Indeed, architecture is the term that corresponds to the *holism* of open systems explained by Ludwig von Bertalanffy through founding laws in physics and chemistry. In IT, it reflects the existence of complex programmes in circuits which allow the microprogramming at different component levels and “the flexibility of modification and maintenance of different microprogrammes”<sup>8</sup>.

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while for the mathematical model of computation, Gödel suggested a vitalistic approach, i.e. an embedded teleology, [Lethen '20].

<sup>6</sup> [Suteanu '13] described man as having an in-betweenness status accessing the nodes of the (Aristotelian) causal network of intertwining material and informational world, the informational being not only the “formal cause” but also the efficient one and the telic one.

Concerning Mihai Drăgănescu’s paper, it’s clear today that only the enthusiasm of conjectures making led him to consider that the psychological level opens “to the establishment of structures that it can invent”, but these structures “are not given to it from its existing structures or received from outside”. The structures of thinking and feeling are both given by the structures of the human brain and in their relationships with a complex environment.

<sup>7</sup> [Stefan '17].

<sup>8</sup> *Ibidem*, p. 61. And, p. 62: “The structure of circuit is functionally updated by program-

Architecture is another name of *organisation* – or, “administration of things”, as Engels said a long ago – and this involves not only the clear-cut image of the parts of systems (including systems of processes), i.e. of the elements of structures of the systems, but at the same time the unitary, coordinated system of *semiotic control* both at the level of parts and of the system<sup>9</sup>. Organisation is the result of organising and, as architecture is, it is the net of relationships between all the structural elements of the system giving the appearance, the “form” of the system.

In the technical systems – like the computing devices – the architecture is given by the human design of the fitness of structures and functions, in our example of the fitness of hardware and software, and certainly of all types of programmes (at different parts of the circuits). They are *open* systems but *without autonomy from the standpoint of fitness creation* or of creation of correspondence of structures and functions. By defining the architecture of computers as “user-computer interface”, Mihai Drăgănescu pointed out the imperiousness of “movers” of systems. Man is the “unmoved mover” for technical systems, if we can borrow Aristotle’s formula from *Metaphysics* Λ, or, summarising it as *primary cause*, man gives the *telos*, the *what for* of those systems. In other words, man gives the form, or informs the otherwise insignificant “*hylē*”.

The living systems are not only open but they *create autonomously their architecture*. Using the model of computer, Mihai Drăgănescu showed the vehicle of this formidable feature: *information*, embedded in matter and at the same time being the trigger of its movement and development. As the architecture of a computer is the *whole* computer resulted from the synthesis of microprogrammes as such and the hardware adequate to them, and thus it reflects or is the *ensemble* of needs or intentions of the user considering the computer – the user being the information provider from outside, formatting the whole computer and its parts – as the architecture of living systems is formatted by the junction of information, obviously embedded in and carried by material structures as the atoms, molecules, cells, organs, group of organs, at all the levels of the organism. Once designed, the computer has its architecture from the deployment of algorithms, so from the coherent manifestation of the designed device *as if* this one would be autonomous. The living systems “design” themselves as a result of the information acquired and stored both genetically and epigenetically in their active relationships with their environment, and the

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ming. From this point of view, electronics can only evolve as functional electronics”.

<sup>9</sup> Apart from information science, see [Pagni '16].

“self-design” itself is not only a changing *unity* of all the “micro-exchanges” of matter-information designs, but also a coherent *unity* of complex feed-backs from both the bottom of different types of micro-designs to the top of the comprising organism, and from the top to bottom. This complex integration of different types of sub-systems in and with the system of organism is like the Russian dolls toy transformed into a model when information flows transcend the sub-systems in complex interfaces.

The holism of the living is created by the information flows constituting in forces/tendencies aiming to keep the *integral* organism, *plus* the *local* fluxes (at the level of the “hardware” – cells, organs, groups of cells/organelles), *plus* the fluxes at *inferior* levels (chemical reactions, electro-chemical signals etc.), *plus* the fluxes and forces at *superior* levels (for instance, of psychology and cognition). The “user” is the whole living being, or the computer, or the Descartes’ living machine or systems of machines of the human body<sup>10</sup>.

However, also in computer science one can “program at the level of microprogramming”, said Mihai Drăgănescu. Consequently, the information provider infuses the formatting information in a flexible manner and in an integrative one. Information is “the key” and links different systems because it itself is *intro-open*: it has a material basis and it is purposive. And when we see the development of conjoint nonliving and living informational structures<sup>11</sup>, we once more understand the far from simplicity intro-openness.

Beyond the model of the computer, Mihai Drăgănescu suggested a deep material basis, a “deep substance”: it would be, apart from his further papers, that Aristotle’s active form simply means that successive (and concomitant) fitted into like tiles on the roof and like Russian dolls, overlapping physical, electrical, chemical information-signals generate different and successive formatted matter entities, from quantum to cells<sup>12</sup> etc. The signal-information is unique, corresponding to the unique experiences in the flow of information-matter formatting, gathers and rearranges over and over again, according to the forces/tendencies resulted from information acting as impulses.

This complexity requires the “architect” configuring/organising/arranging the whole of systems according to their complex (intro-)openness. But the architect

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<sup>10</sup> [Bazac ’10]

<sup>11</sup> [Palacios ’11].

<sup>12</sup> [Koch ’99] [Koch ’04] [Fisher ’15] [Wang ’16] [Hamblin ’16] [Li ’18] [Wang ’19] [Adams ’20] [Shinhmar ’20].



does not make a single architecture, because as the computer “can be viewed at different levels”, so the technical and living systems in man’s environment can be seen – understood – from different perspectives, on different aspects of holism (and these aspects were considered, and still are, in very fragmented views, damaging the holism). However, the accumulation of knowledge allows the comprehension of both the information flows and configuration from the balanced and necessary disequilibria at the local levels – where the fragmented view seems useful – to those of the whole, where by transmission and interpenetration, through interface layers between systems, with higher systems / levels, a moving synthesis realised.

The reason to be of information as such, and of information doubling of matter, was the existence of systems, and thus the *functions* through which the existence of systems was assured.

Information leads to rearrangements, reordering, and already this emphasises the local purposes, or *teloi* – the *what for* Aristotelian cause, till the superior ones and till the *telos* of the whole, mutually fitting into as the Russian dolls toy. The architecture of systems is just the development of the *telos* of the architects: man, but also the whole of a living system<sup>13</sup>. And information and information transmission means not only the *architecture* as appearance or *phenomenon* as in its Greek etymology, but also purpose, namely, according to the anthropological model, *intentionality*: related to the deployment of functions. The architecture gives the telos of systems. Finally, Mihai Drăgănescu took over the philosophical concept *phenomenology* to suggest that the existence itself of the material world is related to the *meanings* constituted by the information imprint of matter and by the transmission of information: “The architecture of our universe seen at the level of depths is informational, and phenomenologically intentional structure, as a whole”.

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<sup>13</sup> Even the brain has a dynamic architecture (but, being a little inconstant, Mihai Drăgănescu considered it “without architecture”).

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