

## From Explanation to Understanding: The Paradigm Shift in Visioning the Factuality

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In this paper I intend to review the conceptions of description, explanation and understanding in correspondence with their meaning under contemporary stage of science's development. To do this I would focus rather on ontological premises of these conceptions than on methodological procedures' analysis. At the same time the notions of such a study will to some extent rely upon the main ideas stressed in my previous paper concerning the visions of factuality introduced by present-day science and philosophy.

Description and explanation of facts have been considered as paramount assignments for scientific activity since the very becoming of classical science. I would cite the words of German physicist, the founder of thermodynamics – R. J. von Mayer: "If a certain fact is known from all its sides, then just by this it is explained, and the task of science is fulfilled" [1]. This view of the scientific enterprise truly corresponds to the whole classical *Weltanschauung*. First of all, explanation here is understood as *a complete in-depth description*, as a description of all possible features of the object. Then, in accordance with classical views, to explain a certain phenomenon meant *presenting it as an effect of general laws*. These laws in turn describe *essence* of things.

At the beginning of the 20th century such classical world-picture was criticized by several philosophers. The science's ability to achieve the 'in-depth' knowledge is now being doubted. E. Husserl viewed the sources of the crisis of European sciences in this classical substitution of 'liebenwelt' with the hypostatic ideal world of abstract mathematical essence. The whole scientific enterprise became possible only after geometrization, idealization and rationalization of the world. "For Galilean natural science, mathematical-physical nature is objective-true nature; it is this nature that is supposed to manifest itself in the merely subjective appearances. It is thus clear... that nature, in exact natural science, is not the actually experienced nature, that of the life-world. It is an idea that has arisen out of idealization and has been hypothetically substituted for actually intuited nature" [2].

Other prominent thinker, M. Heidegger, expresses similar ideas on considering the metaphysical premises of classical science. The human then for the first time in history becomes *subject* opposing to *object* – that is, the world, the existing. During the ancient times human 'heard' the existing, which used to speak itself up through the human; in the New times human 'presents' the world, 'pictures' it. That is, the being of the world is limited to its presentation by the human [3]. And what is more, the science, particularly physics, according to Heidegger, does not try to understand 'experimentally' the essence of natural things: "Physics as a pure theory demands the nature to show itself in the forces predicted, it conducts its experiments with the only aim to ask nature questions – whether it follows, and in what ways does it follow, the scheme outlined by science" [4].

Another great philosopher – Fr. Pavel Florensky – had stated similar ideas even earlier than Husserl and Heidegger, however the complete edition of his principal philosophical work "The Watersheds of Thought" was published only a couple of years ago [5]. Florensky aims his critics at neocantian conceptions of reality, which is just the sincere expression of the whole spirit of modern European thought. The history of this thought is the history of the struggle with life, in order to strangle it with a system of schemes. The New-age European is selfish, he considers the being only as the source to satisfy his needs. The ancient or medieval person is in contrast a realistic person – he did understand that one must *be* in order to want some satisfaction.

Human activity based on 'scheme-building' is being criticized by Florensky as illusionism, as isolation from life and reality, as human's self-locking in his subjectivity, and,

thus, as rejection of his humanity, his connection to the reality of the Universe. "Scheme-building... originates from the premise of denial of reality, and it is to give, instead of reality, some illusion of reality, some 'als ob', which would be accepted as a reality, while not only being not a reality, but by its nature denying the reality of essence" [6].

It is important to note here that neither Florensky nor Husserl and Heidegger are eager to reject or to put into disrepute the very notion of scientific enterprise. It is not the right of science to exist that is being doubted – but rather its claim for overall completeness. The scientific world-picture is found to be not natural but artificial; there are other possible 'pictures' and other realities beyond. In relation to the description and explanation – it is now observed that the true description can never be achieved, at least under classical scientific paradigm. Explanation as a complete description still remains the ideal and the main task of science – but science is unable to fulfill this task only by itself. The reason is that science has no ability to view a certain phenomenon (event, or fact) from *all* its sides – as the scientific world-picture is based on a pre-outlined scheme, the vision of fact by science is presuppositionally limited to only one side (or sometimes several, but still not all sides) of fact. In other words, it is acknowledged that science (classical science) deals with *abstractions* and not with 'real' phenomena. However, the new type of science emerges in 20th century, which rests on the other type of rationality, and phenomenon under non-linear paradigm is closely related with the essence to be explained. According to I. S. Dobronravova, in nonlinear open systems exercising the observation can determine systems' choice as for the variant of evolution's path. "Thus, the transition to consideration of concrete existence of concrete systems in their historical distinctness by chance (and irreversible in their fortuity) choices of one of possible ways of their evolution, makes the subject of scientific description being not phenomenon as just manifestation of the essence, but existence, which is unindifferent to the essence and which is not unindifferent for the essence itself" [7]. Or, as M. K. Mamardashvili has stated on 'nonclassical ideal of rationality', under this ideal empirical fact is no longer seen as "a repetition of the essence, but it is meaningful for the essence itself..." [8]. The phenomenon in nonclassical science has its own ontological existence or meaning.

In order to understand the impact of this feature as to the role of explanation under new paradigm let us turn to the classical distinction of essence and phenomenon. Of course, this distinction refers to Kant's division of *rerum naturae* into phenomena and "things-in-themselves". As M. Heidegger has commented, this division is not really an opposition, but rather a complementarity. Such double characterizing of the existing corresponds to its twofold relation to infinite and finite knowledge, as the existing both in itself and in its representation as an object. As Kant himself noted in "Opus Posthumus", "thing-in-itself is not another object, but another attitude of imagination toward *the same* object" [9]. Although thing-in-itself remains inconceivable for the finite knowledge, it could form the object of infinite knowledge. However, classical science was limited only to one side, abstract side of a fact; but the new science does not permit being so certain about limits of its possibilities.

The metaphysical considerations of the 20th century demonstrate some trends toward achieving new levels of concreteness. Thus, the cited work by Florensky has a subtitle "Features of Concrete Metaphysics". The inability of classical science with its abstract essentialist approach to reach the complete explanation revealed that "there are realities, that is, centers of being, certain clots of being, which obey *their* own laws, and thus they have each *own* form; that's why nothing existing can be considered as indifferent and passive material for filling any schemes, ...forms must be conceived by *their* life, be described *through themselves*, and not in pre-outlined perspective" [10].

In other words, the new vision of facts, of phenomena enables us to talk about

different possible consideration approaches. In Florensky's words, the everyday world-view deals with *singularity*; the science (it is classical science, of course) demolish this singularity and composes the *general* – abstract, stark *plurality*. But then the dialectical reasoning overcomes the numbness, immobility of abstraction: "Then flows unfettered plurality, and, on running, coils again into the single, but now it is not one of singles, but the single predominantly – the single that embraces singles. It is *universal*" [11].

Such a picture, in my opinion, could correspond to the way scientific paradigms change each other through the course of history. The fact of contemporary, post-nonclassical science is found to be concrete and not abstract – it is the *particular* as a certain dialectical synthesis of singularity (unity) and plurality. Concrete is indeed a singularity considered from the plurality of all its sides, it is a certain 'unity in plurality'. That is, the task of scientific explanation could appear now as attainable (See Fig. 1).

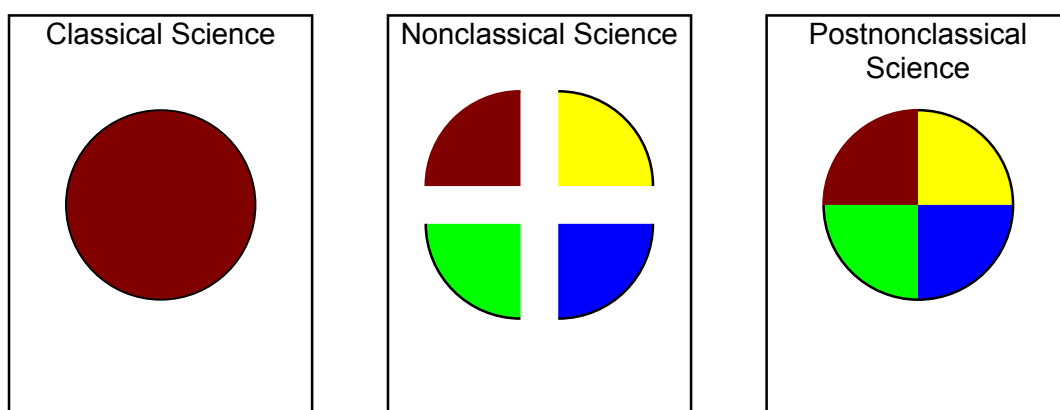


Fig. 1.

It can be stated that description (and explanation as a complete description) has its task in *translating* the phenomenon into the language of science. That's why different abstract schemes are being used, in order to provide the metaphysical base for such a transcription. Description always means coining a name tag, drawing some limits for a phenomenon. However, in post-nonclassical science, the attempt to achieve concreteness of fact can be shown, in my opinion, as an attempt to *understand* the phenomenon rather than just to explain it. In correspondence with the stated ideas of dialectical reasoning and concrete universality of the reality-in-itself, understanding could be presented as a new scientific approach, which is oriented on speaking the language of the phenomenon itself rather than on trying to translate it in accordance with the pre-outlined abstract scheme.

Hermeneutical method is quite a new method which is yet to be applied to nonlinear studies in the science, but we can at least see some possibilities of its use in the area mentioned. Hermeneutics in fact means acknowledging the existing 'dialogue' between our subjectivity and the essence of the phenomenon. The scientist has to accept the relativity of his abstract schemes, while accepting the 'freedom' of the phenomenon not to follow these schemes. As H. G. Gadamer states on the principles on hermeneutical comprehension of a certain text, "we must remember about our jaundice, in order for the text to become apparent in all its otherness, thus seizing the ability to oppose its factual truth to our own a priori opinions" [12].

*In no way* I want to assure that description, explanation and understanding are the three paradigms that change each other in the course of science's history. I think that explanation and understanding are two complementary approaches with each of them having the right to exist under the situation of present-day science. Explanation and understanding are the two possible views that open up before our eyes when considering *two different*

*standpoints*. Particularly, explanation is, so to say, a 'view from outside', while understanding is a 'view from inside'. Assuming that the current scientific paradigm has quite unlike systems as its objects of investigation, including, but not limited to, open nonlinear human-related systems, when the observer, the scientist himself finds his position, his standpoint being inside this very system – assuming that can be enough to argue that both standpoints and both explanation and understanding are relevant for present-day nonlinear studies.

The conception of two possible standpoints is correlated with the previously stated conception of classical duality of essence and phenomenon. *Essentia* and *existentia* (or 'thatness' and 'fact of being', in Heidegger's terms) as dual characteristics of any existing also depend on the chosen standpoint. However, the 'factuality' of present-day nonlinear science relates to both essence and phenomenon. According to V. V. Kizima, factual truth represents the essential level of conceiving the thing, because the problem of essence is being solved here on the level of unity with the being of the thing. Such approach to the essence lies in understanding it as an individual (that is, particular) thing; such way of comprehension presents the thing as a certain totality, that is, in our terms, it views the thing as a concrete unity of plural sides [13].

Florensky has also expressed several interesting ideas concerning the possible unity of the dualistic standpoint, which are rather similar to Heidegger's interpretation of Kant's metaphysics. According to Florensky, the two sides of every thing (he calls them *essence* and *energy*) are two manifestations of the one: "Essence is the side of the object that turned ad intra, and the energy – ad extra" [14]. The two sides are one being, but the essence serves the self-affirmation of that being, and the energy – its exposure, its manifestation. Energy of the object is also its phenomenon, which displays the object; that's why it's possible to say that the energy is the very object in its aspiration for another being.

An interesting idea is the possibility of energies to intersect in co-operation, in synergy. In this situation beings unite while not allowing fusion, reduction of one to another. Besides, an object can carry in its energy the energy of another object belonging to a higher level of reality. In that case the first object serves as a symbol for the latter one. As M. V. Popovich states on Florensky's ontology, each event of the world is presented here as a symbol, because the sense of each event depends on the sense of the Whole, a part of which is being represented by that event [15]. In other words, the objects of contemporary science have one important feature: they are not only complex self-organizing systems, wholes, – they are also interdependent with the greater Whole. Examples of such a notion could be 'Many-world interpretation of quantum mechanics' by H. Everett and B. De Witt, or 'bootstrap' conception by G. Chew. The latter theory pictures a reality where all elementary particles are correlated between themselves. The particle owes its very existence to other particles; the system composed of such particles is the Whole so that its existence serves as *the essence* of each individual particle [16].

The position of the scientist, if he is to try achieving the understanding of a phenomenon, also has some double characteristics. That is, in my opinion, the scientist, the observer attempts here to observe the object not only 'from outside', but 'from inside' as well, thus uniting explanation with understanding – and that would probably be the best way of perceiving complex self-organizing system (See Fig. 2).

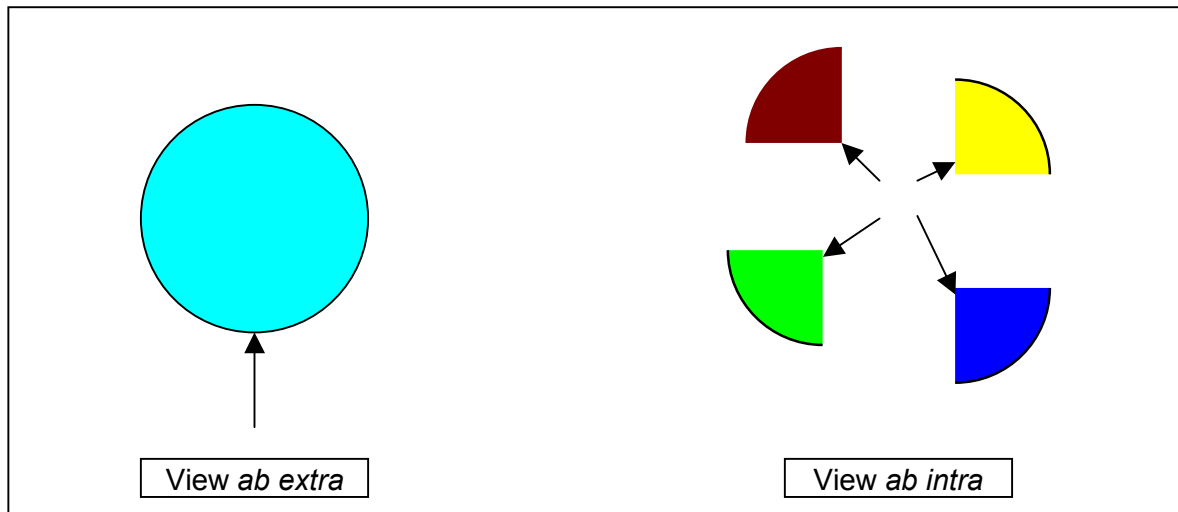


Fig. 2.

In this case the outside (ab extra) position of the observer would enable him to conceive the system as *a whole*, while the insider position (view ab intra) will help to understand the *individuality of elements* of that system. The former view could be described as a 'quasi-classical' standpoint. The object presented under this view is an abstract object; the observer finds his position resembling 'the God's eyes' view'. In post-nonclassical science, however, there is still a certain possibility to attain the described 'ab extra' position by transcendence; that is the observer 'from inside' can overcome his everyday standpoint thus becoming a 'meta-observer' [17], an observer that masters the 'system / observer' division achieving the view of the whole while not sacrificing the view of elements, the 'insider' position in studying systems, which human is being part of.

However, even when taking into consideration less complex and more usual systems, like natural objects, there is a possibility of understanding remaining, as well as a certain similar duality of standpoints. Florensky used to call the very process of knowledge synergetical – literally, 'synenergetical', because of the becoming unity of 'energies' ('outer' parts of wholes) of subject and object, observer and the observed, spirit and the world. It is important to note that the essences of participating sides of that dialogue are not being lost; instead there is rather a third party showing up. After all, every experiment is, according to V. I. Arshinov, "the way out of isolating abstraction, its practical sublation by establishing in a certain way a communicative dialogue between the investigator and the fragment of reality, which is being investigated" [18].

Thus it can be considered that explanation and understanding are the two ways of conceiving phenomena under current scientific paradigm, and they correspond with two standpoints for the observer. However it cannot be thought that these two paths of comprehension could exist separately. Explanation and understanding as well as both 'inner' and 'outer' positions of the observer are indeed *complementary*; the investigator cannot maintain only one position at a time – he rather holds both of them, and sometimes it is quite difficult to tell whether the scientist applies explanation or understanding at a given moment.

The noted difficulty arises again when we try to imagine the appearance of *prediction* in contemporary science (See Fig. 3). When the observer holds an outer position, the prediction of possible phenomena in the future is made through the conditional scheme 'if... then...' Indeed, the procedure of predicting possible future facts in this case is very similar to the procedure of conceiving the facts of the past, including those of unrealized paths of 'evolution curves': the standpoint 'from nowhere' allows the observer to achieve (at least,

phantom) position of 'God's eyes view'.

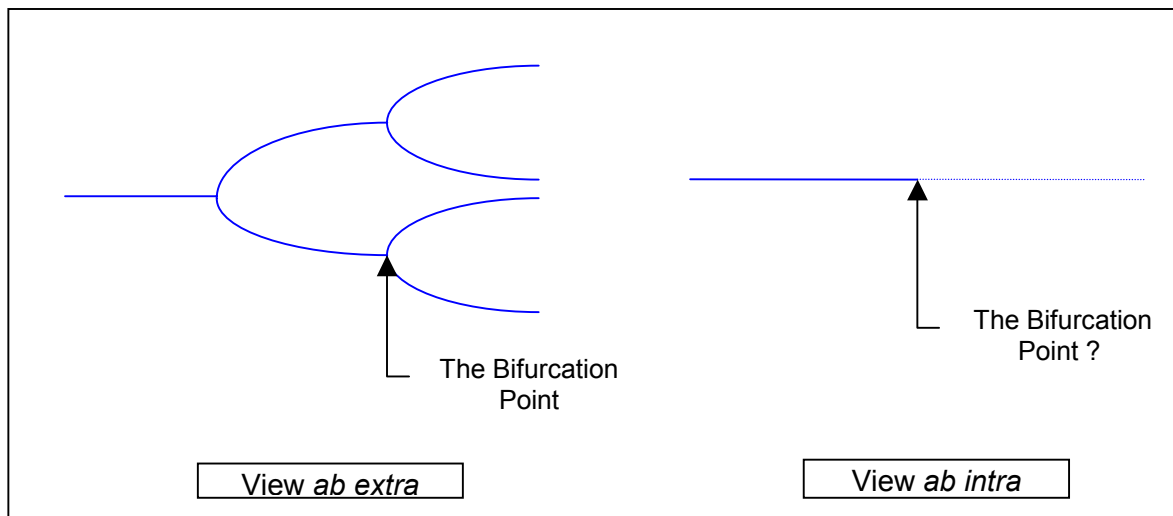


Fig. 3.

However, the situation becomes different when we take into account the complementary possibility of another position of view, that of an insider. In this case it is almost impossible to trace probable bends of system's evolution, in the future as well as in the past. The prediction, in my opinion, can here assume the form of *prevision*, when the knowledge of future phenomena receive the tint of personal convictions, with no external evidence sufficient for strict scientific conclusion. In truth, these pictures still remain abstract, for under the post-nonclassical scientific paradigm both views are being combined, when classical (or 'quasi-classical') position could be somewhat complementarily united with nonclassical 'insider' position, thus outlining the premises for relating explanation and understanding as two sides of one knowledge process.

The proposed conception is only drafted here and would certainly require more attention and investigation, but the task of conducting such an investigation lies beyond the aims of this paper.

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