Special Symposium: VARIETIES OF EXPLANATION
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PATTERNS OF EXPLANATION REVISITED

In his authoritative *The Structure of Science* (1961), Ernest Nagel has set out four "Patterns of Scientific Explanation" (Ch.2): deductive, probabilistic, functional (or teleleological), and genetic explanations. Together with his further analysis of causal and reductive explanations as sub-kinds of deductive explanation, Nagel has set the stage for many refinements of and critical debates about explanation.

In my *Structures in Science* (2001), I have proposed to reorder the landscape of explanation by setting genetic explanations apart as a hybrid category and introducing a divide between 'explanation by subsumption' and 'explanation by specification'. Here, the former pattern may also be called 'nomological explanation' and leaves room for deductive, approximative, and probabilistic explanations, all of which may or may not be causal or reductive. The second pattern leaves room for intentional and functional explanation as well for a certain kind of causal explanation. The rationale of the divide is that the two patterns obey two different formal patterns.

In my paper I will first rehearse the main lines of this divide and discuss how some recent developments in explanation fit in this general framework, notably 1) the manipulationist / interventionist theory of causal explanation of Judea Pearl and James Woodward, and 2) the notion of causal explanation that arises when using the intrinsic notion of a causal law as presented by Julien Blondeau and Michel Ghins.

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VARIETIES OF IDEALIZATION AND MODES OF EXPLANATION IN SOCIAL SCIENCES

ODMIANY IDEALIZACJI A SPOSOBY WYJAŚNIANIA W NAUKACH SPOŁECZNYCH

The paper aims to characterize dependencies between type of idealization used in social sciences and adopted strategy of theory building and mode of explanation. It is possible to risk thesis that these two kinds of idealizations namely neo-Weberian and neo-Hegelian are the most popular in social sciences. Idealization perceived in Weberian mode (Nowak 1993: 46-47) presupposes that:

- empirically perceived empirical phenomenon under investigation is exaggerated (intensified) in order to build analytical notion that contains all features of empirical phenomenon in their extreme (minimal or maximal) intensity;

- empirical phenomena are confronted with ideal type and they are classified according to criterion of proximity (or distance) from an ideal type;

- if a given phenomenon is too distant from an ideal type then the ideal type loses its applicability and its replaced by another one.

Whereas idealization inspired by Hegelian (Nowak 1993: 48-49; 1998) tradition relies on:

- construction of abstract model of phenomenon under investigation is depriving of some of its properties; those which are remains are recognized as fundamental for phenomenon under research, secondary ones are eliminated from the model; in this way there formulated dependence of phenomenon on its basic factors;

- by the way of concretization, secondary factors are incorporated into model and initial dependency is modified;

- obtained in this way the theory gives an explanation of the historical development of the phenomenon under investigation (e.gr. society): its first model shows the ideal development of the social system and its subsequent auxiliary models presents different deviations from the ideal path of development multiplying of reducing possible ways of development.

Idealization perceived in Hegelian mode lead to elaboration of dependencies between social phenomenon and their main factors. Weberian mode of idealization relies on construction of notion which systematize and order social phenomena pointing out discrepancies between empirical case and ideal type. Due to it, Weberian approach to modeling is often accused of being static and unable to capture the dynamics of social reality. This accusation can be avoided when one construct the whole sequence of ideal types connected which each other by relation of time succession.

Different interpretation of methodological status of even this same social theory leads to different strategies of its developments. This can be shortly illustrated by different mode of modifications of Brzeziński/Friedrich's totalitarian syndrome. Mark Thompson (2002) treats totalitarian syndrome as ideal type understood in Weberian spirit. It leads to construction all sequence of ideal types which are to explain evolution of real socialism systems after 1956 and their final fall in 1989 or existence (China and North Korea). Achim Siegel (1998), in turn, treats totalitarian syndrome as functionalist-idealizational theory what leads him to different strategy of development Brzeziński/Friedirch's approach. He namely reconstruct the main tenet of this theory: dependency of stability of totalitarian dictatorship on syndrome factors. Later on, he concretizes this dependency showing how stability of totalitarian dictatorship depends on secondary factors which can strengthen or weaken dictatorship in a given country. In the last section of this paper advantages and disadvantages of both strategies will be discussed.

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THE THEORY OF PSYCHOPHYSICAL EMERGENCE AND EMERGENT EXPLANATION
TEORIA EMERGENCJI PSYCHOFIZYCZNEJ I WYJAŚNIENIE EMERGENTNE

The theory of psychophysical emergence has – as Robert Poczobut writes – two main aims. The first is “to express all causations and determinations of mental-cognitive processes” and the second is to state “the kind and degree of relative autonomy of mental activities and states in relation to their base-processes” (Poczobut 2006, p. 507). Amongst the above-mentioned causations and determinations are also those belonging to the ontologically lower level – i.e. neuronal level - of organization than the mental-cognitive level. What is the nature of the explanation of relationships between the level of brain neuronal activity and the level of mental states offered by the theory of psychophysical emergence?

It seems that next to, for example, deductive-nomological, statictical-inductive, statistical relevance, causal, teleological, functional and reductive types of explanation we should distinguish also another type of explanation – emergent, i.e. one that appeals to the relation of emergency and emergent interlevel laws. The author discusses certain aspects of the emergent explanation and its limits based on certain formulations of the relation of emergence.

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EXPLANATION AND A DEFINITION OF NATURAL KIND TERMS
WYJAŚNIANIE A DEFINICJA TERMINÓW NATURALNORODZAJOWYCH

I examine the question of non-formal conditions for a proper, useful scientific definition. I evaluate the historical definition of the planet from the logical point of view and discuss current proposals of this definition. According to the theory of definition and methodological factors, as well as this short historical case study, I will try to make

recommendations for the most effective definition of the planet and to frame the non-formal conditions for a well-defined natural kind term. I propose and defend the hypothesis that the most important factor is fruitfulness of a definition understand as explanatory power of a definition-theory pair.

Well-defined terms enable both classification of old and new knowledge and organization of thoughts and communication between scientists. Such terms play an important role in scientific processes, especially in natural sciences, in which the borders of our cognition (with the help from new methods and tools) are crossed regularly. But a proper definition is not only a good starting point for scientific discourse, it develops or limits this discourse constructively. The rules how to built good definitions are not clear enough – what does 'a well-defined term' exactly mean? The theory of definition gives us a set of statements and principles about formal conditions of a proper definition. But scientific practice shows us that even a correct definition (from the formal point of view) can be inadequate and not useful at all. E.g. even though the Ptolemy's definition of the planet is properly constructed, it does not correspond to the current state of knowledge, and because of that it is not useful for science from other than the historical points of view. In my paper intention is to explore the concept of non-formal conditions of a proper definition in natural sciences, especially for a natural kind term such as 'planet'. The goal is to find the set of conditions which could be guidelines in problematic cases when several definition proposals compete. The main criterion would be pragmatic – nomological utility of definitions, what involves as well the explanatory power of the pair: definition-theory.

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PSYCHOLOGICAL EXPLANATION AND „THE INTERFACE PROBLEM"

One of the most lively and exciting debates with the field of philosophy of psychology is connected with the methodological question concerning the relationship between the commonsense psychology and special sciences. More precisely, it is the question how and to what extent it is possible to explain psychological processes and states in terms of strictly scientific categories. It is especially unclear how these two levels of description and explanation are related. In general, we take for granted that consciousness can be explained by reference to subpersonal level, that is, the level of stipulated unconscious information

processing states. The distinction between personal and subpersonal levels is involved in the so called vertical explanation. This explanation can take two forms: top-down and bottom-up. In the former lower subsymbolic manipulation on stimuli are described and explained in terms of higher symbolic cognitive operations, which are, one way or another, related to them. Bottom-up explanation is a reversal of this procedure and is usually implemented when one attempts to establish the correlation between mind and its physical substratum. The alternative to vertical explanation is horizontal explanation, which consists in identification, on a given level, of the causal chain, whose link is the explained state or event.

Explanation of all these kinds has to deal with the same problem: „how does commonsense psychological explanation interface with the explanations of cognition and mental operations given by scientific psychology, cognitive science, cognitive neuroscience and the other levels in the explanatory hierarchy?" (Bermúdez 2005, s. 35). They often seem to suggest the reduction of the commonsense psychology to special sciences. I would like to show, on the example of the category of phenomenal consciousness in perception and by making use of arguments put forward by Colin McGinn (1989; 1991) and James J. Gibson (1979), that this reduction is unattainable. If this is indeed so, the interface problem would demonstrate the unavailability of a full account of the relationship between mental and natural concepts. This is turn would give a strong reason for showing why commonsense psychology is a useful explanatory-predictive practice.

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EXPLANATION AND REDUCTION: THE CASE OF MODALITIES

Modal realism is considered as a highly controversial doctrine in view of the fact that it postulates the existence of plentitude of spatiotemporal possible worlds. Nonetheless advocates of this theory (as well as its inventor David Lewis) have been pointing out that it is worth to pay the cost of these ontological commitments because of theoretical benefits of modal realism. It is claimed that one of the most important of the benefits in question is that the theory delivers a reductionist account of modalities, i.e. it explains modal terms such as "it is possible that there are blue swans" or "it is necessary that every square is non-round" in simpler and clearer non-modal terms. For modal realists every modal statement should be elucidated as follows:

(MR) *P* is possible ≡ there is a world *w* in which *P* is true

In virtue of this schema every modal statement might be paraphrased into statements free from modal terminology, and that in turn gives a better grasp of the nature of possibilities. This apparent theoretical benefit constitutes an important reason of adhering to the controversial ontology of infinitely many possible worlds, conceived as spatiotemporally isolated universes.

However some philosophers (Colin McGinn, Scott Shalkowski) have been trying to point out that the MR schema is reductionist only *prima facie,* and that it provides either circular or false analysis of modality. It is so – they claim – because the term "world" on the right-hand side of the equivalence means in a fact "possible world". MR schema is true only if the conjunction of the following conditionals is true as well:

1) *P* is possible → there is a world *w* in which *P* is true

2) there is a world *w* in which *P* is true → *P* is possible

The main problem is with the second conditional. To admit that it is true one has to assume that the term "world" means "possible world". If not, one could substitute "It is raining and it is not the case that it is raining" for *P* and conclude that contradictions are possible. This surely is a highly controversial statement. To avoid this paradoxical consequence advocates of modal realism have to restrict the quantification to range only over these worlds which are possible. This fact forces one to reject the thesis that modal realism

delivers a reductionist theory of modalities, since on the both sides of the MR schema modal terms occur.

In my paper I would like to show that this argument is based on a methodological mistake. Critics of modal realism seem to ignore something very important for every reductionist analysis. They overlook the fact that the aim of reductionist schema is to explain terms of folk (objectual) language in terms of theoretical language (metalanguage). In this particular case the role of metalanguage is played by the language of modal realism, which lacks modal terms. It is so because they were explained by theoretical terms such as "world", "counterpart" and "logical space". From the methodological point of view the phrase "possible world", which according to critics must occur on the right-hand side of the MR schema, should be taken as incorrectly formed formula. It is incorrectly formed since it mixes terms of objectual language with metalinguistic categories.

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PHILOSOPHICAL AND SCIENTIFIC EXPLANATION

It is commonly accepted that scientific theories are able to play important explanatory roles. On the other hand, it is much less clear according to philosophical conceptions. Various authors have postulated that philosophical conceptions do not explain anything, instead of that they are proto-scientific conceptions (see [1]), or they are rather tools for socio-political change (e.g. [2]). Within that context it can be asked whether philosophical conceptions have any explanatory abilities and if they have what are differences and similarities between scientific and philosophical explanations.

In the presentation I describe a conception of philosophical explanation which fulfils two conditions:

A) the philosophical explanation is a different method of explanation than that which realizes the main explanatory goal of scientific theories, and

B) scientific data (e.g. hypothesis, empirical descriptions) can be used in the philosophical explanation.

The first condition is important because it guarantees the autonomy of the philosophical explanation. Without it there is probably no need to use philosophical conceptions in explaining at all because they are not able to add anything to scientific

explanations. The second condition is relevant for the influential contemporary investigations which combine philosophical conceptions with scientific theories (e.g. [3]).

I start by briefly describing some of the most influential conceptions of scientific explanation: the D-N model [4], the statistical S-R model [5], the causal-mechanistic model [6] and the why-question account [7]. As the result, I state that the main explanatory goal of scientific theories is to find a specific relation between various empirical phenomena. Of course, distinct conceptions of the scientific explanation propose different accounts of this relation – logical, causal, epistemic or probabilistic.

In the next step, I present a conception of philosophical explanation which is based on three recurring intuitions about the explanatory role of philosophy that can be found in the contemporary philosophical literature. These intuitions are: (1) that the philosophical explanation can operate on various kinds of data, both nonempirical and empirical (e.g. [8]), (2) that the philosophical explanation shows how different data can create a coherent system (e.g. [8]), (3) that the coherence of data is shown by constructing a certain conceptual scheme (e.g. [10]).

Presented conception of the philosophical explanation can be called “the explanation by the systematization of data” (ESD). It consist of the three basic elements:

1. Body of data

The body consists of data which are connected with a certain philosophical problem. This could be various kinds of data e.g. philosophical intuitions, scientific statements or whole theories, empirical descriptions, linguistic facts etc. However, all of them should be logical elements (like statements or propositions), which can enter into logical relations, e.g. entailment or contradiction.

2. Conceptual scheme

The data constituting the body are always in some respects imprecise. To explicate the meaning of those data a conceptual scheme can be applied. Such scheme precisely defines the concepts used in the body, adds new elements to the body and interprets the statements constituting the body. Many different conceptual schemes can be applied to every single body of data.

3. Coherence analysis

Having a body of data specified by a conceptual scheme, it can be analyzed whether this whole of logical elements is internally consistent. If it is not, then the next step is to find the source of contradiction and to modify the conceptual scheme to resolve it. If it is consistent, then the elements which do not contribute to the consistency should be removed to achieve

more economical conceptual scheme. It should be noted that these steps cannot be done by decreasing the precision of a conceptual scheme.

By iterating the above procedure, it can be explained what set of conditions has to be met by a conceptual scheme to be consistent with a certain body of data connected with a particular philosophical problem. ESD fulfills the condition A) because it does not search for relations between empirical phenomena but for conditions of coherency between conceptual schemes and sets of various data. It also satisfies the condition B) due to the fact that scientific data can be included in the body.

Finally, I consider relations between philosophical explanation understood as ESD and the main explanatory goal of scientific theories. I state that explanatory abilities of philosophical conceptions constitute a subset of scientific explanatory abilities. Scientific theories can make explanations by the procedure described as ESD and by finding relations between empirical phenomena, while philosophical conceptions are only able to use the ESD. However, the relation between data used in the philosophical and the scientific explanation is opposite to that between scientific and philosophical explanatory abilities. The data used by scientific theories constitute a subset of data used by philosophical conceptions. Because of that, in the course of philosophical explanation it can be explained what are the consistency conditions between data and conceptual schemes which lay beyond the ordinary interests of sciences.

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EXPLANATION AND TRUTHMAKING
WYJAŚNIANIE A UPRAWDZIWIANIE

Is truthmaking explanation? The question can be understood in two different ways:

(1) Can we define the notion of truthmaking by identifying it with the (more familiar?) notion of explanation?

(2) Is (the existence of) a particular entity playing the role of a truthmaker of a certain proposition an explanation of the truth of this proposition?

Some authors maintain that the answer for (1) is affirmative. They take the notion of explanation as primitive and on that basis attempt to elucidate the notion of truthmaking. I believe this is wrong direction. Explanation is not a separately identifiable relation that can be taken as primitive or specified by some analysis of its contents. It is rather that explanation is **a purpose** that different relations serve on different occasions. Perhaps truthmaking can serve this purpose on occasion, but this does not justify the idea of explaining the notion of truthmaking by calling it 'explanation'. What relations serve this purpose on what occasions depends on the logic of particular inquiry: on questions we are asking. Sometimes we ask for causes – then specifying some causal relation is an explanation; sometimes we ask for proofs – then specifying some entailment is an explanation; sometimes we ask for motives – then specifying some intention is an explanation; sometimes we ask for physical mechanisms, then specifying some theoretical reduction is an explanation, and so on. Truthmaking is just another relation that occasionally serves explanatory purposes. For instance, truthmaking is explanation in the case:

(3) <If John turned around he would have a sensory impression of a snapping crocodile> is true in virtue of the fact [There is a snapping crocodile behind John];

and it is not explanation in the case:

(4) <Socrates exists> is true in virtue of the fact [Socrates exists].

In (3) it makes sense to replace ‘in virtue of’ by ‘because’; in (4) it does not. However, it is (4) which is a paradigmatic example of truthmaking, not (3). It is trivial in terms of explanation, but not in terms of truthmaking. All truthmaking theories start from examples like this. It is the cornerstone of truthmaking. Therefore, in general truthmaking is not explanation in the sense of (1) and evoking the concept of explanation adds nothing to the contents of truthmaking. However, because the answer to the question (2) is sometimes affirmative, we can take some properties of truthmaking and use them to illuminate further the notion of explanation, or rather one of its numerous varieties.