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METHODOLOGICAL PECULIARITIES OF HISTORY IN LIGHT OF IDEALIZATIONAL THEORY OF SCIENCE

1. Introduction

It is maintained in contemporary methodology of science that idealization of investigated reality is one of the principal methods of research. The theoretician investigating certain phenomenon does not approach the object of study in all its complexity and complication but focuses on such its aspects which are recognized principal from his theoretical perspective, ignoring some properties of the phenomenon under research. On the force of idealizing assumptions, remaining secondary properties of investigating reality are omitted. Scientific cognition does not depend, then, on faithful imitation of reality but on its deformation that is able to demonstrate the most essential associations and relationships. It is only later, at the second stage of scientific research, that the deformed reality becomes “more realistic,” and the researcher introduces into the simplified approach of the investigated object its secondary aspects which were omitted in the preliminary model and which modify crucial laws and relationships.

A standard example of the scientific conduct sketched above in the idealizational theory of science (hereinafter referred to as ITS) is a set of procedures adopted in natural sciences and particularly in physics.¹ That leads to underestimation of methodological peculiarities of the humanities, even those which can be expressed in the conceptual apparatus of ITS. One of such issues, as Hans-George Gadamer remarks, is the paradox of “small causes and great effects”:

¹ Introductory formulation of the method of idealization has been presented in Nowak (1971); whereas a mature reconstruction of that theory may be found in Nowak (1977a, English: 1980).

An old principle of knowing the nature is the equality of a cause and an effect, and in experiencing history it is the opposite: small causes may bring about great effects. It is a surprise that belongs to the experience of man immersed in history. . . . People know what has been planned, and understand what factors have been set working, they know what is expected of them, but they forget about unpredictable, unplanned and surprising events.²

Gadamer solves the paradox of small causes and great effects on the metaphysical plane. He claims that causes in the social world act in teleological way. Human history is then directed by the previously assigned aim. Therefore, history:

seems to be governed, as if it were a process of production, by the previously allocated aim, as if they strove for the shape that had been defined before, let us say, the shape of the ripe living organism; that all happens as if what originally existed put itself into motion which aims at the final form: the material which we preferably call the matter appears by itself to motivate the process of growth and change.³

The discussion on the paradox of small causes and great effects may be conducted at the level of metaphysics but it is also worth considering whether that paradox could be also solved by smaller means without committing to inevitably controversial, age-long disputes of metaphysicians. The paradox of small causes and great effects can be also discussed on the methodological plane. In the further part of the present chapter I will characterize the paradox of small causes and great effects, which was perceived by Gadamer, in terms of the idealizational theory of science, though it is also possible to interpret that paradox using the language of other methodological theories.

2. Basic Concepts of the Idealizational Theory of Science

Let me characterize two fundamental concepts of the idealization theory of science that are useful for the purposes of the present paper: the concept of influence and that of essentiality. Each magnitude \( F \) under study has a number of determinants \( \{H, p_3, \ldots, p_2, p_1\} \) that influence it in different ways. The influence in question can be ordered by distinguishing main and secondary factors in an essential structure of the magnitude studied \( F \). According to this conception, the influence of magnitude \( H \) on magnitude \( F \) occurs when adopting a certain value by \( H \)

² Gadamer (1979), p. 81.
³ Ibid., p. 85.
Methodological Peculiarities of History

excludes the adoption of any value by $F$.

It may be said metaphorically

that magnitude $F$ under the influence of factor $H$ has a restricted “choice”

of intensity. The influence of one factor on the other is thus determined

by a set of values $W_r(H)$ that the magnitude determined cannot adopt. Set

$W_r(H)$ can also be named the level or power of influence of factor $H$ on

magnitude $F$ under study. I am going to use these terms interchangeably.

Such an account of influence also allows explaining the concept of being

“more essential.” Magnitude $H$ is more essential to $F$ if the power of

influence of magnitude $H$ on $F$ exceeds the power of influence of factor $p$

on $F$. This can be demonstrated graphically in the following way:

\[ F \]
\[ W_r(H) \]
\[ H \]
\[ W_r(p) \]
\[ P \]

\textit{Fig. 1. The power of influence of factors $H$ and $p$ on $F$. Key to symbols: $W_r(H)$ – the domain of influence of the factor $H$ on $F$; $W_r(p)$ – the domain of influence of the factor $p$ on $F$.}

Thus, the above figure shows the power of influence of factors $H$ and $p$ on the phenomenon under investigation. The power of influence of the factor $H$ is greater than the power of influence of the factor $p$ if the set $W_r(H)$ is composed of more elements than the set $W_r(p)$; so the factor $H$ is more essential to the magnitude $F$ than the factor $p$. With the use of the concepts of “essential” and “more essential” defined above, it is possible to reconstruct the essential structure of the examined magnitude. Generally speaking, the reconstruction of the essential structure of the phenomena under investigation depends upon the identification of factors, which in any way affect the examined magnitude, as well as upon the ordering of the power of influence: from the strongest to the weakest. Figuratively, the order of the power of influence of several factors upon the examined phenomenon can be presented in the following form:

The order of the power of influence of particular factors upon phenomenon $F$ under study, i.e., $<H, A, B, C, \ldots, N>$ indicates that the power of influence of factor $H$ in consideration of phenomenon $F$ under study is the greatest because set $W_f(H)$ contains the largest number of elements. The power of influence of factor $A$ in consideration of phenomenon $F$ under study is lesser than $H$ but greater than $B$ because set $W_f(A)$ contains fewer elements than set $W_f(H)$ but more elements than set $W_f(B)$, etc. The smallest power of influence is characteristic of factor $N$, the area of influence of which upon the examined phenomenon $F$ is the smallest.

3. Two Types of Essential Structures

In their research practice, scientists meet two types of essential structures. In the first case it is enough to examine the main factor, approximately define the influence of secondary factors and on the basis of an approximated idealizational law formulate a prognosis which will satisfactorily define the behavior of the phenomenon at hand. In the second case, ascertaining the influence of the main factor proves to be insufficient to formulate the prognosis with the requested degree of precision. In such circumstances, it is necessary to concretize the
idealizational law almost fully. Furthermore, after the reception of duly precise theorem the influence of the remaining but less important secondary factors is approximated. It is only then, after the procedures of concretization and approximation of idealizational law were implemented, that such prognosis can be formulated, which to a sufficient degree in a given time and in a given kind of science will define the behavior of the phenomenon under study.\footnote{Cf. Paprzycka and Paprzycki (1992a), pp. 255-265. The authors ponder on the problem of why it is enough to recreate the influence of the main factor in order to satisfactorily explain and predict the conduct of certain phenomena, while each subsequent exemplification enhances the accuracy of the initial idealizational law. In other cases, in order to be able to explain the conduct of given phenomena, it is necessary to introduce almost all factors into the models of a given theory. That paradox, according to the authors, is due to the issue of separating the exclusion ranges of factors which influence a given magnitude $F$. If the exclusion ranges of individual factors are separate, then each subsequent exemplification increases the accuracy of the idealizational law. However, if the exclusion ranges of individual factors overlap or are included one in another, then the subsequent exemplifications do not increase the accuracy of the idealizational law. In such case it is necessary to take into account the influence of “almost all” factors.}

While exploring that problem, Katarzyna Paprzycka and Marcin Paprzycki use the example of a tossed coin. Knowledge of two main important factors, i.e., the coin’s weight and the distance of the fall prove to be of little use in finding the side on which it fell. Therefore, in order to formulate a precise prognosis one should take into account the influence of the remaining factors: the force of the toss, the rate of rotation around the axis, the shape, etc.

In the face of the phenomena, which are characterized by different types of essential structures, a researcher resorts to different strategies of constructing idealizational scientific theories. In the first case, the researcher, after defining the influence of the main factor, proceeds to approximate the influence of secondary factors, arriving at a satisfactory explanation of the examined phenomenon. By contrast, in the second case the researcher, after formulating the idealizational law, is obliged to concretize it almost fully. Only then can she/he approximate the influence of secondary factors and come forward with satisfactory explanation of the phenomenon under study.

On the basis of the above distinction, it is possible to identify two types of essential structures: an essential structure dominated by the main factor and an essential structure dominated by a class of secondary factors. In an essential structure dominated by the main factor the power of influence that it exerts is greater than the sum of the power of influence of secondary factors. And in an essential structure dominated
by secondary factors, their total influence is greater than the influence exerted by the main factor, although the power of the latter influence is, by definition of an essential structure, greater than the power of influence of each secondary factor taken separately. The two types of essential structures in question can be presented in the following way:

![Diagram](image)

*Fig. 3. Two types of essential structure. Left: an essential structure dominated by the main factor; right: one dominated by secondary factors.*

This distinction is useful for explaining differences between two types of phenomena. The approximation of the idealizational law is sufficient to explain phenomena of the essential structure dominated by the main factor. In the structure of that type, the advantage of the main factor over secondary ones is so significant that it is sufficient to ascertain the influence of the main determinant for a given phenomenon. On the other hand, in the face of the phenomena of the essential structure dominated by a class of secondary factors, almost full concretization of the idealizational law should be used, combined with an approximation of the concretized theorem. Since in that type of structure the power of influence of the main factor is smaller than the power sum of influences of a class of secondary factors, ascertaining the influence of the main determinant by itself is insufficient to explain the phenomenon under study. Hence, a number of concretizations of the preliminary idealizational law is being conducted.

The first type of essential structures, which is dominated by the main factor, seems to be characteristic of the phenomena of the natural world. By contrast, the second type of essential structures, dominated by a class of secondary factors, is characteristic of the phenomena of the social world. The differences between phenomena belonging to the natural and social worlds are one of the sources of the methodological peculiarity of the humanities.

The evidence for the issue discussed above can be found, e.g., in historians’ research practice. In the historical sciences, it is unusual to
explain any phenomenon by revoking to the influence of only one factor. As a rule, explanations made by the historians are multifactoral. For instance, Henryk Samsonowicz in his considerations of the reasons for the rise of Protestantism in 16th century Poland states that “there were many factors for such a rapid growth of the Reformation.”\(^6\) Samsonowicz lists two groups of such factors. The first included those which discouraged Catholicism, whereas the other comprised the advantages offered by conversion to Protestantism.\(^7\) The first group included the prevailing public disapproval of the Catholic Church, which ensued from treating that institution as ideological embodiment of the social order. On that account, the burghers resisted the Church as much as they were deterred from running their own businesses by the kind of piety that was promoted. The peasantry, too, expressed their disapproval of the Church, since they had to pay the tithes. The held true for the nobility and part of the magnates who envied the economic wealth of that institution. Moreover, it was the depravity among the clergy, i.e., the dissipation and lack of the moral fiber that brought that social group into disrepute. The additional factor that undermined the authority of the Church was the poor intellectual standards of most of the priesthood. Insufficient knowledge, for example inadequate familiarity with the Bible on the part of Catholic priests, was even more meaningful in the 16th century, when along with the Gutenberg’s invention the book was becoming a mass product and comprehensive of the society education was on the rise.

On the other hand, H. Samsonowicz points to many features of Protestantism which affected its attractiveness for the social elites in sixteenth-century Poland. First of all, according to the Samsonowicz’s opinion, the denomination provided an arsenal for the battle against the political and economic privileges of the clergy, added to which the Reformation itself was the expression of the development of national consciousness. It broke with medieval cosmopolitism of Catholicism to institute national churches instead. In the domain of culture, the Polish language replaced Latin. Also, the democratic system of the Calvinist communes, more than the Catholic centralism, came in useful to the nobility, which battled to strengthen the democracy of the nobility. Protestantism was intellectually more attractive than Catholicism since it stressed the importance of human’s progress and stimulated, through diligent studies of the Bible, an individual study of the faith.

It is evident from the above example that the multifactoral interpretation is a natural kind of explanation used in history. The

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\(^7\) Ibid., pp. 159-161.
historian whom I quoted above does not limit his illustration to one reason which, from his perspective, was responsible for the dissemination of the ideas of Protestantism. Instead, he gives at least eight separate factors which, while acting at the same time, contributed to the development of the Reformation in sixteenth-century Poland.

4. When Small Causes Bring about Great Effects:
The Explication of the Cascade Effect

In essential structures dominated by a class of secondary factors yet another effect can occur. Frequently, some phenomena that were subject to factors that exert main influence on them in a given period of time are influenced by new, different secondary circumstances. Initially, the influence of these co-existing, accidental factors merely modifies fundamental regularities, but then it introduces essential disturbances into them, and finally balances the influence of the main factor on the phenomenon under investigation. In the final stage, the accumulation of these accidental factors that occur together may be so vast that it surpasses the influence of a given regularity that the phenomenon under investigation was subject to so far. The influence of the main factor may then be said to be overbalanced by, figuratively speaking, a “cascade” of secondary factors, the common influence of which on the phenomenon under investigation is greater than the influence of the main factor.

A simple cascade effect consists in introducing subsequent secondary factors. For an essential structure dominated in an initial stage by the main factor under the influence of a gradual occurrence of new secondary factors becomes transformed into an essential structure dominated by secondary factors. An inverted cascade effect is the disappearance of the influence of some secondary factors that brings the domination of the main factor back again. Thus, in a simple cascade effect an essential structure of the first type becomes gradually transformed in an essential structure of the second type in which the common power of the influence of secondary factors is greater than the power of the influence of the main factor.
Fig. 4. A cascade process. Explanations: if in an essential structure of the magnitude $F$ there appear factors $A$, $B$, and $C$, then $W_F(H) > W_F(A, B, C)$; if there appears factor $D$, then $W_F(H) = W_F(A, B, C, D)$; and the moment factor $E$ appears, $W_F(H) < W_F(A, B, C, D, E)$; a solid-line arrow stands for transformations of an essential structure of the phenomenon under investigation from a structure dominated by the main factor to a structure dominated by secondary factors or the reverse; a dotted-line arrow designates transformations within an essential structure dominated by the main factor.

This can be presented visually in the following way. In the above figure, there are magnitude $F$ under study and a number of factors that influence the phenomenon under investigation in various ways. Factor $H$ is the main one among them, as it exerts its influence in the whole period of time considered and its power of influence is the largest. Factor $A$ already exerts secondary influence, although it also acts in the whole period of time considered. Further factors, $B$ and $C$, appear later and exert relatively the smallest influence on the phenomenon under investigation. But they initiate a cascade process in which the role of the influence of the main factor changes in a structure of influences. Although the power of influence of this factor is still the greatest, its dominance over remaining elements of an essential structure gradually diminishes with the occurrence of new secondary factors, i.e. the number of elements of the set $W_F(H) - W_F(A, B, C, \ldots)$ decreases. The occurrence of the factor $D$ in turn “almost balances” the power of influence of the main factor with the sum of power of influences of secondary factors. When the next
factor $E$ appears, secondary factors gain dominance in an essential structure. Then also the sum of power of influences of secondary factors $A$, $B$, $C$, $D$, and $E$ is greater than the power of influence exerted by the main factor. A cascade lasts as long as secondary factors are able to maintain dominance in an essential structure. The disappearance of the influence of any factor occurring in a cascade brings the domination of the main factor back again. In the above figure, the factor which closes the dominance of secondary factors is $D$, which while disappearing brings the dominance of the main factor back. In a limit case, a factor which both closes a cascade, i.e., initiates the dominance of secondary factors in an essential structure and closes the domination of these factors can be one and the same magnitude.

The cascade effect may also interpret the paradox of “small causes and great effects,” which was observed by Gadamer in history. Factor $E$ is such a “small cause.” When it appears, it initiates “great effects,” i.e., a change of the dependencies that have governed the examined phenomena so far. Since then, therefore, the phenomenon has been affected by cascade factors that exert primary influence upon it. That influence is modified only by the influence of the main factor. However, the paradox of “small causes and great effects” does not appear always and everywhere, because it can come into existence solely in a defined type of essential structures, namely such that are dominated by the class of secondary factors. It does not appear always but only when the accumulation of the cascade factors is sufficiently advanced, i.e., when the joint influence of secondary factors balances the influence of the main factor. Only then can the appearance of the “small factor” initiate “great effects”; the advantage of the cascade of secondary factors in the essential structure of the phenomenon under study.

Due to the cascade effect, one may explicate one of the variants of the concept of “the turning points in history” that appears in historical works. Such moment in the history of the phenomenon under study a state in which two influences are counterbalanced: on one hand, the influence of the main factor, and on the other hand the influence of the cascade of secondary factors. Then, the appearance of the factor closing the process of accumulating the cascade, or the lack of it, is decisive in gaining the dominance in the essential structure either by the main factor or by the cascade of secondary factors.

In the next section of the present paper, I will investigate the new element in thus explicated cascade effect. Such a new element contributes to the structure of the scientific theory and historical narration as well as
to the ongoing discussion about the methodological foundations of the nomothetic and idiographic approaches to history.

5. Interaction of Factors in the Cascade

The cascade of variables may be of differing structure. The factors which may be found in it may affect the magnitude being investigated separately and they also may interact. At this point, it is worth using the definition of the interaction of variables (factors according to the accepted terminology) offered by Ackoff. According to his definition: “two variables are interacting if the influence which one of them exerts upon the dependent phenomena relies upon the values adopted by the other variable.”

While approaching the problem in terms of ITS, the interaction arises between two factors \( A \) and \( B \), which belong to the essential structure of the value \( F \), if the joint influence of those factors upon \( F \) depends upon the values which each of these factors adopts separately.

Any two secondary factors \( A \) and \( B \) influence \( F \) in isolation if the joint area of influence \( A \) and \( B \) upon \( F \) is equal to the sum of influences of each factor, while considered separately.

\[
W_F(AB) = W_F(A) \cup W_F(B)
\]

Whereas if the factors \( A \) and \( B \) enter into interaction, then their joint area of influence upon \( F \) is not equal to the sum of the areas of influence of each factor upon \( F \) while considered separately.

\[
W_F(AB) \neq W_F(A) \cup W_F(B)
\]

Let us now use the example of two factors \( A \) and \( B \) to inquire into possible types of interaction. In order to do that, we will arrange the set of cases of factor \( A \) with respect to the power of influence, from the minimal to the maximal power, which they exert upon value \( F \) being determined. In the set of cases of factor \( A \) some cases may be identified whose influence while exerted upon \( F \) is minimal. One can also distinguish a class of factor \( A \) cases such that their influence, while exerted upon \( F \), is the most powerful. Finally, it is possible to distinguish cases whereby the power of influence is smaller than the maximal, yet larger than the minimal influence.

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The weakening interaction between $A$ and $B$ in respect of $F$ arises if factor $A$ under the influence of $B$ assumes a value at which the power of influence exerted by $A$ upon $F$ is decreasing. By contrast, the strengthening interaction between $A$ and $B$ occurs if $A$ under the influence of $B$ adopts a value at which the influence of $A$ upon $F$ is increased.

Thus, in the interaction, the impact of $A$ upon $B$ (or vice versa) indirectly ascertains the influence which $A$ (resp. $B$) exerts upon $F$. Depending upon the type of the interaction, the influence of $A$ upon $F$ may decrease or increase.

The weakening interaction between $A$ and $B$ in respect of $F$ arises if the joint area of influence of the factors $A$ and $B$ upon $F$ is smaller than the sum of influences of the factors $A$ and $B$ exerted separately upon $F$.

$$W_F(AB) < W_F(A) \cup W_F(B)$$

By contrast, the strengthening interaction between $A$ and $B$ in respect of $F$ occurs if the joint area of influence of the factors $A$ and $B$ upon $F$ is bigger than the sum of influences $A$ and $B$ separately exerted upon $F$.

$$W_F(AB) > W_F(A) \cup W_F(B)$$

6. The Cascade Process and the Structure of the Idealizational Theory

Regardless of its internal structure, a cascade of factors not only influences a transformation of basic relations that the phenomenon under investigation was previously (i.e., before its occurrence) subject to, but also imposes a transformation of the way in which theories are formulated. Let us put ourselves in the shoes of a researcher who attempts to build a theory of cascade phenomena. According to the idealization theory of science each theory is a sequence of models, from the most abstract to more and more realistic ones. The first model of a theory of a given phenomenon contains only the characterization of the influence of the factor that is recognized as the main one for it and disregards influences of factors that are recognized as secondary ones. The method of idealization is thus supposed to abstract a given phenomenon from the context of accidental influences and to show its relations with factors that are the most important to it. But subsequent models of a given theory gradually introduce new secondary factors. Consequently, the very theory becomes more and more realistic, describing not only basic relations that the phenomena under
investigation are subject to, but also their disturbances and modifications introduced by secondary factors.

Things are not the same in the case of a structure of theories of phenomena in which the cascade effect occurs. In a theory that describes such phenomena, a hierarchy of theoretical models is inverted: a basic model describes the influence of a cascade of secondary factors and it is only a derivative model that describes the influence of the main factor. Already in the first model of a theory, the researcher introduces all secondary factors that a cascade consists of for the sum of the power of influence of such factors is greater than the power of influence of the main factor for the phenomenon under investigation. Thus, it is already the first model of cascade phenomena that is more realistic than that of phenomena of a standard essential structure because it is composed of more factors. And the influence of the main factor that modifies only basic relations, which for the phenomena determined are influences of secondary factors occurring in a cascade, are described in a derivative model.

Thus, the peculiarity of theories of phenomena of a cascade nature is a far-reaching transformation of its structure despite the fact that an essential structure of the phenomenon under investigation was not transformed because the power of the influence of the main factor is still higher than the power of the influence of particular secondary factors.

Therefore, what is decisive in the process of constructing a theory of phenomena in which the cascade effect occurs is determining the period of time in which an essential structure dominated by the main factor is transformed in an essential structure in which dominance is assumed by secondary factors and the identification of a factor the occurrence of which at that particular period of time brings about a cascade and “tipping the scales of influences” in a structure in favor of a set of secondary factors.

7. A Cascade Process and the Structure of a Historical Narrative

The structure of a historical narrative is a reflection of an essential structure of the phenomena described.¹¹ The very historical narrative consists of two layers. Its surface layer records states of phenomena under investigation, and its deep layer refers to determinants that decide about this rather than that state of it. As factors determining behavior of the magnitude studied are ordered with respect to their essentiality, a

¹¹ Nowakowa (1990), pp. 31-40.
deep layer of a narrative consists of strips. The first strip of a narrative describes the magnitude studied in terms of the first model of the idealization theory assumed. It describes forms of the phenomenon under investigation depending on the main factor. The second strip of a narrative contains subtler interpretations, for it also takes into account the influence of a secondary factor on the phenomenon under investigation. Subsequent strips of a narrative contain yet richer interpretations of subsequent states of the phenomenon under investigation, since they account for new secondary factors that were disregarded in the initial strips of a narrative.

Compared with a narrative of phenomena of an essential structure dominated by the main factor, a historical narrative of phenomena in which the cascade effect occurred has a specific peculiarity. Its structure changes despite the fact that an essential structure of the phenomenon in question has not changed. This is because, owing to the cascade effect, the first strip of a narrative allows the influence of many secondary factors at the same time, and their common influence is greater than the influence of the main factor. It is only the second strip of a narrative that accounts for the influence of the main factor. Thus, a cascade narrative is richer and closer to the historical reality already in its initial strip.

Another important problem in a narrative of historical events subject to the cascade effect is to grasp the moment of the transformation of an essential structure. This is connected with a proper recognition of a type of an essential structure: does the main factor still exert the dominating influence on it or have secondary factors already dominated it? The problem is also linked to a proper identification of a particular factor that has been able “to tip the scales of influences” in a structure in favor of a cascade of secondary factors, as well as with the determination of the moment in which this happened. Therefore, errors that may occur in a narrative of such a type of historical events are of three kinds: a wrong determination of a type of an essential structure, a wrong identification of a factor that closes a cascade and, finally, a wrong determination of the moment in time in which, under the influence of a factor initiating the domination of secondary factors, there gets transformed a type of an essential structure: from a structure dominated by the main factor it gets transformed to a structure dominated by a cascade of secondary factors.
8. The Cascade Effect in light of Categorial Ontology

The cascade effect, which was discussed in light of the idealizational theory of science, also leads to certain philosophical consequences. These consequences can be expressed in the language of categorial ontology. Let me present in brief the basic concepts of this theory, which are suitable for the philosophical interpretation of the cascade effect.

The theory of categorial ontology emphasizes the existence of two basic aspects of each phenomenon, i.e., its essential structure and nomological structure. Each phenomenon remains under the influence of a number of determinants which affect it in a specific way. All the factors which influence the phenomenon under study form a space of factors that are essential to that phenomenon. A sequence of factors that are essential to a given phenomenon and arranged with respect to the power of influences forms the essential structure of a given phenomenon. In that structure, one may discriminate between the main factor for a given phenomenon, characterized by the greatest power of influence, and a number of secondary factors, of smaller power of influence compared with the main factor.

Categorial ontology aims not only to reconstruct essential structures of the phenomena under investigation and to exhibit their possible relations, but it also deals with reconstructing their nomological structures. Such structures consist of dependencies between factors and phenomena determined by them. In the above-mentioned theory, the dependency is understood as a function to bind changes of the factor, which is essential for a given phenomenon, with the changes of the phenomenon itself. On analogy to the hierarchy of the power of influences of factors, one may reconstruct the hierarchy of dependencies of the phenomenon under study, i.e., its nomological structure. Using the term ‘inner dependency’ and ‘regularity’ one may refer to the dependency of the phenomenon under study on the main factor. On the other hand, surface dependency or the form of manifesting regularity is defined by the influence of all factors, which affect a given phenomenon.

The main problems of categorial ontology are changes in the essential structures of the phenomena. It is possible to discriminate between two basic types of conversions: alterations and transformations. Alterations are conversions within the realm of secondary factors, whereas

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12 Nowak (1977b), pp. 51-56.
13 Ibid., pp. 71-76.
14 Ibid., pp. 109-134.
transformations are conversions within the realm of main factors of the phenomena under study.

Within the first type of conversions, three types of alterations occurring among secondary factors may be identified. One is extension. It emerges if the established essential structure is accompanied by some new secondary factors which also influence the form of the manifestation of regularity to which so far an examined phenomenon was subordinated. Another type of alteration is curtailment. Under the influence of curtailment, the repertory of secondary factors becomes limited and the nomological structure of the phenomenon undergoes changes in the phenomenal layer of dependencies. The next type of alteration is replacement. It is achieved when certain factors change their places in the essential structure. The above-mentioned types of alterations of the essential structures of the phenomena, i.e., extension, curtailment and replacement, entail solely a modification in the form of the manifestation of a given regularity. Alterations are thus quantitative conversions whereby the main factor, and thus the given regularity, remains the same, and the change affects solely the repertory of secondary factors and the form of the manifestation of a given regularity.

Conversions of the essential structures of the phenomena which lead to changing the regularity termed transformations. They are such conversions in which only the main factor for a given phenomenon changes. One may distinguish two types of transformations. The transformation of the first order is a conversion in which the main factor in the preceding period is an essential factor for a given phenomenon, though it is no longer the main factor. By contrast, in the transformation of the second order, the main factor for a given phenomenon drops out of its essential structure. Regardless of the type of transformations, each of them brings about the change in the regularity which has governed a given phenomenon until now. Thus, transformations belong to qualitative conversions in which, as a result of changing the factor, the very regularities ascertaining a given phenomenon are changed.

In light of the above-mentioned theory, it may be possible to characterize the nature of cascade conversions in greater detail. The cascade effect occurs in the realm of secondary factors, so it is a sort of alteration. According to what has been stated far, the process of the accumulation of the cascade factors relies on such enrichment of the essential structure in new secondary factors that the main factor ceases to be a dominating one. The cascade change is then the extension of the essential structure of an examined phenomenon. Under the impact of interactive relations between factors, which appear in the cascade, it is
also possible that the internal replacement of the essential structure will occur: under the impact of interaction with some other factors, certain factors increase their influence upon the phenomenon examined, whereas others decrease their influence under the impact of such interaction. The cascade change is thus the extension of the essential structure combined with its internal replacement.

Let us recall that in light of the above-mentioned theory isomorphism arises between the changes in the essential structure and the changes in the nomological structure: quantitative conversions (alterations) lead to the changes of the manifestation of regularity, whereas qualitative conversions (transformations) lead to changes in the regularities themselves. The peculiarity of the cascade derives from the fact that the defined type of quantitative change (extension, which may be connected with the replacement) entails the change of the regularity itself rather than the change of the manifestation of regularity. In this case, then, the principle of isomorphism of conversions between the nomological and essential structures is falsified.

It seems that it is certain tacitly recognized idealizing assumptions of categorial ontology that are responsible for that state of affairs. These assumptions presume that there exists only one type of essential structures, namely such in which the main factor is a dominating factor. In the realm of that type of essential structures, there really arises isomorphism between the conversions of essential and nomological structures of the examined phenomena. However, such isomorphism does not arise in the realm of essential structures, in which the sum of power of influences of secondary factors is bigger than the power of influence of the main factor.

9. The Rationale of Idiographism in the Science of History

The cascade effect also allows a consideration of the above-discussed methodological controversies regarding idiographic and nomothetic understanding of history in a different light.

A classic type of justification of the presence of idiographism in the historical science that was put forward by Wilhelm Windelband, who distinguished between two basic types of sciences. Natural sciences are supposed to aim at revealing the general and universal, whereas the task of historical sciences is to present the individual and the particular. This standpoint was developed by Windelband’s student and follower,
Heinrich Rickert and other thinkers representing the group of German anti-naturalist philosophers.\textsuperscript{15}

Let me now paraphrase the differences between nomothetism and idiographism in terms of categorial ontology, which forms the body of ITS assumptions. Set $U$ of all objects, which encompasses magnitude $F$ with certain intensity, makes up the universe of a given magnitude. Let us acknowledge the fact that in this universe one may identify definite subsets $Z_1, \ldots, Z_n$. These sets are $F$-species. Thus, the sum of $F$-species of the same main factor forms a type of a given magnitude in its scope. Thus, $F$-kinds differ among themselves with respect to the main factor that is distinguished, whereas $F$-species which belong to the given $F$-kind differ with respect to secondary factors. A given $F$-kind is then a sum of those $F$-species, which share the same main factor. That differentiation can be illustrated by a scheme. Let us assume that there are essential structures of the following shape:

\[
\begin{array}{c}
S_F^1: H \\
S_F^2: H \\
S_F^3: G
\end{array}
\]

\[
\begin{array}{c}
H, p \\
H, q \\
G, q
\end{array}
\]

Each of the sets $Z_1, Z_2, Z_3$ is an example of $F$-species. Moreover, factor $F$ has two $F$-kinds. Kind $R_1$ is identical with the sum of classes $Z_1$ and $Z_2$ and kind $R_2$ is identical with class $Z_3$.

Within the conceptual apparatus of that theory, it is feasible to paraphrase the theses of idiographism and nomothetism by distinguishing between two versions for each of the two positions.

Radical idiographism pronounces that each $F$-kind to be a one-element set. It is of substantial methodological significance because it means that the magnitude $F$ upon every object carries a separate essential structure, and for the magnitude $F$ upon every object an independent theory should be constructed.

Radical nomothetism, in turn, claims that the universe of each magnitude $F$ contains only one $F$-kind. It follows that there is one and only one main factor for the magnitude $F$, ascertained upon all objects. A moderate standpoint (moderate idiographism or nomothetism) presupposes the existence of more than one $F$-kind in that universe, but less than the number of elements of the universe.

At this point, a certain simplification is worth mentioning. Scientists do not usually examine essential structures of individual factors but they

\textsuperscript{15} For differences between nomothetic and idiographic approach to history see: Malewski, Topolski in this volume.
strive to examine certain distinguished entities. These entities, called
categorial, are characterized by the situation whereby their constituent
factors are the main factors for themselves. However, in order to avoid
further complication, I assume that the object of scientific examination is
the essential structure of a single magnitude and not of complexes of
magnitudes.

The cascade effect also casts a new light on the opposition between
radically conceived idiographism and nomothetism. That phenomenon
allows to pluck a rational gist out of idiographic approach to history (in
its radical version). As was stated before, each cascade is an unrepeatable
and unique combination of factors, which hardly ever appear in the same
configuration. Even if a given configuration of the cascade factors recurs,
they can still vary with respect to the accumulation rate of secondary
factors and as to which of its components initiate and finish the cascade.
Thus, in practice, each cascade is an unrepeatable combination of factors.
Thus the effect of the cascade justifies the thesis of radical objective
idiographism, since for each cascade a separate essential structure should
be established. Moreover, the cascade of factors changes the structure of
a scientific theory and influences the way in which historical narration is
constructed. In the theory, which explains the phenomena of a standard
essential structure, its first model renders the influence of the main
factor, and derivative models render the influence of secondary factors.
The reverse holds true in the case of a theory which describes the
phenomena characterized by the essential structure of the cascade type.
In such a case, the first model contains the description of the influence of
secondary factors and only the derivative model demonstrates the
influence of the main factor. Similar changes occur in the structure of
historical narration. The first strip of narration concerning the
phenomena, which fall under the cascade effect, demonstrates the
influence of secondary factors, whereas its second strip presents the
impact of the influence of the main factor. The changes, which were
brought about by the cascade effect in the structure of scientific theory
and historical narration, justify to a certain extent intuitions of
idiographism, which draws upon the science of science and program.

However, the scope of the applicability of the basic intuitions of
radical idiographism is not unlimited. In spite of the fact that individual
configurations of cascade factors are unrepeatable, they fall under some
general type, i.e., the type of the cascade. Furthermore, this effect may
only appear in a defined kind of essential structures, namely such in
which the sum of the power of influences of secondary factors is larger

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than the power of influence of the main factor. Adequately paraphrased theses of radical idiographism are thus limited to the phenomena of the essential structure of this type. It is evident from a theoretical perspective which assumes nomothetic approach to history.

The fact that at least some intuitions of idiographism can be incorporated into the body of theorems of the contrary methodological standpoint indirectly proves to be against idiographism, constituting an argument in favor of the nomothetic approach in history.

REFERENCES


