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On the Systematic Role of the Deduction of Categories in "The Logical Foundations of the Exact Sciences"

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Abstract. This work studies the systematic role of the deduction of categories in Paul Natorp's *Logical Foundations of the Exact Sciences.* Through an analysis of the deduction of the categories of quantity and quality, we contend that this deduction is not merely a historiographical exercise, but it is the core of Natorp's system. It is argued that Natorp follows a synthetic method, rather than an analytic, similar to that employed by Kant in the *Critique of Pure Reason*. We argue that the core of Natorp's deduction is rooted in the principle of correlation. Unlike Kant, who derives categories from the table of judgments, Natorp constructs his deduction by examining the structure of thought itself. We demonstrate that this approach allows for a systematic deduction of the properties of number and the fundamental series. The study shows how this deduction of categories is the ground for the construction of the fundamental series and how it is aligned with Natorp's methodological prescriptions.

Keywords: Natorp, fundamental series, synthetic method

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О систематической роли дедукции категорий в «Логических основаниях точных наук»

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Аннотация. В данной работе исследуется систематическая роль дедукции категорий в «Логических основаниях точных наук» Пауля Наторпа. Анализируя дедукцию категорий количества и качества, мы утверждаем, что эта дедукция является не просто историографическим упражнением, а ядром системы Наторпа. Утверждается, что Наторп следует синтетическому, а не аналитическому методу, подобному тому, который использовал Кант в «Критике чистого разума». Мы утверждаем, что в основе дедукции Наторпа лежит принцип корреляции. В отличие от Канта, который выводил категории из таблицы суждений, Наторп строит свою дедукцию, исследуя саму структуру мышления. Мы показываем, что этот подход позволяет систематически выводить свойства числа и фундаментального ряда. В исследовании показано, как эта дедукция категорий является основанием для построения фундаментального ряда и как она согласуется с методологическими предписаниями Наторпа.

Ключевые слова: Наторп, фундаментальный ряд, синтетический метод

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Introduction

The deduction of the pure concepts of the understanding is at the heart of the *Critique of Pure Reason*. In metaphysical deduction, Kant presents one of the foundations of his theoretical proposal. The understanding, by its own means, produces concepts. Concepts are functions of unity which order the manifold of sensibility. In this direction, as the Marburg school has detected, Kant introduces a novel view of conceptual representation [1. P. 559]. Concepts are functions which arise from the understanding, and which have no reference to anything sensible *in their origin*[1].

[1] Caimi explains that 'this interpretation of the expression ‘empty concept’ was unknown to pre-Kantian logic. The fact that concepts without content are empty is something new in the history of general logic. That content must be an intuition is a fundamental concept of the new transcendental logic' [2. P. 146].

The deduction of the pure concepts of the understanding in the metaphysical deduction of the categories is introduced as a result of the synthetic method, with which Kant proceeds in the *Critique of Pure Reason* (Prol, AA 04:274). In the synthetic method, nothing is presupposed as given except reason itself. It begins with a fact that initially appears obscure and indistinct, and then gradually brings clarity and distinction to it. Each element, when clarified, introduces the next. The elements form part of an organic whole. Therefore, the clarification of each of them leads to another element which is in a necessary connection with it. This new element is endowed with clarity and distinction and thus leads to another new element. In this way, more and more complex syntheses are obtained. This is the method of philosophy. It is not based on definitions, but on an obscure representation[2]. Metaphysical deduction in particular proceeds from the results achieved in Transcendental Aesthetics. Transcendental Aesthetics left as a result that the mind possesses a passive faculty by virtue of which it receives representations. The analysis of sensibility leads to the need to introduce another function that accounts for the way in which the multiplicity of given representations must be brought together. Since sensibility is passive, another faculty is required: the understanding. In metaphysical deduction it is exhibited which are these pure concepts. The leading thread for the discovery of the pure concepts of the understanding is the table of judgements.

As has been noted in the literature, and as Natorp himself points out on several occasions, the Marburg school takes the analytical method, which Kant employs in the *Prolegomena*. The starting point is the fact of science, and the task is to investigate its conditions of possibility. Marburg neo-Kantianism refers to this procedure as the transcendental method. For well-founded reasons, this method of investigation has been described as regressive. According to this conception, the neo-Kantian method '...begins with "the fact of science", that is, the acceptance of mathematical physics as a datum; it then explains how that fact is possible, specifying the conditions for a mathematical knowledge of nature' [4. P. 489]. The method of Marburg's neo-Kantianism is identified with Kant's regressive method[3]. The neo-Kantian proposal certainly appears to move in this direction, especially given that Natorp[4], Cohen[5], and Cassirer[6] all argue along similar lines.

[2] But the starting point is the notion of representation, not taken as a psychological event but as a logical fact. That Kant will apply the method of isolating the elements is already announced in the title "Transcendental Doctrine of Elements" (KrV, A 17/ B 31) [3. P. 12].

[3] Helmut Holzhey, Jünger Stoltenberg, Frederick Beiser, Alan Kim, Ëric Dufour, Hernán Pringe, among others, claim that the Neo-Kantian transcendental method takes the science of nature as a point of departure of the investigation. [4. P. 466; 5. P. 23; 6. P. 48; 7. P. 34; 8. P. 186; 9. P. 133].

[4] Natorp stresses that science is not a *factum* but a *fieri*. The starting point of the investigation would be science in its constant development. [10. P. 199].

[5] Knowledge is a factum that is achieved in science [11. P. 5]. The fact is the experience, and the conditions of its possibility must be found. Experience is the science of nature. Cohen considers this to be the method followed by Kant. Kant departs from Newton's principles of science as his starting point [12. P. 1]. In this regard, Cohen maintains: "…experience is given; the conditions on which its possibility rests must be discovered. (…) This is the whole business of transcendental philosophy. Then, the experience is given in mathematics and in the pure science of nature" [13. P. 24].

[6] I interpret the Kantian question of transcendence as Cohen has formulated it again. He saw the essence of the transcendental method in that said method begins with a fact, before which the

The method of investigation has led some commentators to conclude that there is no systematic role for category deduction in Natorp's system. Morris Cohen argues that this moment is only part of a modern category deduction that does not affect the core of the system. In his review of *Die logischen Grundlagen der exakten Wissenschaften* (The Logical Foundations of the Exact Sciences), Morris Cohen states: "In the second chapter, we have a modernized deduction of the categories. The dry bones of the Kantian framework receive a great deal of flesh and blood. In the end, however, they turn out to be our old friends the Twelve, marching in four groups of three each. If it were not for the fact that students at our colleges do not read German, this chapter could profitably be recommended to those who are reading Kant for the first time and who generally cannot grasp what these categories are about." [15. P. 694].

Helmut Holzhey, in the same vein, claims that the very concept of 'category' has a purely historiographical function in referring to the Kantian system. According to Holzhey: "In his 1910 book Die logischen Grundlagen der exakten Wissenschaften, Paul Natorp used the concept of "category" only in a historical sense when referring to Kant" [7. P. 70]. Regardless of the opinions of these commentators, if philosophy must begin with the fact of science, what then is the meaning and purpose of a deduction of categories? This raises the question of what role such a deduction plays and, moreover, in what sense it is necessary at all.

Within the framework of this problem, the aim of this research is to analyse the systematic place of the deduction of categories. We argue, contrary to the views of Holzhey and Morris Cohen, that the deduction of categories is the core of Natorp's work. From the deduction of categories, Natorp deduces the properties of the fundamental series of numbers. Consequently, and as a corollary, we will exhibit that the method that Natorp employs is synthetic and not analytic. Natorp does not start from the fact of science but from the principle of correlation.

Our argument will unfold in three stages. First, we will conduct a brief analysis of the deduction of categories, focusing on the categories of quantity and quality. Second, we will demonstrate how this deduction serves as the foundation for the construction of the fundamental series. Finally, we will show how this procedure aligns with Natorp's methodological prescriptions.

I. The deduction of categories

The deduction of categories is demanded by a peculiar way of understanding the task of philosophy. Natorp argues that: "by the peculiarity of the object to be investigated, the peculiarity of the method of investigation must be partly conditioned; therefore, nothing can be established about the latter until the field of the objects to be investigated is determined with certainty" [7. P. 2]. According to Natorp, the object of research defines the method to be applied in each specific field

following general definition: "Begin with a fact in order to ask about the possibility of that fact ... [14. P. 294].

of knowledge. The research is based on a minimum of assumptions that determine the method to be employed. This ensures that the method is consistent with the objective of the research. Thus, the first step in philosophical research is to define the object of study. For Natorp, philosophy is the science responsible for revealing the fundamental principles of thought. It is the primary science on which all others depend and is considered the basic science of thought and knowledge[7]. Natorp states: "According to its historical concept, philosophy is the fundamental science, that is, that science which must ensure the unity of human knowledge by demonstrating the common ultimate foundation on which they all rest" [18. P. 3]. As a general science of knowing, the starting point of research cannot be alien to itself. However, a minimum of assumptions is required to begin the investigation; thus: "That a deduction should begin without any presupposition would be an absurd requirement. In any case, something is always presupposed in addition to what is necessary to understand the task, an ultimate foundation from which it is deduced. The absence of assumptions can only be demanded in the sense of presupposing no more than what is indispensable, without anticipating anything that already belongs to the solution. Therefore, our first task is to determine the minimum of assumptions that is necessary and sufficient for the required deduction." [...] "The general task, to which ours is subordinated as a particular problem, is to establish the ultimate foundations of knowledge, in the sense explained above, as objective foundations. Therefore, in any case, a general concept of knowledge is presupposed" [19. P. 2].

The starting point is a general concept of knowledge. To think is to establish relationships. Relations contain terms. Terms do not "precede the relation, but it is the relation that first establishes the terms" [20. P. 99][8]. Thus, the minimum concept of knowledge required is the relation between terms in a relation: correlation. Correlation is the highest principle expressing the unity of thinking. The initial presupposition required is this general concept of knowledge as correlation. The deduction of categories takes this starting point and develops on four levels: quantity, quality, relation and modality[9]. The first two levels establish the concept

[7] According to Natorp, there is no qualitative difference between thinking and knowing (§2 in [16]). As Hernan Pringe explains: "The Kantian distinction between thinking and cognizing an object (CPR B 146), which relies precisely on the consideration of intuition as a non-conceptual representation, is thus abandoned in favor of a doctrine of thought that is at the same time a doctrine of knowledge" [17. P. 137].

[8] For Mario González Porta, the essential definition of thought as the establishment of relationships is one of the foundational assumptions of the system that Natorp has not adequately justified. According to González Porta: "the difficulties ultimately revolve around the assumption of the primitive and indefinable nature of the relationship, which seems to presuppose exactly what it aims to prove" [21. P. 209].

[9] Natorp uses both, the concept of levels (*Stufen*) and of categories (*Kategorieen*). For example: In [16; 20; 22] we find the concept of *Stufen*, but in [23; 24] Natorp talks about categories. As Holzhey, explains, Natorp prefers to talk about logical functions rather than of categories. Cf. [25. P. 107].

of the object in general[10]. The analysis of the concept of thought as correlation leads to the discovery of three first fundamental actions of thinking in the position of quantity: 1) the position of unity (Einheit), 2) plurality (Mehrheit) (repetition of the position of unity), 3) totality (Ganze) [20. P. 54]. The first moment of the process is the establishment of unity, and what is regarded as one is completely indifferent. "One" is both the atom and the triangle, and for the quantitative judgment, the determinate content of what is established as unitary is indistinct. Discreteness is established as the first moment of quantitative synthesis. At this level, unity is the starting point. An indeterminate "x" is posited which must be conceptualized under a general concept, for example: A. The first judgment we obtain is: "This particular x is A". The possibility of a plurality requires the repeated position of these units. Each element differentiated as a unit is only relative to something else. The distinction of an x1 requires an x2 to constitute a distinct unity. However, this x2 is nothing if considered independently. The x2 is always relative to the x1. The concept of plurality starts from unity and generates a plurality as a one-to-one repeated position. The position of x2 can only be repeated (a second position) if x1 is retained as already established. This is how an indeterminate plurality is conceived as multiplicity. In this way, one obtains the open series expressed in the judgment: "These (individuals) x1, x2, x3 ... are A". This second stage consists in the repetition of the units. Thus, we obtain pluralities and units as correlated moments; the units are units of a plurality, and the plurality is a plurality of differentiated units. However, in this second moment the series remains indeterminate; a third articulating form is required that constitutes the unity of the series. This is provided by the third moment: the conformation of a totality, the unity as unity of the many. This third moment is expressed in the judgment: "All x is A". This judgment contains the two previous moments as its condition. In the third moment, we obtain the totality of the unities [20. P. 55]. The beginning of the position is always a relative beginning. The element that is established as the initial moment can contain within itself a multiplicity. Similarly, the whole can be placed as a unity in relation to a higher synthesis of thought. This process of thought allows the development of progression. It is possible to form more and more encompassing units. This possibility of thought to determine more and more its object and to reach higher units allows progression. The symbolic representation of the levels of quantity would be [22. P. 345ff.]:

I
II
III ...
(I) (II) (III) ...

[10] According to Eric Dufour, this derivation of categories a priori limits the division between mathematics and the science of nature. For Dufour, this is one of the ruptures of Natorp's thinking with that of Cohen, for whom the science division is a *factum* found a posteriori. Cohen takes the science division as a given fact. Natorp believes that this division is exhibited *a priori* in the foundation of science in the logical law. [5. P. 104].

Number is the scientific expression of this natural operation of thought, which includes these three moments: the establishment of the numerical one, the establishment of unlimited plurality, and the generation of the determinate plurality of totality.

However, the categories of quantity alone are insufficient to guarantee a differentiated objectification. The functions of the categories of quality that objectify sensation are required to conform the object. This function aims to distinguish one thing from another in order to understand it from a higher point of view (from a comprehensive unity). Quality is the synthetic function of unity that provides a central understanding, an original unity. This function has, as in quantitative synthesis, three distinguishable moments. First, a plurality of differentiation must be established on the basis of a qualitative identity. As with the numerical unit, in this case, the identity is the first basis, no matter what is considered as an identical one. However, in every judgment of identity one inevitably finds an allusion to an otherness. The "this" something can only be defined in relation to an "other" something, and the "other" something can only be defined in relation to an "this." Both terms are required by the comparison itself. In this qualitative relation, one is established as the qualitative opposite of the other. There must be at least one differentiating characteristic that establishes the one with respect to the other. This is the basis of the series of identity positions. However, there must be a third moment in which what was separated is reunified from one point of view, under a higher unity of understanding. This point of view is required by thought as that from which it compares. In this way, the qualitative function represents the synthetic unity of diversity on which a genus is founded. The genus (Genos) is the logical name for this new qualitative unity of uniformity of diversity (Einerleiheit des Mehrerlei). Quality, as the production of the diverse from unity, establishes the condition for the exercise of the quantitative function; that is: homogeneity. The establishment of something capable of being numbered occurs thanks to the function of quality that grants something differentiable that can be measured by number. Only the procedure of enumeration of elements makes it possible to define 'what', allowing not only a mere description of its attributes, but the differentiation of an entity from others. In this way, qualitative synthesis constitutes a unit of understanding that differs from a mere composition, allowing identity to be constituted in diversity. This comprehensive totality based on qualitative synthesis must not be confused with quantitative totality, which is a composition. The qualitative unity is the unity of understanding, an original unity. The synthetic-qualitative function constitutes unity as identity. Unlike the quantitative unity which establishes a purely compositional totality (Allheit), the qualitative synthesis constitutes a comprehensive whole (Ganzheit). The constitution of the object in general is realized in the correlation between qualitative and quantitative synthesis. The synthesis of quantity and quality together represents the two fundamental forms of the logical development of thought. The numerical series is constructed on the basis of this operative of thought.

II. The construction of the fundamental series

Number is the purest expression of thought [20. P. 98]. The laws of number are derived from the logical process of quantity and quality. These logical functions determine the properties of the numerical series. The relation of the series to its members is determined on the basis of these fundamental logical processes.

The series is generated in the iteration of the quantitative and qualitative process in which each term placed is considered as a counter-term in relation to a previous position. First, there is the position of the one, the position of a term as the first element to form multiplicity. Secondly, a repetition of this initial position is necessary. This repetition must ensure that the previous moments are preserved; a repetition of the initial position is generated while the previous positions are retained. The second term is presented as a counter-term with respect to the previous one. The third moment generates the possibility of taking the terms as new initial moments. That which was put as "the other" with respect to an initial position can be considered as a new position in relation to another position. The unity of the one and the other can be considered as a totality with respect to a later moment. The unity of the one and the other can also be a unity. Each of the terms can be both a first term and a counter-term. This process is infinitely iterable. What was a whole with respect to its parts can also be considered as a unity for the conformation of higher order totalities. There is no absolute beginning of the position of the one, but there is an iterable structure where nothing is itself a unity or a totality in an absolute sense. The possibility of placing terms in different relations can generate the false impression that they can exist independently of the relation itself. Each term appears independent because of its ability to enter into multiple relations. However, terms can only be placed in different relations because their determination consists precisely in being part of a relation. This apparent independence is nothing more than the possibility of establishing different relations, since the terms have no other determination beyond these positions. Each member of the series is defined by virtue of the position it occupies.

The iteration of terms is determined by quantity. However, each term belongs to an ultimate qualitative unit: the rule for forming the series. Quantity represents discretion, while quality represents continuity in the relationship between terms. Quantity is expressed through discrete numbers and represents specific limits, but it leaves the transition between these limits indeterminate. That is, quantitative magnitude alone does not define continuity between numerical values (for example, between 0 and 1). Quality resolves this indeterminacy, as it provides the continuity that is lacking in mere discrete quantity. Quality refers to the continuous totality of distinctions that can be established between limits, implying continuity without exceptions. This continuity cannot be understood quantitatively, but qualitatively, as a totality that encompasses all possible distinctions. The concept of intensive magnitude refers to the qualitative unit that generates quantitative values [26. P. 212f]. This intensive magnitude is the basis of extensive magnitude. Discrete

quantity represents the assigned values, while quality ensures continuity, unifying differences under a qualitative law or principle [16. P. 23f].

The iterated position from term to term generates the series along with the possibility of directing the plus and the minus as opposing relationships. Each established relationship between two terms, such as P and Q, is not unidirectional; if there is a relationship of Q with P, it can also be asserted that there is a relationship of P with Q. This implies that each relationship carries an opposite sense that presents itself simultaneously. P can be considered the fundamental term and Q the opposing term. However, a single term cannot play both roles in a specific relationship; that is, if in a relationship P acts as the term and Q as the counter-term, it cannot be conceived that P and Q simultaneously fulfill both functions within that relationship. Each established relationship is "new." The term that was previously opposing can become the fundamental term in a new relationship. Thus, the directionality of the fundamental series is established with two directions of plus and minus. Furthermore, the coexistence of these reciprocal relationships indicates that where there is a relationship between two terms, an inverse relationship is also present. In this way, positive and negative directions combine into the concept of a unique "direction." In thought, these relationships can be considered in both directions as a single relationship. Thus, "on these grounds, some of the simplest properties of numbers can already be derived" [20. P. 103].

The properties of the numerical series are derived from the operation of these fundamental logical processes. The properties of the series are concrete expressions of the general operation of thought. As an expression of pure thought, this series is: necessary and universally valid, unique, infinite, homogeneous, and continuous. All these properties of the fundamental series are obtained from the derivation of the categories of quantity and quality [22. P. 355]. The fundamental series possesses the properties that arise as a result of being an expression of the fundamental functions of thought, which establish the object as magnitude. The series is universally valid because it is based on the pure process of thought. It is unique because the permutation of values only alters the position in relation to the same set of relationships. The exchange of values does not generate a new series as long as the determination of value is based solely on its position in the series. The function of each value is always interchangeable [20. P. 113]. Since the process is always iterable, the series is infinite and open. This iteration results in an infinitely open series on both sides, from the positive side and the negative side. In the series, each fundamental member of a first relationship can become a counter-term, and each counter-term can become a fundamental member in relation to another counter-term in a new relationship [16. P. 31]. This iteration allows a term to always be considered as a counter-term and vice versa. No term can constitute an absolute beginning, but each term can assume the function of a beginning. The series is homogeneous because its values are equivalent. The direction of plus and minus can be reproduced anywhere in the series by taking a moment as 0 and expressing in relation to it, again, a relationship of term and counter-term. Each determination

of a value is relative to the function it occupies. Quantity allows for indefinite positions and guarantees the possibility of considering the plurality of differentiated positions within a total quantitative unit. Meanwhile, quality enables the continuous transition from one magnitude to another. [22. P. 365; 20. P. 180].[11] In this way, the fundamental series finds its foundation in the operation of thought. The process of quantity and quality is expressed in numerical relationships. This is the true sense in which it can be asserted that "number originates in pure thought." [20. P. 99].

III. The Methodological Basis for the Deductive Foundation of Number

Natorp derives the properties of the fundamental series from the deduction of categories, particularly from the categories of quantity and quality. The properties of the fundamental series are obtained through the derivation of these categories, based on the principle of correlation. As we noted, the category of quantity allows for discretion and the establishment of differentiable terms; quality enables the continuity from one term to another. Likewise, as we have shown, the directionality and fundamental properties of the numerical series are determined through the deduction of categories.

Although we have not developed it here, the object of thought is not limited to quantity and quality, even when variability is explained by the magnitude derived from the qualitative unit of continuity. However, even with this understanding of the object, the objects are not yet understood in their relationships of interdependence within experience. The dynamic properties of experience are established through a new production of thought: the assembly within the series, the generation of a series of series. The technical term for this operation is function. Thus, a new level is introduced in the deduction. In this sense, experience must be understood as a higher level of thought. Reality itself is ultimately a creation of pure thought [20. P. 65f]. Therefore, the formation of the object of experience follows the same methodological prescription: a metaphysical deduction for the discovery of the concepts of understanding.

The deduction of categories underpins the construction of the object as magnitude and the objects of experience. As we have noted, Natorp does not begin with science as a mere fact; rather, he starts from the concept of thought as correlation. He conducts a deduction of categories that first establishes the fundamental series, from which the existential properties of objects are subsequently derived.

Natorp had already explicitly identified the place of this deduction in his 1902 article, *Gnoseological Foundations of Mathematics.* In this article, he argues that the logical foundations of the exact sciences can be derived through two

[11] Natorp seems to give precedence to the category of quality over that of quantity. He holds: "Continuity is such a primordial, unbreakable law of thought that any discretion can only be conceived as the discretion of a continuum. Thus, for pure thinking, there exists the continuum of relationships or directions as well as the continuum of values" [20. P. 237].

approaches. The first approach is based on the principle of correlation, while the second pertains to the operations of quantity and quality. The first approach is the one he adopted in *Number, Time, and Space* and *On the Logical Foundations of Modern Mathematics*. The second approach is the path he follows *in Gnoseological Foundations of Mathematics*[12].

As we have demonstrated, the path of *The Logical Foundations…* develops the first approach: the derivation of the properties of number from the metaphysical deduction of the categories. This deduction is not based on the table of judgments but on the principle of correlation[13].

In Natorp's deduction, the starting point is this definition of thought as correlation. Unlike the Kantian conception, where the table of concepts arises from the table of judgments, here the guiding thread is the study of the structure of thought itself. The starting point in the concept of thought as correlation is the only way to ensure the systematic construction of the deduction[14]. As we have noted, the deduction of categories underpins the properties of number and the fundamental series. In conclusion, we have demonstrated that the metaphysical deduction of categories in the second chapter of Natorp's *The Logical Foundations of the Exact Sciences* is the central core of his system. In this sense, the deduction does not serve merely a historiographical function; rather, it is essential for the construction of the fundamental series. We have shown how this deduction of categories follows a synthetic method that is consistent with Natorp's methodological prescriptions.

References

[1] Katsur I. From Monism to Pluralism: Cassirer's Interpretation of Kant. *RUDN Journal of Philosophy*. 2023;27(3):556–567. https://doi.org/10.22363/2313-2302-2023-27-3-556-567

[12] "It concerns the ultimate common foundations of arithmetic and geometry, whose revelation would signify nothing less than a purely logical deduction of both space and time. The relevant investigations are presented in two treatises: one, published in French on the occasion of the International Philosophical Congress at the Universal Exposition in Paris, titled "Number, Time, and Space"; the other, "On the Logical Foundations of Modern Mathematics," published in the "Archiv für systematische Philosophie." However, I will adopt a slightly different approach here, as I believe this new approach makes the proof more rigorous from a logical standpoint, although it leads to no different result. (...) I proceeded in such a way that I first derived the laws of number from the fundamental principles of the "quantitative-qualitative synthesis," that is, from the two most fundamental and inseparable thought processes through which, on the one hand, we conceptually create a multiplicity as such, and on the other hand, we create that unity of a multiplicity that constitutes a content of thought". [23. P. 2].

[13] Natorp develops a metaphysical deduction of categories. The question is to identify the categories. As there is no heterogeneity between sensibility and understanding, a transcendental deduction is not necessary at all. Hernán Pringe explains: "Without the distinction between a passive capacity (sensibility) and an active faculty (understanding), there is no *quid juris* question and therefore no necessity for a transcendental deduction". [8. P. 210].

[14] Geer Edel holds that the Neo-Kantians are the last philosophers who defend the idea of systematic philosophy [27. P. 110].

[2] Caimi M. Gedanken ohne Inhalt sind leer. *Kant-Studien*. 2005;96(2):135–146. https://doi.org/10.1515/kant.2005.96.2.135
[3] Caimi M. *Kant's B Deduction*. Cambridge: Cambridge Scholars Publishing; 2014.
[4] Beiser FC. *The Genesis of Neo-Kantianism, 1796-1880*. Oxford: Oxford University Press; 2014.
[5] Dufour É. *Les Néokantiens*. Valeur er vérité. Paris: Vrin; 2003.
[6] Kim A. Neo-Kantian Ideas of History. In: Warren N, Staiti A, comps. *New Approaches to Neo-Kantianism*. Cambridge: Cambridge University Press; 2015.
[7] Holzhey H. Neo-Kantianism and Phenomenology: The Problem of Intuition. In: *Neo-Kantianism in Contemporary Philosophy*. Bloomington and Indianapolis: Indiana University Press; 2010. P. 25–40.
[8] Pringe H. Infinitesimal Method and Judgment of Origin. *Kant e-Print*. 2021;16(2):185–199.
[9] Stolzenberg J. The Highest Principle and the Principle of Origin in Hermann Cohen's theoretical philosophy. In: Makreel R, Luft S, editors. *Neo-Kantianism in Contemporary Philosophy*. Indiana University Press; 2010. P. 132–149.
[10] Natorp P. Kant und die Marburger Schule. *Kant-Studien*. 1912;17(1–3):193–221. https://doi.org/10.1515/kant.1912.17.1-3.193
[11] Cohen H. *Das Prinzip der Infinitesimal-Methode und sein Geschichte*. Berlin: Ferd. Dümmlers Verlagsbuchhandlung; 1883.
[12] Cohen H. *Kants Theorie der Erfahrung*. Berlin: Ferd. Dümmlers Verlagsbuchhandlung; 1885.
[13] Cohen H. *Kants Begründung der Ethik*. Berlin: Ferd. Dümmlers Verlagsbuchhandlung; 1877.
[14] Heidegger M. *Gesamtausgabe*. Frankfurt am Main: Vittorio Klostermann; 1975.
[15] Cohen MR. Natorp's Die logischen Grundlagen der exakten Wissenschaften. *Journal of Philosophy.* 1911;8(25):693–697.
[16] Natorp P. *Logik. Grundlegung und logischer Aufbau der Mathematik und mathematischen Naturwissenschaften in Leitsätzen zu akademischen Vorlesungen*. Marburg: Elwert; 1910.
[17] Pringe H. Cohen's Logik der reinen Erkenntnis and Cassirer's Substanzbegriff und Funktionsbegriff. *Kant Yearbook*. 2020;12(1):137–168. https://doi.org/10.1515/kantyb-2020-0006
[18] Natorp P. *Philosophische Propädeutik*. Marburg; 1904.
[19] Natorp P. Quantität und Qualität im Begriff, Urteil und gegenständlicher Erkentnnis. *Philosophische Monatshefte*. 1891;27(1–32):129–160.
[20] Natorp P. *Die logischen Grundlagen der ecxakten Wissenschaften*. Berlin; 1910.
[21] González Porta MA. La teoría del número en Natorp y Cassirer. *Thémata: Revista de Filosofía*. 1996;(17):199–222.
[22] Natorp P. Nombre, temps, espace, dans leurs rapports avec les fonctions primitives de la pensé. *Bibliothèque du Congrès International de Philosophie*, *vol. 1, Philosophie générale et Métaphysique.* Paris: Colin; 1900. P. 343–389.
[23] Natorp P. Die erkenntisteoretischen Grundlagen der Mathematik. In: *Unterrichtsblätter Für Mathematik und Naturwissenschaften.* Berlin: F. Pietzker, Verlag von Otto Sall; 1902. P. 2–8.
[24] Natorp P. Zu den logischen Grundlagen der neueren Mathematik. *Archiv für systematische Philosophie*. Bd. 7. 1901. P. 177–209
[25] Holzhey H. *Cohen und Natorp*. Basel/Sturrgart: Schwabe; 1986.

[26] Giovanelli M. Reality and Negation-Kant's Principle of Anticipations of Perception. An Investigation of Its Impact on the Post-Kantian Debate. In: *Studies in German Idealism*. Vol. 11. Dordrecht-Heidelberg-London-New York: Springer; 2011.
[27] Edel G. Der Zusammenhang der Systemteile in ihrer methodischen Verknüpfung. In: *Hermann Cohen und die Erkenntnistheorie*. Königshausen & Neumann: Wolfgang Marx, Ernst Wolfgang Orth; 2001.

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