Poznań Studies in the Philosophy
of the Sciences and the Humanities
2004, Vol. 82, pp. 253-271

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WHY DID HUSSERL NOT BECOME THE GALILEO OF THE SCIENCE OF CONSCIOUSNESS?

Abstract. It is well known that Husserl clearly recognized the importance of the introduction of idealization in physics and its contribution to the further advancement in natural sciences. The history of the successful applications of idealization in natural sciences encouraged attempts to extend the use of this sophisticated instrument of theoretical investigation and theory construction to other domains of science. Since Husserl designed his phenomenology as the rigorous science of consciousness we have to find out why he did not use the method he understood so well to study experiences, the objects located by him in the domain of consciousness. The paper offers an answer to this question. It explains why Husserl conceived of the method of idealization as a tool of objectivization of previously subjective knowledge. Since idealization is used to objectify knowledge its application to experiences, conscious acts would produce objective knowledge of consciousness. This, however, would contradict phenomenological assertion that subjectivity is an essential component of experience and that the reliable knowledge about conscious acts could not be objectified. It is the core of Husserl's argumentation that there is no place for idealization in the research on consciousness.

1. *The method of idealization and the development of science*

Science has long been known to apply idealization. Statements to that effect were to be found within the realm of science itself, and in works on the history of science, methodology or philosophy. Such statements usually recorded the use of the idealization procedure and viewed it as one of many ways of conducting scientific investigations. However, the knowledge that was thus gained did not offer an account for the nature and the role of idealization in science. It was Leszek Nowak, who in his works (1971a, 1972, 1977a, 1980) explained why idealization is the basic method of formulating theorems and developing theories in advanced empirical sciences. His contribution from 1971 (Nowak 1971b) is the first systematic investigation of the method of idealization. Nowak offered the evidence of its use in advanced empirical theories and explained its importance for the development of science. Drawing on examples from scientific practice, he showed that there is a solid methodological justification for the astounding fact that empirical knowledge,

which is concerned with what actually happens, is based on theses on frictionless motion, the ideal gas, etc. It means, that this knowledge refers to objects and situations that are nowhere to be found in the world around us. According to Nowak, idealization allows to determine the basic relationship that is sought by scholars in a given scientific discipline or subdiscipline. Nowak argues that the scientific investigation of "idealized" cases does not mean "departing" from empiricism. Conversely, it serves to identify essential properties of reality (Nowak 1977b). These ideas were developed further in Nowak's idealizational theory of science (ITS) (Nowak 1974, 1980), which is a comprehensive and systematically developed theory based on the hypothesis that the method of idealization is the basic research method in empirical sciences.

The theory of science proposed by Nowak is itself an idealizational construct. This means that Nowak created a depiction of science which, in line with his own postulates (Nowak 1977b), is its caricature, not a photograph. It is not to be just any caricature, though. Its task is to highlight those properties of the investigation and of the scientific product that the ITS founder thinks to be the "essence" of science, and to neglect those that he believes to be of secondary importance. Thus, if ITS is true in the essential sense, i.e. if it is an apt deformation of real science (Nowakowa and Nowak 2000), then the research procedure adopted by the outstanding scholars in the history of science, should in a minimal degree deviate from the research method of a perfect researcher, who – as postulated by the ITS models – creates a perfect scientific construct, i.e. the idealizational theory of objects of the given domain of reality. Hence, the empirical test for ITS are these great theories in science, which have been recognized as revolutionary in the history of a given discipline. The task of an ITS advocate is to demonstrate that the success of the scientific revolution was the result of a deliberate and systematic use of the method of idealization. Leszek Nowak undertook this task and reconstructed a number of scientific theories in order to show that in each case an application of the method of idealization brought about a breakthrough in the considered science. He proposed a hypothesis that the emergence of an idealizational theory in a given field of knowledge indicates that the science in question achieved maturity (Nowak 1974). In one of his reconstructions he showed that physics became mature science because Galileo discovered the method of idealization and used it to formulate the law of free fall. Introducing this method to biology, owing to Darwin's theory of evolution, resulted in that discipline achieving maturity (Łastowski and Nowak 1982). In social sciences, idealization was consciously used by Karl Marx. Hence, Nowak argued that Darwin was the Galileo of the biological sciences, and Marx was the Galileo of the social sciences (Nowak 1971b, 1980; Nowakowa and Nowak 2000). These succinct comparisons aim to point out that it is only skilful adoption and

application of a suitable method of gaining knowledge that can ensure that the research activity that is subordinate to that method gives rise to a scientific discipline in which the ideal of scientific investigation viewed as recording and collecting facts is replaced by the ideal of looking for basic relationships obtaining between the phenomena occurring in a domain in question. The researcher who finds these basic relationships (essential regularities) and formulates appropriate idealizational laws liberates himself from the overwhelming feeling of helplessness caused by the rising flood of facts collected by his colleagues. His mode of conduct consists in applying idealization as a tool which deforms the picture of the world by idealizing neglect, thus "erasing" from it everything that makes it overloaded with details and hence extremely difficult to analyze. The method of idealization thus allows to expose the basic relationship as the dependence between the most relevant magnitudes and disregard the influence of other magnitudes which are also present and detected but being of secondary importance only blur the image of the inquired phenomena.

It is clear, that the introduction of the method of idealization in a given science does not guarantee that this science will reach the stage of maturity. Moreover, there is no algorithm showing how idealization can be introduced into those disciplines in which it has not been used so far. However, Leszek Nowak seems to assume that it is difficult to imagine a discipline of science in which a systematic progress of knowledge (understood as a sequence of theories with increasing truthlikeness) could be observed and in which idealizational statements could not be found. Thus, a system of research inquiries cannot be recognized as a mature science if it does not use the method of idealization.

Since Galileo, Darwin, Marx and other outstanding thinkers (Nowakowa and Nowak 2000) were successful in gaining knowledge because they skillfully used idealization, this may be seen as a manifestation of a universal regularity in the development of the methods of scientific inquiry (Magala and Nowak 1985), whereby every science will sooner or later start applying the method of idealization.[1] This picture of the development of science seems to be supported not just by historical examples but also by the idea of self-enhancing scientific reason, the idea without which a responsible, rational

[1] It must be emphasized that it is only the rough approximation that idealization is a relatively simple procedure which involves disregarding the factor that is deemed to be of secondary relevance. Leszek Nowak's work as well as that of his followers include many subtle analyses of various varieties of the method of idealization. Hence, it could be the case that respective sciences have reached the maturity stage using different varieties of the method of idealization. Selected examples of various types of idealizing procedures in sciences are described in Nowakowa and Nowak's book (2000).

theory of science could hardly be imagined. According to this view, even those disciplines which at best could be called the developing ones are still waiting for their Galileo.

2. *Is it possible to become mature science without the use of the method of idealization?*

I do not want to discuss if the picture of the development of science suggesting that its maturity is guaranteed by the application of the method of idealization adequately portrays the essence of all scientific progress. What I would like to analyze is the peculiar position adopted by a philosopher who recognized and discussed the revolutionary importance of Galileo's method of idealization for further development of natural sciences. Admitting that Galileo's method was successfully applied by his followers and contributed to the flourishing of natural sciences, this philosopher defended the view that it is not universally applicable. He pointed to a domain of inquiry which comprises objects that, in his view, cannot be subjected to idealization. The reason was not the insufficient advancement of inquiries in that discipline, but the specific character of objects in the domain under study. The idealization, as he interpreted it, leads to the objectivization of the studied entity. Yet the objects belonging to that special domain are necessarily (i.e., according to their essence) subjective (in the sense that will be elucidated below), and an inquiry conducted in the idealizing mode, leading to their objectivization, would have to result in "purifying" them by the removal of their essence. It would deprive them from their subjectivity. In this way, the idealization that is conceived as the method of revealing the essence of the objects under study would become its very opposite and effectively conceal the essence of the objects belonging to that special domain.

The philosopher that is being referred to is Edmund Husserl, and the objects that in his view do not lend themselves to inquiries conducted in the idealizing mode are mental states or experiences. His position was by no means an effect of any deep-seated reserve towards rigour in scientific inquiry that is sometimes manifested by philosophers. Those who criticize such rigour argue that due to its dominance in scientific practices science completely lost the ability to grasp the authenticity and uniqueness of human experience of the world. While this view may have been attractive to many philosophers drawing on the phenomenological tradition[2], it was certainly not favoured by the founder of this tradition, that is by Husserl. For him phenomenology was

[2] Such inclinations are particularly noticeable in Patocka's and Levinas's works.

an exact science and he never ceased in his efforts to found his conception on a reliable knowledge obtained in inquiries which are no less rigorous than scientific investigations. At the same time, however, he maintained that – due to the specificity of the domain of pure consciousness and its constituent experiences – phenomenology must develop its own research methods rather than borrow them from the sciences.

I would say that Husserl had correctly recognized the revolutionary nature of Galileo's conduct by pointing to the idealization that he applied, and that he was aware of the momentousness of extending that programme to other natural sciences. On the other hand, however, he firmly rejected further extension of the programme to the realm of mental phenomena. He opposed the use of idealization to objects belonging to the domain of mind, because according to his "intellectual sight" mental phenomena do not lend themselves to idealization in their very essence. As I will try to argue Husserl was not and did not want to be the Galileo of the science of consciousness, since he was certain that there can be no Galileo-style revolution in that field.

A question may arise why should we bother - except for the purely historical reasons - with the reconstruction of Husserl's views on idealization in science? The current knowledge about the nature and the use of the method of idealization in science is far more sophisticated than the knowledge that Husserl had.[3] Will it allow a comparison to be made between Husserl's philosophical ruminations on idealization in natural sciences with the extended methodological framework of Leszek Nowak's idealizational theory of science? Who will be shown in a better light in this comparison: the phenomenological philosophy of science or the idealizational methodology? I believe that in this case we are dealing with a fortunate situation whereby both sides can benefit. A phenomenologically oriented philosophy of science stands a good chance to make Husserl's rough depiction of science more subtle. However, this will require far-reaching modification of the theses formulated within that philosophy and concerning the nature of idealization, and the place of idealization in the theories of developed empirical sciences. On the other

[3] While I admire Leszek Nowak's generous approach to unrestrained pluralism of philosophical ideas, I do not share his view and – unlike Nowak – I assume that philosophy cannot abandon the idea of a cognitive progress or replace it by postulating the multiplication of opinions. I would insist that a well-trained philosopher has (or should have) the ability – albeit one that unfortunately has not yet been elevated to the status of a method – to judge philosophical ideas in terms of their truth value. A vision of successive generations of philosophers facing the Sysiphean effort of climbing the backs of the same giants seems paralysing rather than stimulating to me. This concerns the philosophy of science in particular. Its history shows clearly that progress in that field is not about returning to the ideas of the past, however grand. In my view, a return to the ideas of the past can be justified only when we cannot find answers to our contemporary puzzles in our present knowledge. In such cases an inspiring support from past ideas might be helpful.

hand, ITS faces a riddle[4] whose authorship may be attributed to Husserl. The puzzling question is as follows: can we apply the method of idealization to mental states and to relationships between them? A comparison of a Husserlian and contemporary concepts of idealization demands a reconstruction of the position of the founder of phenomenology. This is the primary objective of the present article. I will try to expose these aspects of Husserl's concept of idealization which will allow to show why a philosopher, who was convinced of the revolutionary nature of his approach to consciousness, rejected the possibility of constructing phenomenology, considered by him as a rigorous theory of pure consciousness, on the basis of the method of idealization.

I will present Husserl's proposal in three steps. First step will consist in the description of the ontological assumptions of his phenomenological philosophy. It will help to understand his view of practicing science and creating a scientific theory. Next, Husserl's analysis of the Galilean revolution in physics will be used to illustrate his opinion that the creation of modern science led to discarding objects of everyday experience, i.e. "material things", and replacing them by "physical things". I will argue that by a physical thing he meant an idealized theoretical construct that was a product of the objectivization process. According to Husserl the constitution of a physical thing demands the use of mathematical instruments, especially geometry. In his view a physical thing is a superstructure based on a material thing. In consequence, his proposal led to the rejection of an opinion originated in modern science that physical thing is a core of a material thing. Being the result of the process of objectivization a physical thing loses its binds with objects of everyday experience which are "contaminated" by subjective elements. Finally, I will show why this procedure of objectivization cannot be applied to mental experiences, which are the objects investigated in phenomenology, designed by Husserl as the rigorous science of consciousness.

Let me make one more comment to avoid a misreading of this paper and clarify my attitude in this study. I am not concerned with tracking and locating all utterances referring to idealization which could be found in a "database" of edited and published texts based on manuscripts written by a real person: Edmund Husserl. Even if I do refer to that name, I mean an ideal representative of a certain systematized philosophical conception which can be reconstructed based on suitably codified and categorized statements.[5]

[4] I believe that it is a riddle for all contemporary theories of idealization.

[5] There is no doubt that a scientist or a philosopher transforms a chaos of utterances into an organized structure of statements and then extracts from it a system of intersubjectively accessible objective knowledge. A tentative explanation of the process of construction of a theoretical structure is presented in Klawiter (1991, 1994).

Phenomenology is conceived here as a certain philosophical conception that takes a form of a theoretical system.[6] This philosophical position was first presented in *Ideas I* (Husserl 1913/1914) and its modifications are to be found in Husserl's later work in the form of extensions and corrections. Therefore, my discussion is based primarily on *Ideas*, comprising the basic assumptions of phenomenology, and on *The Crisis of European Sciences*, which contains a case study that is conceptualized on the basis of these assumptions, namely a description of Galileo's revolution in physics.

3. *Ontological foundations of the phenomenological philosophy of science*

a) *Fact and essence*

The differentiation between fact and essence is the fundamental ontological distinction in phenomenology. I do not aim at making this distinction more precise; nor am I going to search for tools that could render it more vivid. Even though the distinction that is put forward in *Ideas I* appeals to intuition rather than to the analytical dispositions of the mind, I assume that it is clear enough to allow the reconstruction of the theses on the general ontology of the object that underlie the phenomenology of pure experience. I will also disregard the debate on the plausibility and usefulness of this distinction in ontological investigations. I will confine my analysis to the exposition of the principal features of that distinction. It will suffice to show the difference between the discussed conception and the other contemporary ontologies that are postulated as the basis of scientific knowledge.

The ontology that is assumed in phenomenology is the result of the analyses of scientific knowledge. These analyses show that there are two basic types of knowledge: the empirical and the theoretical one.[7] Since the

[6] This approach, by the way, is not alien to phenomenologists themselves. When listing and discussing various frameworks in the theory of cognition, Roman Ingarden writes: "Because of the way in which I am going to present and critically discuss various frameworks, they will be a certain idealization of the existing theories in the historical sense. The idealization will consist in disregarding the historical burden on the one hand, and – on the other hand – in a certain simplification, albeit one that is accompanied by a more consistent and, in a way, enhanced formulation of individual conceptions, positions and related solutions. As a result, my deliberations will concern purely the merits of the issues discussed, free from the diversions and deficiencies that have occurred in the course of the historical development of the theories in question" (Ingarden 1971, p.17).

[7] "It is well known that the basic means of natural scientific theorizing are the purely mathematical disciplines such as the material disciplines of geometry or phoronomy, the formal

theoretical knowledge cannot be derived from the empirical one we have to assume that both types differ with respect to the referred objects. The empirical knowledge refers to individual objects while the theoretical one refers to general objects, i.e. essences.[8] To each kind of objects corresponds a definite kind of cognitive acts. These are: individual (experiencing) intuition, i.e. any act of experience in which an individual object is apprehended, and eidetic intuition, i.e. any act in which, rather than directing our attention to something that is particular and unique, we apprehend that which is universal and which "necessarily" manifests itself in a given individual object. This individual object, which is recorded in experiencing intuition and taken in with its specific endowment is a fact.[9] On the other hand, essence – i.e. what is universal and necessary – is neither a property nor a class of individual objects; instead, it is a separate kind of object. Whereas fact is what is individual and contingent[10], essence is what is universal and necessary.[11] As can be seen, universality is taken as contrary to individuality and necessity as contrary to contingency. Even though these are two different kinds of objects the relationships between them can be clearly identified. More specifically, every essence has its individuations[12], which are individual objects that are possible "realizations" or instances of that essence. A set of individual

(purely logical) disciplines such as arithmetic, analysis, etc. It is manifestantly clear that these disciplines do not proceed empirically, that they are not grounded by observation and experiments on experienced figures, movements, and so forth" (Husserl 1913/1982, p. 44; page numbering based on the German original).

[8] "The essence (Eidos) is a new sort of object. Just as the datum of individual or experiencing intuition is an individual object, so the datum of eidetic intuition is a pure essence" (p. 11).

[9] The endowment may be constituted e.g. by a specific spatial and temporal location, specified dimensions, etc.

[10] "Individual existence of every sort is, quite universally speaking, 'contingent'. It is thus; in respect of its essence it could be otherwise" (p. 9).

[11] "Eidetic universality and eidetic necessity are therefore correlates" (p. 16).

[12] "to each essence there correspond possible individua which would be its factual singularizations" (p.16). I would rather use the term "individuation" than "singularization" chosen by Frank Kersten as the English equivalent for Husserl's *Vereinzelung*. Husserl used the term *Singularität* when he referred to infimae species, that is to species which cannot be a genus to a further species. *Singularität* belongs to the lowest level in the hierarchy of essences and singularization is a procedure of descending from the higher essences to the lowest ones. Thus singularization is a special kind of particularization (descending from the higher to the lower essence). In *Ideen* the distinction between individual instance of an essence (*Vereinzelung*) and eidetic singularity (*eidetische Singularitäten*) understood as an infimae species (*die niederste Differenz*) is evident. The terms "singularization" and "singularize" used in English translation as corresponding to the noun *Vereinzelung* and the verb *vereinzeln* blurs the distinction between the singularization (a specific kind of particularization) understood as descending from the given essence to the lowest essence and the individuation (*Vereinzelung*), understood as inference of an individual instance of an essence.

instances of a given essence is called an extension of individuations [*Umfang von individuellen Vereinzelungen*].[13] To this extension belong all possible individuals that instantiate that essence. Those of the possible individuations that actually occur are members of an empirical extension.[14] The latter is a proper subset of the extension of individuations. Thus, each fact that is recorded in an empirical science necessarily falls under (instantiates) some essence. At the same time this fact is a contingent case of the essence, it is an element of the empirical extension of that essence (whereby this extension is also contingent). Hence, when a skilled researcher is examining a fact, this very fact may become a point of departure for the act of apprehending (seeing) the essence of this fact.[15] The ontological distinction between fact and essence is accompanied by an epistemological distinction between judgments about relations between essences ("judgements about essences") and judgments about relations between the extensions of individuations ("judgements that have general eidetic validity"). Judgments of one kind can be transformed into equivalent judgments of the second kind.[16] Judgments of both types are purely eidetic, also referred to as purely essential.[17]

In *Ideas I*, the researcher's conduct aiming at seeing an essence or a relationship between essences (the researcher's primary aim is to discover these relationships) is described as follows: s/he apprehends a certain individual case, whether in empirical experience (when a fact is recorded) or by imaging certain individual situation in his/her mind, that is by conducting a thought experiment.[18] This imaginary presentiation allows to apprehend an

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[13] "Any essence which is not an infima species has an eidetic extension, an extension made up of specificities and always ultimately of eidetic singularities. ... Furthermore, any essence whatever has its extension of individual singularizations, an ideal sum-total of possible This-heres to which it can be related in eidetically universal thinking" (Husserl 1913/1982, p. 27).

[14] "The phrase, empirical extension, indicates more than that: namely, the restriction to a sphere of factual being by virtue of a combined positing of factual being annuling the pure universality" (p. 27).

[15] "no intuition of essence is possible without the free possibility of turning one's regard to a 'corresponding' individual and forming a consciousness of an example – just as, conversely, no intuition of something individual is possible without the free possibility of bringing about an ideation and, in it, directing one's regard to the corresponding essence exemplified in what is individually sighted" (p. 12).

[16] "Any judgment about essences can be converted into an equivalent unconditionally universal judgment about single particulars [subsumed under] essences" (p. 14).

[17] "Judgments concerning what is purely essential (purely eidetic judgments) belong together, no matter what their logical form may be" (p.14-15).

[18] "It is of the universal essence of the immediately intuitive seizing upon essences that ... it can be effected on the ground of a mere presentation of exemplificative single particulars. Presentiation, e.g., phantasy, however, as we have just explained, can be so perfectly clear that it makes possible a perfect seizing upon essences and a perfect eidetic insight. ... There are reasons by virtue of which in phenomenology, as in all other eidetic sciences, presentations and, more

essence or a relationship between essences. The researcher "activates" eidetic intuition what helps her/him to "see" the essential relationship between extensions of individuations. The result of this research is communicated in the form of a general judgment (statement) which describes the relationship obtaining between the extensions of individuations of the considered essences. Here is an extremely simplified example of such conduct, which draws on Husserl's investigations. Let us imagine a researcher who perceives a red billiard ball. During this observation s/he records that the entire surface of the ball is uniformly red. From the uniformly red ball surface that has been apprehended in the visual observation, the researcher proceeds to the essences "redness" and "sphericity". Then s/he ascends from these essences to more general essences: those of colour and extension.[19] The researcher tries to imagine an individual instance of a coloured object which would not be extended. As these attempts fail, he concludes that the essences of colour and extension are not self-sufficient and that their co-occurrence is necessary Such findings provide a foundation for formulating a general statement: every coloured object is extended.[20] Although the statement does not directly concern essences, it has "eidetic universal validity", to use Husserl's expression. This means that it establishes a relationship between the extensions of individuations of both essences. This statement can be easily converted into one that concerns essences directly.

Since scientists aim at formulating general statements of the above type, it can be assumed that there are sciences in which scientists concentrate their efforts on finding relationships between essences and relationships between extensions of individuation of considered essences. These are the so-called eidetic sciences.[21] Thus, we are dealing with empirical sciences ("sciences of

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precisely, free phantasies acquire a position of primacy over perceptions and do so even in the phenomenology of perception itself, excluding, to be sure, the phenomenology of the Data of sensation" (Husserl 1913/1982, pp. 129-130).

[19] All this requires the use of a certain method. In his later works Husserl introduced the method of free variation. I will skip the discussion of this method here. Let me add, that he applied this method to show how is it possible to rise from an individual red thing to the essence redness and then from the essence redness to the essence colour. Description of this procedure can be found in Husserl (1948/1973), p. 356-58.

[20] The researcher first states that "colours are inconceivable without extension" Husserl (1913/1982, p. 95) and from it derives the essential regularity of the higher level that "sensuous quality necessarily refers to some species or other of spread; spread is, again, necessarily the spread of some quality united with it, 'covering' it" (p. 29).

[21] "There are pure eidetic sciences such as pure logic, pure mathematics, and the pure theories of time, space, motion, and so forth. ... But for the geometer who explores not actualities but 'ideal possibilities', not predicatively formed actuality-complexes but predicatively formed eidetic affair-complexes, the ultimately grounding act is not experience but rather the seeing of essences" (Husserl 1913/1982, pp. 16-7).

matters of fact"), in which statements about facts[22] are formulated, and with "theoretical" sciences, which formulate purely essential statements. Sciences of essences are independent of sciences of matters of fact, but the reverse is not the case. Since every science of matters of fact, deals with individual cases of an essence, it cannot be fully independent and always depends on knowledge gathered in eidetic science.[23] Eidetic sciences thus provide tools that allow explaining facts investigated in empirical sciences. Among eidetic sciences, one must distinguish sciences on "real" essences, such as e.g. extension or movement (these sciences are geometry and kinematics respectively) from sciences on the form of essence.[24] While the former are material ontologies, the latter are formal ontologies which constitute the *mathesis universalis*. This includes: logic, set theory, arithmetic and analysis.[25]

Scientific knowledge is thus gathered within sciences of three kinds: empirical, theoretical (material ontologies) and formal (formal ontologies). The history of real science is a history of developing theoretical and formal sciences, and of relating them skillfully with empirical knowledge.[26]

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[22] "And this is precisely why science of matters of fact and experiential science are equivalent concepts". (p. 17).

[23] "Any science of matters of fact (any experiential science) has essential theoretical foundations in eidetic ontologies" (p. 19).

[24] "On the one side stand material essences; and in a certain sense they are the 'essences proper'. But on the other side there stands something that is indeed eidetic but which, nevertheless, differs in its fundamental essence: a mere essence-form, ... it is an essence which, with its formal universality, has all material universalities, even the highest of them, under it and prescribes laws for them by virtue of the formal truths pertaining to its formal universality. ... This subordination of the material to the formal is shown by the circumstance that formal ontology contains the forms of all ontologies (*scil.* all ontologies 'proper', all 'material' ontologies)" (p. 21-2).

[25] Husserl (1913/1982), p. 18.

[26] "Also with regard to cognitive practice it is to be expected beforehand that the closer an experiential science comes to the 'rational' level , the level of 'exact', of nomological science – thus the higher the degree to which an experiential science is provided with developed eidetic disciplines as its fundamentals and utilizes them for its [cognitive] groundings – the greater will become the scope and power of its cognitive-practical performance. This is confirmed by the development of the rational natural sciences, the physical sciences of Nature. Their great era began in the modern age precisely when the geometry which had already been highly developed as a pure eidetics in antiquity (and chiefly in the Platonic school) was all at once made fruitful in the grand style for the method of physics. People made clear to themselves that the material thing is essentially *res extensa* and that geometry is therefore the ontological discipline relating to an essential moment of material thinghood, namely the spatial form. But, in addition, people also made it clear to themselves that the universal (in our terminology, the regional) essence of the material thing extends much further. This is shown by the fact that the development followed at the same time along the line that led to the elaborating of a series of new disciplines coordinate with geometry and called on to perform the same function, that of rationalizing the empirical. The magnificent flowering of the formal and material mathematical sciences sprang from this aim. With passionate zeal these sciences were developed, or newly constructed, as purely 'rational'

b) *Idealized (exact) essence and morphological essence*

Essences can be classified in various ways. From the point of view of someone who, like Husserl, is concerned with the ontological foundations of scientific knowledge, it is particularly important to distinguish between the morphological and idealized essences.[27] Whereas sciences dealing with idealized essences are exact sciences, those which deal with morphological essences are descriptive sciences.

Addressing the issue of direct access to essence, Husserl argues that it is possible to "see" essence while observing (or imaging) the individual object. It means, that the essence can be directly inspected on the basis of perceptual (or imaginary) experience of an object. First, an individual object (fact) is perceived (or imagined), and then an essence is identified within it. After becoming the focus of attention, that essence becomes an object of a new act: an act of seeing, that is an intuitive grasping of the essence. At this point, however, a certain problem arises. How perception of a real object can lead to identification of purely geometrical shapes that are attributable only to ideal objects postulated in science? How can we educe a triangle, circle or square from a sketchy, irregular contour of a real object that we perceive? Even with the best of effort and intentions, it is difficult to extend the concept of seeing an essence so as to include seeing ideal entities such as a point, a line or a triangle. To solve these problems, Husserl introduced a distinction between essences that can be directly extracted from the experience of an individual object, and therefore can be seen and also described, and those which do not manifest themselves openly in such experiences but are produced in a certain operation, called ideation. The former are morphological essences, and the latter are idealized (ideal) or exact essences. While morphological essences are characterized by means of descriptive concepts, exact essences are

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sciences (as eidetic ontologies in our sense), and indeed ... not for their own sake but for the sake of the empirical sciences. They then abundantly bore the hoped-for fruits in the parallel development of that much-admired science, rational physics" (p. 20).

[27] Husserl did not use the term "idealized" when he referred to essences. He wrote about "ideal essence" (*Idealwesen*). However, there is no doubt that by "ideal essence" he meant "idealized essence". Ideal essence was contrasted with a morphological one, and not with the real one. For him the ideal essence was a product of an "idealizing procedure" (p. 141). In contradistinction to the morphological essence, the ideal essence cannot be approached via a perceived or imagined individual object. No real individual object instantiates an ideal essence, whereas it instantiates multiple morphological essences. In Husserl's later works (1937/1970, 1948/1973) "idealizing procedure" is described more extensively. Elements of his analyses will be presented below.

characterized by idealized concepts.[28] The procedure of constructing idealized concepts and the exact essences denoted by them is not clearly exposed neither in *Ideas* nor in Husserl's later works. In a rough approximation, the procedure consists in a gradual, step-by-step "smoothing" or "perfecting" morphological essences. This is how the simplest idealized essences, i.e. those that are referred to in the axioms of the science in question, are constructed. Husserl enigmatically describes the procedure of creating the simplest idealized essences by referring to the construction of exact geometrical concepts.

In a nutshell, this operation is carried out as follows. When we perform an act of an ordinary perception of a three-dimensional object and proceed from seeing this-here object to grasping the essence that is manifested in it, e.g. shape, what we can apprehend directly is a certain typical, openly observable shape.[29] It is a shape determined by the outline of the front side of the object that we are facing. Let us assume that we recognize an object that we see as oblong and rounded. If our aim is to extract a shape (not a colour or size) and we focus on that shape, the essence that we are going to perceive will be the "oval" shape. Using the fuzzy descriptive concept of "oval", we point to the essence which can be ascribed to any oblong and rounded object. The qualitative nature of that concept does not hinder the completion of elementary practical tasks involving the use of that concept, moreover it allows effective communication of observed oblong and rounded objects. On the other hand, such concept is practically useless in science.[30] This is because science needs quantitative concepts which permit precise measurement of attributes or a precise description of object's movement. As any morphological essence, the essence of "ovalness" is fuzzy. Hence, the solid line that delineates the contour of the object being classified as oval does not have to be perfectly smooth. By smoothing this line and correcting irregularities in the oval shape, we obtain a perfect shape of an ellipse. In this way, the morphological essence has become a basis for constructing the idealized essence. The latter is a shape that is not attributable to any real object. This is how, according to Husserl, idealized essences of geometry such as a line, a triangle or a circle emerge in the process

[28] "Contrasted with these ideas, or ideal essences, we find morphological essences as the correlates of descriptive concepts" (p. 138).

[29] For Husserl, shape is a dependent ("non-selfsufficient") essence, i.e. an abstract (p. 29). I will disregard here the issue of further specification of essences.

[30] "The most perfect geometry and the most perfect practical mastery of it cannot enable the descriptive natural scientist to express (in exact geometrical concepts) what he expresses in such a simple, understandable, and completely appropriate manner by the words 'notches', 'scalloped', 'lens-shaped', 'umbelliform', and the like – all to them concepts which are essentially, rather than accidentally, inexact and consequently also non-mathematical" (p. 138).

of "perfecting" the morphological essences of typical, simple shapes.[31] The rise of geometry was the result of such transformations of morphological essences into idealized ones. It can be said, that from Husserlian perspective geometry was an offspring of the first idealizational revolution in human knowledge.[32] Under this interpretation, geometry was a pure science, and its statements referred only to idealized essences or individual instances of these essences. However, all these individual instances of essences, such as particular triangles, circles, spheres or cubes, were exemplars of limit shapes and thus did not belong to the real world.[33] Yet there was an extremely important feature of this pure science: acquaintance with idealized objects did not require sensory experience. This meant, for example, that one did not have to refer to visual experience for ultimate verdict when discussing a shape of some geometrical solid. In this manner, knowledge about geometrical objects was freed of the dictate of sensory experience. It meant that statements about properties of objects considered in geometry were not justified by subjective forms of experience (perception) but by knowledge about intersubjectively accessible ideal objects which were obtained in the process of idealization. This intersubjectivization of geometrical objects was later identified with their objectivity.[34] It may be argued that, in a certain important sense, the subject as the source of subjectivity was removed from geometry. Let us note that objectivity in the above sense cannot be ascribed to morphological essences or their individuations. It is impossible to characterize morphological essence

[31] "[W]e can understand that, out of the praxis of perfecting, of freely pressing towards the horizons of conceivable perfecting 'again and again', limit-shapes emerge towards which the particular series of perfectings tend, as toward invariant and never attainable poles. If we are interested in these ideal shapes and are consistently engaged in determinig them and in constructing new ones out of those already determined, we are 'geometers'" (Husserl 1937/1970, p. 26).

[32] I will not discuss in detail Husserl's exposition of the process of the emergence of geometry. In particular I will omit a description of how it became a theory of all possible ideal shapes rather than merely a theory of elementary geometrical figures.

[33] "[W]e now have an ideal praxis of 'pure thinking' which remains exclusively within the realm of pure limit-shapes. Through a method of idealization and construction which historically has long since been worked out and can be practiced intersubjectively in a community, these limit-shapes have become acquired tools that can be used habitually and can always be applied to something new – an infinite and yet self-enclosed world of ideal objects as a field for study" (p. 26).

[34] To complete this objectivization of geometrical entities, one also needed to idealize the measurement. "This purpose [of procuring objectivity] is obviously served by the art of measuring ... So it is understandable how, as a consequence of the awakened striving for 'philosophical' knowledge, knowledge which determines the 'true', the objective being of the world, the empirical art of measuring and its empirically, practically objectivizing function, through a change from the practical to the theoretical interest, was idealized and thus turned into the purely geometrical way of thinking" (Husserl 1937/1987, pp. 27-8).

without referring to the appropriate type of experience. For example, one cannot define the essence of "ovalness" without pointing to the kind of visual experience in which this essence can be discerned.

4. *Husserl's exposition of the Galilean revolution in science*

The picture of the development of natural sciences painted by Husserl shows how the emergence of Galileo's physics transformed nature, which before Galileo was a realm of morphological essences into realm of idealized essences. This means that, for Husserl, Galileo's principal achievement was that he objectivized nature. That is, Galileo dethroned nature as the world of our daily experience, filled with natural objects and replaced it by a "physical" nature understood as the world of idealized objects accessible for the intersubjective mind. However, Husserl emphasizes that the notion of the physical object should not be interpreted as suggested by the mathematized science of nature. It is not the ultimate foundation of objective nature, which is given to us in the imperfect, sensory apparel of the experienced outer object. It is a theoretical construct, a kind of superstructure, built over the sensory object. A physical object is an individuation of an idealized essence, constructed in the idealization mode from a morphological essence. Hence, the physical object cannot be, literally speaking, apprehended in the act of sensory experience. Physics does not help us in grasping things as they are. It merely substitutes a physical object for a natural object, while asserting that it is the physical object that is the "true" object in nature, whereas the natural object that is apprehended by senses is merely its imperfect approximation. Physics itself fails to see that what it postulates as the ultimate component of nature is merely a construct built over what is actually given in experience.

According to Husserl, the way in which Galileo objectivized nature consisted in extending the application of the method of constructing idealized essences to every object that could be found in the world of empirical, i.e. experienced natural objects. In his opinion, the method, which turned out to be effective with respect to the geometry of shapes or, more broadly speaking, mathematics, should be just as effective when applied in physics.[35]

[35] "Here we observe the way in which geometry, taken over with the sort of naïveté of a priori self-evidence that keeps every normal geometrical project in motion, determines Galileo's thinking and guides it to the idea of physics, which now arises for the first time in his life-work. Starting with the practically understandable manner in which geometry, in an old traditional sphere, aids in bringing the sensible surrounding world to univocal determination Galileo said to himself: Wherever such a methodology is developed, there we have also overcome the relativity of subjective interpretations which is, after all, essential to the empirically intuited world. For in this

Idealization, which originally covered just the domain of shapes, was developed in such a way as to allow creating limit cases even of those attributes of objects that appeared totally independent of shapes. An implicit ideal was a situation in which those attributes could be reduced to shapes alone.[36] This approach resulted in physics becoming, as it were, applied mathematics, and idealized and thus objectivized physical objects gained the same status as objects of geometry had earlier.[37]

The above outline of Husserl's interpretation of Galileo's revolution in physics intended to show how he viewed idealization. For Husserl, idealization was a procedure which consisted in the apriorization of an empirical science. This was possible due to tools provided by mathematics. An idealizational statement describes idealized essences (or, to be more precise, relationships between extensions of individuations of idealized essences), which are constructs built over natural objects by means of a sequence of mediating operations. These mediating operations consist in deductive inferences from the axioms of a given science.[38] While natural objects are accessible in acts of individual intuition, e.g. in a perception, the physical objects as idealized and objectivized are independent of the cognitive dispositions of the experiencing subject.

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manner we attain an identical, nonrelative truth of which everyone who can undestand and use this method can convince himself" (Husserl 1937/1987, p. 29).

[36] "What we experienced, in prescientific life, as colors, tones, warmth and weight belonging to the things themselves and experienced causally as a body's radiation of warmth which makes adjacent bodies warm, and the like, indicates in terms of physics, of course, tone-vibrations, warmth-vibrations, i.e., pure events in the world of shapes. This universal indication is taken form granted today as unquestionable. But if we go back to Galileo, as the creator of the conception which first made physics possible: what came to be taken for granted only through his deed could not be taken for granted by him. He took for granted only pure mathematics and the old familiar way of applying it" (p. 36-37).

[37] "The whole of infinite nature, taken as a concrete universe of causality – for this was inherent in this strange conception – became [the object of] a peculiarly applied mathematics" (p. 36-37).

[38] "Geometry fixes a few kinds of fundamental structures, the ideas of solid, plane point, angle, and the like, the ones which play the determining role in the 'axioms'. With the help of the axioms, i.e. primitive eidetic laws, it is then in a position to derive purely deductively all the spatial shapes 'existing', that is, ideally possible shapes, in space and all the eidetic relationships pertaining to those shapes in the form of exactly determining concepts which take place of the essences which, as a rule, remain foreign to our intuition" (Husserl 1913/1982, p. 135)

5. *Phenomenology as a descriptive theory of experience*

Now, we have reached the point, where the question posed in the title of the present contribution can be answered.

According to Husserl all natural sciences are based on the study of idealized essences. Galileo, the pioneer of this approach showed how to use the method of idealization to spatial objects. This resulted in the substitution of (the individual instances of) idealized essences constructed in geometry for (the individual instances of) morphological essences of shape intuited from ordinary experience. This method, primarily applied to spatial extension was extended to other properties, such as force, mass, velocity etc. In consequence, all nature became a world of idealized (individual and universal) objects. The properties of idealized objects and relationships between them are described in "laws of nature". Having successfully applied idealization to nature researchers might be tempted to apply it to such objects as mental experiences which so far have not been "naturalized". Husserl rejected this temptation and overtly declared that attempts to construct idealizational science of consciousness are inevitably doomed to failure. Phenomenology is an eidetic science of consciousness and its objects are essences of pure experiences[39] that are directly apprehended in eidetic intuition. These are morphological essences which could not be transformed into idealized ones.

Here is a phenomenological justification of this position. The objects that are studied by science of consciousness are pure experiences. Morphological essence can be "seen" in an individual experience. Hence, it is possible to identify essences such as: "perception taken universally", "memory taken universally", "empathy taken universally", "willing taken universally", etc. (Husserl 1913/1974, p. 140). These are generic essences, which are "contained" (Husserl 1913/1982, p. 26) in subordinate species, such as "the perception of physical things" or "the perception of animate beings" are subordinate species to "perception taken universally". It is morphological essences of experiences of this and similar kind that could provide a basis for idealization, should it turn out to be justified. However, if we consider mental process taken universally, i.e. if we search for properties shared by all and only mental processes we will find that every mental experience is "consciousness of something", and at the same time it is a "consciousness of somebody". While the former property, called intentionality, is a fundamental concept of phenomenology, the latter, which I propose to call subjectivity, is of equal importance but attracts much less attention of phenomenologists. Both these

[39] Pure experience is an experience which is bracketed, i.e. detached and isolated from all objects in the natural world.

properties are universal among experiences. Since they are morphological essences they can be directly apprehended in the eidetic intuition.[40] In other words, it can be "seen" that mental experience that lacks either intentionality or subjectivity is impossible. Let us now imagine that we attempt to idealize – in Husserl's sense – the essence "subjectivity". Regardless of how that idealization progressed, its would have to result in "objectivized subjectivity", i.e. in an object which involves an inherent contradiction within phenomenology. We would obtain something that would allow speaking of an experience that is deprived of subjectivity, which contradicts the above characteristics of the essence of experience. Hence, it is impossible to construct an idealized essence in the domain of experiences, because this would in consequence lead to objectivization of pure experience, which means that the process of idealization would sacrifice the subjectivity of experience. In this way, we would arrive at something that lacks subjectivity and thus has little to do with conscious experience. Therefore, phenomenology can only be a descriptive science, and consequently can only apprehend morphological essences. It cannot be turned into an exact science that would deal with idealized essences.[41]

Let us summarize the above argumentation. Naturalization of consciousness would demand idealization of mental experience. Such idealization would deprive experiences of their subjectivity, that is would produce something that could not be considered mental experience any more. Since idealizational theory of mental experience is impossible we have to confine our research on consciousness to analyses and descriptions of morphological essences such as perception, memory, expectation, phantasy and numerous other mental species.

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[40] "As for phenomenology, it is concerned to be a descriptive eidetic doctrine of transcendentally pure mental processes as viewed in the phenomenological attitude; and like any other descriptive, non-substracting and non-idealizing discipline, it has its inherent legitimacy" (Husserl 1913/1982, p. 167).

[41] "It is only a misleading prejudice to belive that the methods of historically given a priori sciences, allof which are exclusively exact sciences of ideal objects, must serve fortwith as models for every new science, particularly for our transcendental phenomenology – as though there could be eidetic sciences of but one single methodic type, that of 'exactness'. Transcendental phenomenology, as a descriptive science of essence, belongs however to a fundamental class of eidetic sciences totally different from the one to which the mathematical sciences belong" (pp. 169-70).

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