Is a Contemporary Hegelian Philosophy of Nature Possible?

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Abstract: Hegel's philosophy of nature (*Naturphilosophie*) is impossible to separate from the rest of his system, in which nature is shown as a reflection of the idea (Idee) as presented in the logic (in the *Enzyklopädie der philosophischen Wissenschaften*). The system composed by logic, nature, and spirit, represents a dialectical relation in which logic as the universal, nature as the particular, and spirit as the singular, mediate through one another and develop as immanent and constitutive parts of the system as a whole. Yet, the goal of the philosophy of nature is not unrelated to a philosophy of science in the contemporary sense. The latter aims to solve (among other problems) the problem of dualism between the conceptual scheme/the world and the demarcation of science (and knowledge), where the crucial difference is that the Hegelian philosophy of nature benefits from having an answer to these in the form of the absolute idea (*die absolute Idee*). In a contemporary sense, the constitution of these problematics would follow an abductive reasoning where the Hegelian idea (Idee) would solve these crucial problems for philosophy of science. The following paper will attempt to provide some guiding points for such a project and suggest the assumptions necessary for its development, with the sole purpose of underscoring the similarities and differences between the Hegelian philosophy of nature and a contemporary philosophy of science.

Keywords: Metaphysics; Philosophy of Science; Philosophy of Nature; Logic; Epistemology; Hegel.

I. Introduction

The idea of elaborating a contemporary philosophy of nature is somewhat anachronistic since many of its themes have been developed separately (and with varying degrees of success) by the history, the methodology, and the philosophy of science. Some of the most important problems for the latter are the demarcation of scientific knowledge (such as the separation of science from pseudoscience), the possibility of realism (and its variants like metaphysical realism, epistemological, structural, etc.), and reductionism, not only as an inter-theoretical issue, but linked to the possibility of objective grounding, understood as a relation of fundamentality and/or metaphysical priority.

Schelling's *Naturphilosophie* aimed to demonstrate the objective ground of nature through its theoretical structure, which was positioned at the base of his philosophical

system. Although Hegel's philosophy of nature has the same goal, the discussion is far more nuanced than it seems to be, as we can trace at least two different aspects in play in the relation between nature and the epistemological subject. This issue will be discussed throughout this article.

First, we should be aware of what Hegel understands by fundamentality, that is, the grounding relationship between the theoretical and reality itself. This is usually depicted as hierarchical, whereas Hegel's system favors a kind of epistemological holism and rejects the a priori/a posteriori distinction. Second, several variations of realism (particularly ontological and epistemological) wouldn't make too much sense if Hegel abandoned this distinction. The reality of nature (as an ontological or epistemological assumption) would not work in favor of a supposed hierarchy or fundamentality relation between nature and scientific knowledge.

Contemporary philosophy of science, no doubt, would have a hard time trying to grasp both insights since it would first need to translate the goal of *Naturphilosophie* to the philosophical sensibilities of our time. That alone can take us in very different directions. For example, a philosophy of nature could be understood in one of the following ways:

(1) A philosophy that explains, through objective categories in nature, the possibility of subjectivity; that is, the conceptual scheme/world problem from the dimension of the objective world, either as a materialism or a type of realism that explains how nature itself sustains this metaphysical priority[1];

(2) The rational reconstruction of what we know about nature, made possible through an epistemological criterion that accounts for the relationship between knowledge, the objective world, and our place in it as living organisms.

Perhaps the biggest difference between (1) and (2) is that the metaphysical priority of objective nature is not necessarily a problem for (2), since the idea of rational reconstruction can dispense with the normative performance of epistemology, as in Quine's naturalism.[2]

Hegelian Naturphilosophie aims to answer these questions, for example, (1) through the development of the relationship between the sections of the system such as logic, nature and spirit; while (2) corresponds to the explanation of how the categories of the logic find their objective instance in nature and how this impacts the possibility and activity of science.

All these theoretical connections are possible thanks to the systematic construction of Hegelian philosophy. In this sense, before clarifying the goals and possible performance of a philosophy of nature, it will be necessary to interpret some crucial points of the system to demonstrate how these theoretical considerations are compatible with our current

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1 Thinking in Davidson's approach to the Kantian human knowledge/noumenal reality separation in his article "On the Very Idea of a Conceptual Scheme" (Davidson 1984).

2 "Epistemology Naturalized" by W. V. Quine where the aim "… is to discover how science is in fact developed and learned than to fabricate a fictitious structure to a similar effect" (Quine 1969, 78).

philosophical context. I will start from these two problems to follow this thread: (1) the conceptual scheme/world dualism, and (2) the criterion for rational reconstruction; aiming to demonstrate that if grounding is not necessarily a hierarchical relation, and if the a priori/a posteriori distinction is not essential to knowledge, our understanding of *Naturphilosophie* will change dramatically along with its possible relationship with the problems of contemporary philosophy of science.

As a brief note about the secondary literature, I would like to point out that a great deal of the contemporary interest in Hegel's philosophy of nature remains focused on disentangling his sophisticated net of concepts (see examples of inquiries into Hegelian *Naturphilosophie* in Houlgate 1998; Deligiorgi 2006; Winfield 2006; Ng 2020). In that regard, the present work has opted for taking the Hegelian solution to the problem of fundamentality (and ground) from a contemporary perspective, opting to keep metaphysics at the center of the discussion, though there is certainly a need to compare with recent work in metaphysics, since contemporary studies of 'grounding' in any of its varieties do not usually address the German Idealists (see Correia & Schnieder 2012; Jago 2016; Bliss & Priest 2018; Raven 2020). As a consequence of this approach, addressing the "organic concept of the world" (I will refer the reader to Beiser 2003 and Berger 2023) would be much needed, just like the relationship between nature and spirit as second nature.[3] Due space constraints, this will not be possible and will be left to a future work.

II. Dualism and the Status of the *A priori*

Hegel famously rejects a dualistic solution to the contemporary conceptual scheme/world problem[4] in the introduction to *Phenomenology of Spirit*, where he argues against the idea that we cannot know things in themselves since this ends up substantializing our ignorance. The assumed fallible nature of knowledge seems to show that there is an unknowable reality that it cannot attain; but this is nothing more than a metaphysical commitment since we cannot know that reality in order to hold it over that which knowledge does provide.[5]

The rejection of dualism puts him in a place akin to realism, but the story is too complex to label him in this way and is linked to the position he will adopt in the face of the problem of demarcation (of knowledge) and its foundations.

Hegel approaches the question via Kant, who postulated that for the constitution of knowledge it is necessary to make a transcendental synthesis between empirical content

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3 J. McDowell is famous for trying to make sense of this relation in contemporary analytic philosophy (see McDowell 1996), and a rich literature has grown up around his proposal (Pippin 2015; Guzman 2015; Perini-Santos 2018 – just to mention a few).

4 Davidson characterizes this distinction as the plurality of conceptual frameworks that are incapable of determining the reality of a single objective world, to the extent that he considers it another dogma of empiricism (Davidson 1984, 183–198).

5 „... sich eher als Furcht vor der Wahrheit zu erkennen gibt" (Hegel 1969a, 70).

and the pure concepts of the understanding (categories). The requirement for such a synthesis is that both the empirical content and the categories should be objective. In the *Phenomenology of Spirit,* Hegel's arguments are based on counterexamples ("what if we could explain the objective constitution of consciousness from empiricism?", "what if we could explain it from an organ in the body?", etc.) that show the constitution of the categories of consciousness cannot be explained transcendentally. We can briefly reconstruct this epistemological argument in the *Phenomenology of Spirit* from five general premises[6]:

(1) Knowing objects presupposes the unity of self-consciousness, and self-consciousness presupposes the existence of objects independent of it;

(2) The ground of the determinations of objects (categories) does not lie merely in self-consciousness;

(3) The ground of determinations that are the product of self-consciousness does not reside unilaterally in the individual;

(4) The ground of determinations that are the product of self-consciousness does not reside unilaterally in society;

(5) The ground of the determinations of objects and of self-consciousness can be found in the inseparable relation that both have with the absolute.[7]

The study of the absolute is, therefore, the study of the determinations of thought [*Denkbestimmungen*] or of the determinations which proceed from the identity between thought and objective reality, which means that both roughly possess the same objective ground. This objective ground cannot be presented as a principle, as Hegel explains in the introduction to the *Science of Logic*, because every foundation as a principle (which has metaphysical priority) is shown to be assumed by the same thought (logic) that discovers it (Hegel 1985, 27). In this way, logic must demonstrate how it constitutes its own objectivity as a process.

Meanwhile, the problem of the rational reconstruction of what we know about nature could be expressed by assuming a fundamentalism (e.g., a naïve empiricism) which reconstructs knowledge through the criterion of experience. It can also be explained from the perspective of social constructivism and coherentism, or by abandoning the idea that such a criterion has any normative performance, where reconstruction is a description of scientific activity. Hegel moves away from these positions by showing that demarcation is the foundation. To understand the Hegelian position, it is necessary to revise the alleged a

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6 This synthesis is possible thanks to the excellent work of K. Westphal *Hegel's Epistemological Realism* (Westphal 1989). The present work is distanced from his conclusions. While Westphal claims that this thread of argument ends in a kind of epistemological realism, it seems that, if we are to be fair to the system elaborated in the *Science of Logic* and later works, Hegel calls for leaving behind the dichotomy of realism and (subjective) idealism, hence the resulting philosophy should not be qualified as such.

7 Which can be anticipated as the relationship between logic (the study of the absolute qua systematicity), nature (the objective world), and spirit, in the *Encyclopedia of the Philosophical Sciences* (*Enzyklopädie der philosophischen Wissenschaften im Grundrisse*, 1830 Edition, in Hegel 1969c and Hegel 1969d).

priori status of the categories of logic. On the one hand, the idea of grounding is linked to the idea of metaphysical priority, where ultimately one or a series of founding principles are shown through which reality is composed in a hierarchical way. Hegel is critical of this position since if there is a first principle, as pointed out earlier, it would be presupposed by logic itself, leading to the distinction between (philosophical) logic and logics[8] as a product of the Kantian understanding that operates according to principles.

The idea of grounding seems to be more closely linked to the idea of explaining, where the relationship between an antecedent as explanans and a consequent as an explanandum (in Hempel & Oppenheim 1965) cannot be thought of in deductive terms since it would preserve the same notion of metaphysical priority among some of the members.[9] It is a non-hierarchical explanation, where the concept to be grounded must show its dialectical constitution only through the determined negation.

Although during the development of the *Science of Logic* Hegel refers first to categories, then essences, then finally concepts, all these terms share the same reflexive dialectical structure that points to the journey from reality [*Realität*] to actuality [*Wirklichkeit*] expounded in the critique of the notion of the thing-in-itself (Hegel 1985, 102). Hegel points out the problem inherent in the thing-in-itself in a way that is different from (but complementary) to his critique of the danger of substantiating ignorance. Taken as a category, the thing itself is an incomplete (insufficiently explanatory) category since it focuses merely on what it includes and not on what it excludes, and as such it can lead to a misunderstanding of how a criterion (of explanation) should work. Spinoza's maxim cited in the preface to the second edition of the *Encyclopedia of the Philosophical Sciences* may explain this: truth is index sui et falsi.[10] Taken as a criterion, the thing-in-itself only tells us that the object exists, but we cannot determine its capacity to possess predicates, and it acts in much the same way as the notion of something [*Etwas*]: as an abstract concept that refers to anything as a token capable of possessing any predicate, but whose existence cannot be determined.

One of the most radical consequences of this is the abandonment of the a priori/a posteriori distinction. There is a great debate about the a priori status of the Hegelian logic in the *Science of Logic*; for example, Orsini (Orsini 2021) lists at least four and adds his proposal:

> 1) A priori, not a posteriori. Hegel's Logic is a priori because it carries forward Kant's project of a transcendental logic inquiring into the conditions of possible experience (…)

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8 The distinction between das Logische [*Verstandeslogik*] and die Logik [*Vernunftlogik*]; we refer to an interesting analysis in Ficara (Ficara 2021, 12–40).

9 Although this notion is presented in the *Science of Logic*, the philosophy of nature as a contemporary philosophy of science would contrast with some of the most popular views on scientific explanation, like Hempel and Oppenheim (Hempel & Oppenheim 1965) who propose a model of explanation where the relation between explanans-explanandum is presented deductively and the explanans involves at least a law of nature.

10 Indicator of what it is true and false (Hegel 1969c, 31).

2) A priori as a mark of an aprioristic philosophy. This standpoint gathers a number of interpretations that aim to discredit Hegel's philosophy as an aprioristic metaphysics devoted to proving the primacy of divine thought (in Hegel's own terms, the logical idea) as a first cause of the world (…)

3) A posteriori, not a priori. The third group takes Hegel's Logic as an a posteriori reconstruction of the categories that have already appeared on the experiential ground of the history of philosophy and the sciences (…)

4) Neither a priori, nor a posteriori. The fourth group offers what may be called a neutralist view: Hegel's Logic is neither a priori nor a posteriori, because this distinction can only hold for transcendental philosophy, not for speculative philosophy (…)

5) Inclusivist [Orsini's stance]: Hegel's Logic is both a priori and a posteriori, because it transforms this distinction into the differentiation of one idea into the complementary features of activity and passivity (Orsini 2021, 49–51).

The position I want to defend will coincide with number (4); however, I would prefer not to assume the label of naturalism because the result will not be entirely compatible with a naturalistic epistemology. I will argue that it is necessary to dispense completely with the a priori/a posteriori distinction when referring to the categories of Hegelian logic, since to preserve the distinction (even if we characterize the categories as a posteriori) would presuppose some kind of a priori somewhere in the system.[11]

A superficial reading might lead us to think that Hegel employs the terms immediate [*unmittelbar, Unmittelbarkeit*] and mediated [*vermittelt, Vermittlung*] as synonyms of a priori/a posteriori. Although initially one can find in these terms a certain relationship with a priori/a posteriori respectively, "immediate" is not necessarily comparable to a priori, it merely indicates that which has not been reflected upon; that which is taken as valid either because it was the result of a careful analysis beforehand, or that which simply has not been questioned regardless of whether it should continue to be taken as valid or not.

Kant had pointed out that the most problematic type of judgments for the constitution of knowledge were synthetic a priori judgments; however, Hegel claims that Kant could have encountered these problems by only attending to the logical form of the Judgment, which goes from a Universal term to a Particular. For Hegel, the sole predicative form (Universal to Particular) indicates that all judgments are synthetic and not analytical (Hegel 1969b, 38–41). Thinking (as the activity of speculative reason) involves experience, that is, experience is not only sensory, pointing out that self-evident content is not possible, and that any synthetic content need not be a priori since there

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11 This does not mean that it is not possible to speak of a priori or a posteriori in the resulting epistemology, but that such concepts could not be applied normatively in the terms that will be specified through the rest of the work.

would no longer be self-evident content with which to compare its status.

To clarify the above interpretation, let us consider the following example: an average adult throughout their education is informed about various arguments that demonstrate that the earth is round. However, when they encounter a skeptic of science, they might not remember exactly how those arguments worked (or even what they were), mainly because they turned them into facts that have an immediate performance within the compendium of things that they take as true about the world. In this case, the belief that the earth is round has the same status in the mind of an individual who does not remember the supporting arguments, just as any other belief that may not be adequately justified is merely taken to be true. The process of justification would consist in the subject's reflection on the content that they held as a belief in this immediate performance (the validity of that belief), realizing that they do not remember the specific arguments that justified said belief. If they are committed to the truth, they will seek those vital arguments to demonstrate the roundness of the earth, which is the very process of mediation and reflection, the product of which is now actuality, i.e., the belief taken as true immediately and the arguments that rightly demonstrate and mediate/explain it. Knowledge is the product of reflection as reflection becomes speculative thought.[12]

III. Demarcation and Grounding

The next problem is to show how a criterion of demarcation can ground knowledge, where such a critique is found through the sections of Essence, Essentialities, and Ground in the second book of the *Science of Logic*.[13]

For Hegel, there is a profound contradiction in the notion of essence, especially if we take the performance of essence as an a priori or analytical concept. The question of the essence of being is answered by something other than being. Essence fails as an explanandum of being. Hegel points out that essence then becomes a kind of negation because instead of showing what it is supposed to determine, it superficially shows what it is not, putting itself forward as a kind of "appearance" [*Schein*].

The category of "appearance" presupposes the immediate content of which essence intended to be, but it emphasizes how essence – insofar as it is a type of appearance – is not that content [*an sich*]. This relation between what a category shows immediately, and now mediately [*an und für sich*], is what Hegel calls reflection of essence (Hegel 1969b, 24), which shows what the category includes and what it excludes, reconciling both aspects (immediate and mediated) and constituting content in its actuality.

If we omit the strictly metaphysical performance of the concepts put into play

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12 According to Solomon, knowledge is not the same as reflection; reflection, Hegel argues, reaches its limit in the Kantian understanding, then the journey to reason [*Vernunft*] as speculation is necessary (Solomon 1974, 279, footnote 6).

13 *Der Schein, die Wesenheiten, der Grund* (Hegel 1969b, 17–124).

here, we can explain the argument more in accordance with the needs of contemporary epistemology: by investigating the nature of an object we end up defining that object. However, defining an object does not end up exhausting it; quite the contrary, depending on the frame of reference of our definition, we could generate different characterizations of the object with different referents in turn. What Hegel seeks to point out here is that reflecting on the set of definitions is what integrates the object, and not the appeal to an object 'in itself' (or noumena). Therefore, the object is not "unreflectively" placed a priori, but it is through the multiple definitions that the object is determined for what it is.

Thus, the question "what is an object?" becomes quite misleading. It has a simple answer: it is what we usually answer about whatever we are asked (a chair, a book, etc.) depending on a certain context, a specific vocabulary, a given language game, etc. That is, answering what an object is immediately. But the philosophical question "what is an object" is not really asking about its "objectual-ity" (the property which constitutes the materiality of the object), but about what determines it as objective, what grounds it, or how it is constitutive of knowledge. This question is possible through speculation and is answered only through speculation; where the object becomes a criterion of itself (index sui et falsi) and the object actualizes the immediate sense of "what it is" with the multitude of possible definitions, showing how the object constitutes knowledge through these and its history of definitions and pointing out what it is and what it is not. A criterion of demarcation becomes a criterion of foundation.

The question of objectivity concerns that property of being a criterion (of objectivity), its determinacy [*Bestimmtheit*], and therefore, being able to ground itself through speculative reflection. The absolute idea is the abstraction of this process, it is the very property of the system to be the criterion of itself through its necessity. However, the idea of necessity seems to be another obstacle to understanding the process of demarcation/foundation.

IV. The Necessity of the Concept

Hegel responds to the problem arising from the conflict between necessity and contingency with what he calls absolute necessity. It is important to note that the answer does not consist in opting for determinism (in the usual philosophical sense) or contingency; the problem lies in taking the normative performance of these concepts to be immediate.

Both determinism and contingency are taken as a "way of being" of reality itself, but both are metaphysical assumptions. Reflecting on them (what is their foundation?) calls into question the knowledge we have of reality itself, showing that they are just immediate ways of deterministically or contingently understanding reality. Necessity is then the criterion of necessity itself, through which a deterministic or contingent description

could be held to be objective, showing that, as a criterion, necessity is contingent.[14]

Let us consider one more example: when asking a question, it is reasonable to expect an answer, but it is also reasonable to not get one. The question continues to narrow down what counts as an answer and what does not. Getting an answer actualizes the question: did it answer it? Was it a good or bad answer?

A criterion works in the same way, insofar as it dictates what satisfies it and what does not, and states that we can obtain some content or none that satisfies it; that the property of being a criterion is not dependent on its fulfillment. This is what Hegel means by necessity being contingent. Returning to the object, knowledge (of the object) is only possible through actuality, where the object, as a criterion of its own objectivity, finds some content (the historical, ontological and epistemological constitution of itself) that satisfies it.

The Absolute Idea (Idee) shows this performance, it responds to the problems pointed out at the beginning and allows the rational reconstruction of nature under the aforementioned scheme. The idea is the logical instance of systematicity, i.e., the necessity (in the terms set out above) of the property of being a criterion [*Bestimmtheit*] of each category (i.e., of the categories as a whole) abstracted and applied to the idea of what a philosophical system (of knowledge) would imply. Knowledge thus exhibits its objective (actuality) necessity (contingency).

The next step is to show how the idea finds its material (external) form in objective reality. This means answering the question of how the determinations of thought (*Denkbestimmungen*) are possible in objective nature.

V. The Link between Nature and the Categories

The debate around the notion of "force" is a very interesting example of the link between nature and the categories, starting from the relation of "force" with the notion of "matter" in physics. Since Newton's time, there has been a transition from a corpuscular conception of matter (which characterized matter as discrete, inert, and impenetrable, pointing out that no force could be inherent in matter and that all changes in matter would be the result of non-material causes), to a theory of matter as dynamic, possessing active forces, attributed first to chemistry and later to Newtonian physics (Westphal 2008, 289–290).

Kant tried to make sense of this in the *Metaphysical Foundations of Natural Science*, where he points out that the metaphysical component of science shows the real or

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14 "Aber damit ist diese Wirklichkeit – weil sie gesetzt ist, absolut, d, h. selbst die Einheit ihrer und der Möglichkeit zu sein – nur eine leere Bestimmung, oder sie ist Zufälligkeit. Dies Leere ihrer Bestimmung macht sie zu einer bloßen Möglichkeit, zu einem, das ebensosehr auch anders sein und als Mögliches bestimmt werden kann. Diese Möglichkeit aber ist selbst die absolute; denn sie ist eben die Möglichkeit, ebensosehr als Möglichkeit wie als Wirklichkeit bestimmt zu werden. Damit, daß sie diese Gleichgültigkeit gegen sich selbst ist, ist sie gesetzt als leere, zufällige Bestimmung" (Hegel 1969b, 213).

physical possibility of a scientific theoretical concept from the concept itself. According to Buchdahl,

> The category (…) only forms a conceptual mould, to apply to the analysis of the physicist's concept. 'Possibility' here means applying the categories to the empirical concept in such a way as to allow of the application of mathematical construction (…) providing a 'metaphysical foundation' (Buchdahl 1993, 22).

Hegel thinks of the Kantian approach as a great advance. It does not posit matter where the possible forces are extragenous and unrelated to it, and then those forces are placed inside of it necessarily: the concept of matter involves the forces instead being part of its conceptual determination (Buchdahl 1993, 23). Yet, in the philosophy of nature (according to Hegel's *Encyclopedia*) this is still too empirical for Hegel, since it starts from the perception of any given determinations (the forces) and only then does Kant consider forces as the foundation of the phenomenon, hence this stance falls back on the problem that both matter and forces must be self-subsisting entities (Buchdahl 1993, 23–24).

Hegel criticizes this too in the *Phenomenology of Spirit*, pointing out that if we consider a singular object (e.g., matter) to be a set of universal properties (forces), we fail to show how these universal properties are held together in the object since their subsistence does not depend on the object, i.e., the reason for their union, or the possibility of force is constituted exactly as a scientific law, showing that the notion of force is inadequate. Going further, Hegel implies that the way laws are linked to each other is different than the way phenomena are linked between each other, i.e., the law (of laws or the property of being legal of laws themselves, their legality) that we seek is the understanding itself.[15]

The content of laws is phenomenal, but the conceptual structure of laws is logical. Since dualism is not an option and determinations [*Bestimmtheiten*] must find their root under the identity of being and thought, Hegel proceeds in a Kantian way by expounding the possibility of the concept in question in conformity with the categorical network of the logic (Buchdahl 1993, 24) with the nuances set out in the previous points of this work (e.g., rejecting the a priori/a posteriori distinction, etc.).

The project of a logic without presuppositions (Hegel 1985, 27), whose method is identical with its content, does not mean that logic is a priori or atemporal; it means it cannot deductively present its procedure from some kind of principle which it has to take as immediately objective. On the contrary, every principle must show its objectivity in its relation to the rest of the historically determined categories.

In the *Science of Logic*, Hegel employs a similar strategy to that in the *Phenomenology of Spirit* where, given the immanent character of the analysis of consciousness, the use of any product of consciousness (historical situations, religious passages, literary images, etc.) can be illustrative of the condition of consciousness itself. Thus, the use of notions

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15 „Es zeigt sich, daß hinter dem sogenannten Vorhange, welcher das Innere verdecken soll, nichts zu sehen ist, wenn wir nicht selbst dahintergehen, ebensosehr damit gesehen werde, als daß etwas dahinter sei, das gesehen werden kann" (Hegel 1969a, 135–136).

such as "attraction" and "repulsion" represent "pictorial expressions" of a strictly logical process that obtains physical significance when Hegel introduces matter as a category (Buchdahl 1993, 24).

The relationship between the logical construction of the concept of matter through the categories of attraction and repulsion, and the resulting physical concept of matter in the *Encyclopedia*'s philosophy of nature, suggest a more complex idea than might be found in mere categorical realism. The origin and formation of the philosophy of nature presupposes and is conditioned by empirical physics (Hegel 1969c, 15), which means that the categories are not isolated but are historical-conceptual developments. The philosophy of nature – just like the logic – does not take the conceptions of the empirical sciences as objective a priori, but as immediate, showing that their objectivity is possible through the conceptual mediation that develops their rational reconstruction in terms of the criterion of demarcation/grounding that is the Idee.

In the philosophy of nature, Hegel characterizes matter as the result of the concept of gravity, taken as a criterion of attraction and repulsion applied to physical reality (Hegel 1969c, 60). Matter is thus the actualization cum rational reconstruction of the logical categories of attraction and repulsion, expounded necessarily and systematically in the theory of universal gravity. Here all the different axes are shown coinciding in the concept of matter: on the one hand, there is the purely logical constitution of the categories of attraction and repulsion, on the other, the theoretical notion of gravity, concretized in the empirical concept of matter.

Precisely for this reason, one of Hegel's arguments against Newton's purely mathematical demonstration of Kepler's laws is that mathematical analysis cannot establish the reality of Kepler's laws of physics, since Kepler's laws are "(…) phenomenological in the sense that they merely describe regularities in manifest, observed phenomena" (Westphal 2008, 289). Hegel's critique would be aimed at pointing out the lack of reality (as actual, *Wirklichkeit*) in Newtonian analysis, given that in terms of "logical, epistemic, or metaphysical necessity (…), natural phenomena could instantiate any mathematical function, or none whatsoever" (Westphal 2008, 293).

VI. A Contemporary Philosophy of Nature

In the previous sense, quantum physics represents a turning point. The position of a historical Hegel would most likely agree with the Einstein, Podolsky, and Rosen's paper "Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?" (Einstein, Podlsky, & Rosen 1935) against the model of the nascent Copenhagen interpretation that characterizes the state of a system as a mere list of its observable properties and where simultaneous measurements would be inconsistent (Bub 2008). Einstein and his colleagues believed the Standard Model's description of reality was incomplete, and their objections expressed in that article opened the way for future interpretations of quantum

physics that sought to make sense of the theory by imagining the possibility of hidden variables.[16] From this point of view, a philosophy of nature would have no choice but to hope for a unification theory that would satisfy, if not a strict reductionism between theories (general relativity and quantum physics), a clearer systematic criterion of what physical reality and nature must be. Faye summarizes some of these problems:

> The conceptual reconstruction would be affected by a series of metaphysical commitments of what reality should be and not of what a theory (quantum physics in this case) shows us about reality, for instance, quantum physics rejects different basic ontological principles of classical physics such as, a) the principle of time and space, b) the principle of causality, c) the principle of determination, d) and the principle of continuity (Faye 2008).

The problem lies in the ontological principles (violated by quantum physics) that we hold to be essential features of reality. A rational reconstruction from the perspective of a contemporary philosophy of nature should seek to underline the danger of such metaphysical commitments which clearly were not evident in Hegel's time and show what's already been discussed: the fact that reality can instantiate any given logical determinations only shows the possibility of understanding reality immediately, for objectivity must be presented systematically and through speculative reflection. That is, such a reconstruction must resist the temptation to assume that the role of a philosophy of nature is just to evaluate which theory is better in empirical and functional terms; rather, it should assume that it is to show the objectivity of our knowledge not in terms of what it ought to be, but of what already is.

Before proposing an outline of what a contemporary Hegelian philosophy of nature would entail, it is necessary to address the elephant in the room: Hegel's philosophy of nature no longer finds a correlate in contemporary science. This, however, is by design, since the Hegelian system aims to reflect on the current state of knowledge, not to predict it. Thus, a contemporary philosophy of nature would imply not only finding the logical determinations in the concept of nature of our time, but also starting the system anew through the development of the necessity of the absolute in accordance with the philosophical sensibilities of our time. Although in the light of works such as the *Science of Logic* this task is presented like an insurmountable challenge (how can we penetrate the labyrinth of determinations of Hegelian thought so carefully strung together?). Fortunately, it is not a question of re-writing logic as if it were a deductive whole: re-writing Hegel's logic as a deductive whole would lead us to presuppose the absolute a priori, taking the idea of the non-absolute as a circle that has no center (a holism not unlike a monism), when the goal should be to understand that any place can be taken as its center, following Hegel's idea that every principle is only the starting point from which to begin our explanations and is only pedagogical and not foundational (not metaphysically a priori). To explain any concept qua thought determination [*Bestimmtheit*] would entail

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16 This is the meaning behind Einstein famous quote "I, at any rate, am convinced that [God] does not throw dice" in a reply to Max Born (Einstein 1971, 91).

the development of the absolute as systematicity itself.

Thanks to Hegel and his monumental work, it is not necessary to demonstrate again the necessity of the absolute (what is necessary is to translate these arguments into a language that can be understood by the philosophy of our time). It is in fact possible to start from the pure immediacy of the absolute. But this is different to Schelling's critique of Hegel (as we saw in the characterization number 2 of the a priori with Orsini 2020, 49–51) pointing out the absolute is posited at the base of the system as a presupposition with metaphysical priority, which extols this ouroboric reading of Hegelianism. On the contrary (it is useful to return to the example of "asking a question" in Section IV), asking about "the objectivity of" is possible from the property of systematicity itself, as that is a property of necessarily being a criterion [*Bestimmtheit*], where necessity is not the prescription of that criterion but its contingency as a possibility. Therefore, it would be possible to at least take a deep breath, and avoid committing ourselves to a description that carefully reconstructs through triad after triad the relationship and function of the different sciences and their objects of study, since systematicity is already placed in the dialectical development, and perhaps it is far more important for contemporary philosophical sensibilities to now show this facet (avoiding suggesting more hierarchies) which reconciles both epistemological pluralism and multi-disciplinary approaches, as it presents a legitimate alternative to reductionism, while providing the rational reconstruction required by epistemology.

References

Beiser F. 2003. "Hegel and Naturphilosophie", *Studies in History and Philosophy of Science Part A* 34(1):135–147. https://doi.org/10.1016/S0039-3681(02)00083-3

Berger B. 2023. *Schelling, Hegel, and the Philosophie of Nature, from Matter to Spirit*. New York: Routledge.

Bliss R. & Priest G. (Eds.) 2018. *Reality and Its Structure*. Oxford: Oxford University Press.

Buchdahl G. 1993. "Hegel's Philosophy of Nature and the Structure of Science," in R. Stern (Ed.), *G. W. F. Hegel: Critical Assessments*, Vol. 4 (pp. 15–40). London: Routledge.

Bub J. 2008. "Quantum Entanglement and Information," *The Stanford Encyclopedia of Philosophy (Winter 2008 Edition)*, ed. by E. N. Zalta, http://plato.stanford.edu/archives/win2008/entries/qt-entangle/

Correia F. & Schnieder B. (Eds.) 2012. *Metaphysical Grounding: Understanding the Structure of Reality*. Cambridge: Cambridge University Press.

Davidson D. 1984. "On the Very Idea of a Conceptual Scheme," in Idem, *Inquiries into Truth and Interpretation* (pp. 183–198). New York: Oxford University Press.

Deligiorgi K. (Ed.) 2006. *Hegel, New Directions*. Trowbridge: McGill-Queens University Press.

Einstein A., Podolsky B., & Rosen N. 1935. "Can Quantum-Mechanical Description of Physical Reality Be Considered Complete?" *Physics Review* 47(10):777–780. American Physical Society, USA. https://doi.org/10.1103/PhysRev.47.777

Einstein A. 1971. "Letter to Max Born 4 December 1926," *The Born-Einstein Letters* (pp. 90–91). Trans. by I. Born. London: Macmillan.

Faye J. 2008 (2002[1]). "Copenhagen Interpretation of Quantum Mechanics," *The Stanford Encyclopedia of Philosophy (Fall 2008 Edition)*, ed. by E. N. Zalta. http://plato.stanford.edu/archives/fall2008/entries/qm-copenhagen/

Ficara E. 2021. *The Form of Truth: Hegel's Philosophical Logic*. Berlin: De Gruyter.

Guzman L. 2015. *Relating Hegel's Science of Logic to Contemporary Philosophy*. New York: Palgrave Macmillan (Kindle Edition).

Hegel G. W. F. 1969a. *Phänomenologie des Geistes* (abbr. PG), ed. by E. Moldenhauer & K. M. Michel, *Werke*, Vol. 3. Frankfurt am Main: Suhrkamp.

Hegel G. W. F. 1969b. *Wissenschaft der Logik II*, ed. by E. Moldenhauer & K. M. Michel. *Werke*, Vol. 6. Frankfurt am Main: Suhrkamp.

Hegel G. W. F. 1969c. *Enzyklopädie der philosophischen Wissenschaften im Grundrisse, Erster Teil Die Wissenschaft der Logik Mit den mündlichen Zusätzen* (abbr. ENZ I), ed. by E. Moldenhauer & Karl M. Michel. *Werke*, Vol. 8. Frankfurt am Main: Suhrkamp.

Hegel G. W. F. 1969d. *Enzyklopädie der philosophischen Wissenschaften im Grundrisse, Zweiter Teil: Die Naturphilosophie mit den mündlichen Zusätzen* (abbr. ENZ II), ed. by E. Moldenhauer & K. M. Michel. *Werke*, Vol. 9. Frankfurt am Main: Suhrkamp.

Hegel G. W. F. 1985. *Wissenschaft der Logik I, Erster Teil die Objektive Logik*, ed. by F. Hogemann & W. Jaeschke. *Gesammelte Werke*, Vol. 21. Hamburg: Felix Meiner.

Hempel C. G. & Oppenheim P. 1965, "Studies in the Logic of Scientific Explanation," in C. G. Hempel, *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science* (pp. 245–290). New York: Free Press.

Houlgate S. (Ed.) 1998. *Hegel and the Philosophy of Nature*. New York: State University of New York Press.

Jago M. (Ed.) 2016. *Reality Making*. Oxford: Oxford University Press.

Lucas G. R. 1993. "A Re-interpretation of Hegel's Philosophy of Nature," in R. Stern (Ed.), *G. W. F. Hegel: Critical Assessments,* Vol. 4 (pp. 41–51). London: Routledge.

McDowell J. 1996. *Mind and World*. Cambridge: Harvard University Press.

Ng K. 2020. *Hegel's Concept of Life, Self-Consciousness, Freedom, Logic*. New York: Oxford University Press.

Orsini F. 2021. "Hegel's A Priori and the Critique of Three Aprioristic Readings of the Science of Logic," *Hegel Bulletin* 43(1):47–68. http://doi.org/doi:10.1017/hgl.2021.23

Perini-Santos E. 2018. "A Second Naturalization for a Second Nature," in F. Sanguinetti & A. J. Abath (Eds.), *McDowell and Hegel: Perceptual Experience, Thought and Action* (pp. 177–192). Cham: Springer. https://doi.org/10.1007/978-3-319-98896-2

Pippin R. B. 2015. *Interanimations*. Chicago: University of Chicago Press (Kindle Edition).

Quine W. V. 1969. "Epistemology Naturalized," in Id., *Ontological Relativity and Other Essays* (pp. 69–90). New York: Harvard University Press.

Raven M. J. (Ed) 2020. *The Routledge Handbook of Metaphysical Grounding*. New York: Routledge. https://doi.org/10.4324/9781351258845

Solomon R. C. 1974. "Hegel's Epistemology," *American Philosophical Quarterly* 11(4):277–289.

Westphal K. R. 1989. *Hegel's Epistemological Realism*. Dordrecht: Kluwer Academic Publishers.

Westphal K. R. 2008. "Philosophizing about Nature: Hegel's Philosophical Project," in F. C. Beiser (Ed.), *The Cambridge Companion to Hegel and Nineteenth-Century Philosophy* (pp. 281–310). Cambridge: Cambridge University Press.

Winfield R. D. 2006. *From Concept to Objectivity, Thinking Through Hegel's Subjective Logic*. New York: Routledge.