

# Conceptualizing Nature. Cognition and Comprehension in the Introductions to Hegel's *Lectures on the Philosophy of Nature*



<https://doi.org/10.36592/9786554600620-17>

Giuliano Infantino

University of Stuttgart

[giuliano.infantino@philo.uni-stuttgart.de](mailto:giuliano.infantino@philo.uni-stuttgart.de)

## Abstract

A debate has emerged in recent years within the literature regarding the ontological aspect of Spirit and its epistemic contributions to that which is inherently non-spiritual, namely Nature. The purpose of this paper is to demonstrate that Hegel, in the Introductions to his *Lectures on the Philosophy of Nature*, advocates for an “epistemic transformation theory” of nature. According to this theory, our understanding of nature is fundamentally shaped by the transformative epistemic activities, or “empirical cognition”. Instead of merely accepting nature as it is, we “divide” Nature into distinct concepts (such as genera or natural laws), which can then be seen as determinations of Nature’s universal conceptual order.

The epistemic activities of Spirit undoubtedly occupy a central position in Hegel’s sophisticated philosophical system. This is because Spirit is the highest definition of the Absolute, insofar as it decisively provides for the self-knowledge of reason, which forms the all-encompassing focal point of the entire system.

Nevertheless, a controversy has been taking place for some years concerning the question of what role Spirit plays for the existence of concepts. Here, proponents of a “conceptual realist reading” claim that Nature is already conceptual in itself, structured according to concepts, judgments and inferences, so that the epistemic activities of thinking animals serve the

function of making these concepts which are inherent in Nature explicit (HALBIG, 2002; KREINES, 2015). In contrast, those who advocate a “conceptual idealist reading” argue that Nature is not conceptually structured in itself. According to conceptual idealists, concepts are the result of epistemic activities that originate exclusively in rational animals (MARTIN, 2012; PIPPIN, 2018). Consequently, conceptual idealist readings claim that the epistemic activities of Spirit do not only have an explicating function, but also, as Hegel puts it, “transform” Nature into the conceptual realm, thereby contributing real (ontological) conditions for the conceptual structure of Nature.

This debate about the objectivity of concepts is inspired foremost by some passages from Hegel's *Philosophy of Subjective Spirit*, especially his “Psychology”. While seemingly ambiguous passages there cause a never-ending debate<sup>1</sup>, I would like to enrich this discussion by examining passages that have received little attention so far, namely the “Introductions” to Hegel's *Lectures on the Philosophy of Nature*.<sup>2</sup>

The purpose of this paper is to show that Hegel, in his *Introductions*, advocates for an epistemic transformation theory of Nature. According to this theory, our understanding of Nature is fundamentally shaped by transformative contributions of our epistemic activities. Instead of merely explicating concepts which are somehow “inherent” in Nature, we first “divide”<sup>3</sup> Nature into *distinct* concepts, which we then qualify as essential determinations of the concept of Nature.

This paper is divided into two parts. The first part (I.) focuses on (empirical) cognition. I will show that the contribution of cognition is to divide Nature, which is an inherently inhomogeneous space-time continuum, into

---

<sup>1</sup> The following passage can undoubtedly be cited as the *locus classicus* of this research controversy: “Thus, intelligence is, for itself, in itself cognitive; –is in itself the universal, its product, the thought is the matter [my translation, G. I.]” (Hegel, G. W. F. *Gesammelte Werke*, ed. by the Nordrhein-Westfälischen Akademie der Wissenschaften und der Künste in Verbindung mit der Deutschen Forschungsgemeinschaft, Hamburg: Meiner, 1968 et seqq. From here on cited as HEGEL, 1968, with the volume and page number specified, in this case: HEGEL, 1968, 20, §465).

<sup>2</sup> Under the title of the *Lectures on the Philosophy of Nature*, I encompass both the original transcripts (HEGEL, 1968, 24.1-2) and the Michelet posthumous edition (HEGEL, 1968, 24.3).

<sup>3</sup> Hegel explicitly refers to empirical concepts as “the fragmented”, which are the result of cognition characterized as “the shattering” (HEGEL, 1968, 24.1, p. 492).

conceptual unities. This division of Nature into conceptual unities enables us to gain knowledge about *specific* natural phenomena. Cognition thus transforms Nature into a conceptual multiplicity of genera and laws. However, this conceptual multiplicity poses a challenge to philosophy because it becomes difficult to grasp the conceptual *unity* of Nature based on the *multiplicity* of empirical concepts. Thus, I will argue that cognition cannot explain what constitutes the general unity of Nature.

The second part (II.) then deals with the conceptual unity of Nature. I will show that the conceptual unity of Nature is secured by a genuine form of *philosophical activity* –comprehensive cognition (comprehension), as Hegel puts it. However, the form of unity that is established by comprehension is an exceptional one because philosophy alone can take the conceptual multiplicity resulting from empirical cognition and transform it into mere aspects of a unified whole, i.e. into determinations of the general concept of Nature.

### **I. Nature from an Empirical Point of View**

From the earliest version available to us, Hegel's *Lectures on the Philosophy of Nature* do not begin with the *concept* of Nature, but instead with different "attitudes" towards Nature. Before addressing the general concept of Nature in a philosophical way, Hegel thus first reminds us of our pre-philosophical, theoretical and practical ways of dealing with Nature (cf. HEGEL, 1968, 24.1, pp. 187-204; HEGEL, 1968, 24.1, pp. 475-508; HEGEL, 1968, 24.2, pp. 757-774), often with the following thought: in our practical attitude towards Nature, we are primarily concerned with the means by which we manipulate and modify natural objects. In contrast to this, our theoretical attitude towards Nature could be understood as one in which we receive Nature's conceptual determinations (general concepts or laws) directly and without further action. In this passive reception, we seem to leave the individual things in Nature as they inherently are. (cf. HEGEL, 1968, 24.1, p. 478 ff.; HEGEL, 1968, 25.2, p. 758 ff.)

However, Hegel points out that this thought is actually misleading. It only applies to very specific cognitive faculties, namely our sensual perception. A prime example of this is intuition [*Anschauung*]. When we observe Nature, we perceive its phenomena as they are immediately present to us. We neither modify them according to our purposes, as it occurs in our practical relationship with Nature, nor do we causally interfere with them, as we do when touching things. By merely observing Nature, we leave Nature untouched, in the truest sense of the word.<sup>4</sup>

All higher forms of epistemic activities do not possess this kind of passivity. Even basic general concepts such as the concept of the lion does not represent something that we can directly perceive to be *in* Nature. The concept of the lion cannot be seen, it can only be thought because the lion is a concept that combines specific characteristics that all lions have in common, while at the same time abstracting from the unique characteristics that distinguish all lions from one another. In this sense, the concept of the lion is a product of cognition that reveals abstract equivalences between numerically different lions that do not exist *as such* intrinsically in Nature itself.<sup>5</sup>

Against this background, a peculiarity of Nature comes into play through intuition, which firstly can be brought to consciousness only through sensibility: Nature itself does not contain any conceptual differences because conceptual differences have abstract equivalences as their precondition, which originate from cognition exclusively. On the contrary, Nature in itself is a unified whole, which –as it shows itself to our non-conceptual epistemic faculties as intuition– lacks in itself all ideal and conceptual distinctions. However, Nature cannot be a mere homogeneous manifold, for then it would not be clear how it is that we can recognize certain objects in it that are different from each other. Conversely, this means that the totality of Nature is an inhomogeneous continuum.<sup>6</sup>

---

<sup>4</sup> "Seeing is the only truly free theoretical sense; one does not take anything away from things, one does not destroy them, they do not need to perish." (HEGEL, 1968, 24.1, p. 480)

<sup>5</sup> Cf. HEGEL, 1968, 24.1, p. 193; HEGEL, 1968, 24.1, p. 481 and especially HEGEL, 1968, 20, §465.

<sup>6</sup> "The material in general is divisible, i.e., it is external to itself. When we consider such material or spatial things, we know of space that wherever it is, we can divide it. One can place as many points on

Since an inhomogeneous continuum is an uncountable manifold, lacking any differences within itself, it provides a basis for an uncountable infinity of distinctions which can be made by cognition. Consequently, Nature cannot have a single rule as its principle, from which all possible distinctions could be generated. For this would imply that a series of all possible empirical phenomena could be created as a result from a fundamental operation. It is precisely within this idea that Hegel's metaphor of the "impotence of Nature" (HEGEL, 1968, 24.1, p. 142) resides, where the infinite numbers of forms and shapes cannot be grasped within any conceptual framework, no matter how powerful that framework might be (cf. HEGEL, 1968, 20, §250; HEGEL, 1968, 24.1, p. 210). For cognition, this means that it is impossible to divide Nature as a whole into a series of true judgments. Cognition is, in principle, restricted to dealing with a limited scope of specific empirical generalities.<sup>7</sup>

A specific generality can represent both a genus, such as the lion, and a natural law, like the law of falling bodies. Both forms of generality originate from epistemic activities. Hegel expresses this idea by asserting that cognition "transforms" specific representations [*Vorstellungen*] into general concepts or natural laws (HEGEL, 1968, 24.1, p. 480; HEGEL, 1968, 24.1, p. 486; HEGEL, 1968, 24.1, p. 492). In the case of general concepts, it mainly involves identifying equivalences by abstracting from specific and individual properties that encompass a multitude of things. In contrast, when it comes to laws of Nature, typical patterns of motion and behavior of experimentally isolated bodies are transformed into possible objects of mathematical equations through the introduction of variables.<sup>8</sup> However, both types of generality exhibit a

---

a line as one wants; between each point, one can place more points. [...] Nature, therefore, is an infinite manifold, an externality. This is what initially astonishes people, this immeasurability both outward and inward. From star to star, and just as much on a microscopic scale." (HEGEL, 1968, 24.1, p. 209 ff.)

<sup>7</sup> This does not imply that there is something specific that cannot be known in principle, but rather that, in fact, not every individual detail can be known.

<sup>8</sup> The specific constitution of the laws of Nature thus depends on the way they are modeled, which is internally connected to real thinking. Hegel's way of expressing this Hegel: "The concept is he judge who decides what is true." (HEGEL, 1968, 24.1, p. 509). In this way, Hegel alludes to Kant's image of reason as a judge that questions Nature like a witness: "Reason, in order to be taught by Nature, must approach Nature with its principles in one hand, according to which alone the agreement among appearances can count as laws, and, in the other hand, the experiments thought out in accordance with these principle yet in order to be instructed by Nature not like a pupil, who has recited to him

fundamental issue. Due to the separating tendency of cognition, which divides Nature into a multiplicity of specific concepts, the peculiar *unity of Nature* becomes unclear.

This tendency of cognition to divide Nature into a multiplicity of concepts can easily be made clear by empirical objects. Let us take, for example, a red rose. A red rose can be understood as an object with specific properties like "red", "fragrant", etc., which can be highlighted through abstract equivalences. Consequently, for cognition, a red rose is an entity composed of numerous mutually compatible properties.<sup>9</sup> However, we cannot consider a red rose *merely* as an arbitrary aggregate of different properties.<sup>10</sup>

Here one could argue that it is due to the inadequacy of our everyday cognition that there is no possible way of grasping a very specific *particular* to get an account of the internal unity of the red rose. But from that it does not follow that our most sophisticated scientific theories cannot grasp the *general* form of unity by natural laws as stated in physics. However, even laws of physics codified in mathematical equations cannot bring the *internal* unity of their concepts into view. Take for example the law of falling bodies. The law of falling bodies states that the distance a falling object travels increases proportionally to the duration of the fall. With that, a relationship between space (s) and time (t) is highlighted. However, this connection arises neither from the concept of space nor from the concept of time. In this regard, the justification for this conceptual connection relies solely on the fact that those concepts get introduced as variables into a mathematical equation.<sup>11</sup> Thus, the unity of Nature seems to be based on an additive account of those concepts as given in an equation, where variables get connected merely by conjunction.

---

whatever the teacher wants to say, but like an appointed judge who compels witnesses to answer the questions he puts to them." (KANT, 1998, p. BXIII-BIV)

<sup>9</sup> "In short, in this non-philosophical way of cognition, the particularities of the objects are given, one after the other. Then, for example, the expression is used: To exist, to be put together." (HEGEL, 1968, 24.1, p. 194), cf. HEGEL, 1968, 24.1, p. 494.

<sup>10</sup> "The North Pole cannot be understood without the South Pole, they are an inseparable entity" (HEGEL, 1968, 24.1, p. 504), cf. HEGEL, 1968, 24.1, p. 514 ff.

<sup>11</sup> "With the law of fall it is valid that the passed spaces behave like the squares of the times. —In the one determination lies here not yet the other. Necessity exists only when the former is the case." (HEGEL, 1968, 24.1, p. 194)

Because it is essential for natural science to formulate its laws by relations of mathematical equations, it is ineluctable for natural science to divide Nature into distinct concepts in such a way that it comes at the cost of Nature's inherent unity, which, as I will show in the subsequent second part of the paper, can only be preserved through a genuinely philosophical form of knowledge.

## II. Philosophical Comprehension of Nature

What is striking about the Introductions is that Hegel does not seem to be concerned with *justifying* the claim that philosophy is, in fact, capable of providing an account of the conceptual unity of Nature. Instead, this task is made plausible at most by reference to original intuitions as well as mythological, religious, or artistic cultural practices that have always developed notions of such unity (cf. HEGEL, 1968, 24.1, p. 191; HEGEL, 1968, 24.1, p.483 ff.) The fact that Hegel does not focus on providing conceptual reasons for the unity of Nature within the Introductions, and even seems content with these metaphorical gestures, is neither due to intellectualism nor a lack of philosophical diligence. This is because the unity of Nature, which must be brought into view through philosophical comprehension, cannot be demonstrated pre-philosophically. On the contrary, it lies within the scope of Philosophy of Nature itself and cannot be justified, at least argumentatively, neither prior to nor independently of it.

Therefore, the question of what conceptual form of unity Nature exhibits can only be answered programmatically in the Introductions. In this regard, starting from empirical knowledge, we can identify a set of criteria that philosophical comprehension must satisfy if it aims to grasp the unity of Nature. Since the specific form of unity through which philosophical comprehension can grasp Nature as a whole cannot be the result of a bijective representation of natural phenomena –which was already inadequate for cognition– it must essentially be the result of a unifying activity, such that Hegel can with regard to philosophical comprehension rightly speak of a

transformation of Nature as well. (Cf. HEGEL, 1968, 24.1, p. 212; HEGEL, 1968, 24.1, p. 490).

In contrast to cognition's tendency to separate Nature into different concepts not hanging together internally, philosophical comprehension has to transform the fundamental concepts of cognition into necessarily interconnected aspects of a general form of unity. Thus, while cognition focuses on transforming the content of *particular* representations into different general concepts, philosophical comprehension is concerned with the transformation of a series of different general concepts into an internally interconnected totality –the concept of Nature. Consequently, the specific content of philosophical comprehension can only be a very peculiar type of concept. This type of concept features special determinations that are not external to them but rather internal, originating from within themselves and thus establishing unity both vertically and horizontally. Hegel is known for referring to this type of concept as "self- determining generality" (HEGEL, 1968, 24.1, p. 200).

Self-determining generalities, like empirical concepts, are unified forms that encompass various particular determinations. However, they differ from empirical concepts in that the determination of the general cannot be conceived independently of its particular determinations. Therefore, self-determining generalities do not merely transitively regulate their subdomains and instances, but are internally related to and dependent on them regarding their general validity. Unlike empirical concepts, where species-specific properties are irrelevant to their constitution, self-determining generalities are concepts that can only attain their general determination in relation to particular determinations of themselves and thus internally aim at "self-explication".

We don't need to delve into every aspect of Hegel's notion of self-determining generality, if we want to understand how they can bring unity into the divisions that cognition left behind. Instead, for now, it's enough to focus on just one aspect of self- determining generalities. Self-determining generalities are characterized by the fact that they derive their determinacy from a series of particular determinations, which have an inner connection



among themselves. A serial generality, therefore, is a general concept whose meaning cannot be understood and maintained independently of the series of all its particular determinations. In other words, the meaning of a serial generality cannot be grasped independently of its species, as in the case of empirical concepts. Instead, it is merely a label for something whose meaning can only be explored through the intrinsic connections between the series' individual elements.<sup>12</sup>

Because a series is a structured connection of elements, it is essential for every serial generality that its determinations are variations derived from a certain archetype. Simultaneously, the series' connection, as its elements should be subject to an order, must have a starting element that establishes and enables the development of various series elements. The individual determinations of the series should be understood as different transformations of their underlying archetype, in which they evolve into aspects of their succeeding elements without being types or determinations of their predecessors. To summarize, the specific form of unity for a general concept must be ensured through a series of particular determinations, whose internal order can be regarded as an expression of a certain idea for which the general concept provides the rule.

The concept of Nature can therefore be understood as a self-determining generality that encompasses fundamental concepts, which appear disjointed in empirical cognition, as essential determinations of a unified order. As a series, specific conceptual determinations like space, time, and motion do not stand indifferently alongside one another and thus are not solely part of an additive interconnection by operators of mathematical conjunction. Instead, they evolve

---

<sup>12</sup> On the one hand, Hegel speaks of a "system of stages" (HEGEL, 1968, 20, §249) and thus demarcates himself from the series concept, insofar as this had a primarily quantitative meaning in for example Schelling (cf. HEGEL, 1968, 24.1, p. 522). On the other hand, Hegel himself often chooses the concept of series in order to make his theory design comprehensible: "This series [of philosophical systems, G. I.] is the true realm of Spirits [*Geisterreich*], the only realm of Spirits that really exists, —a series that does not remain a multiplicity, nor even a series as succession, but rather, in self-knowledge, makes itself into moments of the one Spirit, into the one and the same present Spirit." (*Georg Wilhelm Friedrich Hegel. Werke in zwanzig Bänden*, ed. by Eva Moldenhauer and Karl Markus Michel, Frankfurt a. M., 1986 ff. From here on cited as HEGEL, 1986, with the volume and page number specified, in this case: HEGEL, 1986, 20, p. 462).

from each other as different manifestations of the general concept of Nature. Consequently, space can neither be understood independently of time nor disregarding motion. Instead, those determinations conceptually evolve from each other in such a way that later determinations necessarily augment the earlier ones, which are incomplete on their own. As has been shown, Nature initially presents itself to us sensuously as a space-time continuum. Investigating Nature from an epistemic point of view thus means transforming it in a twofold sense. In the course of the first transformation, the single coherent inhomogeneous continuum is divided by cognition into different concepts, by virtue of which insights into local natural phenomena become possible. In the course of the second transformation, these empirical concepts are taken up and transformed by a genuinely philosophical comprehension into aspects of a necessarily coherent order, whose general form of unity is the concept of Nature. Since this specific form of unity of Nature, however, does not adhere to Nature by itself but is essentially the result of philosophical comprehension that can originate in thinking animals alone, the conceptual unity of Nature leads by itself beyond itself into the sphere of Spirit, in which both empirical and philosophical epistemic activities contribute to the absolute self-knowledge of reason.<sup>13</sup>

## Bibliography

HEGEL, G.W.F. (1968 ff.), *Gesammelte Werke*, ed. by the Nordrhein-Westfälischen Akademie der Wissenschaften und der Künste in Verbindung mit der Deutschen Forschungsgemeinschaft, Hamburg: Felix Meiner.

HEGEL, G.W.F. (1986 ff.), *Werke in zwanzig Bänden*, ed. by Eva Moldenhauer and Karl Markus Michel, Frankfurt a. M.: Surhkamp.

HALBIG, C. (2002), *Objektives Denken. Erkenntnistheorie und ‚Philosophy of Mind‘ in Hegels System*, Stuttgart: Frohmann-Holzbog.

KANT, I. (1998), *Critique of Pure Reason*, Cambridge: Cambridge University Press.

---

<sup>13</sup> I would like to thank Thomas Engeland who helped me with the translation.

KREINES, J. (2015), *Reason in the World. Hegel's Metaphysics and Its Philosophical Appel*, Oxford: Oxford University Press.

MARTIN, C. (2012), *Ontologie der Selbstbestimmung. Eine systematische Rekonstruktion von Hegels „Wissenschaft der Logik“*, Tübingen: Mohr Siebeck.

PIPPIN, R. (2018), *Hegel's Realm of Shadows*, Chicago: Chicago University Press.