



NATURAL HISTORY AND VARIABILITY OF ORGANIZED BEINGS IN KANT'S PHILOSOPHY

Abstract: *This paper aims to examine Kant's views on evolution of organized beings and to show that Kant's antievolutionary conclusions stem from his study of natural history and variability of organisms. Accordingly, I discuss Kant's study of natural history and consider whether his conclusion about impossibility of knowledge about such history expands on the research of history of organized beings. Moving forward, I examine the notion of variability in Kant's philosophy, and show that his theory of organized beings relies on the preformationist conception of variability that provides limited insight into the history of organisms. I explain that Kant's endorsement of preformationism is conditioned by a lack of knowledge about the mechanism that successfully explains adaptation and transmutation of organisms leading towards the creation of new species. Finally, I summarize the following reasons for Kant's rejection of the hypothesis of evolution: lack of cognitive ability to discover all changes of natural phenomena in different periods of time and adoption of preformationist conception of variability of organized beings. I finish off with a discussion about mechanical inexplicability of organisms and find a third reason Kant believes that the idea of evolution is only "a daring adventure on the part of reason".*

Key words: *Kant; evolution; organized beings; natural history; variability;*

In *Critique of Judgement* ([1790] 1872) Kant makes a notable statement that the hypothesis about the evolution of organisms is nothing more than "a daring adventure on the part of reason" that occurred even to the most acute scientist of the time (Kant 1872: 301).¹ As known, theory of evolution by natural selection was not formulated in Kant's time – that task was undertaken by Darwin (1890–1882) who published *The Origin of Species* in 1859. However, some scholars entertained the idea about variability of

1 All references to Kant's *Critique of Judgement* are to German edition of *Kritik der Urtheilskraft* ([1790] 1872), whilst the translation is provided by J. C. Meredith in English edition of Oxford University Press (2007c). The references to the Kant's essays used in this paper are to English editions provided by Cambridge University Press (*Metaphysical Foundations of Natural Science*, 2004; *Of the different races of human beings*, 2007a; *On the use of teleological principles in philosophy*, 2007b; *Physical Geography*, 2012).

species before Darwin,² and apparently Kant was one of such scholars. Kant questions the variability of species and means of their adaptation to distinct environment. However, his theory (compared to Darwin's) is often characterised as antievolutionary and has become an attractive theme for many contemporary authors.³ In this paper, I will try to contribute to the contemporary discussion of Kant's theory of organized beings. My intention is to show how Kant's antievolutionary theory of organisms stems from his study of natural history and preformationist conception of variability of organisms. For the sake of clarity, the paper is divided into several sections. In the first part, I provide a brief overview of dominant philosophical and scientific ideas of Kant's time; these ideas undoubtedly influenced Kant's theory of nature, history, and variability of organized beings. The second section presents a discussion of Kant's study of natural history. As known, Kant believes knowledge about such history is impossible. No one can uncover *all* changes in nature as they occur in different periods of time. Does this conclusion imply the impossibility of knowledge about the history of organized beings? I believe the answer to this question depends on the interpretation of *variation* of organisms, and in third section I show that Kant adopts the preformationist conception of variation. This conception is also known as *preformationism of natural predispositions* (Cohen, 2020) and presupposes that all potential variations of an individual are already contained within it. Thus, the variability of organisms is reduced to the manifestation of certain predispositions. If my analysis is successful, it shows that Kant's preformationism enables limited knowledge about the history of organized beings. However, one should note that this preformationism neutralizes the need to discover the mechanism that explains successful adaptation and transmutation of organisms. Hence, the idea about the evolution of natural species remains a daring, but unscientific hypothesis about organized beings. As known, Darwin revisits this question and uncovers the mechanism – natural selection – that successfully explains the adaptation and evolution of natural species, and transforms Kant's daring hypothesis into scientific theory.

Kant's endorsement of preformationism of natural predispositions ties his general study of natural history to the problem of evolution of organisms and unveils several reasons Kant dismisses the idea of evolution. The first reason is the absence of adequate cognitive abilities to discover and understand *all* changes in organized beings as they happen in different instances of time. As

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- 2 Considering the process of selective breeding, Comte de Buffon (1707–1788) and Erasmus Darwin (1731–1802) believed that intentionally caused changes in the species of domestic animals confirms the assumption that equally significant changes can occur in wild animals after a long period of time (Butler 1879); Lamarck's (1744–1829) *Zoological Philosophy (Philosophie Zoologie)* offered an intriguing view that forces of nature, and not an intelligent creator, conditioned the adaptation of plants and animals which, after a long period of time, could cause the emergence of new species (Lamarck [1809] 1963).
- 3 For example, Kolb (1992); Richards (2000); Weber, Varela (2002); Morris (2011); Fisher (2014); Cohen (2020).

noted above, we find the second reason in the preformationism of natural predispositions. Finally, the third reason presents the unique organization of living beings that, as Kant believes, cannot be explained by mechanical laws. I turn to this issue in the last part of the paper.

1. Philosophical and scientific ideas of Kant's time: *vitalism vs. reductionism*, and *preformationism vs. theory of epigenesis*

We can distinguish several dominant philosophical and scientific ideas of Kant's time. On the one hand, this period is marked by the development of vitalism and reductionism; on the other, there were two influential theories about embryological development – preformationism and theory of epigenesis. Undoubtedly, all these theories influenced Kant's thought about nature, history, and organized beings.

Vitalism states that the cause of the unity of organized beings can be found in their specific structure and internal forces (Kolb 1992: 11). Blumenbach's theory of *Bildungstrieb*, the vital power or formative impulse, presents a good example of the development of vitalist ideas. Namely, Blumenbach (1752–1840) believes that the *Bildungstrieb* is the cause of reproduction, maintenance, and restoration of injured parts of an organism. Further, *Bildungstrieb* enables the realization of various stages of individual development (Blumenbach 1825: 49–51). In other words, Blumenbach assigns a constitutive role to the *Bildungstrieb* in the creation and development of organisms (Richards 2000: 21). Opposing vitalism, reductionists try to explain organized beings through the same principles and laws that govern the behaviour of inorganic entities (Roll-Hensen 1976: 62).

As Richards notes, we find the original idea of preformationism in Swammerdam's works (Richards, 2000).⁴ Swammerdam, namely, believes that the female seed contains a miniature, complete form of an adult individual of certain species. That being the case, embryological development consists in gradual growth or enlargement of an organism (Richards 2000: 13). Whilst preformationism insisted on the existence of an initially formed material unit within parental seed, the theory of epigenesis advocates a different idea: in the beginning of development, an individual is nothing but an unformed mass that gradually becomes articulated; its final form reveals the organism that belongs to certain species (Richards 2000: 13). Accordingly, the term “evolution” refers to the gradual formation and development of an individual species.⁵

4 Jan Swammerdam (1636–1680) was Dutch entomologist. His work showed that various phases during the life of an insect—egg, larva, pupa, and adult—are different forms of the same animal.

5 However, I use the term “evolution” in a Darwinian sense. In other cases, I will rely on the term “embryonic development of the individual.”

Kant prefers the theory of epigenesis because it “regards nature as at least itself productive in respect of the continuation of the process, and not as merely unfolding something” (Kant 1872: 306–307). At the same time, he rejects vitalist view that certain fundamental forces – such as Blumenbach’s *Bildungstrieb* – cause the emergence and development of living beings (Ginsborg 2006: 456).⁶ Although Kant is a defender of Newton’s reductionist theory, he admits that mechanical laws cannot explain the behaviour of organized beings because they significantly differ from physical, inorganic matter. Whilst physical matter is lifeless, organized beings represent matter “in which everything is mutually related to each other as end and means, which can only be thought as a *system of final causes*” (Kant 2007b: 214). Since that is the case, Kant agrees with Blumenbach that life could have not “sprung from the nature of what is void of life” (Kant 1872: 307). Apparently, Kant believes there are notable differences between physical matter and organized beings:

- 1) Physical matter is lifeless; organized beings present formed, *alive* matter;
- 2) Whilst physical entities represent systems of classical causation, organized beings are systems of *final causality* whose parts are related as means and ends.⁷

These differences lead Kant towards conclusion that life, i.e., organized beings, could not have arisen from inanimate matter. In fact, Kant argues that we cannot know how distinct types of organisms came into being: “This problem lies entirely beyond the limits of all physics possible to human beings, within which I believed that I had to hold myself” (Kant 2007b: 214). Further, differences between physical entities and organized beings affect their possible explanations. Whilst the behaviour of physical entities can be explained by mechanical laws, the explanation of organized beings must be found in teleology (Kant 2007b: 214).

I believe there are two possible interpretations of Kant’s conclusion that we cannot uncover the origin of distinct types of organisms. First, “the origin of different types of organisms” can refer to the moment of actual creation, the beginning of the existence from non-existence. Given that, we can say that Kant denies the possibility of knowledge about the origin of *life* because any explanation of such an origin must begin with an already organized matter; the archaeologist of life “is obliged eventually to attribute to this universal mother an organization suitably constituted with a view to all these forms of life” (Kant 1872: 300–301). Second, it seems that “the origin of different types

6 Richards discusses the relation between Blumenbach’s and Kant’s view in his paper *Kant and Blumenbach on the Bildungstrieb: A Historical Misunderstanding* (2000).

7 Classical causation refers to the causal relation in which the cause always precedes its consequence.

of organisms” can be understood in Darwinian sense – as an emergence of new species (or types) through the evolutionary process. Thus, we can state that Kant denies the possibility of knowing the *evolution* of organisms, which remains nothing but “a daring adventure on the part of reason” (Kant 1872: 301). In the following sections, I discuss reasons that led Kant towards this conclusion. As I show, these reasons are scattered throughout his various essays. Nevertheless, they provide us with a coherent theory about the variability of organized beings.

2. Kant's natural (biological) science: nature as *physical system*

As some scholars rightly emphasize, Kant's discussion about the idea of evolution is intimately related to his study of *the physical description of the earth* (*Naturbeschreiben*) and *natural history* (*Naturgeschichte*).⁸ In the explanation of the physical description of the earth, i.e., physical geography, Kant writes:

We owe our **knowledge of nature** to **physical geography**, that is, to a **description of the earth**. In the strictest sense, there are no **experiences**, only **perceptions**, which, taken together, constitute **experience**... The physical description of the earth is thus the **first** part of knowledge of the world... Consequently, it is necessary to learn the physical description of the earth as a knowledge that can be completed and corrected with the help of experience (Kant 2012: 445–446).

The knowledge of physical geography is defined by our experience. Since our experience is confined to the present state of affairs (Kant 2012: 445), the knowledge about physical geography is also limited to the present state of natural phenomena.

Kant states that the history of nature includes “different geographies”, i.e., different states of nature throughout geological time. Only if one were to describe “all events of the whole nature, as it has been through all time, then and only then would one write a real so-called natural history” (Kant 2012: 449–450). In other words

Yet *natural history* would only consist in tracing back, as far as the analogy permits, the connection between certain present-day conditions of the things in nature and their causes in earlier times according to laws of efficient causality, which we do not make up but derive from the powers of nature as it presents itself to us now. Such

8 For example, Fisher (2007); Morris (2011); Cohen (2020). At the same time, some scholars state the value of Kant's study on physical geography and natural history is unveiled in discussions of Kant's views on history, racism, as well as the general interpretation of the *Critique of Judgment* (Louden, (2011) Clewis (2018)).

would be a natural history that is not only possible but that also has been attempted often enough, e.g., in the theories of the earth (Kant 2007b: 197).

However, the discovery of natural history does not seem to be possible for the human intellect which, due to the absence of testimony, tends to speculate: “But there is the problem that it has to be guessed, more through experiments than by accurate testimony... But we cannot guarantee the accuracy of our information, even since the invention of writing” (Kant 2012: 450). Kant believes that the human mind cannot “glance” into the past and discover the causes of distinct states of nature without speculation. That being the case, he concludes we cannot have adequate and complete knowledge of natural history.

Kant’s conclusion on the impossibility of knowledge about natural history is a consequence of certain epistemological assumptions of his philosophical system. The first and apparent assumption is the one about the *limits of possible knowledge* imposed on us by our cognitive apparatus.⁹ However, the second assumption describes the knowledge as *system*:

Moreover, we need to become acquainted with the objects of our experience **as a whole**. Thereby our knowledge is not an **aggregation** but a **system**; for in a system the **whole** is prior to the parts, while in an aggregation the **parts** have priority (Kant 2012: 446).

I noted that Kant insists that knowledge about natural history includes information about any changes nature has undergone throughout different instances of time (Kant 2012: 450). Put differently, Kant believes we must learn the natural history as a *whole*. Such knowledge is not possible if we consider nature as *logical system* in which natural phenomena are not studied as wholes, but through relations of similarity and difference of their parts – size, colour, number etc. Consequently, our knowledge becomes an aggregate of information about nature. However, the study of nature as *physical system* implies that we consider nature and its phenomena as wholes with mutual *geographical* and *historical* relations. Whilst the former type of relation is found between entities existing at the *same* time, the latter occurs amongst entities that occupy certain places in a single *causal chain* (Fisher 2007: 105–106).

We can say that knowledge of natural history requires the fulfilment of two epistemological-methodological conditions: 1) developing adequate cognitive abilities to discover *all* historical states of nature as they happen in different geological times and 2) studying nature as a *whole*, i.e., the physical system in which phenomena are connected through geographical and historical relations. The development of certain cognitive abilities seems to be mandatory for creating the possibility of knowing natural history. Without an adequate cognitive apparatus, such knowledge is not possible.

9 Kant’s study about the limits of possible knowledge is well-known, which is why I believe there is no need for more detailed explanation of this study.

The fact that no human intellect can uncover and record all states of nature, as they happened in different instances of time, indicates the possession of an inadequate apparatus for discovering natural history. Apparently, the same conclusion applies to the study of the history of *organized beings*:

If, for example, one were to consider how the various breeds of dogs descended from one line, and what changes have befallen them through all time as a result of differences in country, climate, reproduction, etc., then this would constitute a *natural history* of dogs. Such a history could be compiled for every single part of nature, for instance, on plants and so forth. But there is the problem that it has to be guessed, more through experiments than by accurate testimony. For natural history is not one whit shorter than the world itself. But we cannot guarantee the accuracy of our information (Kant 2012: 450, emphasis added).

The history of organized beings, as well as the history of nature, reflects the causal chain of their changes throughout time. Thus, if we cannot know the history of nature, then we cannot uncover the history of organized beings. In the next section, I argue this is not necessarily the case because the ability to know the history of organized beings depends on the interpretation of their *variability*.

3. Variation of organisms: compatibility of preformationism and epigenesis

Kant defines *variation* as hereditary properties of phyletic origin that “agree with their point of origination” (Kant 2007a: 85). In other words, variation is understood as hereditary *change* that indicates the origin of an organism. Further, in *Metaphysical Foundations of Natural Science* ([1786] 2004), Kant refers to the *Second Law of Mechanics*: every change in matter has some external cause (Kant 2004: 82). I mentioned that Kant believes organisms differ from lifeless physical matter. However, it should be noted that organized beings represent formed, alive *matter*, raising the question whether the Second Law of Mechanics applies to organized beings as well. The positive answer to this question indicates that every change – variation – of organized being has some external cause that affects the formation of its natural history. Accordingly, the knowledge about such cause would imply the knowledge about a specific part of individual's history.

Some textual evidence confirms such conclusion. For example, in his essay *On the Different Races of Human Beings* ([1775] 2007a), Kant writes that

The condition of the soil (humidity or aridity), likewise that of nutrition, gradually introduce a hereditary difference or sort among animals of one and the same phylum and race, chiefly with respect

to size, proportion of the limbs (heavy or thin), as well as natural disposition, which, while resulting in half-breeds in mixing with foreign ones, disappears over the course of few generations on other soil and with different nutrition (even without a change of climate) (Kant 2007a: 86).

Few pages later, he notes that *air* and *sun* “appear to be those causes which most deeply influence the generative power and produce an enduring development of the germs and predispositions” (Kant 2007a: 90). Finally, Kant suggests that individual physical characteristics can reveal changes of an organism:

But the most important point, namely the *derivation of the Americans* as an incompletely adapted race, a people that long resided in the northernmost region, is quite well confirmed through the suppressed hair growth on all parts of the body except the head, through the reddish rust iron color in the colder and the darker copper color in the hotter regions of this part of the world. For the red-brown color appears (as an effect of aerial acid) to be as suitable to the cold climate as the olive-brown color (as an effect of the alkaline-bilious nature of the fluids) to the hot region (Kant 2007a: 92).

Apparently, Kant believes that external conditions of certain environment – soil, humidity or aridity, air and sun (climate), as well as nutrition – *can cause changes in physical characteristics and reproductive ability of an organism*. In other words, external conditions affect the formation of natural history of organized beings, raising once again the question whether the Second Law of Mechanics can be applied to the behaviour of organized beings. And the answer to such question is essential, particularly if we consider Kant’s theory of natural history. As explained above, natural history reflects the causal chain of changes in organized beings, and Kant believes the discovery of natural history exceeds the limits of our possible knowledge. However, it seems that we *can* discover natural history *if* we can successfully apply the Second Law of Mechanics to the behaviour of organisms. Although this appears to be the case, one should not overlook that, in his *Critique of Judgement*, Kant criticise reductionist attempts to explain organized beings by referring to mechanical laws. In an essay *On the Use of Teleological Principles in Philosophy* ([1788] 2007b), he emphasizes that we can judge organisms only teleologically, not physical-mechanically, “at least as far as *human* reason is concerned” (Kant 2007b: 214). Yet, Kant seemingly adopts the opposite stance, and argues that external conditions can explain the changes of organized beings. Does Kant make the opposite statements about mechanical explicability of organisms?¹⁰

10 It is worth noticing that a positive answer to this question would bring Kant’s naturalistic theory closer to Darwin’s theory of evolution. As known, Darwin argues that new hereditary characteristics arise due to the work of natural selection; the gradual

As indicated in the previous section, the answer to these questions depends on our understanding of the concept of variation of organized beings. I noted that Kant's work is marked by dominant ideas of his time – preformationism and theory of epigenesis. Although Kant prefers the theory of epigenesis, he does not completely dismiss preformationism. Kant writes:

In birds of the same kind which yet are supposed to live in different climates there lie germs for the unfolding of a new layer of feathers if they live in a cold climate... Since in a cold country the wheat kernel must be more protected against the humid cold than in a dry or warm climate, there lies in it a previously determined capacity or a natural predisposition to gradually produce a thicker skin... Chance or the universal mechanical laws could not produce such agreements. Therefore we must consider such occasional unfoldings as *performed* (Kant 2007a: 89–90).

Kant apparently adopts the preformationist assumption that *all* potential changes of organism are initially contained in the germ of the original parental pair of a particular species. In other words:

What is supposed to propagate itself must have laid *previously* in the generative power as antecedently determined to an occasional unfolding in accordance with the circumstances in which the creature can find itself and in which it is supposed to persistently preserve itself (Kant 2007a: 90, emphasis added).

Even though change represents the transition of an individual from one state to another, Kant believes that both states are already present in the same organism. Thus, a change – or variation – of an organism is the appearance of a certain property already contained within it. External factors such as climate, soil and nutrition do not influence the *development of the new, but the manifestation of an existing property*. Due to this – *preformationist* – conception of variation, we cannot employ the Second Law of Mechanics (and mechanical explanations) to the organized beings.¹¹ However, this does not imply the impossibility of knowledge about their natural history. Kant recognizes that birds migrating to colder climates develop an additional layer of feathers that protects them from freezing at low temperatures. In cold regions, a grain of wheat forms harder ligule to protect itself from humidity

accumulation of small changes eventually leads towards the emergence of new species of offspring that significantly differ from their parental species. In other words, the gradual accumulation of changes causes the emergence of a new Kantian strain that leads to the formation of a new species. Further, Darwin (like Kant) argues that external conditions have a significant impact on the organization of organisms and their reproductive organs (Darwin 2009: 31–32).

11 Mechanical conception of change would imply that from the existing state A (cause) arises a new, previously non-existent state B (consequence).

and cold. And, Americans inhabiting the northern parts of the continent have "reddish rust iron" skin colour. These examples indicate that 1) the manifestation of certain predisposition represents a *variation* of organized beings, and that 2) the appearance of any predisposition is caused by *external factors of certain geographical region* (Kant 2007b: 208). In other words, the uniqueness of each geographical region enables us to judge organized beings historically as organisms with distinctive origin (Morris 2011: 178). That being the case, investigation of external factors that caused the manifestation of particular predisposition *can* provide insight into the natural history of an individual or the whole species.

Kant's view on natural history of organized beings reveals compatibilism of theory of epigenesis and preformationism. Whilst the first studies nature as producing entity in which an organism is always a product of another organic being, the second explains the productive capacity of living beings by means of their internal purposeful predispositions (Cohen 2020: 126–127). Why does Kant adopt preformationism? Cohen states that Kant seeks naturalistic *mechanism* to explain *how* organized beings successfully adapt to distinct natural environment. In absence of such mechanism, Kant turns to preformationism of natural predispositions (Cohen 2020: 134), and I concur. However, I believe Kant's investigation of naturalistic mechanism remains unsuccessful because it completely relies on our *present* experience that does not show the transformation of species. In long annotation in third *Critique*, Kant writes that hypothesis about the evolution of organized beings

[It] Never ceases to be *generatio univoca* in the widest acceptation of the word, as it only implies the generation of something organic from something else that is also organic, although, within the class of organic beings, differing specifically from it. It would be as if we supposed that certain water animals transformed themselves by degrees into marsh animals, and from these after some generations into land animals. In the judgement of plain reason there is nothing a priori self-contradictory in this. But experience offers no example of it. On the contrary, as far as experience goes, all generation known to us is *generatio homonyma*... and a *generatio heteronyma* is not met with anywhere within the range of our experience (Kant 1872: 301).¹²

Kant realizes the idea about the evolution of species raises important questions that our experience cannot answer: 1) *how* do organisms adapt to distinct environment and 2) *how* members of one species produce offspring that belong

12 In fact, many of Darwin's contemporaries emphasized that our experience does not show transformation of one species into another. In his response, Darwin wrote well-known words: "We see nothing of these slow changes in progress, until the hand of time has marked the lapse of ages, and then so imperfect is our view into long-past geological ages, that we see only that the forms of life are now different from what they formerly were" (Darwin 2009: 66).

to another natural species? In other words, Kant recognizes that hypothesis of evolution of species raises the question about *mechanism* that would explain the adaptation and transformation of natural species. Since our experience does not reach the knowledge about such mechanism, this hypothesis remains “a daring adventure on the part of reason” (Kant 1872: 301).

In his work *The Origin of Species*, Darwin provides the answers to aforementioned questions. He recognizes that individuals of the same species possess distinct characteristics, i.e. variations, and defines the natural selection as preservation of advantageous and rejection of harmful variations through struggle for survival (Darwin 2009: 64–65). As known, the preservation of advantageous variations enables the successful adaptation of natural species to specific environment, and the accumulation of such variation eventually leads to the creation of new, descendant species. Certainly, there was no theory in Kant's time that provided similar answers to the problem of evolution. However, I should note that Kant dismisses the idea of evolution of organized beings due to the implications of his theory of natural history. As I explained, history encompasses all changes – variations – of natural phenomena in different instances of time. Knowledge of natural history includes information about the causes of these changes, and can be discovered by an intellect who 1) possess adequate cognitive abilities to discover all historical states of nature as they happen in different geological times, and 2) studies nature as a *whole*, i.e., the physical system in which phenomena are connected through geographical and historical relations. Further, the possibility of knowledge about natural history of organized beings depends on the concept of variability. Whilst change of physical entities signify their transition from one state of affairs to another, new and previously non-existing state, variability of organized beings represents the manifestation of already existing predispositions. These predispositions appear due to an influence of certain environmental factors. Discovery of such factors should provide us with an insight into the history of natural species. Thus, knowledge about history of organized beings is possible due to preformationism of natural predispositions. However, this preformationism also neutralizes the demand for naturalistic mechanism that would explain how individuals evolve and successfully adapt to different environments. As Kant writes:

The human being was destined for all climates and for every soil; consequently, various germs and natural predispositions had to lie ready in him to be on occasion either unfolded or restrained, so that he would become suited to his place in the world and over the course of the generations would appear to be as it were native to and made for that place (Kant 2007a: 90).

Thus, preformationism of natural predispositions demotes the idea of evolution to a degree of daring, but unscientific hypothesis about organized beings.

As indicated in the beginning of this paper, Kant's preformationism ties his general study of natural history to the problem of evolution of organisms and reveals several reasons Kant dismisses the idea of evolution. However, another reason is found in *Critique of Judgement*, where Kant explores his assumption about *mechanical inexplicability* of organisms. In the next section I review this thesis and complete my analysis.

4. Critique of Judgement: Mechanical Inexplicability of Organized Beings

The thesis about mechanical inexplicability of organisms is tied to Kant's study about the limits of possible knowledge and his inquiry about the status of teleology in natural science. Being a defender of Newton's mechanics, Kant believes that nature represents a system with physical-mathematical relations constructed by subjective, but necessary apperception of space and time, along with the categories of pure reason. Yet, it seems that some natural phenomena are not subjected to the operation of mechanical laws, meaning they cannot be subsumed under *a priori* principles of pure reason (Weber, Varela 2002: 104). It seems that we find such phenomena in biology, a secondary science that studies organized beings. As noted before, Kant admits organisms differ from physical, inorganic matter. Whilst physical matter is lifeless, organisms represent organized matter, a system of *final causes* in which everything is "mutually related to each other as end and means... and since therefore their possibility only leaves the teleological... mode of explanation, at least as far as human reason is concerned" (Kant 2007b: 214). Thus, in order to explain biological phenomena, Kant introduces teleology to natural (biological) science.

Kant offers a detailed analysis of the status of teleology and so-called *purposiveness of nature* in his third *Critique*. Here, he observes that nature is governed by innumerable empirical laws that cannot be subsumed under *a priori* principles of pure reason (Kant 1872: 20). In other words, Kant notices that natural phenomena are not subjected to the operation of mechanical laws, leaving us with a *contingent* unity of nature itself and our experience of natural phenomena. Although Kant admits that biological phenomena cannot be explained by mechanical laws, he states that empirical laws of nature should be recognized as *necessary*: "Such a unity is one which must be necessarily presupposed and assumed, as otherwise we should not have a thoroughgoing connection of empirical cognition in a whole of experience" (Kant 1872: 20–22). That being the case, the power of judgment – a third cognitive faculty – formulates and adopts the principle of purposiveness of nature as an *a priori* principle stipulating that "what is for human insight contingent in the particular (empirical) laws of nature contains nevertheless unity of law in the synthesis of its manifold in an intrinsically possible experience" (Kant 1872: 20–22).

The principle of purposiveness of nature grants the unity of nature itself and our experience of natural phenomena. It is a principle that compensates for our cognitive inability to provide mechanical explanations of biological phenomena. However, the principle of purposiveness is merely a *regulative* principle that lies solely in reflective judgment, meaning that

[For] We cannot ascribe to the products of nature anything like a reference of nature in them to ends, but we can only make use of this concept to reflect upon them in respect of the nexus of phenomena in nature — a nexus given according to empirical laws (Kant 1872: 18).

In other words, the principle of purposiveness is essentially an epistemological principle formulated and adopted by reflective judgment in order to grant us a coherent experience of nature governed by empirical and apparently necessary laws. Further, it enables us to associate distinct parts of our experience of the abundant natural phenomena. Yet, since it is a regulative principle of reflective judgement, it does not provide any objective claim about natural entities as purposes. As Zuckert rightfully states, purposiveness does not represent an ontological characteristic of natural entity, but an epistemic principle that governs the unity of representations or judgments (Zuckert 2007: 10).

The principle of purposiveness is closely related to Kant's thesis about the mechanical inexplicability of organisms. Generally speaking, this thesis states that behaviour of organized beings cannot be explained by physical-mechanical laws. In *Critique of Judgement*, Kant writes:

So where the structure of a bird, for instance, the hollow formation of its bones, the position of its wings for producing motion and of its tail for steering, are cited, we are told that all this is in the highest degree contingent if we simply look to the nexus effectivus in nature, and do not call in aid a special kind of causality, namely, that of ends (nexus finalis). This means that nature, regarded as mere mechanism, could have fashioned itself in a thousand other different ways without lighting precisely on the unity based on a principle like this, and that, accordingly, it is only outside the conception of nature, and not in it, that we may hope to find some shadow of ground a priori for that unity (Kant 1872: 232).

Kant recognizes organized beings as unique phenomena. Their uniqueness is reflected through their structure that cannot be explained by mechanical laws. Mechanical mode of explanation treats organization and behaviour of organisms as *contingency*. Matter, of which organisms are composed, can organize itself in a thousand different ways. If allowed, this contingency threatens to undermine the mechanical conception of nature where *all* phenomena should be subsumed under the operation of necessary mechanical

laws (Allen 2003: 377–378). Kant resolves this problem by introducing the so-called thesis of mechanical inexplicability of organisms (Ginsborg, 2001). In this respect, it is not possible to use the mechanical laws to explain the structure and behaviour of organisms:

Indeed, so certain it is, that we may confidently assert that it is absurd for human beings even to entertain any thought of so doing or to hope that maybe another Newton may some day arise, to make intelligible to us even the genesis of but a blade of grass from natural laws that no design has ordered (Kant 1872: 278).

Since the structure and behaviour of organisms cannot be explained by mechanical laws, Kant relies on teleology and utilises the notion of *purpose*. His *Critique of Judgement* shows that purpose has *heuristic*, not constitutive role:

We are right, however, in drawing upon teleological judging, at least problematically, with regard to the investigation of nature; but only with a view to bringing it under principles of observation and research by analogy to the causality that looks to ends, while not pretending to explain it by this means. Thus this is an activity of reflective, not of determining, judgement (Kant 1872: 232).

The concept of purpose should explain the organization and behaviour of organisms *as if* they were intentionally created by an intelligent designer (Kant 1872: 259). The conjunction “as if” has an important role because it allows us to compare organisms to human artefacts whilst simultaneously leading to a different conclusion: although they look *as if* they were created by an intelligent designer, organisms are actually the products of nature. The notion of purpose *does not have constitutive role in creating their organizational unity*, but it does play a role in our ability to *cognize* them in a respectful way (Richards 2002: 8–9).

Kant introduces teleology to natural science to provide explanation of mechanically inexplicable organized beings. Apparently, his theory leaves us with two worlds of nature: the world of physical entities determined by physical-mechanical laws, and the world of organized beings and teleology (Kolb 1992: 26). At the first glance, these worlds seem to oppose each other. However, this is not the case. As Kant emphasizes, teleology provides an additional mode of explanation that complements mechanical research which by itself is insufficient as a method of empirical research (Kant 1871: 259). Thus, Kant believes that Newtonian mechanics and teleology are methodologically compatible. Whilst our investigation should follow mechanical principles and laws, we need to acknowledge teleological explanation of organisms.

5. Concluding remarks

My aim in this paper was to analyse various parts of Kant's naturalistic philosophy, and explore his theory of organized beings. I attempted to show how Kant's theory of natural science and organized beings relies on his study of natural history. Kant's theory of organized being is antievolutionary; he dismisses the idea about evolution of natural species as daring, but unscientific hypothesis. Kant's reasons are presented in a form of three major thesis of his philosophical system. The first one is the thesis about the absence of adequate cognitive abilities which builds upon Kant's doctrine about the limits of possible knowledge. The second thesis is formulated as preformationism of natural predispositions, whilst the third establishes the mechanical inexplicability of organisms. As shown, the last thesis extends Kant's study of purposiveness of nature where organized beings are perceived as natural purposes, systems of final causes. Since nature shows extraordinary diversity and contingency, human intellect cannot explain it by means of *a priori* concepts and principles (Van de Vijver et al 2003: 106). Thus, purposive conception of nature appears to be necessary for Kant. The principle of purposiveness of nature neutralizes the threat of the contingency of natural system. As Allen notices, without such principle, each individual entity and nature itself would be perceived as disorganized, chaotic system (Allen 2003: 379).

We can say that Kant provides convincing epistemological reasons against the idea of evolution. At the same time, he poses a challenge for sympathizers of evolutionary hypothesis of his and later time. Evolutionist need to explain how organisms successfully adapt to different environment and emergence of new species. In other words, Kant challenges evolutionists to find a mechanism that provides answers to these questions. In XIX century, Darwin accepted Kantian challenge and provided necessary answers in his famous essay *The Origin of Species*. That, however, is a theme for another paper.

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