

Kant on Biology and the Experience of Life

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1 Introduction

Recent years have seen remarkable advances in the life sciences, including increasing technical capacities to reproduce, manipulate and even replace living nature with the products of human artefact. These developments raise important questions about our understanding of that which we call 'life'. If, as science suggests, there is in principle no difficulty in engineering the living world in the same way as we build and construct the non-living world, then what is the ground for our distinction between the seemingly so self-sufficient and self-determined living beings and the apparently inert and inactive non-living parts of nature? If the difference between the living and the non-living cannot be based on the distinction between that which escapes and that which is within our control and manipulation, what makes our experience of a blossoming tree so fundamentally different from the experience of a piece of woodwork?

In light of the advances of the biological sciences and an increasing interest in the philosophy of biology, Kant's treatment of the living deserves particular attention.¹ Kant's account occupies a unique position.

1 In the recent literature, Kant's teleological account of the organism has received revived interest. To mention only a few examples, see Quarfood, Marcel: *Transcendental Idealism and the Organism: Essays on Kant*. Stockholm 2004; Guyer, Paul: *Kant's System of Nature and Freedom: Selected Essays*. Oxford 2005; Ginsborg, Hannah: "Kant's Biological Teleology and its Philosophical Significance". In: *A Companion to Kant*. Ed. G. Bird. Oxford 2006, 455 ff.; Zuckert, Rachel: *Kant on Beauty and Biology: An Interpretation of the Critique of Judgment*. Cambridge 2007; Breitenbach, Angela: *Die Analogie von Vernunft und Natur: Eine Umweltphilosophie nach Kant*. Berlin 2009; as well as the collections by Steigerwald, Joan (ed.): *Studies in History and Philosophy of Biological and Biomedical Sciences* 37, *Special Issue on Kantian Philosophy and the Life Sciences*, 2006; Huneman, Philippe (ed.): *Understanding Purpose: Kant and the Philosophy of Biology*. Rochester 2007; Illetterati, Luca and Michelini, Francesca (eds.): *Purposiveness: Teleology Between Nature and Mind*. Frankfurt 2008; Heidemann, Dietmar (ed.): *Kant Yearbook: Teleology* 1, 2009.

On the one hand, Kant rejects a purely mechanistic understanding of living nature and develops a teleological account of the organism as characterised by purposiveness and goal-directedness. Thus, our understanding of living beings, on Kant's account, is not determined purely by what we can explain causally and reproduce mechanically. Instead, it includes an important teleological element. And yet, Kant denies, on the other hand, that we could make any determinate knowledge claims about purposes in nature. All we can affirm, on his account, is that we can, and indeed must, regard living nature by means of an analogy *as if* it were purposive. The apparently striving and directed character of the living, Kant claims, is something we read into nature.

Kant's analogical conception of living nature, I argue in this paper, opens up a possibility of making sense of our experience of life that stands up to the challenge posed by recent advances in the life sciences. Kant's account, I suggest, makes sense of our experience of the living world as essentially characterised by a self-determined and goal-directed activity, while, at the same time, allowing for causal explanation and technical manipulation of that which is identified as alive.

In order to develop this claim I begin, in Section 2, by giving a brief sketch of Kant's analogical account of the organism. I argue that, according to Kant, we make sense of the distinguishing character of living nature by analogy with our own capacity for purposive activity. In Section 3, I examine in more detail how precisely Kant's analogy grounds our understanding of living nature. I argue that the analogy does not play a purely heuristic role in our search for causal explanations but that it is a necessary condition for making sense of something as a living being at all. This result, as I show in Section 4, has important consequences for the possibility of experiencing life in nature. It entails, I argue, that our very experience of something as alive has a reflective and analogical character. This characterisation of our experience of the living world raises an important question about the compatibility of Kant's account with the aims of modern science. In Section 5, I argue that Kant's analogical approach is not only compatible with the possibility of gaining scientific knowledge about organisms but also sheds light on the special nature of our experience of life. I conclude that Kant's account makes sense of the particular character of our experience of living nature even in the context of modern biology.

2 Kant's Analogy Between Living Nature and Human Purposiveness

In the *Critique of Teleological Judgment*, Kant argues that our experience of organisms essentially differs from that of non-living nature. We experience living beings as distinguished by a two-fold teleological organisation: by a particular arrangement of the parts within the whole and by a reciprocal interdependency between the individual parts. If we consider, for example, “the structure of a bird, the hollowness of its bones, the placement of the wings for movement and of its tail for steering, etc.” we think of the parts of the bird as determined by their function within the organism as a whole (KU, AA 05: 360; 232).² We can only understand what a wing is, for instance, by reference to its contribution towards the bird's capacity to fly. The existence and form of the parts thus appear as if they were purposive for the existence and survival of the organism as a whole. Moreover, the parts of an organism also appear as if they were dependent on each other. The organs of a bird, the wings, tail, heart and digestive system, for example, can live, grow and function only in mutual interaction. None of the parts can survive on their own. Considered as a whole, the organism thus seems to maintain and bring about itself. In its generation, development and regeneration of damaged parts, the organism appears to strive towards its own existence. Living beings thus display not only a purposive organisation of their parts within the whole but also a capacity for end-directed *self*-organisation.

This two-fold teleological character of living beings, Kant argues, cannot be explained mechanically. To explain an object mechanically is to explain it in terms of the way in which its parts act on one another by means of their forces of attraction and repulsion. By reference to mechanical laws we thus explain changes in a material body in terms of the causal relations between its material parts. But to explain a complex material thing merely by reference to the interaction of its parts is precisely *not* to explain in what sense the parts are there for, have a function in, or are directed towards, the whole. What, then, is it to regard organisms as purposively organised and self-organising beings? According to Kant, we cannot experience, or know of, any purposes in nature. Purposes are essentially tied to intentionality, he argues, to an intellect that sets some-

2 Translations of the *Critique of Judgment* are guided by Kant, Immanuel: *Critique of the Power of Judgment*. Paul Guyer and Eric Matthews (transl.). Cambridge 2000, but may be altered. All other translations are my own.

thing as a purpose.³ However closely we investigate nature, we will never find any such intentional purposiveness in nature. All we will ever be able to discover through the study of nature are cause and effect relations. The idea of a purpose must therefore be something that is read into nature by us: We consider organisms *as if* they were purposive.

On Kant's account, our teleological conception of organisms is thus essentially analogical. It is based on the analogy with something else which we take to be purposive. Many commentators have associated this analogy with its theological version well rehearsed long before Kant. This is the analogy between nature and design, and between the creator of nature and an intelligent designer.⁴ Kant is said to use this analogy in a novel way, not in order to prove the existence of an intelligent author of the universe, but as an analogical elucidation of our understanding of living beings. According to this reading, we only regard living beings *as if* they were the products of design. In the *Critique of Judgment* Kant makes it explicit, however, that the analogy with artefacts is ultimately insufficient for an understanding of organic nature. Thus, he claims, "[o]ne says far too little about nature and its capacity in organised products if one calls this an *analogue of art*" (KU, AA 05: 374; 246). While artefacts are the products of an *external* intelligence distinct from these products, organisms seem to produce *themselves*; they appear to be the products of their *own* striving. The analogy between nature and the product of intelligent design could thus account for the first characterisation of organisms as displaying *purposive organisation*. It would not, however, make sense of the second characterisation of living beings as *self-*

3 A discussion of this claim is beyond the scope of this paper. The assumption has been criticised by those who argue that natural purposiveness should not be interpreted on the model of the teleology of action but on that of interdependent causal processes. Cf., e.g., Toepfer, Georg: "Teleology in Natural Organised Systems and Artefacts: Interdependence of Processes versus External Design". In: Ill-etterati: *Purposiveness*, 162–181.

4 This reading is proposed by some of the most often cited commentators of Kant's teleology, including McFarland, John: *Kant's Concept of Teleology*. Edinburgh 1970, 111; McLaughlin, Peter: *Kant's Critique of Teleology in Biological Explanation*. Lewiston, NY 1990, 39; and Guyer, Paul: "Organisms and the Unity of Science". In: Watkins, Eric (ed.): *Kant and the Sciences*. Oxford 2001, 259 ff. A more critical reading of the artefact analogy can be found in Ginsborg, Hannah: "Two Kinds of Mechanical Inexplicability in Kant and Aristotle". In: *Journal of the History of Philosophy* 42, 2004, 33 ff.; and Zuckert: *Kant on Beauty and Biology*. I have dealt with the question of the precise content of Kant's analogy in detail in Breitenbach: *Die Analogie von Vernunft und Natur*, chapters 3 and 4.

organising, that is, as maintaining themselves and striving for their own existence and survival.

The organised and self-organising character of living beings is not, therefore, understood purely in accordance with the artefact model. Rather, in a second step, we must consider organisms by analogy with our own rational capacity of freely setting ourselves ends and of acting for those ends. Thus, in the *Metaphysical Foundations of Natural Science*, Kant defines life as “the capacity of a substance to determine itself to act from an inner principle” (MAN, AA 04: 544). This “inner principle” is, as Kant spells out in the *Critique of Judgment*, “our causality in accordance with ends” (KU, AA 05: 375; 247). Just as in our actions we strive to realise purposes that we have set ourselves and aim, thereby, to maintain our capacity for free activity, so we also view organisms as if they were directed at their own ends and, ultimately, at their own survival as an organised whole. In experiencing something as alive, we thus read the idea of our own rational capacity for purposive activity and the striving for unity into nature. We reflect about living beings as if they were the products of their own striving. In this way, the analogy with human reason can account for both the unified organisation and the purposive self-organisation of living beings.

3 The Epistemic Function of Kant’s Analogy

We thus regard living beings as if they were purposively organised and self-organising by analogy with our own capacity for purposive activity. This raises an important question about the epistemic function of Kant’s analogy. For if the analogy is necessary for making sense of the distinguishing character of living nature at all, then its role must go beyond what is commonly described as its heuristic dimension. According to this purely heuristic function of Kant’s analogy, our analogical consideration of organisms as purposively organised and goal-directed beings is a useful tool for the study of nature. Thus, Kant writes,

it is a [...] necessary maxim of reason not to bypass the principle of ends in the products of nature, because even though this principle does not make the way in which these products have originated more comprehensible, it is still a heuristic principle for researching the particular laws of nature. (KU, AA 05: 411; 280)

The “principle of ends”, that is, the maxim to regard nature as if it were purposive, does not explain the origin of an organism or, as Kant adds, “the ground of its possibility” (ibid.). But it may nevertheless help us in explaining nature by guiding our search for natural laws. When we reflect on organisms by analogy with our own capacity for end-directed activity, we may ask for the particular purpose of a trait, or an organ, or a particular activity of a living being. By thus considering certain parts of nature as purposive for other parts, and by thinking about the organism as a whole as directed towards its own survival, we may uncover dependencies that indicate the existence of natural laws and that provide further causal knowledge of the world around us. The analogy may thus present a useful means, as Kant puts it in his *Lectures on Logic*, “for the sake of the extending of our cognition by experience” (Log, AA 09: 133).

If, however, Kant’s analogy performed *only* this heuristic function then we could dispense with it as soon as an adequate causal explanation had been achieved. Once we had found out, for instance, how the leaves of a tree causally affect the survival of the tree as a whole, we would no longer have to regard the tree’s leaves as if they were in any way purposive for the tree’s survival. The analogy could ultimately be reduced to the causal and mechanical explanations that it helps us to discover. This conclusion, however, would be at odds with Kant’s claims about the necessity and indispensability of the analogical reflection. Thus, Kant argues that causal-mechanical explanations of nature

could of course subsist alongside the teleological principle, but could by no means make the latter dispensable; i. e., one could investigate all the thus far known and yet to be discovered laws of mechanical generation in a thing that we must judge as an end of nature, and even hope to make good progress in this, without the appeal to a quite distinct generating ground for the possibility of such a product, namely that of causality through ends, ever being cancelled out. (KU, AA 05: 409; 278)

Mechanical explanations, Kant claims here, will never be able to account for the particular character of living beings. The teleological perspective will always remain necessary.

What further role remains, then, for Kant’s analogy over and above its heuristic function? Kant crucially claims that we can make sense of the *very possibility* of an organism only by means of the analogy. Our analogical reflection about living nature, Kant suggests, has not only heuristic import but also a necessary role in our very thinking about the “form” and “internal possibility” of living nature (KU, AA 05: 408; 277; and 05: 373; 245). For beings with a type of understanding such as our

own the very “possibility of the form” of an organism can only be grasped by means of the analogy with human purposiveness (KU, AA 05: 408; 277).

In order to make sense of this claim, we need to take into account a second function that analogies perform on Kant’s account. Thus, analogies provide not only a heuristic tool but also an indirect, symbolic representation of concepts that cannot be represented directly. This role of analogical reasoning is important for Kant insofar as we can make sense of a concept, on his account, only if we can give an intuitive representation of it.⁵ In the *Critique of Pure Reason*, Kant had shown that the transcendental schemata provide a direct intuitive representation of the a priori concepts of the understanding. By containing the rules for applying the a priori concepts to the empirical world, the schemata establish the empirical validity, and hence reality, of the a priori concepts.⁶ Those a priori concepts “which only reason can think”, by contrast, cannot be represented directly in this way (KU, AA 05: 351; 225). The ideas of reason, such as the idea of a God or the world as a whole, can be represented only *indirectly* by means of a symbol, where a symbol, in turn, represents “by means of an analogy” (KU, AA 05: 352; 226). The indirect, symbolic representation is made possible, Kant explains, by judgment performing

a double task, first applying the concept to the object of a sensible intuition, and then, second, applying the mere rule of reflection on that intuition to an entirely different object, of which the first is only the symbol. (ibid.)

By applying a concept to an object experienced in intuition, we can thus transfer the way we think about the first object to the unknown second object.

For Kant’s account of living nature, this means that analogical reflection is necessary in order to provide intuitive representation of the living world. As we have seen, the distinguishing character of living beings, their purposiveness and goal-directedness, cannot be represented directly. We cannot, in other words, ascribe purposiveness to nature itself. We can only represent the purposive character of living nature indirectly by means of the analogy with our own capacity of setting ends and acting for purposes. Kant’s analogy thus performs not only a heuristic role in our search for mechanical explanations, but it also provides a symbolic representation of life in nature.

5 Cf. FM, AA 20: 279 f.

6 Cf. KrV, A 141/B 179 f.

4 The Particular Character of Our Experience of Life

If, then, our experience of living nature is necessarily based on analogical reflection, this has crucial implications for the particular character of that experience. The fact that the analogy between organisms and human purposiveness is not purely heuristic but provides a necessary condition for making sense of something as a living being at all means that we cannot have the experience of an organism independently of our implicitly subjecting certain sensations of the living world to analogical reflection. Without Kant's analogy, we could not experience any purposiveness in nature. All we could find in nature would be cause and effect relations. It is thus the analogical reflection itself that grounds not only our understanding of what it is for something to be alive but also the very experience of something as a living being.

This thought requires elaboration. For one may worry that something could not be the object of analogical reflection unless we already had a fairly stable, empirically grounded conception of it. The difficulty, in other words, lies in showing that our experience of living nature is, on the one hand, based on the analogical thought process that enables us to make sense of the particular purposive character of life while, on the other hand, being grounded in an objective awareness of the world around us.

At least part of the solution to this problem is provided, I believe, by the distinction between two conceptions of "experience". We may have experience of the living world in one sense, without having experience of what distinguishes the living from the non-living world in another sense. Thus, independently of the analogy with our own purposiveness we can have experience of objects, based on application of the categories. By itself, however, this categorical experience does not give us any understanding of what it is for the thing thus experienced to be part of the living world. For a richer experience of something as a living being, the analogy with our own purposive activity must come into play. And here, the crucial insight of Kant's account is that our analogical experience of living nature is based on a creative thought process. Our analogical reflection does not simply draw out existing similarities between organisms and our own capacity for purposive activity but it creates these similarities. This creative process can be described as an interactive reflec-

tion.⁷ By combining and comparing different associations that we connect with the two sides of the analogy, we come to see certain aspects of the analoga that we would not have seen otherwise. Through projecting certain properties of the first analogon onto the second, we reflect about the two sides of the analogy in a way that would not have been possible without the analogy. It is this “double task” of our faculty of judgment – of reflecting about one object and of transferring those reflections onto another object – that thus enables us to experience parts of nature as purposive (*ibid.*).

As a result, our experience of living beings has a crucially different character from experience as it is ordinarily understood on Kant’s account. My experience of something as alive is essentially unlike the experiences I have when I see a car passing by outside my window, when I hear the news on the radio, or when I smell my neighbour’s cooking. Experiencing life in nature does not provide me with determinate knowledge of the world around me. Rather, it presents a non-determining, reflecting type of experience that leads me to see the world in a different light. It is non-determining because it is based on a judgment that fails to subsume our experiences of nature under the concept of a purpose. And it is reflecting because it is nevertheless grounded in considerations about our experiences of nature by means of an analogy.⁸

Even if the experience of organisms in nature, of cats and dogs, flowers and trees, is essentially analogical, however, one may wonder whether we do not have direct intuitive representation of our own vitality. One might object that, since we are directly familiar with our own purposive activity, we could experience our own life without dependency on analogical reflection. I believe, however, that there are serious difficulties with this suggestion. The experience of myself as setting myself purposes and as striving to achieve my own ends is itself non-determining and reflecting. I may always doubt whether I really acted for my own, freely set purposes, or whether I was only moved along by causal laws, by an invisible demon, or by another exterior principle. Even in my own case, it therefore seems, I must read the idea of the capacity for purposiveness

7 This interactive account of Kant’s analogy is related to the interaction theoretical conception of metaphors. Cf., e.g., Black, Max: *Models and Metaphors: Studies in Language and Philosophy*. Ithaca 1962, 25 ff.

8 This characterisation of the experience of life has striking similarities with aesthetic experience. I discuss this similarity in Breitenbach, Angela: “Biological Purposiveness and Analogical Reflection”. In: *Kant’s Theory of Biology*. Ed. I. Goy and E. Watkins. Berlin-Boston, forthcoming.

and for the free setting of ends into the experience of my own activity. This suggestion raises further difficult questions about the analogical basis of our conception of ourselves as purposive living agents. These questions go beyond the scope of this paper. I believe that they indicate, however, that the analogy between living nature and the purposive capacity of human beings is ultimately significant for our understanding of both sides of the analogy.⁹

5 Biological Science and the Experience of Life

I have thus argued that on Kant's account it is a necessary condition of our very experience of something as a living being that we view it by means of the analogy with our own capacity for purposive activity. It follows, I have shown, that our experience of something as alive has a special character. It is an essentially non-determining and reflecting type of experience. One might object that this claim has rather counterintuitive epistemic consequences. Since, on Kant's view, analogical reflection is embedded ineliminably in our experience of the living world, it seems that nothing we say about rabbits and blades of grass, for instance, could ever count as cognition. And yet, if no knowledge about the living world were possible, then biology would lose the status of a science. No scientific knowledge of living nature could ever be achieved.

I believe that this objection to Kant's account is mistaken in an important way. Kant's analogical account of living nature, I suggest, is not only compatible with the possibility of biology as a science. It also provides a plausible account of the special nature of our experience of life that sits comfortably with recent advances of modern biology. The claim that our experience of life requires analogical reflection is an epistemological claim about what it is for us to consider something as alive rather than as a non-living piece of matter. Kant's analogical approach thus aims to give an account of the way in which we have to reflect about nature in order to make sense of it as a living being. As a result, Kant's analogy does not rule out that the structures and processes we find in nature can also be explained in purely causal terms. It is possible to abstract from our analogical reflection about nature and to explain

9 This, I believe, is why Kant employs a similar analogy in his discussion of the organism in the third *Critique*, and in his treatment of reason in the first *Critique*. Cf. KrV, A 832 f./B 860 f.

what we have picked out as an organism by means of the underlying causal processes that determine nature. And it is this abstraction from our analogical reflections that makes biological knowledge possible.

Kant's analogical account of our experience of life thus leaves room for determinate claims that can provide us with knowledge of the living world. And yet, crucially, purely by means of such determinate knowledge claims, we could never fully grasp what, for us, distinguishes the special character of the living from the non-living world. On Kant's account, the analogy remains necessary even for the biologist who needs to assume it, if only implicitly, in order to be able to pick out and identify something as alive at all.

Kant's analogical approach thus offers an account of our experience of the living world that sheds light on the question why we seem to experience living beings as so fundamentally different from the non-living world. Even if there is in principle no difficulty in manipulating and mechanically reproducing the living world, we nevertheless experience nature as essentially characterised by a self-determined and goal-directed activity. And even if, in science, the difference between the living and the non-living parts of nature cannot be based on the distinction between that which escapes and that which is within our control and manipulation, we nevertheless experience the living but not the non-living world as necessarily determined by an inner principle. Even within the context of modern biology, the special character of our experience of life must be regarded by analogy with our own capacity for purposive activity. Far from proving Kant's teleological conception of nature as presenting an outdated piece of history, I conclude that recent developments in the biological sciences have made Kant's analogical account all the more relevant.

