An Unstable Middle Position
The Kantian Account of Teleology and its Controversial Legacy

Andrea Gambarotto[1]

1. Introduction

This paper addresses Kant's arguments about the problem of whether living organisms should be considered as organized according to specific purposes. In the opening paragraphs of the Critique of Teleological Judgment, the second section of his *Critique of the Power of Judgment* (1790), Kant famously uses the structure of a bird as an example. The form of a bird, especially its bone structure and the position of its wings, suggests a positive answer to that question: they seem intended for flight. Kant, however, finds this concept tantamount to conceiving nature in technical terms, i.e. as the product of a maker. This opposition between mechanism and teleology is at the heart of Kant's so-called antinomy of teleological judgment: on the one hand, "all generation of material things is possible in accordance with merely mechanical laws," while on the other hand, "some generation of such things is not possible in accordance with merely mechanical laws."[2] The Kantian solution to this dilemma is the introduction of the distinction between "determinant" and "reflective" judgment. The former refers to a constitutive property of the object in question, the latter to the way in which our cognitive faculty makes sense of things. According to Kant, we must consider living organisms *as if* they were the products of intentionally acting causes, while nonetheless dealing with them within a mechanistic explanatory framework. The question of how Kant resolves this antinomy is of course controversial, and whether Kant was able to work this out coherently is still open to debate.

https://doi.org/10.36311/2318-0501.2017.v5n2.07.p91

Scholarship on the topic offers two main lines of interpretation: the first roughly represented by Timothy Lenoir and Clark Zumbach and the second by Robert Richards and John Zammito. Lenoir has argued that German biology in the early nineteenth century was the result of a coherent research program developed at Göttingen by Blumenbach and his students, which received its first formulation in Kant's *Critique of the Power of Judgment* in 1790.[3] Along these lines, Zumbach has argued that Kant's remarks on teleology have a significance that has been almost totally overlooked, advancing a cohesive conceptual framework for understanding the functional and goal-directed features of living organisms. In this sense, he argues they provide sound conceptual foundations for the German biological methodology.[4] Richards was the first to contest these readings, arguing that the alleged agreement between Kant and Blumenbach upon which they are based is a "historical misunderstanding" of their respective conceptions of teleology. He contends that Blumenbach in fact ignored the Kantian distinction between constitutive and regulative principles and conceived of the *Bildungstrieb* as a goal-directed drive proper to all organized beings.[5] For this reason, Zammito has contended that the "Lenoir thesis" can no longer serve as our point of departure for reconstructions of this period.[6]

The first camp thus maintains a 'foundationalist' (or 'quasi-foundationalist') reading of Kantian teleology: internal purposiveness determines the domain of biology, thereby establishing its autonomy as a special science. The second camp instead develops a more 'eliminativist' account: Kant took organisms to be mechanically inexplicable and denied that biology can ever be reconciled with his prescriptions for proper natural science.

Behind this disagreement is an issue that has occupied Kantian interpreters throughout recent decades, an issue that Hannah Ginsborg has defined as "the problem of coherence."[7] This issue concerns the central concept of Kant's *Critique of Teleological Judgment*, namely the notion of a "natural purpose" (*Naturzweck*). For Kant something qualifies as a purpose not only if it was brought about by intentional design but also if we can conceive of its possibility only by assuming that it *was* produced by intentional design: "an object or a state of mind or even an action, […] even if its possibility does not necessarily presuppose the representation of an end, is called purposive merely because its possibility can only be explained and conceived by us insofar as we assume as its ground a causality in accordance with ends, i.e. a will that has arranged it so in accordance with the representation of a certain rule."[8] Accordingly, "organized beings" must be considered purposes because, in Kant's view, we can conceive of their possibility only by assuming that they were produced as the result of an intentional design. At the same time, however, he argues they must be considered products of nature. These two aspects, however, seem to contradict each other.

In § 65 Kant sketches the two conditions that must be fulfilled for something to be called a natural purpose: (1) the first is "that its parts (as far as their existence and their form is concerned) are possible only through their relation to the whole."[9] This kind of purposiveness is often found in artifacts: every part of a machine is there only on account, or rather as a function, of the whole for which it serves as a part. (2) To be called a *natural* purpose it must also have parts "combined into a whole by being reciprocally the cause and effect of their form."[10] This requirement marks a radical difference between artifacts and organized beings,

because the former are produced *by something else*, the latter *by themselves*, i.e. they self-produce. By formulating these two requirements, Kant emphasizes both an *analogy* and a *disanalogy* in the comparison between artifacts and organisms. Thus the problem of coherence: if we are not ascribing organisms the properties of artifacts, in what respect can we coherently regard them as similar to artifacts? The issue arises from the fact that, according to Kant, on the one hand we cannot understand the possibility of organized beings unless we invoke the notion of design, while on the other hand we cannot legitimately affirm that organisms are in fact the product of design. So how is it possible to reconcile these apparently opposed conditions? How can we regard an organism as a purpose while at the same time regarding it as natural?

Hannah Ginsborg has attempted to resolve this problem by appealing to a conception of purposiveness as normativity, arguing that organized beings can be regarded as subject to normative standards without implying that they were in fact designed according to those standards: "to regard something as a purpose without regarding it as an artifact is to regard it as governed by normative rules without regarding those rules as concepts in the mind of a designer."[11] Considering something as subject to normative standards implies that we judge the way it is in relation to the way it ought to be. My question is: could Kant have accounted for this normativity without referring to the argument from design? Could he have spoken of organisms and their parts as subject to norms without any commitment to the idea that they have a supernatural origin? And if he did, then where do these norms come from? More importantly, can they provide the ground for a scientific account of vital organization?

I analyze the Kantian account of teleology with specific regard to *Der einzig mögliche Beweisgrund*, the *Metaphysische Anfangsgründe der Naturwissenschaft*, the the *Kritik der Urteilskraft* and the *Erste Einleitung*. In particular, I take into account the Kantian distinction between external and internal purposiveness: the former implies a technical-teleological approach of organized beings, according to which they must be understood as the result of purposeful design, the latter points towards a different understanding of teleology as self-organization. I argue that, despite this distinction, Kant was ultimately unable to move beyond a technical understanding of organization and consequently took a scientific treatment of the purposeful characters displayed by living organisms to be an impossible task.

2. The Technique of Nature

Recent scholarship has dug deeper into the background of Kant's treatment of organized beings.[12] In this respect, Philippe Huneman has shown that eighteenth-century life scientists were dealing with empirical problems connected to generation, physiology, and classification, while Kant's treatment of organized beings is part of his wider philosophical agenda, namely his critique of the concepts of necessity, contingent order, and purposiveness and his open confrontation with rationalist metaphysics, most importantly Leibniz.[13] On this score, Hein van den Berg has emphasized the link between Kant's views on the concept of purpose to those of Christian Wolff and Alexander Gottlieb Baumgarten. This analysis is an especially valuable contribution to the field in that it shows how Kant adopted the definition of his predecessors of

"purpose" as "intention." In fact, for Wolff and Baumgarten purposes are objects of intention, namely God's intention. Kant adopted this intentional definition of purpose but could not appeal to God as an explanatory ground, thus making it impossible for him to take teleology constitutive of organized beings.[14]

The roots of this understanding of teleology as intention are found in the philosophy of Leibniz. In his *Système nouveau de la nature et de la communication des substances aussi bien que de l'union de l'âme avec le corps* (1695) Leibniz formulates the concept of "machines de la nature." He thereby differentiates human machines from natural or divine machines, arguing that a machine made by the art of man is not a machine in each of its parts, "but the machines of nature, that is to say, living bodies, are still machines in their smallest parts, to infinity. This is what makes the difference between nature and art, that is to say between the Divine art and ours."[15] According to Leibniz, "the body of animals are machines of perpetual motion, or, to put it more clearly, arranged to maintain in the world a determined and singular kind of organic perpetual motion."[16] Leibniz understands the animal body as a *divine machine*, distinguished from the ordinary products of human artifice through its infinite complexity and consequent indestructibility. In this respect, both living bodies and artifacts are the product of intelligent design. The difference between artificial and natural machines ultimately lies with the designer, i.e., humans in the former case, God in the latter. It is not surprising that Leibniz endorsed preformation: for him organs were designed by an omniscient creator and brought into existence together at creation, and they developed from their latent state within organically preformed beings.[17]

With regard to this background, the argument of the third *Critique* seems to be unstable: an instability notably expressed in the notion of a "technique of nature."[18] In fact, on the one hand Kant rejected the argument of design as an explanatory ground for the purposive characters of living organisms, but on the other hand, he held that purposiveness can be conceived of only in relation to an intention, which per se implies reference to a designer.

Already in *The Only Possible Argument in Support for a Demonstration of the Existence of God* (1763), Kant had dedicated an entire section to physico-theological arguments for the existence of God. Here Kant criticizes physico-teleology, because it "regards all perfection, harmony and beauty of nature as contingent and as an arrangement instituted by wisdom, whereas many of these issue with necessary unity from the most essential rules of nature."[19] At the same time, however, he admits that the unique order organizing living organisms seems necessarily to imply reference to an Intelligent Author. In fact, "the great regularity and the harmoniousness of a complex harmony is perplexing, and even common sense itself finds it inconceivable in the absence of an Intelligent Author," because "extensive harmony is never adequately given in the absence of an intelligent ground."[20] Here Kant is fairly explicit that, when considering how well-connected the organs of an animal are, "one would have to be of an ill-natured disposition (for no-one could be so unreasonable) not to recognize the existence of a Wise Author, who had so excellently ordered the matter of which the animal was constituted."[21]

The internal constitution of plants and animals suggests "an artificial order of nature" that "cannot be explained by appeal to the universal and necessary laws of nature."[22] In fact, using an

example that he would more famously employ again in the third *Critique*, Kant maintains that the specific ways in which a tree is able to reproduce itself are utterly unintelligible in light of human knowledge – nor could "arbitrary inventions," such as the theories of generation advocated by Buffon and Maupertuis, account for them. At the same time, he asks whether one is "obliged for that reason to develop an alternative reading oneself, which is just as arbitrary, the theory, namely, that, since their natural manner of coming to be is unintelligible to us, all these individuals must be of supernatural origin? Has anyone offered a mechanical explanation of yeast to generate its kind? And yet one does not appeal for that reason to a supernatural ground."[23] This is the "problem of coherence" in its very first formulation, essentially the insufficiency of mechanical explanations to account for organized beings and the illegitimacy of the technical explanations offered by proper natural science. One cannot account for the contingent order within living organisms by means of mechanical laws; one instead has to make reference to teleological principles. Still, teleological principles seem necessarily to imply reference to intentional design, which Kant invalidates because it involves reference to the supersensible.

What Kant means by this discussion of mechanical inexplicability is sketched in detail in the *Metaphysical Foundations of Natural Science* (1786). Here Kant maintains that natural science can be either *properly* or *improperly* natural science, the first treating its objects wholly according to a priori principles and the second according to laws of experience."[24] Only a discourse with apodictic character – i.e. necessary connection between grounds and consequences – can be called a proper science (*Wissenschaft*), while if it contains mere empirical certainty, the argument should be considered just general *knowledge* (*Wissen*). A rational doctrine of nature thus deserves the title of a natural science only if the fundamental laws therein are known a priori and not the mere result of experience. If the grounds or principles are merely empirical, as in chemistry, they carry no consciousness of their necessity. In this case, the knowledge involved does not merit the title of natural science.

Accordingly, chemistry should be considered a systematic art rather than a science. Natural science instead derives its legitimacy from its "pure" basis in the a priori principles of natural explanations. Indeed, the most complete explanation of appearances based on chemical principles always leaves behind a certain dissatisfaction for Kant, because one can adduce no a priori grounds for these principles, which, as contingent laws, have been learned merely from experience.

In Kant's view, although a pure philosophy of nature (i.e. that which investigates only the concept of nature in general) may be possible without mathematics, a pure doctrine of nature is only possible by means of mathematics: "in any special doctrine of nature there can be – in fact – only as much *proper* science as there is *mathematics* therein."[25] Therefore, as long as there is no a priori law to explain chemical effects, chemistry can be nothing more than a systematic art or experimental doctrine – never a proper science. The same argument applies to the life sciences.

This claim is grounded in the definition Kant provides for the concept of matter. The first chapter of *Metaphysical Foundations* begins with a definition of matter as what is "movable in space."[26] With this notion, Kant claims that, since motion represents the primary category of our experience of nature, it has to be the first determination in our construction of the

concept of matter. Since for Kant a science must be grounded upon necessary and universal concepts, and since such knowledge cannot be based upon experience alone but needs an a priori foundation, physics has to derive its universality and necessity from a priori grounds, which can be nothing other than the categories of the understanding. Motion represents the first and most important predicate of matter: "the fundamental determination of a something that is to be an object of the external senses must be motion, for thereby only can these senses be affected. The understanding leads all other predicates which pertain to the nature of matter back to motion; thus natural science is throughout either a pure or an applied doctrine of motion."[27] By means of this analysis, Kant expected to be able to construct the complete metaphysics of nature through determination of matter as such.

Kant maintains that "matter fills the space, not by its mere existence, but by a special moving force."[28] However, since this repulsive force is itself inadequate to explain matter, it becomes necessary to assume the existence of an attractive force as well. In fact, if there were no agent countering the repulsive force, there would be no limit to the extension of matter, which would thus disperse to infinity. If these are the only forces that exist in nature, *matter* can only behave *mechanically*: "matter as mere object of the external senses has no other determinations than those of external spatial relations, and hence undergoes no changes except by motion."[29] The cause of change cannot be internal, for matter has absolutely no internal grounds of determination. Hence, all change in matter is based upon an external cause. The inertia of matter "signifies nothing but its *lifelessness*,"[30] as life for Kant means the capacity of a substance to determine itself, to act from an internal principle. To the extent that physics is concerned with motion in space, i.e., with mechanics, it excludes the possibility of any other cause of motion except external causes. The only two forces one can legitimately assume are the attractive and the repulsive force.

In the *Erste Einleitung* to the *Kritik der Urteilskraft*, Kant contrasts this mechanical view of nature with the kinds of statements he defines as "technical." A technical statement is a proposition that concerns "the art of bringing about that which one wishes to exist."[31] Accordingly, Kant uses the expression "technique" with regard to the objects of nature when they are "*judged as if* their possibility were grounded in art."[32] These peculiar objects are organized beings, whose purposive structure must be considered "in accordance with the analogy of an art." In analogy, that is because this judgment does not determine anything about the constitution of the object nor "the way in which to produce it."[33] This analogy, according to Kant, in which we can call nature technical: since this technique "contains no objectively determining propositions" and "does not constitute any part of doctrinal philosophy."[34]

Kant argues that such a definition of nature (as technical) necessarily implies "a formal purposiveness of nature, which we simply *assume* in it"[35] but which we cannot use to ground a theoretical understanding of nature. In other words, the definition implies the impossibility of considering the purposiveness of nature as an objective ground for our cognition of organized beings, because this assumption would imply reference to an intentionally acting maker, which is untenable in natural science, since it goes beyond the realm of possible experience.

Kant thereby repudiates the legitimacy of technical-teleological arguments, which explain the organization of living bodies by reference to God's original design. Kant thus maintains that the concept of a technique of nature "does not ground any theory" and does not "contain cognition of objects and their constitution."[36] On the other hand, he argues that the only way we can make sense of the organized products of nature is to conceive of them as the products of a purposeful intention. But since we cannot legitimately refer to a designer as the origin of purpose within the context of natural science, Kant argues that purposiveness is not present in the object but inheres strictly in the subject, or more precisely, in the principles of a priori reflection inherent to its power of judgment.

Purposiveness is defined as the "lawfulness of the contingent as such."[37] The organization of living organisms is contingent, since it cannot be reduced to mechanical laws, but it is nonetheless lawful, since it indeed seems to work according to a rule: a rule which, however, is not possible to grasp using the tools of proper natural science, i.e. mechanism. In fact, considering its "products as aggregates, nature proceeds *mechanically, as mere nature*, but with regard to its products as systems, e.g. crystal formations, various shapes of flowers, or the inner structure of animals and plants, it proceeds *technically*, i.e. at the same time as an *art*."[38] According to Kant the only legitimate explanation is mechanical; if we take it as constitutive, this form of technical causality lies beyond the scope of proper natural science.

It is important to note that, without being constitutive, Kant sees the technical argument as the *only possible explanation* for organized beings, because, in his view, organization can be explained only in relation to an intention. In fact, he argues explicitly that his consideration of purposiveness "by no means extends so far as to imply the generation of *natural forms that are purposive in themselves*."[39] Therefore, the only thing that we can legitimately do if experience shows us purposive forms in natural beings is to ascribe them a supreme ground, "even though this ground itself may lie in the supersensible and beyond the sphere of the insights into nature that are possible for us."[40] Of course, this reference is not sufficient to explain the possibility of living forms but makes it possible for us to apply the concept of purposiveness to nature and its lawfulness. This is a deflationist version of Leibniz's argument, as it were, and shows that, from a conceptual point of view, Kant's argument remains ultimately coherent with Leibniz's fundamental assumption, namely the construal of teleology as connected to intention.

In fact, purposes "must in general be given from someone," and if they are natural purposes, they "must be able to be considered as if they were products of a cause whose causality could only be determined through *representation* of the object."[41] Therefore, the concept of a real *purpose of nature* "lies entirely outside the field of the power of judgment."[42] Mechanical laws cannot explain vital organization, and technical-teleological explanations represent for Kant the only possible alternative. In fact, Kant's major preoccupation in the *Critique of Teleological Judgment*, and most explicitly in the "First Introduction," is to distance himself from the argument about design with claims such as: "no *intentionally* acting cause is thereby ascribed to nature, which would be a determining teleological judgment and as such transcendent, since it would suggest a causality that lies beyond the bounds of nature."[43] It is precisely this preoccupation that testifies to the fact that, at least in this respect, Kant is still

moving in the same conceptual space as his predecessors, in which *purposiveness* can be grasped solely in terms of *intention*. In the following section, I will provide further evidence for this claim by analyzing Kant's stance on teleology and organization in the *Kritik der Urteilskraft*.

3. Organized beings and machines

In the opening paragraphs of the *Critique of the Teleological Power of Judgment*, Kant introduces the crucial distinction between *external* and *internal* purposiveness. The former might be defined as utility; it is constitutive of artifacts while being inconsistent with regard to natural products, the defines the most peculiar phenomena of living beings, such as growth, reproduction and functional integration A watch, as an artifact, has a determined purpose, i.e., to mark the hours. This is a case of external purposiveness, because the watch's purpose was posited by an external designer (the watchmaker) in order to make the object useful to someone wanting to know what time it is. Conversely, a living body displays a different form of purposiveness: it is not produced by someone else but rather by itself, and its purposive features are not related to another's utility but only to itself.

As an example of internal purposiveness, Kant famously takes the case of a tree. A tree generates another tree in accordance with a known natural law. Secondly, a tree also generates itself as an individual. A plant prepares the matter that it adds to itself in a manner particular to its species, "which could not be provided by the mechanism of nature outside of it, and develops itself further by means of material which, as far as its composition is concerned, is its own product."[44] Thirdly, one part of this creature also "generates itself in such a way that the preservation of the one [part] is reciprocally dependent on the preservation of the other."[45] The leaves, for instance, are at once products of the tree and yet, in turn, preserve it, such that its growth depends upon their effect. As Blumenbach stressed, other unique properties characterize organized beings, such their ability to heal in cases of injury, miscarriage, and growth malformation, when certain parts form themselves in entirely new ways because of chance defects or obstacles. These phenomena seem to take place according to a determined purpose.

Kant defines a purpose (*Zweck*) as something that is possible only in relation to a concept, i.e., an entity that owes its form to a previous design, implying representation of a whole. This is the case for artifacts: the structure of a watch, for example, and the way its parts are arranged is accordant with the idea that a device works in a certain way for a specific purpose. In order to achieve this purpose, it is necessary to have some previous representation of the whole, based upon which the single parts can be orderly arranged. A *natural* purpose is thus an entity characterized by the same feature (a concept involving the representation of a whole) but found in nature, and therefore unable to imply a previous representation of the whole.

What's at stake in § 65 of the *Critique of the Power of Judgment* is showing that the only entities in nature which display these features are what Kant calls "organized beings": "for a thing to be a natural purpose it is requisite, *first*, that its parts (as far as their existence and their form are concerned) are possible only through their relation to the whole. For the thing itself is a purpose, and is thus comprehended under a concept or an idea that must determine *a priori*

everything that is to be contained in it" and "*second*, that its parts be combined into a whole by being reciprocally the effect of their form."[46] In such a product of nature, each part is conceived as if it exists only through the others, "thus as if existing *for the sake of the others* and *on account of* the whole." This must be thought of as an organ that *produces* the other parts, which cannot be the case for any instrument of art: "only then and on that account can such a product, as an *organized* and *self-organizing* being, be called a *natural purpose*."[47]

First of all, Kant rejects the possibility of accounting for the structure of organized beings in mechanical terms, but at the same time, he argues against the legitimacy of a technical-teleological account: (1) Mechanism is insufficient to explain the structure of organized beings since each part of an organized body is conceived as if it existed for the sake of the others and on account of the whole, i.e., as an instrument (organ). In other words, every part of an organized beings seems to have a specific purpose, as if it were the result of prior design. This was the main argument of preexistence theorists, for whom the role of efficient cause was played by God. (2) However, this kind of organization is the one we find in a work of art, i.e. the product of a rational cause distinct from the matter itself, which set the final goal in first place.

Nevertheless, organized beings display self-organizing features that are absent in machines. In a watch, in fact, every part is organically arranged in relation to the others, but the watch does not *produce* them. It "is certainly present for the sake of the other but not because of it." Hence the producing cause of the watch is the watchmaker, not the watch itself:

> one wheel in the watch does not produce the other, and even less does one watch produce another, using for that purpose other matter (organizing it); hence it also cannot by itself replace parts that have been taken from it, or make good defects in its original construction by the addition of other parts, or somehow repair itself when it has fallen into disorder: all of which, by contrast, we can expect from organized nature.[48]

On the basis on these considerations, Kant claims that "an organized being is thus not a mere machine, for that has only a *motive* force, while the organized being possesses in itself a *formative* force (*Bildungskraft*), and indeed one that it communicates to the matter, which does not have it (it organizes the latter): thus it has a self-propagating formative power, which cannot be explained through the capacity for movement alone (that is, mechanism)."[49]

In summary, on the one hand Kant argues that mechanism, as a reference to efficient causes, cannot account for the structure of organized beings, which seems to invoke a form of technical causation. However, a technical account is inadequate to explain organized beings for two reasons: first, because the reference to intelligent design lies beyond the scope of proper natural science, and second, because organized beings display a peculiar form of self-organization that sets them apart from machines. As the scholarship on Kant attests, his solution to this predicament is to argue that the purposive features displayed by organized beings should not be considered ontologically defining properties, i.e. as having their own *constitutive* character, but should rather be ascribed to the way we make sense of them based on our own particular cognitive faculties, i.e. as reflective of the *regulative* principle of our power of judgment.

This regulative principle, according to Kant, should then guide our research into objects of this kind, such that we consider their teleological features only heuristically, as a way of "reducing" them to mechanical forces: "organized beings are thus the only ones in nature which, even if considered in themselves and without a relation to other things, must nevertheless be thought of as possible only as its ends, and which thus first provides objective reality for the concept of an end that is not a practical end but an end of nature, and thereby provide natural science with the basis for teleology."[50] The problem here, however, is that despite the distinction Kant made between internal and external purposiveness, teleology is still conceived in terms of intention.

In this respect, Kant opened up ground for overcoming a technical understanding of teleology but did not consistently separate the concept of purposiveness from the concept of intention. In fact, in Kant's view, "teleology cannot find a complete answer for its inquires except in a theology."[51] This unstable middle position leads to the antinomy between mechanical inexplicability, on the one hand, and the illegitimacy of the technical-teleological argument, on the other.

Understanding this element of Kant's argument allows us to better situate the famous passage concerning the "Newton of the grass-blade." Since Kant is quite certain that we can never adequately come to know organized beings merely according to the mechanical principles of nature, "we can boldly say that it would be absurd for humans even to make such an attempt or to hope there may yet arise a Newton who could make comprehensible even the generation of a blade of grass according to natural laws that no intention (*Absicht*) has ordered; rather, we must deny this insight to human beings."[52] But since the reference to intention is illegitimate for proper natural science, this quote represents Kant's denial of the possibility of something like a scientific biology.

According to Kant, Blumenbach had rejected the possibility that raw matter could have originally formed itself in accordance with merely mechanical laws – and thus the possibility that life could have arisen from the lifeless, assembling "into the form of the self-preserving purposiveness by itself." At the same time, however, Kant argues that Blumenbach gives "natural mechanism an indeterminable but at the same time also unmistakable role under this *inscrutable principle of an original organization*, on account of which he calls the faculty in the matter in an organized body (in distinction from a merely mechanical formative power that is present in all matter) a *formative drive* (standing, as it were, under the guidance and direction of that former principle)."[53]

How we interpret this quote is an extremely delicate issue. Lenoir has read it as the most decisive confirmation of the "teleo-mechanical" program upheld by both Kant and Blumenbach, and indeed this passage seems to provide textual evidence for his account. Yet as my previous analysis suggests, for Blumenbach the *Bildungstrieb* played a constitutive role as an organizing principle, rather than a merely regulative role in generation, growth, and regeneration: this gives a different epistemic meaning to the notion of vital force than the one inferred from Kant's arguments in *Kritik der Urteilskraft*. This gives us reason to support Richards' claim that Kant and Blumenbach were involved in a "creative misunderstanding," though the above-cited

Kant quote shows that Kant felt he was in agreement with Blumenbach.

I would like to suggest that a slightly different reading is also possible – one which better accounts for the above passage. Keeping in mind that Blumenbach aimed to build a theory for the formation of organized bodies that responded to the criteria of eighteenth-century experimental philosophy, we can note that he finds it is impossible to make sense of the formation of organized bodies by means of mere mechanical forces. Accordingly, he felt it necessary to presume matter was already endowed with the power of producing vital organization through generation and development. Hence the postulation of the *Bildungstrieb*. It was of course essentially unimportant to him whether the causality implied by this sort of vital principle depended upon the reflexive power of judgment. Kant's perspective is different, since it essentially questions the faculties of reason involved in Blumenbach's representation of this particular form of causality, which goes beyond simple mechanical efficiency. Hence Kant's thesis that the representation of such teleological causality is merely a regulative principle. Despite this different epistemological perspective, in Kant's view Blumenbach's *Bildugstrieb* theory is a genuine example of a legitimate statement concerning the causes of vital organization.

4. Concluding remarks

In conclusion, with his distinction between internal and external purposiveness, Kant cleared ground for a teleological approach to living organisms, but he was ultimately unable to conceive of purposiveness outside the model of practical-technical agency. As a result, he ended up confusing the conceptual distinction between internal and external purposiveness, interpreting the former as the latter, i.e. understanding teleology as solely the result of subjective intention.

Of course, this position is rather controversial throughout the third *Critique*. There we find passages in which Kant insists on the need to distinguish organized beings from machines, chiefly in § 65, but these passages ultimately fail to take teleology, understood as internal purposiveness, seriously enough to admit self-organization as a legitimate object of scientific inquiry. Consequently, Kant argues that, since mechanical laws cannot explain organic processes, the only possible alternative is the design argument, which he nonetheless finds untenable within the framework of proper natural science. In this respect, Kant's main concern is to distance himself from Intelligent Design, insisting that purposiveness is not a constitutive feature of organized beings but only a regulative principle inherent to our power of judgment. As a result, he categorically denies the possibility of scientifically explaining the purposive characteristics displayed by organized beings.

In this sense, Kant lays the foundations for overcoming both mechanical and technical-teleological understandings of vital organization but is ultimately incapable of moving beyond this conceptual space. Indeed, Kant's account of purposiveness is extremely interesting precisely because it lies at the crossroad of a conceptual revolution – from the concept of teleology as intention endorsed by Leibniz and Haller, to the concept of teleology as self-organization upheld by Kielmeyer and Schelling. In fact, the shift from a regulative to a constitutive understanding of teleology was *the* most important factor enabling the emergence of biology

at the beginning of the nineteenth century (at least in Germany). This shift – which took place in the writings of Blumenbach, Kielmeyer, and Treviranus, as well as in Schelling's and Hegel's *Naturphilosophie* – occurred in firm opposition to, rather than in continuity with, Kant, since Kant ultimately understands purposiveness only in terms of conscious intention, not as autonomous self-organization.

Abstract. The paper analyzes the Kantian account of teleology with specific regard to *Der einzig mögliche Beweisgrund*, *Metaphysische Anfangsgründe der Naturwissenschaft*, *Kritik der Urteilskraft* and the *Erste Einleitung*. In particular, I take into account the Kantian distinction between external and internal purposiveness: the former implies a technical-teleological approach of organized beings, according to which they must be understood as the result of purposeful design, the latter points towards a different understanding of teleology as self-organization. I argue that, despite this distinction, Kant was ultimately unable to move beyond a technical understanding of organization and consequently took a scientific treatment of the purposeful characters displayed by living organisms to be an impossible task.

Keywords: Kant; Teleology; Organism; Biology.

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Notes

1 Andrea Gambarotto completed a Cotutelle Doctoral Degree Program under the joint supervision of the *Istituto Italiano di Scienze Umane* (Florence) and the *Institut d'histoire et de philosophie des sciences et des techniques* (Paris). His main areas of expertise are classical German philosophy, philosophy of nature and philosophy of biology. He is currently post-doctoral researcher at the *Université Catholique de Louvain*, where he is developing a project on Hegel's philosophy of biology.

2 Kant, 1990, Ak, 5 : 387 (259)

3 Lenoir 1982.

4 Zumbach 1984, cf. also McLaughlin 1990.

5 Richards 2000.

6 Zammito 2012, cf. also Zammito 2003. 2006.

7 Ginsborg 2014.

8 Kant Ak, 5: 220.

9 *Ivi*, 373.

10 *Ibidem*.

11 Ginsborg 2001, 251.

12 Huneman 2007, Goy & Watkins 2014.

13 Huneman 2008.

14 Van den Berg 2014.

15 Quoted in Fichant 2003, 2.

16 *Ivi*, 6.

17 Smith 2011, 15.

18 This instability was already stressed by Paul Guyer (2001, 275). See also Weber & Varela 2002.

19 Kant Ak 2: 118.

20 *Ivi*, 124.

21 *Ivi*, 125.

22 *Ivi*, 114.

23 *Ivi*, 115.

24 Kant Ak, 4: 468.

25 *Ivi*, 470.

26 *Ivi*, 480.

27 *Ivi*, 477.

28 *Ivi*, 497.

29 *Ivi*, 554.

30 *Ibidem*.

31 Kant Ak, 20: 200.

32 *Ibidem*.

33 *Ivi*, 201.

34 *Ibidem*.

35 *Ivi*, 204.

36 *Ivi*, 204.

37 *Ivi*, 217.

38 *Ibidem*.

39 *Ivi*, 218.

40 *Ibidem*.

41 *Ivi*, 232.

42 *Ivi*, 233.

43 *Ivi*, 236.

44 Kant Ak, 5: 371.

45 *Ibidem*.

46 *Ivi*, 373.

47 *Ivi*, 374.

48 *Ivi*, 374

49 *Ibidem*.

50 *Ivi*, 376.

51 *Ivi*, 399.

52 *Ivi*, 400.

53 *Ibidem*.

Recebido / Received: 2.8.2017.
Aprovado / Approved: 5.11.2017.