Novum sub Sole: Organicity and Temporality in Kant and Bergson

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Abstract
In his book Creative Evolution, Bergson characterizes the project of the *élan vital* as that of accumulating (solar) energy and dispensing it in an act of singular creativity. The living organism can thus be viewed as the material process that breaches the material order. In this way, the virtual becomes operative in the real through the anticipative procedures of the organism, giving rise to novelty. A similar idea is entertained by Kant in the Critique of the Power of Judgment, where he links the idea of the inexplicability of the organism with that of a breach in the immanent order without appealing to anything beyond material forces. In this paper, an attempt is made at clarifying the precise way in which the organism is recalcitrant to traditional notions of explication by examining and relating the views of Kant and Bergson on the subject. Both thinkers struggle to clarify the relation between organization on the one hand and temporality on the other. I suggest that their casting talk of organization in terms of retrograde temporality is an attempt to come to terms indirectly with the challenge the organism poses to any traditional model of temporality.
Keywords: Kant, Bergson, Organicity, Temporality, Novelty

1 Introduction

In the project of computing anticipatory systems, anticipation figures at two different levels. The first level is that of the anticipatory procedures of the system itself. An anticipatory system is a system that has a very peculiar relation to its environment: it can predict future events and act in accordance with this knowledge. Thus, anticipation involves two distinct elements: an epistemic one (the knowledge of the future based on that of past and present) and a pragmatic one (the successful interaction with the environment).[1] Formulated in this way, living systems, and especially human beings, are paradigmatic anticipatory systems. What we would like to understand, therefore, is the structure of the anticipator.

Since the investigation into anticipatory systems is directed primarily towards grasping and reproducing their essential structure, we can meaningfully say that anticipation is involved in the observer's account of this structure as well. We want to

[1] These elements can easily be extracted from Rosen's influential definition: "An anticipatory system is a system containing a predictive model of itself and/or of its environment, which allows it to change state at an instant in accord with the model's predictions pertaining to a later instant" (Rosen 1985: 339).

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interact with the anticipator in such a way that we can anticipate its behaviour when subject to changes. Thus, in wishing to compute anticipatory systems, we already adopt a very specific outlook on living systems that may very well prove to be in contradiction with our acknowledging them as anticipatory systems. This is, in any case, what I would like to suggest in this paper.

There are a number of scientific advances made throughout the twentieth century that have fed the view that we can anticipate anticipatory systems. These advances are in particular those that are at the basis of the modern conception of biology, being modern evolutionary synthesis and molecular biology. The main change in focus brought about by these advances is that the genesis of biological entities and classes is no longer a deep problem biology would like to dismiss for the time being, but one that it addresses directly. They have converged into a model that holds that (1) all essential phenotypical traits are coded for in the sequence of the DNA-molecule of a living system, and (2) the diversity of living systems is the result of a process of natural selection that is primarily driven by the mutation of DNA.[2] This model regards living systems as consisting of isolable traits and parts. Admittedly, recent evolutions in biology have challenged this picture, suggesting that the phenotype is coded for by the whole of the genome rather than specific parts of the DNA-sequence, and that the translation of DNA to molecules involves more than just its sequence. Nevertheless, the dominant conception is that these findings complicate rather than complexify our picture of living systems.[3] Thus, the dream of anticipating anticipatory systems remains unharmed.

I want to suggest instead that living systems, if they are to be anticipatory, are complex rather than complicated. I will do this by discussing the views of two philosophers who are often wrongly dismissed as rendered utterly irrelevant by findings in modern biology. These philosophers are Immanuel Kant (1724-1804) and Henri Bergson (1859-1941). Pairing these thinkers may seem somewhat peculiar, since much of Bergson's life-project consisted in refuting Kantian theses.[4] When it comes down to their respective philosophies of biology, however, they can be seen to converge on two

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[2] One of the most influential formulations of this conception is Jacques Monod's book *Le hasard et la nécessité* (Cf. Monod 1970: 133-152). Mind that Monod does adopt the Central Dogma of molecular biology (Monod 1970 : 144-145) as a fundamental principle in a much more categorical way than its inventor, Francis Crick (Cf. Crick 1970).

[3] An editorial of *Nature Biotechnology* (1999: 511) explained the distinction between "complicated" and "complex" in the following way: "A complicated system is composed of a large number of interacting components. Importantly, the properties of such a system can be accurately predicted from a knowledge of the properties of each of its components and a complete enumeration of their interactions. In other words, a complicated system is exactly the sum of its parts. Complex, on the other hand, is a term reserved for systems that display properties that are not predictable from a complete description of their components, and that are generally considered to be qualitatively different from the sum of their parts." Sui Huang (2000: 471) rephrases the idea by saying that "the "omic" strategy is based on the same linear, monocausal, deterministic thinking that has reigned in molecular biology over the past decades; it just extrapolates it to the entire genome. This is brute-force, genocentric reductionism in the guise of *entireness,* rather than a novel integrative approach devoted to *wholeness*."

[4] Philonenko (1994), for instance, has argued at length that Bergson's philosophical arguments can only be understood correctly if they are taken as an informed refutation of Kant.

essential points.[5] The first point is that the essential thing about a living system, the trait that allows it to be anticipatory, is its complex and circular organization. The second point is that the main reason why we are incapable of grasping the complexity of this structure as well as unwilling to acknowledge it, is the conception of time we adopt in our scientific investigations. Thus, both thinkers converge on relating the issue of the organization of the organism to a particular notion of temporality.[6]

In the first part of this paper, I will discuss Kant's views on living systems, especially why he considers them recalcitrant to mechanical explanation. I will give special attention to his conception of mechanical explanation and the notion of temporality it involves. This will allow me to show why Kant eventually chose to allow for talk of final causes in biology, despite his otherwise anti-metaphysical stance, as well as why he believed that the concept of a final cause only partly covers the essential aspect of living systems.

In the second part of the paper, I will go into Bergson's much-debated and much-ridiculed account of living systems. The issue of temporality enters the scene here in a much more straightforward manner than in Kant's theory, since it is the fundamental problem of Bergson's metaphysics. For this reason, I will reconstruct his image of temporality and its importance for the structure and behaviour of living systems by going into some core discussions of the theme. This will allow me to draw up a picture of Bergson's conception of circular dynamics in biology.

I will conclude this paper by summing up what lessons can be drawn from these philosophers. In addition, I will discuss some possible misconceptions that can arise from this discussion and that have arisen regarding their theories. It is particularly important to see that these philosophies need not lead one to adopt vitalism and/or creationism, but that they rather suggest that these accounts are parasitic upon the dominant conception of living systems and can therefore be dismissed along with the latter.

2 Kant on Epigenesis and Organization

Immanuel Kant formulated his mature philosophy, which he called "transcendental idealism", in a number of works of which the three so-called Critiques form the pillars. The third and final Critique, the *Kritik der Urteilskraft*, presents a great difficulty to Kant scholars, because it is not immediately evident how it fits within the unity of Kant's work and because the internal unity of the work is far from obvious as well. It consists of two main parts, the Critique of Aesthetic Judgment and the Critique of Teleological Judgment. They are unified by their involvement of the faculty of Judgment, which aims at systematicity by means of the notion of "purposiveness". The

[5] Even Philonenko, who is otherwise very eager to describe Bergson as an able interpreter of Kant, points out that when it comes down to the philosophy of biology, Bergson's rejection of Kant is based on a misinterpretation of the latter's views (Philonenko 1994: 260).

[6] Van de Vijver (1998) suggests that the important point in the issue of anticipation is organization rather than temporality. I concur, but would like to add that the shift towards organization itself forces us to rethink the temporality of an organized system.

issue of biological theory and the status of living systems is raised in the second part, the Critique of Teleological Judgment. Thus, the issue of the living system imposes itself from the onset as an issue that needs to be addressed separately and that is of the utmost importance to the completion of the "critical" phase of transcendental philosophy.[7]

The status of the living system within Kant's philosophy may seem fixed in advance by the fact that he discusses it in relation to teleology and purposiveness. Kant indeed starts off by indicating the popular concept of purposiveness, which involves a causality that has the form of an intentional act.[8] He quickly limits this to artefacts, however, by remarking that

> [i]n order to judge something, however, that we recognize as a product of nature, as a purpose, therefore as a *natural purpose* all the same, if at least there is no contradiction in this already, more is required. I will say, for now: a thing exists as a natural purpose if it is cause and effect of itself; for in this lies a causality the kind of which cannot be connected with the mere concept of a nature without ascribing a goal to it, but in this way it can perhaps be thought without contradiction, though it cannot be understood.[9]

This passage allows us to see how Kant already shifts the focus of the question concerning biological entities from that of purposiveness to that of a particular kind of internal causality. Most of this section will be devoted to teasing out that kind of causality, which, according to Kant, can only be *understood* by adopting the analogy with a final cause, but which need not be *thought* in this way.

In the following paragraph, Kant goes further in to the concept of a natural purpose. He distinguishes two criteria to which an entity must conform if it is to qualify as a natural purpose. The first criterion is what I would like to call the holism criterion: "For a thing as a natural purpose is required, *firstly*, that its parts are only possible (with respect to their existence and their form) through their relation to the whole."[10] Since products of art satisfy this criterion as well, Kant introduces a second criterion, which I call the circularity criterion: "If a thing as a natural purpose is, however, to contain in itself and according to its inner possibility a relation to purposes, i.e. as a mere natural purpose and without the causality of the concepts of rational creatures, then it is required, *secondly*, that its parts connect into the unity of a whole because they are to each other reciprocally cause and effect of their form."[11] Together, these two criteria serve to delineate natural purposes not only from mechanical entities and events, but from artefacts as well.

Kant holds that any entity conforming to the above criteria is mechanically inexplicable. Usually, he is taken to mean that natural purposes are recalcitrant to mechanical explanation because they (at least seem) to necessitate talk of intentional

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[7] It is already of some importance to note that Kant regarded the third Critique as merely critical: it could never serve as the basis for a doctrine (KdU AA V 170). This will become clear in the discussion on the status of teleological judgment in biological research.

[8] KdU, AA V 370.

[9] KdU, AA V 370-371 (My translation).

[10] KdU, AA V 373 (My translation).

[11] KdU, AA V 373 (My translation).

acts[12] and therefore point towards an intelligent creator. Whereas Kant will eventually allow for the analogy of intelligent design in biology, he also dismisses the idea that organisms in any way commit us to the notion of intelligent design. This notion merely serves as a regulative idea. In order to understand this peculiar thesis, we have to take a look at the notion of causality Kant believes to be unable to account for organisms.

Amazingly, Kant is exceedingly sparse in his characterizations of mechanical causation in the Critique of Teleological Judgment. A rare instance can be found 22 paragraphs after his discussion of natural purpose: "If we consider a whole with respect to the matter of its form as a product of the parts and their powers and capacities to connect in themselves (supplemented with other matters, that these bring to each other), then we are picturing ourselves a mechanical form of production."[13] This means that a mechanical explanation would involve an explanation of biological form in terms of the properties of the parts. First of all, it is to be noted that Kant is not a hylozoist and is therefore unwilling to ascribe non-mechanical powers to the parts that would allow them to produce the whole.[14] It would be incorrect to infer from this that he believes parts can never have the powers needed to form an organic whole, since he says that parts will never have the powers needed *in themselves*. Indeed, the mechanical powers of matter are those that can be esteemed in abstraction from any operation within a physical system[15], which is merely the outcome of the relations between the pre-existing powers of the parts. The powers and capacities of the parts of a living system, on the other hand, are formed by their figuring in the whole and their reciprocal causality.

This brings us to the problem of circularity in the doctrine of natural purposes: if the parts of organisms receive their form from their place in the whole and cannot have anything remotely like this form in abstraction from the whole, then the explanation of the structure of a living system has to start from that which can only be regarded as the end-product: the fully formed organism. Kant was very much aware of this difficulty, since he himself engaged in the discussions on preformation and epigenesis in the embryology of his day. Moreover, these passages show that he has a quite radical epigenetic view: the parts of organisms are not there yet in advance, they are only formed within the organism. This only exacerbates the issue of a seeming hysteron proteron at work in life itself.

In the important paragraph 65, however, in the passage immediately preceding his formulation of the two criteria for qualifying as a natural purpose, Kant operates a remarkable shift on the entire issue:

> The causal connection, insofar as it is thought by the understanding alone, is a link that makes up a series (of causes and effects) that always goes downwards. The things themselves that, as effects, presuppose others as cause, cannot at the same time be causes of the latter in a reciprocal way. This causal connection is called that of efficient causes

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[12] This reading can be found, for instance, in Guyer (2005: 110) and Kreines (2005: 288). The very fact that Kant cares to distinguish the intentional (absichtlich) from the purposive (zweckmässig) casts doubt on this assimilation of the two meanings.

[13] KdU, AA V 408 (My translation).

[14] Cf. KdU AA V 394-395.

[15] Kant makes this point in the *Metaphysical Foundations of Natural Science* (AA IV 536-537).

(nexus effectivus). On the other hand, however, a causal connection according to concepts of reason (goals) can be conceived as well that would, when considered as a series, involve dependency both upwards and downwards, in which the thing that is now labelled as an effect, nonetheless, when the series is considered upwards, deserves the name of cause of that of which it is the effect. [...] Such a causal connection is called that through final causes (nexus finalis). One could perhaps better call the first form the connection of real causes, the second that of ideal causes, because through this designation it is understood immediately that there can be no more than these two kinds of causality.[16]

A preliminary reading of this passage might suggest that Kant is indeed stating that there are only these two kinds of causality, and that the causal relations at work in a living system must therefore be of one of either kind. This is a mistake, however, that can be countered by taking Kant's distinct philosophical style into account. What we are witnessing here is the formulation of an antinomy between two kinds of causality, an antinomy that will eventually be resolved by indicating that the exclusivity of the dichotomy is a false one, even though it is perfectly correct within its own domain. Admittedly, Kant will not properly work out the nature of this antinomy until the Dialectic of Teleological Judgment. It is clear, however, that the tension must already be felt in the analytic, because of Kant's constant insistence that teleological judgment cannot be used constitutively.

This reconstruction allows us to look at the argument of the two criteria in a new way. The holism criterion does seem to suggest that an organism is analogous to an artefact and is for that reason mechanically inexplicable.[17] The circularity criterion, however, is not merely a further restriction on the first, but changes its outlook altogether. The inclusion of the second criterion does not so much delineate artificial from natural purposive entities as show that the analogy between artefacts and natural purposes is itself extremely misleading.[18] The main difference is that of *organization*: a natural purpose is an organized and self-organizing entity[19], and

> an organized being is, thus, not merely a machine, because a machine merely has locomotive power, but it possesses formative power, and one that communicates it to the materials that do not have it (organizes them) at that, i.e. a reproducing formative power that cannot be explained through locomotive capacity (the mechanism) alone.[20]

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[16] KdU AA V 372-373 (My translation).

[17] Interpreters usually agree that for Kant the inexplicability of natural purposes is deeply linked to the analogy their structure has with that of organisms, even though positions range from stating that he believes purposive structure proves the existence of an intelligent designer (Kreines 2005: 288) to that of reproaching him for not letting go of the artefact analogy despite having all the philosophical means to go beyond it (McFarland 1970: 139).

[18] This is meant as a challenge to Ginsborg's analysis of the two criteria, which she concludes by stating: "[I]t cannot be in virtue of their non-machine-like character that organisms are mechanically inexplicable in the sense invoked in the Antinomy. Our failure to explain organisms mechanically must instead be a function of whatever it is about them which requires us to regard them as purposes: something which an organism shares with a watch or with a hexagon in the sand." (Ginsborg 2004: 39).

[19] KdU AA V 374.

[20] KdU AA V 374 (My translation).

The result of this reasoning is that natural purposes differ *toto caelo* from artefacts, in spite of their clear prima facie analogy with them. Indeed, Kant goes on to say that "we say entirely too little about nature and its capacities in organized products when we call it an *analogon of art*; for in this case we think the artist (a rational being) outside of it. [...] We may come closer to this quality that cannot be investigated when we call it an *analogon of life.*"[21] It cannot be investigated, in Kant's opinion, because "the organization of nature has nothing analogous to any kind of causality that we know"[22]. It can hardly be disputed that Kant is saying here that neither of the two kinds of causality evoked a few pages earlier, i.e. efficient and final causality, are adequate for grasping the structure of a living system. The reason for this can only be found in one mark they both share: their representation of causal connection as *a linear series*.[23]

Here we witness the way in which the observation and investigation of living systems is the ultimate critical apparatus in Kant's philosophy. It challenges the reification of the a priori-s of knowledge catalogued in the first Critique. There, Kant was eager to describe how appearances were synthesized into objective knowledge by means of the figurative synthesis, which transformed subjective time and space into objective time and space.[24] This is done primarily through the imposition of an extensional, quantitative structure on both the forms (space and time)[25] and the matter (sensation)[26] of sensibility. Only by this imposition can the qualitative difference of sensibility be organized into stable objectivity. Thus, knowledge, for Kant, requires a particular interpretation of temporality. In the Critique of Teleological Judgment, we can see that time maintains its independence from the categorical determinations and can still be *thought* as a qualitative whole. It cannot, however, be *understood* in this way, since it can be conceived only in abstraction from the conditions of possibility of knowledge. For this very reason, Kant will never suggest to the biologist to plunge into subjective time in order to grasp the structure of the living. All he does is state that oscillating between efficient and final causes will always be necessary to supplement biological knowledge and that this very supplement will always remain subjective.[27]

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[21] KdU AA V 374 (My translation).

[22] KdU AA V 375 (My translation).

[23] A similar point is made by Rosen, who argues that machines can be grasped according to a reversed linear process: "For the machines we build ourselves, there is indeed a "set of parts" into which the machine can be resolved: these are obtained essentially by reversing the process by which the machine was fabricated in the first place" (Rosen 1991: 21); Depew and Grene (2004: 98-99) attribute the exact same argument to Kant.

[24] KrV B 151, B 157-158.

[25] I refer her to the Axioms of Intuition (KrV A 162-166 / B 202-207)

[26] Kant addresses this as the Anticipations of Sense perception (KrV A 166-176 / B 207-218).

[27] Mind that this is still a much deeper involvement of teleological reasoning in biology than some think. Breitenbach (2008: 367) believes, for instance, that the recognition of natural purpose is needed only in order to pick out biological processes, that we can in all likelihood then go on to investigate in a reductionist manner. This view holds that we can only recognize that we have reduced something to the physical level when we first recognize it as a phenomenon. On my reading, organisms are recalcitrant to mechanical explanation even within the scientific point of view.
On the position of the connection between the supplement and subjectivity, cf. Kolen & Van de Vijver (2007) and Van de Vijver & Van Poucke (2008).

3 Bergson on Duration and Organization

Contrary to Kant, Bergson is quite willing to point to the conception of time glossed over by modern science in its search for objective knowledge. It is, in fact, that which he admitted to make up the very core of his work.[28] This imposes the need to adopt a different strategy for clarifying his views on the relationship between organicity and temporality. Since the issue of temporality is not one that appears only in the margins of Bergson's system, I will need to address some core discussions of this notion, whereas in Kant's case I could focus on the specific paragraphs in which the issue was addressed directly. Moreover, I will have to do justice to what is considered a necessity by many Bergson scholars, namely presenting his views in the order in which he formulated them.[29] For this reason, I will start off by discussing his account of multiplicity and temporality in *Essai sur les données immédiates de la conscience*, which will in turn need to be clarified by discussing the distinction between two kinds of memory in *Matière et mémoire*. Only by investigating these passages can we understand Bergson's philosophy of biology as it figures in the first chapter of *L'évolution créatrice*.[30]

First, we must direct our attention to the opening paragraphs of the second chapter of the *Essai sur les données immédiates de la conscience*. In the previous chapter, Bergson has attacked the then-prevailing psychophysical idea that psychological states have magnitudes, more precisely *intensive* magnitudes. The idea of intensive magnitude, Bergson concludes at the end of that chapter, "is, thus, situated at the junction of two currents, of which the first brings us the idea of extensive magnitude from the outside, and the other has went to look in the depths of consciousness, in order to bring to the surface the image of an inner multiplicity"[31]. It is this latter kind of multiplicity that he intends to investigate here. He does this, however, by first investigating the former kind of multiplicity with respect to its characteristic mark: extension. From the very onset, then, Bergson's theory is directed against a reified practice of quantification that goes hand in hand with a mathematization of both physical and psychic reality.

Bergson does not discuss the mark of extension in light of any of the highly advanced findings of modern mathematics. This is not because he had little knowledge of modern mathematics and wanted to limit himself to the basics. On the contrary, Bergson had always been a very able mathematician.[32] He rather chose the example of counting to show how the problematic metaphysical assumptions of modern science are

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[28] He does so explicitly in his letter to Harald Höffding concerning the latter's influential interpretation of Bergson's philosophy *La Philosophie de Bergson: Exposé et Critique* (EP 443).

[29] Cf. Jankélévitch (1959: 1), Philonenko (1994: 13), Worms (2004: 15).

[30] I would like to note in advance that my discussion here is directed at understanding Bergson's philosophy of biology, and for that reason I will have to make some abstraction from the place the problems addressed here have within his larger philosophical project (cf. Worms 2004: 174: "It concerns, indeed, understanding in the first place that life, as evolution, surpasses our intelligence, and must be thought as creation; but it concerns, in the second place, not merely thinking this creation, but understanding how this creation could have led to the very intelligence that opposes it despite being its effect as well!" (My translation)).

[31] ED 54 (My translation).

[32] Cf. Philonenko 1994: 24.

already carried by basic arithmetic, by the axioms that constitute the Peano-arithmetic: "Truth said, it is arithmetic that teaches us to fragment indefinitely the unities of which the number is made up."[33]

What, then, are the fundamental assumptions of basic arithmetic? "Every number is one, in fact," Bergson says, "since we represent it by means of a simple intuition of the mind and because we give it a name; but this unity is that of a sum; it embraces a multiplicity of parts that we can consider in isolation".[34] What Bergson seems specifically concerned with here is the way in which numbers are constructed or counted, starting from a unit. In a way, then, he is concerned with the metaphysical implications of the successor function. What he points to, in fact, is primitive recursion, which he discusses as follows: "In order for the number to increase as I advance, it is necessary that I hold on to the successive images and that I juxtapose them to every one of the new units of which I call forth the idea."[35] Thus, it is essential to the successor function that it can hold on to each previous application despite representing every application as completely identical. It is to operate as if every step is a new creation. Here, we can already see the basis of the famous dictum from *L'évolution créatrice* that "the world on which the mathematician operates is a world that dies and is reborn at every instant, precisely the one Descartes was thinking of when he spoke of continuous creation".[36]

The repetitive aspect of the successor function is, according to Bergson, intimately linked to another major feature of the quantitative, namely discontinuity:

> We should not deceive ourselves, in fact, as to the discontinuity of the number. It cannot be contested that the formation or the construction of a number involves discontinuity. In other words, like we said above, each of the unities with which I form the number three seems to constitute something indivisible while I operate on it and I pass without transition from the one that precedes to the one that succeeds. When I, however, construct the same number with halves, quarters or any units at all, these units still constitute provisionally indivisible units, insofar as they serve in forming this number, and it is still by jerks , by abrupt leaps, if I may say so, that we go from one to the other.[37]

Here, Bergson is already adamant that recognition of the divisibility of the units does not in itself provide the concept of succession needed to allow for a continuous series. For this very reason, he will transform the notion of temporality that involves that of a linear series of units in order to be able to allow for continuity. Far from constituting the true meaning of succession, the successor function is already contaminated by the image of simultaneity:

> It would not be possible to establish an order between terms without distinguishing them in the first place, without next comparing the places they take up; we perceive them, thus, as simultaneous and distinct multiples; in a word, we juxtapose them, and if we establish

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[33] ED 63 (My translation).
[34] ED 56 (My translation).
[35] ED 57 (My translation).
[36] EC 22 (My translation).
[37] ED 61 (My translation).

an order in the successive, then this is because the succession becomes simultaneity and projects itself in space.[38]

The concept of time Bergson would like to contrast with this one is formulated on the next page: "pure duration could very well be nothing else than a succession of qualitative changes that melt into each other, that penetrate each other, without clear contours, without any tendency to exteriorize from each other, without any kinship to the number: it would be pure heterogeneity".[39] The distinguishing relation of the elements of duration is, then, that of interpenetration, whereas the quantitative series is characterized by the impenetrability of its elements.[40] It is only in duration that free will is possible: determinism is linked to the idea of a reversible linear series[41] that forms the basis of the mechanical concept of causality[42]. In rejecting this conception of time, Bergson believes to have allowed for free, unpredictable acts that are nevertheless not arbitrary, but instead the result of the whole of one's history.[43] This cannot be understood, however, without a deeper understanding of Bergson's notion of personal history, more particularly of memory.

Almost at the very start of the second chapter of *Matière et Mémoire*, Bergson introduces the idea that the past survives in two different forms: motor mechanisms on the one hand and independent memories on the other.[44] He clarifies this distinction by offering the example of learning a lesson. He suggests in this respect that the learning of a lesson cannot be equated with the succession of individual sessions, but rather takes the form of a habit which already selects the relevant motor articulations within each session.[45] Thus, the memories of singular events cannot be said to persist merely through their integration in our learning schemes: they maintain their independency and

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[38] ED 76 (My translation).
[39] ED 77 (My translation).
[40] Cf. ED 65-66.
[41] ED 133.
[42] ED 157.
[43] ED 164-166.
[44] MM 82.
[45] MM 84. I am convinced that Bergson derives his analysis of the problems the notion of a habit poses for an event-based account of change from Félix Ravaisson (cf. Ravaisson 1984: 9-10), whose ideas on the topic he discussed briefly in an essay devoted to him: "The doctoral thesis that mister Ravaisson defended around that time (1838) [...] bears a modest title: On Habit. But it is an entire philosophy of nature that the author sets forth in it. What is nature? How can we represent its interior? What does it hide under the regular succession of causes and effects? Does it even hide something, or does it reduce, eventually, to an utterly superficial deployment of movements that interlock mechanically into each other? In keeping with his principle, mister Ravaisson asks for the solution of this very general problem to a very concrete intuition, the one we have in our own way when we contract a habit. For the motor habit, once contracted, is a mechanism, a series of movements that determine each other: it is the part of us that is inserted in nature and that coincides with nature; it is nature itself. Thus, in the habit, our inner experience shows us an activity that has passed, by insensible degrees, form consciousness to unconsciousness and from volition to automatism. Is it not, then, in this form, as an obscured consciousness and a benumbed will, that we have to represent nature? The habit offers us in this way the living proof of the truth that mechanism in itself does not suffice: it would be, so to say, nothing else than the fossilized residue of a spiritual activity" (PM 266-267) (My translation).

their details[46]. This, along with the findings concerning the problem of aphasia in psychology and physiology he discusses, suggests that memories subsist independently of the present, in a form of existence he calls "virtuality".[47] The virtual subsists despite not being recalled at this point by the memory. For this reason, he also calls it "unconscious"[48]. It is at this point that Bergson can shed new light on the conclusion of *Essai sur les données immédiates de la conscience*:

> Our past psychological life as a whole conditions our present state, without determining it in a necessary manner; as a whole it also reveals itself in our character, although no single past state reveals itself explicitly in our character. When united, these two conditions assure for each of the past psychological states a real existence, despite being unconscious.[49]

What this passage reveals, in the first place, is that past states are retained by a holist system of connections: it is the whole of character that ensures their subsistence. This recalls Kant's holist criterion. In the second place, it makes clear that each state is conditioned by every other state and conditions them in return: only in this way can we comprehend that they are conditioned by all without being fully determined. This points, again, towards Kant's second criterion for qualifying as an organized system: that of circularity. Thus, Bergson's duration, far from being a mere continuous succession, is a circular co-determination of states. In fact, Bergson does not so much reinstate the borders of simultaneity and succession against the confusion of mechanism as he dissolves them in a new kind of temporal immanence: that of the temporality of an organized system, characterized by virtuality and co-penetration.[50]

All that remains now is to see how this affects Bergson's conception of living systems as it figures in the first chapter of *L'évolution créatrice*. Bergson starts off by resuming his view of psychological organization:

> Our personality grows, matures, ripens incessantly. Each of its moments is a novelty that adds itself to that which existed before. Let us go further: it is not merely novel, but unpredictable. [...] even a superhuman intelligence could not have predicted the simple, indivisible form that gives its abstract elements a concrete organization. For predicting consists in projecting that which we have perceived in the past into the future, or in representing for a later time a new assemblage, in another order, of elements that have already been perceived. But that which has never been perceived and is at the same time simple, is necessarily unpredictable. This is, then, the case for each of our states [...]: it is

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[46] MM 86.

[47] MM 145.

[48] Bergson himself later believed his conception of memory had been confirmed scientifically and empirically by Freud (PM: 81). Indeed, Freud was insistent that his notion of the unconsciousness went further than "unconscious for now", and could equally mean "permanently unconscious" (Freud 1969: 158), thus allowing for an autonomous plane of unconsciousness. Gardner (2003: 112, 114) argues that Bergson's picture of the unconsciousness is in fact far removed from that of Freud, because he takes Bergsonist unconscious states to be ineffective, whereas Freudian unconscious states form a dynamic system rather than an aggregate. The analysis I have given here suggests that the Bergsonist unconscious is much more effective in the conscious precisely because it forms an organic system that constitutes conscious states.

[49] MM 164-165 (My translation).

[50] I am here adopting a view of the Bergsonist methodology from Deleuze (1966: 71).

simple and it cannot have been perceived yet, since it concentrates in its indivisibility the entirety of what has been perceived with, in addition, that which the present adds to it.[51]

Precisely the inverse of this is true for a material object: it is perfectly divisible and its states can be predicted because time is not really an issue here. The different states of such a system can be received and reversed without changing anything essential to the system.[52] Such a system is called unorganized: it is, to a certain extent, an arbitrary selection within material reality. Through this process of selection, science closes systems that are actually open, and abstracts for the time being from the complexity at hand.[53] Organized systems, on the other hand, close themselves, and this closure makes the mechanical analysis inappropriate.[54] Each organism, therefore, continues to present novel structures and behaviour that cannot be predicted on the basis of its parts. Bergson is for this very reason convinced that evolution cannot be understood as the superaddition of minor, almost insensible traits.[55] On the contrary, the whole of evolution must be regarded as a process which can be conceived of through neither mechanical nor final causality[56]: the process of the élan vital, which represents the unity of life through its different instances. This project can be said to be directed at the free, creative, novel act of human activity by dispensing the energy present in the world. It can only be presented as goal-directed in a metaphorical way, though: it is rather a process in which the past is drawn into present events by a process of interpenetration rather than concatenation.

4 Conclusion

To conclude, I would like to reconstruct the picture of the relationship between organization and temporality I have attempted to identify in the writings of Kant and Bergson. Both writers, on this reading, are extremely dissatisfied with both mechanist and finalist explanation[57], since each of these kinds of explanation stems from a conception of time which is inadequate to represent the organization of a living system. This is all the more important since both thinkers, on my reading, eventually deny the presence of any radically different force at work in living entities. It is the peculiar structure, the organization of the parts that is responsible for the non-mechanical and unpredictable phenomena. Thus, living systems introduce something non-mechanical in the world, rather than that they draw on an inherently non-mechanical cause in their structure. In this respect, living systems present a singularity: they are not the effect of a

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[51] EC 6 (My translation).
[52] EC 8-9.
[53] EC 10.
[54] EC 12.
[55] EC 62-65.
[56] Bergson's refutation of these two forms of thought can be found on EC 23-44.
[57] Hans Driesch, the major twentieth-century theorist of neo-vitalism, was eager to point out his dissatisfaction with the fact that Kant refused to conclude that organisms unambiguously require us to accept vital forces (Driesch 1922: 73-74). Bergson, on the other hand, felt some affinity with Driesch, but was clearly impatient with the term vitalism, which does not stress the fact that the distinctive feature should be duration rather than life nearly enough (cf. EP 444).

non-natural process, but they are fully natural processes that change the concept of nature altogether. For this very reason, living systems cannot themselves be anticipated, precisely because of the structure that makes them capable of anticipation.

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