Alfred North Whitehead, Precursor of Theories of Self-Creation

Alain BEAULIEU*

Abstract: Despite the popularity of the concept of self-organization in various fields of research since the 1970s, little attention has been paid to what distinguishes self-organization from self-creation. Alfred North Whitehead’s process philosophy provides the foundations for theories of self-creation by developing a radical critique of the evolutionism then current in self-organization theories. After highlighting some characteristics of process philosophy, we will analyze the reasons for the exclusion of various evolutionary doctrines by Whitehead (emergent, cosmologic and mutationist theory of evolution). We will then show how Gilles Deleuze’s principle of intensive individuation and Francisco Varela’s autopoietic systems are following in Whitehead’s footsteps by conceiving a non-progressive and multi-serial process of becoming for living units situated in a chaotic or semi-organized universe.

Keywords: self-creation; self-organization; chaosmos; evolution; process; autopoiesis.

Résumé : En dépit de la popularité rencontrée par le concept d’auto-organisation depuis les années 1970 aussi bien en physique, en biologie qu’en sociologie, bien peu d’attention a été portée sur ce qui distingue l’auto-organisation de l’auto-création. La philosophie des processus élaborée par Alfred North Whitehead jette les bases des théories de l’auto-création en établissant une critique radicale de l’idéal évolutionniste encore effectif dans les théories de l’auto-organisation. Après avoir mis en évidence quelques caractéristiques de la philosophie des processus, les motifs de l’exclusion par Whitehead de différentes doctrines évolutionnistes (évolutionnisme émergent, cosmologique et mutationniste) seront analysés. Nous montrerons finalement de quelle manière le principe d’individuation intensive défendu par Gilles Deleuze de même que le système auto-poiétique du vivant développé par Francisco Varela

* Laurentian University, Department of Philosophy, 935 Ramsey Lake Road, Sudbury, Ontario, P3E 2C6, Canada. (E-mail: abeaulieu@laurentienne.ca.)
From Self-Organization to Self-Creation¹

Beginning in the 1970s, the concept of self-organization garnered a great deal of popularity, becoming the focus of numerous scientific theories in research areas as diverse as sociology, biology, physics, and cybernetics.² However, the idea that systems have the capacity for autonomous organization had found applications long before the popularization of the concept. Kant’s notion of internal finality, according to which “[a]n organised being […] possesses in itself a formative power (bildende Kraft),”³ or the Darwinian theory of evolution, which assumes that organisms have an autonomous ability to reproduce and to regenerate in their environment, can both be considered as earlier expressions of the principle of self-organization. These considerations are part of a logic of de-divinizing the world and nature, in favor of the gradual conquest of immanence, realized to varying degrees.

Self-organization has also received a specific inflection from some authors, who describe the immanence of the world and of nature more radically, this time in reference to a principle of self-creation. These new theories of self-organization maintain the thesis of the autonomy of organisms, but no longer

¹ An earlier version of this paper was presented at the annual meeting of the Canadian Society for the History and Philosophy of Science, May 27, 2002, at the University of Toronto. The author thanks the external reviewers of the Revue d’Histoire des Sciences for their comments.


define them according to their orderly and evolutionary nature. The distinction between the concepts of self-organization and self-creation often remains poorly established. Worse, the two concepts are sometimes considered interchangeable. The merit for giving a foundation to new theories of self-organization by defining a fully self-creative universe should be attributed to Alfred North Whitehead (1861-1947). His “Process Philosophy” constitutes a matrix for ideas of self-creation whose aim is to oppose the self-organizing, gradualist evolution of organisms with an episodic, non-progressive transformism, conducive to greater individuation.4

To clarify the distinction between self-organization and self-creation, we first present a few elements of Whitehead’s process philosophy. We then separate out the main arguments of Whitehead’s critique concerning the Darwinian theory of evolution and subsequent evolutionary doctrines – emergent evolution, cosmological evolution, and mutationist evolution. These advances allow us finally to analyze the transition from self-organization to self-creation as Gilles Deleuze and Francisco Varela present it following Whitehead.

**Process, Disorder, and Self-Creativity**

Three periods in the development of Whitehead’s thought are usually defined. In the first, he was interested in mathematical logic, algebra, and geometry, which culminated in the *Principia Mathematica*, coauthored with Bertrand Russell.5 The second corresponds to his development of a philosophy and epistemology of nature based on the theories of electromagnetism, relativity, and quantum mechanics.6 The third stage is much

---

4  - The process philosophy of Whitehead is an important and often forgotten moment in theories of self-organization. The history of the concept prepared by the editors of the Cerisy conference proceedings above (see footnote 3 of this text) has no place for Whitehead. Most often, self-organization theories are traced to the 1970s – see for example the preface to Milan Zeleny, ed., *Autopoiesis: A Theory of Living Organization* (New York: North-Holland, 1981).


more metaphysical, where Whitehead set out his cosmology. It is mainly this last phase of Whitehead’s work, marked by the writing of *Process and Reality*, which will engage our attention here. Our reference to this book aims not to reconstitute the system of Whitehead’s last period through the complex conceptuality it implements – with its vocabulary of occasion, actual entities, eternal objects, prehension, ingress, concrescence, nexus, and so on – but rather to give, more modestly, some indications of what Whitehead meant by the notion of process.

The ambition of Whitehead’s philosophy of the organism is to give a speculative basis or a metaphysical foundation for the new physics. That which Descartes had done for Galileo, attributing a metaphysical meaning to the experimental method, Whitehead wished to accomplish for electromagnetic theory, the theory of relativity, and quantum theory, which enable a new conception of nature and organisms. More specifically, Whitehead feels the urgency to think of the spatiotemporal effectuation of natural processes in terms of how they correspond to recent scientific discoveries.

Descartes regarded nature as an extensive spatial plenum existing in time. The general theory of the electromagnetic field produced by Maxwell and that of quantum mechanics undermines the model of the *res extensa*, by conceiving of nature in terms of energy transmission. Whitehead consolidated this understanding and took a stand against the abstraction of extensive and timeless spaces by considering the energetic character of the act of process. “It is argued that the creature is extensive, but that

---

9 - This conception of Whitehead’s process philosophy is described in the preface to *Process and Reality*.
10 - Metaphysics is “strongly claimed” by Whitehead, who “has no intention to go beyond metaphysics, but to renew it from within,” Dominique Janicaud’s foreword to the French translation of *Process and Reality*, 16 and 21.
its act of becoming is not extensive.” The purpose of the theory of self-creation is to remove localized matter in favor of relationships between organisms, which are henceforth understood in terms of energy exchanges. In Galileo and Newton, perception allows objectified material data to be revealed, while in the metaphysics of Whitehead, the process becomes a matter of vibrations and potentiality.

[Mass now becomes the name for a quantity of energy considered in relation to some of its dynamical effects. This train of thought leads to the notion of energy being fundamental, thus displacing matter from that position. But energy is merely the name for the quantitative aspect of a structure of happenings; in short, it depends on the notion of the functioning of an organism.]

There can be no timeless space of pure localization, as the relationships between organisms are part of a temporality that can no longer be measured following an invariable scale. Time no longer corresponds to the famous fixed measurement of movement as Plato and Aristotle believed. According to the theory of relativity, time itself becomes a variable quantity dependent on the speed of effectuation processes that may also be situated at several different moments at once. “Whitehead here incorporates the paradoxes of the theory of relativity, namely the dislocation of simultaneity. According to this paradox, there is no universe at time \( t \) […] but only a local present, that is to say, relative to each event.”

Processes understood in the Whiteheadian sense constitute episodic exchanges – prehensions – between organisms enrolled in an intensive spatiality and temporal variability. Classical empiricism assumes that the past determines the future, and Kant’s transcendental philosophy posits the existence of an a priori level that makes experience possible. But with Whitehead, the man of science is never content to describe what is observed, nor does he have the capacity to know a priori what he puts

11 - Whitehead, Process and Reality, 69.
into things himself. Processes have, in fact, an episodic character that exceeds any form of preexisting or constructed objectivity. Thus, Whitehead’s critique of positivism is not only a challenge to essentialist and substantialist doctrines, but it also destroys the logic of “knowing subject / object of knowledge” by advancing the category of “superject.” The organic unity of the real (or actual entity) thought of as the superject is not an origin, but a result, situated in the middle of an infinite number of prehensions.

The Critique of Pure Reason describes the process by which subjective data pass into the appearance of an objective world. The philosophy of organism seeks to describe how objective data pass into subjective satisfaction, and how order in the objective data provides intensity in the subjective satisfaction. For Kant, the world emerges from the subject; for the philosophy of organism, the subject emerges from the world – a “superject” rather than a “subject.”

The episodic characteristic of the exchanges between organisms through which nature transforms itself makes all repetition of phenomena in nature impossible. Thus the waves produced by a pebble thrown into the pond never prehends in the same way. And yet Whitehead refuses to reduce this type of process to a simple accident or a pure spontaneous appearance. In other words, each process has its own determinable rationality that takes place in a “local present” or “immediate present.”

The rational determination of a process is only valid based on the relativity of this local present. The process is thus irreducible to that which is clearly unstable in form. On the contrary, apparently time-invariant actual entities, such as, to use the examples given by Whitehead, the obelisk of Cleopatra or the block of marble, are processes just as much as waves at sea or gust of wind are. These actual entities are continually becoming in nature, prehending and being prehended in a multitude of ways by other organisms. In this context, processes are not permanent; they change, moving from one stable state to

15 - Whitehead, Process and Reality, 27 (first usage) and widely used elsewhere.
another. They simply transform, appearing and disappearing in the local present.

The unpredictable and unstable nature of processes demonstrates the pervasiveness of the possibility of chaos in the world. In contrast to the Greek and Christian models of creation, the cosmology of Whitehead supposes neither a radical break between order and disorder, nor a progressive and growing conquest by organization. For Whitehead, confusion or disorder is a possible element as critical to the world as is the possibility for things to harmonize or to find order among themselves. “There is no reason, so far as our knowledge is concerned, to conceive the actual world as purely orderly, or as purely chaotic.”

The coexistence of the possibilities of order and chaos implies a conception of harmony which “requires the due coordination of chaos, vagueness, narrowness, and width,” where the universe makes of these oppositions (cosmos / chaos) “elements in the nature of things, […] incorrigibly there.” Ultimately, it is the always-specific nature of order relative to each process that imparts a chaotic aspect to a universe of procedural changes:

“Order” is a mere generic term: there can only be some definite specific “order,” not merely “order” in the vague. Thus every definite total phase of “givenness” involves a reference to that specific “order” which is its dominant ideal, and involves the specific “disorder” due to its inclusion of “given” components which exclude the attainment of the full ideal. The attainment is partial, and thus there is “disorder”; but there is some attainment, and thus there is some “order.” There is not just one ideal “order” to which all actual entities should attain and fail to attain.

Potentially semi-ordered organisms are fully empowered inasmuch as they are not created. In addition, their mode of

19 - Whitehead, Process and Reality, 112.
21 - Whitehead, Process and Reality, 84. The principle of order or organization is associated by Whitehead with God, who preserves the world from pure chaos. It is, however, an immanent God (neither Father nor Creator) who becomes, with organisms entering into processes with the world. See the last chapter of Whitehead, Process and Reality, 342-51, entitled “God and the World.”
operation or their manner of prehending and being prehended by other organisms remain determinable. So much so that processes in each local present produce new operational rules. This is why Whitehead makes the principle of creativity the motor of the future of the universe. He writes, “Creativity is the universal of universals characterizing ultimate matter of fact. It is that ultimate principle by which the many, which are the universe disjunctively, become the one actual occasion, which is the universe conjunctively.”

Inasmuch as full autonomy is granted to nature, natural creativity becomes self-creativity. Whitehead says, “The world is self-creative; and the actual entity as self-creating creature passes into its immortal function of part-creator of the transcendent world”; “[t]he freedom inherent in the universe is constituted by this element of self-causation.” Processes never cease to create new operational rules for themselves, such that the full “self-creative unity of the universe” defies all the laws of becoming. Classic modern science has singularly failed to consider this “self-productive” ability of nature.

We are now better able to determine what distinguishes self-organization from self-creation. While the first defends partial immanence by giving nature an autonomous capacity for regeneration, favorable to a progressive ordering of organisms, the second offers a more radical conception of immanence in considering the omnipresent possibility of chaos in the universe, which acts to neutralize the representation of a strictly evolutionary becoming. Therefore, it becomes clear that evolutionist doctrines based on ideals of self-organization comprise the main targets of Whitehead and supporters of self-creation.

Critique of Evolutionist Doctrines

The idea that things, man and the universe, were not created and defined once and for all by a divine power, but that they become and transform themselves through self-organizing, invaded all spheres of culture and knowledge (from botany to

Alfred North Whitehead, Precursor of Theories of Self-Creation

sociology) with incredible speed over the last two centuries. Our tradition rejected this hypothesis for thousands of years in favor of a creationist view of reality understood either through the eidos which transcends the diversity of changing forms, or according to the ousia which endures in change. Charles Darwin developed a new progressive paradigm in studying species, not as immutable essences, but rather as having an origin, a future, and possibly an end. Between 1831 and 1836, Darwin went around the world collecting data that confirmed his hypothesis that humans occupy no privileged place in nature, but rather evolve with nature just as all other species transform and progress. Darwin thought of natural selection as the universal mechanism of evolution by which the organisms best adapted will survive the perpetual struggle in which they are engaged. In On the Origin of Species (1859), Darwin also advances the thesis of gradualism, whereby adaptive speciation can take place only slowly and gradually.

George R. Lucas has clearly shown that the theory of evolution played no significant role in Whitehead’s metaphysics, while also lamenting the fact that Whitehead never took the time to properly situate his thoughts in relation to contemporary evolutionary doctrines. There is however no doubt that Whitehead’s process philosophy defends fundamentally anti-evolutionist positions. In the sixth chapter of Science and the Modern World, devoted to the science of the nineteenth century, Whitehead says nothing at all on the subject of Darwin. He justifies this omission by writing: “There is nothing to evolve, because one set of external relations is as good as any other set of external relations. There can merely be change, purposeless and unprogressive.”

In his Dialogues, Whitehead leaves no doubt about the anti-Darwinist character of his thought:

Darwin [...] is truly great, but he is the dullest great man I can think of. He and Huxley had grasped the principle of evolution in material life, but it never occurred to them to ask how evolution in material life could result in a man like, let us say, Newton.\textsuperscript{28}

In the text that follows this quote, Whitehead criticizes Darwin and his disciple Thomas H. Huxley of having ignored the critique of the inevitability of progress made by the English writer Samuel Butler. According to Butler, there is no progress of the species by natural selection because the organism undergoing self-creation is itself the cause of its transformation.\textsuperscript{29} In other words, the limit of the theory of evolution is defined by the fact that it ignores the creative potential of an individual or of a particular organism, irrespective of the general species to which it belongs. In addition, the process of self-creation gives no priority in to any particular line of becoming. This evidently escapes the reason of the evolutionist who favors the linear explanation. Whitehead declares:

\begin{quote}
The evolution of history is incapable of rationalization because it exhibits a selected flux of participating forms. No reason, internal to history, can be assigned why that flux of forms, rather than another flux, should have been illustrated.\textsuperscript{30}
\end{quote}

In the logic of Whitehead concerning self-creation, the only possible way forward is to “transcend the evidence,” and consider the distinction between true and false “largely irrelevant.”\textsuperscript{31} Whitehead continues:

\begin{quote}
There are no precisely stated axiomatic certainties from which to start. There is not even the language in which to frame them. The only possible procedure is to start from verbal expressions
\end{quote}

\textsuperscript{29} - Samuel Butler, \textit{Evolution, Old & New, or the Theories of Buffon, Dr. Erasmus Darwin and Lamarck, as Compared with that of Charles Darwin} (London: Jonathan Cape, 1921).
\textsuperscript{31} - Whitehead, \textit{Process and Reality}, 7 and 11.
Alfred North Whitehead, Precursor of Theories of Self-Creation

which, when taken by themselves with the current meaning of their words, are ill-defined and ambiguous.\textsuperscript{32}

Whitehead places evolutionism on the side of evidence to be overcome, with the oppositional regime of true / false to be destroyed, axiomatic certainties to be dissolved in an “anexact” language, and so on. Yet Whitehead also seems to show some sympathy for later evolutionist doctrines, including emergent evolutionism, cosmological evolutionism, and mutationist evolutionism. We should clarify this situation.

We often associate doctrines of emergent evolutionism that define a non-positivist science of localized becoming with the wake of a spiritual movement. The evolutionary mind is irreducible to the material, emerging from it at the end of a historical process. Thus, for example, in Creative Evolution (1907) Henri Bergson describes his concept of intuition defined by an ability to apprehend the inner maturation of things in time. According to Bergson, the true doctrine of becoming does not try to “reconstruct […] evolution with fragments of the evolved,”\textsuperscript{33} but rather lies at the heart of the uninterrupted progress of the spiritual life which governs and directs matter. Emergent evolutionism implies a failure of mechanical-scientific thinking to grasp the emergence of vibrant and unpredictable novelty based on previous experience. The Bergsonian theory of creative or spiritual evolution was particularly well received in England by Samuel Alexander (sometimes called the “British Bergson”) and Conwy Lloyd Morgan.\textsuperscript{34}

In the preface of Science and the Modern World, Whitehead considers the books by Morgan and Alexander to be “very suggestive.”\textsuperscript{35} In addition, Process and Reality contains several

\textsuperscript{32} - Whitehead, Process and Reality, 13.
\textsuperscript{35} - “There has been no occasion in the text to make detailed reference to Lloyd Morgan’s Emergent Evolution or to Alexander’s Space, Time and Deity. It will
references to Bergson, Alexander, and the notion of emergence. This apparent affinity between emergent evolutionism and process philosophy is explained by the fact that the authors seek to establish a science on non-positivist bases. Following Bergson and the reception of his thought by the English school of emergent evolution, Whitehead wished to place himself “in the flow of things.” Moreover, he explicitly endorsed the Bergsonian critique of the human intellect in its tendency to spatialize the universe, while ignoring the “fluence” of becoming, and analyzing it “using static categories.”

Does this mean that Whitehead’s metaphysics of process is similar to a form of emergent evolutionism? Well no. Despite the parallels drawn by Whitehead himself between his thought and the Bergsonian school, there still exists an underlying incompatibility between process philosophy and the theory of emergent evolution. The position of emergent evolution that Whitehead cannot admit concerns the spiritual energy of life, understood by Bergson as the engine of becoming, which transports organisms toward an ever increasing order. Whitehead rejects this naïve intuitionism in favor of the ability to determine rationally the operation of any process related to a local present. Like the theories of relativity and electromagnetism, as well as quantum mechanics, process philosophy is able to determine “exactly” a process’s particular behavior or logic of operation at a specific time, without trying to fit it into an evolutionary line. Against Bergsonian intuitionism, Whitehead’s model remains primarily that of mathematical physics.

Cosmological evolutionism is the second major evolutionary thread in relation to which one might be tempted to place the process philosophy of Whitehead. One of its most illustrious...
representatives was the German naturalist Ernst Häckel, who was also the principal architect of the Kosmos journal, published from 1877 to 1886, which focused primarily on the debate between philosophy and natural sciences. Häckel also wrote many books inspired by both Darwinian theory and Immanuel Kant’s monistic cosmogony that he developed in Allgemeine Naturgeschichte und Theorie des Himmels (Universal Natural History and Theory of Heaven, 1755). In this youthful work, Kant establishes the origin of the universe as emerging from a “primordial chaos,” consisting of gas which solidified and warmed gradually to create nebulae, solar systems, and planets. In his Natürliche Schöpfungsgeschichte (History of the Creation of Organized Beings from the Natural Laws, 1875), Häckel continues along this Kantian path. He considers that the appearance of life on Earth proceeded from the cooling and solidification of the globe’s surface, the condensation of water to produce rain, and the formation of valleys that filled with silt to become fertile environments conducive to the evolution of species.

The subtitle of Whitehead’s Process and Reality is “An Essay in Cosmology,” but the text has very little to do with cosmological evolutionism. Whitehead’s process philosophy is not to be taken as a “grand narrative” of origins that tells the story of the gradual triumph of order over disorder. Whitehead’s cosmology does not present chaos as gradually disappearing in favor of the formation of the world. Whitehead has a different starting point – rather than gradually separating from chaos, the cosmos coexists with the possibility of disorder.

Let us now turn to the third term of comparison – Whitehead and mutationist evolutionism. Whitehead’s interest in the discontinuity of processes seems to parallel certain interests of mutationist evolutionism. We owe the discovery of evolutionary systems where the motor of the living world lies in radical

---

mutations, bringing about abrupt variations, to the Dutch botanist Hugo de Vries.\textsuperscript{39} This discontinuity principle opposes the slow gradualism of Darwinism, which implies a multitude of transitional forms. The positions of de Vries concerning the strength of “mutants” struck a chord among many life science specialists. Thus, Georges Canguilhem believed that, in contrast to mere gradual variability, radical changes and anomalies may suddenly create new species: “It does not seem questionable that mutations may be at the origin of new species.”\textsuperscript{40}

Whitehead’s principle of self-creation may give the impression of participating in the definition of this new scientific paradigm of mutational becoming, dominated by the absence of transitional forms. Whitehead’s statement that “there is a becoming of continuity, but no continuity of becoming”\textsuperscript{41} also seems to be closer to the theses of mutationist evolutionism. But for Whitehead, the fact that there is nothing like a “continuity of becoming” does not only mean that there are no transitional forms. The discontinuity of processes also means that there is no unique seriality, and that processes of self-creation produce a multiplicity of lines of becoming, of which none is privileged. This multiple seriality escapes mutationist evolutionism which, despite its emphasis on discontinuity, always thinks of creative advance as a single linear series. In contrast to evolutionary organization, the Whiteheadian principle of creativity maintains a tension between multiple serial lines of becoming: “A multiplicity has solely a disjunctive relationship to the actual world. The ‘universe’ comprising the absolutely initial data for an actual entity is a multiplicity.”\textsuperscript{42}

\textsuperscript{39} - Hugo de Vries, \textit{The Mutation Theory: Experiments and Observations on the Origin of Species in the Vegetable Kingdom} [1900-1901], 2 volumes (Chicago, IL: Open Court, 1909-1910).

\textsuperscript{40} - Georges Canguilhem, \textit{Le Normal et le pathologique} (Paris: Presses universitaires de France, 1966), 89. See also Francois Jacob, \textit{La Logique du vivant} (Paris: Gallimard, 1970), 317: “Evolution is built on incidents, rare events, errors. That which would lead an inert system to its destruction becomes a source of novelty and complexity in a living system. Accident transforms into innovation, and error into success.”

\textsuperscript{41} - Whitehead, \textit{Process and Reality}, 35.

Whitehead’s thought can be described as “post-evolutionist,” because the principle of autonomous creativity which governs organisms gives no priority to one line of becoming, or to any progressive orientation in particular. We have seen that, from Whitehead’s standpoint, the emergence of a man like Newton absolutely escapes any explanation from the evolutionary perspective. Whitehead uses a similar example to invalidate not only Darwin’s theory, but also all subsequent evolutionary doctrine: “The various evolutionary formulae give no hint [...] why there should be cities.” The circumstances of novelty can only be determined based on a local present, and never with reference to a global and general history as suggested by the Darwinian theory of evolution and all other evolutionary doctrines. And there is a multiplicity of lines of becoming that are effective simultaneously.

The Intensive Field of Individuation (Deleuze) and Autopoietic Units (Varela)

In Whitehead’s work, as for proponents of the new thinking of self-creation, recourse to the ideal of progress is still insufficient to account for the self-creative power of organisms. We shall examine the ways in which Deleuze and Varela defend a principle of self-creativity by reproducing the gesture initiated by Whitehead.

Deleuze considered *Process and Reality* as “one of the greatest books of modern philosophy.” This praise is preceded by a critique of evolutionism made in the pure Whiteheadian spirit. Matter is understood by Deleuze in terms of differential regimes of intensity, an issue which obviously escaped Darwin. Deleuze maliciously writes: “The leitmotif of *The Origin of Species* is: we do not know what individual difference is capable of!”

46 - Deleuze, *Difference and Repetition*, 248-54.
47 - Deleuze, *Difference and Repetition*, 248.
Deleuze is therefore less interested in the identity of taxonomic units – species – and their differences, than in differentiation itself, while deploring the fact that “for Darwin, […] individual difference does not yet have a clear status.” With Deleuze, the species gives way to the “intensive field of individuation,” the generality is devalued in favor of particular laws of organization.

Like Whitehead, Deleuze believes that singularity is produced through a process of individuation, which is not dominated by the principle of a progressive and evolutionary self-organization, by an ideal of gradual transformation and a unique and serial linearity. Individuation is rather produced by cosmic forces which impinge upon organisms, never leaving them unchanged. Thus Deleuze calls into question the primacy of the organization of the organs. To be consistent with the state of continuous change and shift in the universe, Deleuze prefers the infinite and productive speeds of relativity to the ideal of measurement. He promotes the minor, the rhizome, the imperceptible, molecular revolutions, and quanta over the Cartesian tree of knowledge and the great revolutions. It is thus no surprise that Deleuze draws from Whitehead’s philosophy of the organism, where classical determinism gives way to a multiplicity of specific rules. Everything becomes a matter of events, for which Whitehead’s metaphysics is able to provide an adequate explanatory framework.

Despite the fact that the context of the generation of an event is separated from any identifiable law, it does not spontaneously appear in the pure contingency of the moment. It is not a passing accident. This calls to mind the examples of the obelisk and...
marble block given by Whitehead. To account for the specific temporality of the event, Deleuze brings in the Stoic notion of *Aion*, the eternal present.\(^{51}\) Neither eternal essence nor instant accident,\(^{52}\) the event coexists in a singularity, which is one of its distinctive features. The writer Joë Bousquet, condemned to total immobility for over thirty years until his death, after suffering a serious injury during the First World War, is emblematic for Deleuze’s idea of the event: “My wound existed before me,” wrote Bousquet, “I was born to embody it.”\(^{53}\) This event (the injury) is not a state of affairs which takes place in chronological and universal time. Deleuze also undermines the ancient concept of time, defined by Plato and Aristotle as the standard or measure of motion.\(^{54}\) The event is divested of origin and end, presenting itself as a special inevitability, with regard to which the singularity affected by it must show itself worthy by understanding it as an “eternal truth, regardless of its spatiotemporal effectuation.”\(^{55}\) What relationship do Deleuzian events have to each other? Their effects go beyond the simple regime of appearance / disappearance, and are determined as being between them in some way. In *The Logic of Sense*, Deleuze destroys the rational principle of causality in favor of a particular type of interaction between events, termed “quasi-causality.” According to the particular type of logic at work in *Alice in Wonderland* by Lewis Carroll, quasi-causality is paradoxical; it creates contradictory effects and irrational sequences from the point of view of classical logic. “Events are never causes of each other but rather enter the relations of quasi-causality, an unreal and ghostly causality, endlessly reappearing in the two senses.”\(^{56}\) An event can be the simultaneous cause or quasi-cause of two other contradictory effects, causing an unpredictable relationship or a discontinuous current.

\(^{51}\) - Deleuze, *The Logic of Sense*, 10, 53, 61, 63-64, 74, 77, 81, 141-44, 146-47, 150, and 162-68.
\(^{52}\) - Deleuze, *The Logic of Sense*, 53.
\(^{53}\) - Deleuze, *The Logic of Sense*, 148.
\(^{55}\) - Deleuze, *The Logic of Sense*, 147 and 150.
\(^{56}\) - Deleuze, *The Logic of Sense*, 33 (see also the 14th series).
Whitehead presents a cosmological model where all possible worlds, thought of as an equal number of systems of organization, are realized. This is indicated by the use of Whitehead’s expression “every world is realized.”\(^{57}\) In contrast with Gottfried Wilhelm Leibniz, the realized worlds are no longer incomposable (the most harmonious does not triumph over all others). There is a compossibility of each world realized or each set of laws. Thus, two systems based on contradictory organizational rules may coexist in reality. For Deleuze, as for Whitehead, there are several realized worlds and each of these worlds is ordered according to a particular organization and rationality. Each actual world has its own laws of organization, which may conflict with the order of the other worlds without calling into question the logic of operation of the natural universe or annihilating the particular type of organization of the whole.

Like Whitehead, Deleuze no longer supports the traditional model of a world understood as a cohesive unit. Reality is rather chaotic in nature: “The divergence of the affirmed series forms a ‘chaosmos’.”\(^{58}\) In the sixth chapter of his book *The Fold: Leibniz and the Baroque*, Deleuze explicitly calls upon the episodic chaosmos of Whitehead. It welcomes Whitehead for having developed a grand logic of the event where “bifurcations, divergences, incompossibilities and discord belong to the same motley world [...] divergent series are endlessly tracing bifurcating paths, it is a chaosmos. [...] Classical reason has toppled.”\(^{59}\) In sum, Whitehead’s critique of evolutionism opens onto a philosophy of a self-created process that is fully compatible with the Deleuzean representation of a chaotic universe. In this chaosmos, singularities enter differentiation processes at infinite

---

57 - Whitehead, *Process and Reality*.
58 - Deleuze, *The Logic of Sense*, 176. See also Deleuze, *Difference and Repetition*, 57 and 199.
speeds. Disorder, there, is no longer something past, but rather manifests itself as an omnipresent possibility in the universe.60

The post-evolutionist philosophy of self-creation developed by Whitehead found another resonance in the work of Varela.61 “Biological phenomenology is neither more nor less than the phenomenology of autopoietic systems in material space.”62 Autopoiesis is not a capacity among others, because it is, in itself, “necessary and sufficient to define the organization of living beings.”63 What is the autopoietic nature of living units? Autopoiesis is the ability for living singularities to produce, by themselves, their unity through a continuous series of disassemblies and interactions of singularities:

An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and

60 - It may be tempting to trace the principles of self-creation to Friedrich Nietzsche, who also presents a critique of the ideal of progress of organisms and Darwinian evolutionism. See, for example, Friedrich Nietzsche, *Twilight of the Idols*, trans. R. J. Hollingdale (Harmondsworth, UK: Penguin, 1977) in the section “Ramblings of an Untimely Character” § 14. However, the predominance given by Nietzsche to disorder and chaos (see, for example, Friedrich Nietzsche, *The Gay Science*, trans. Walter Kaufmann [New York: Vintage Books, 1974] § 109) prevents him from thinking that a partial order is possible, that is, the chaosmos, characteristic of Whitehead’s theories of self-creation.


63 - Varela, *Autonomie et connaissance*, 48 [back-translated from the French]. Author’s emphasis.
(ii) constitute it (the machine) as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network.\textsuperscript{64}

Following Whitehead, Varela clearly distinguishes between, on the one hand, evolutionary life assimilated to a sequence of causal productions or to a unique sequence of historical changes and, on the other hand, living units conceived in terms of autopoietic phenomena. Thus, Varela opposes the theory of evolution and its ideal of “modification of a previous state” with the singularity of “the independent event” or “autopoietic unity.”\textsuperscript{65} This allows the biological phenomenology of Varela to relegate evolutionary determinism to a lower degree of importance, in favor of the capacity for self-production of living units. It is, therefore, not the species that transform over time and adapt to the environment, but a principle of creativity, allowing each living unit to produce, by itself, its own mode of function.

History as a description of the antecedents of a phenomenon is not part of the explanation of the phenomenon. […] These [autopoietic] units do not form a historical network and no evolution occurs. […] It is inaccurate to speak of evolution as the history of transformations of a single unit: units have only ontogenies. […] A species does not evolve: as a unit in the domain of history, it possesses only the history of its changes. […] Reproduction and evolution, as well as all phenomena which flow from them appear only as secondary phenomena, subject to the existence and autopoietic operation of these systems.\textsuperscript{66}

The philosophies of Whitehead, Deleuze, and Varela can aid a better understanding of the distinction between the concepts of self-organization and self-creation. We have shown how the self-organization of organisms, in which the Darwinian tradition of evolutionism participates, considers the act of becoming as being a single series of linear evolutionary changes, whereas

\textsuperscript{64} - Varela, \textit{Autonomie et connaissance}, 45 [back-translated from the French].
\textsuperscript{65} - Varela, \textit{Autonomie et connaissance}, 67 [back-translated from the French].
\textsuperscript{66} - Varela, \textit{Autonomie et connaissance}, 67-71 [back-translated from the French].

self-creation, initiated by Whitehead’s process philosophy, instead conceives these transformations in terms of an experiment of divergent series devoid of any ideal of progress. In short, from self-organization to self-creation, there is an increase in the degree of autonomy given to life which, in the words of Whitehead, “refuses to be embalmed alive.”