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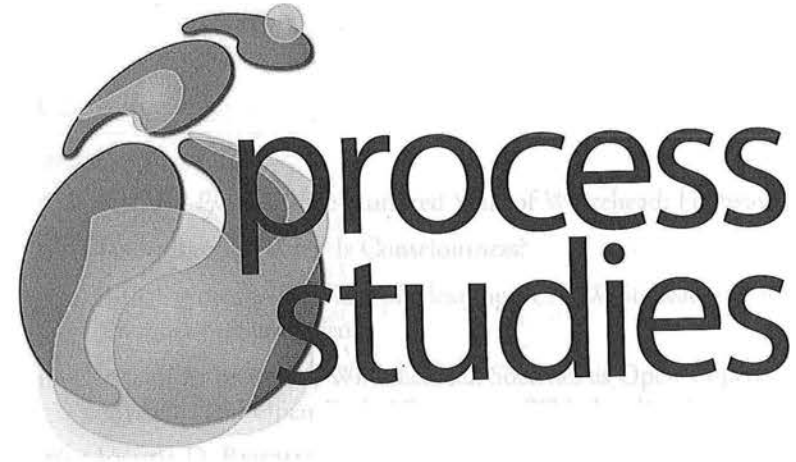
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The Bio-Philosophical "Insufficiency" of Darwinism for Henri Bergson's Metaphysical Evolutionism

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ABSTRACT: *The main goal of Henri Bergson's philosophy of nature is to offer a dynamic understanding of living phenomena. It is in this context that we maintain that the author left us a "bio-philosophy," that is, an interpretation which, by adopting a positive model of biology as a cognitive paradigm, describes the essential character of living activity as time or duration (durée). Bergson's positive metaphysics, which brings science to the metaphysical field and provides an inner perspective of the vital principle, consolidated itself in the study of evolutionary theories like Darwinism. However, the specificity of the perspective Bergson presents to us lies in the fact that he positions himself as a philosopher and not as a scientist: he does not seek a merely scientific explanation of reality, but an integral vision that allows us to give scientific evolution a metaphysical reading. Thus, when Bergson upholds the insufficiency of pure Darwinism, and proposes a true evolutionism, it is because he thinks that the only way to understand the evolutionary nature of life is by overcoming a strictly mechanistic perspective. For Bergson, such an interpretation results from the artificial way in which our intellectual functions deconstruct reality and lead to an incomplete and fragmented reading of the evolution of organisms. As a philosopher he seeks an explanatory level which, being scientifically based, is not restricted to the physico-chemical limits of reality. For that reason, Bergson claims that the inner cause of evolution is an activity where growth and division occur as a natural result of the divergence of life's tendencies.*

Henri Bergson was born in 1859, the same year that Darwin published his famous *On the Origin of Species*. The way in which Henri Bergson refers to

Darwin's works has been the subject of some debate in recent years.¹ One of the areas of dispute arises from the fact that Bergson—one of the first contemporary thinkers to combine the empirical investigation of science with the metaphysical problematization of philosophy—did not make an exhaustive study of Darwin's work. If we consider how strongly Bergson was concerned with the scientific evolutionism of the second half of the 19th century, the apparent lack of a detailed dialogue with fundamental texts such as *On the Origin of Species* becomes more noticeable.

Thus, our article has two purposes: to demonstrate that Bergson's interest in Darwin's work goes beyond what concerns specifically evolutionary matters; and to show that Bergson's study of Darwin's work, and of Darwinism, was fundamental to the construction of Bergsonian evolutionism.

BERGSON'S INTEREST IN DARWIN: A HERMENEUTICAL MISUNDERSTANDING

With the recent Darwin-related celebrations—his bicentenary and the 150th anniversary of the publication of his greatest work, both events in 2009—it is sometimes easy to forget that the status conferred on him today has taken several decades to achieve and that his work was subject to much criticism and rejection at first.

Mayr warns of the need to distinguish between the various "theories" underlying what is commonly labelled as "the theory" of Darwin, and points out that while the idea of a natural evolution and common ancestry between species was given rapid approval during the years following the publication of *On the Origin of Species*, the precise way in which the multiplication of species occurs has remained controversial for many decades (*Toward* 185-94). It is necessary to take this fact into account when considering the writings of a philosopher, or even a scientist, from the late 19th and early 20th centuries.

At the beginning of the 20th century, Bergson formulated his own evolutionary thought, which was laid out in *Creative Evolution* (*L'évolution créatrice*), first published in 1907. At that time, the principle of natural selection still met with opposition, particularly from supporters of natural theology. For them, accepting that living beings evolved as the result of purely natural mechanisms implied not only the abdication of God's role in creation, but also meant handing over cosmic destiny to indeterminate and indeterminable forces. Moreover, Bergson was interested in the construction of a *metaphysics of life* in which it was essential to integrate

the findings of the *sciences of living beings* (*La pensée* 28). Consequently, he studied evolutionary theories in general, focusing on what they said about living phenomena. This is why, as we will see, when outlining what he considered to be an authentic evolutionary theory, Bergson drew not only on Darwinism, but also on other main evolutionary models upon which the great debates of the era reflected, such as the theories of Herbert Spencer, Hugo De Vries, Lamarck, or Theodor Eimer.

Indeed, it would have been entirely unreasonable for Bergson to overrate Darwin's work when compared to all the other scientific theories of evolution of that time, since Darwin represented, according to Bergson, one scientific proposal among others. Even though Bergson did actually know works such as *On the Origin of Species*, his philosophical ideas consisted of a "bio-philosophy"² which endowed the biological sciences with an intuitive metaphysics of duration (*durée*).³ The Bergsonian mode of explanation aimed at pointing out the evidence of the facts of experience as the foundation for a true metaphysics: the *positive metaphysics*.⁴ Thus, Bergson understood Darwinian writings about natural evolution as part of a wider group of positive proposals.

It should also be noted that the French scientific community took some time to accept Darwin's work as a legitimate theory of evolution, deferring their recognition of the characteristic features of Darwinism and resisting its official acceptance. The chief reason for this resistance was institutional pressure fueled by certain prestigious naturalists, which promulgated what Thomas Huxley, a close colleague and friend of Darwin, referred to as a *conspiracy of silence* (see Stebbins). Illustrative of this are the eight years of discussion and debate at the *Académie des Sciences de Paris* about accepting Darwin as a member. Following the categorical refusal of the Anatomy and Zoology sections of the academy, Darwin was finally admitted in 1878 by the Botany section. Nevertheless, the latter safeguarded themselves by maintaining that their interest in Darwin's contributions lay exclusively in the observations and experiences with which the investigator had enriched the area of vegetal physiology, and not in his scientific theories, which were considered excessively revolutionary.⁵

We believe that Bergson's work shows that he was indifferent to any misunderstandings concerned with the underrating of Darwin as an investigator of natural evolution.⁶ He maintained close relationships with the English scientific and philosophical elites, and also demonstrated in his work a detailed study of a number of their scientific works. Our reference

to the French resistance concerning Darwin's evolutionism mainly serves to reiterate the profound differences between the way in which its importance is acknowledged in the study of natural evolution today and the way in which it was understood at the beginning of the 20th century.

DARWIN'S PLACE IN THE DEVELOPMENT OF BERGSON'S BIO-PHILOSOPHY

Bergson's interest was especially directed to the Darwinian evolutionary approach rather than to an exhaustive study of Darwin's work itself. However, as already mentioned, Bergson also considered and reflected upon a number of Darwin's writings. His contact with these works began prior to his formulation of evolutionism as proposed in *Creative Evolution* and his interest embraced a number of themes.

As we will try to demonstrate, we find in all Bergsonian references a group of reflections that allow us to reiterate how serious his scientific problematization was. Bergson was mainly interested in the construction of an all-encompassing view of the positive and metaphysical dynamism that, in his understanding, permeates all natural reality.

In fact, the first references to Darwin appear very early in Bergson's writings. In 1883, at the age of 24, when Bergson was teaching philosophy in Clermont-Ferrand, he wrote a review of Lucretius, the Latin poet. With a brief but incisive comment, he makes an analogy to "Darwin, the great naturalist," underlying the "still" hypothetical character of biological transformism (*Mélanges* 292). Bergson had completed his education in philosophy a few years earlier at the École Normale Supérieure (Paris), during which time he deepened his knowledge of the writings of the man who, for many years, he would consider to be the leading authority on questions of evolution: Herbert Spencer.⁷ Therefore, he was familiar with evolutionism both in philosophy and the biological sciences.

A few years later, in 1889, Bergson returned to his reflections on Darwin's work with the publication of his doctoral dissertation, *Essai sur les données immédiates de la conscience*. This work aimed to clarify a series of misunderstandings regarding psychic phenomena arising from psychological studies of that time. In the first chapter, concerning the inappropriate quantification of the inner states of consciousness, Bergson attempts to throw light upon the role played by the body in the exteriorization of certain emotions. And it is in this context that references to Darwin appear. He quotes from *The Expression of the Emotions in Man*

and *Animals*⁸ regarding what he considers to be a remarkable description of the physiological symptoms involved in emotions such as fury or pain (*L'essai sur les données immédiates de la conscience* 21-23, 27-28).⁹

Bergson does not agree with the theses defended in that book, supported by many other thinkers from the fields of psychology, philosophy, or physiology, according to which emotions can be reduced to the sum of the organic sensory symptoms they provoke. According to Bergson, there are emotional states in the human psyche underlying physiological changes that cannot be examined in the same way as the mind analyses the body or deconstructs external objects located in space. Bergson criticizes associationist tendencies existing at the time, maintaining that inner change in states of consciousness can not be measured in definable quantities, but occurs as a temporal flow or *durée*.

It seems unquestionable to us that, in his early years, Bergson read and reflected upon Darwin's works, while at the same time recognized the distance between his own perspective and that of Darwin. We therefore consider that Bergson's interest in Darwin was not only confined to what he had to say about evolution, but also extended to the biological data which helped him develop his own bio-philosophy. This seems to be reaffirmed by the references made to two botanical studies, *Climbing Plants* and *Fertilisation of Orchids*,¹⁰ in *Creative Evolution*.

In the second part of *Creative Evolution*, Bergson talks about instinct being one of the divergent directions of life's tendencies (*Creative Evolution* 170-72). In fact, Bergson considers that life splits itself in three major tendencies: *torpor*, *instinct*, and *intelligence*—which are present to varying degrees in all forms of life, be they vegetable, animal, or human. In the specific passage of *Creative Evolution* we are referring to, he seeks to show how vegetable torpor is sometimes close to animal instinct, and he refers to the studies made by Darwin in *Climbing Plants* and *Fertilisation of Orchids*.

These studies contain positive descriptions that could clearly support Bergson's theses. The work on climbing vegetation suggests several analogies between the tendrils of certain plants and animal hands (Darwin, *Les mouvements* 109-10), whereas the study *Fertilisation of Orchids* states that, in the absence of a better choice, nature has endowed these plants with a kind of *sensitiveness*, which allows them to engage insects in the pollination process and to guide them specifically to female plants (Darwin, *De la fécondation* 206-07).

It is not with reference to Darwin as the presenter of an evolutionary theory that these observations are made in *Creative Evolution*. Indeed, the naturalist's name is only indicated in a footnote. Bergson is simply referring to certain botanical studies. Again, it seems clear that his goal was to build a natural reading of the characteristics and positive behaviors of living phenomena. For that reason he appealed to the works of naturalists and biologists of the time, including Darwin's; this was an obvious methodological step.

We therefore think it is necessary to introduce a methodological distinction in Bergsonian hermeneutics between, on the one hand, the connection of *Bergson-the metaphysics* with the work of *Darwin-the-biological-sciences-researcher* and, on the other hand, the dialogue between the Bergsonian evolutionism and some evolutionary theories influenced by Darwin.

DARWINISM: A STEP IN THE CONSTRUCTION OF TRUE EVOLUTIONISM

Although Bergson displayed throughout his works a particular interest in the findings of biological studies, it is in *Creative Evolution* that he considers the formation and creativity of the natural world in depth. Moreover, despite the constraints of its language and subject matter, it was this work which increased his popularity beyond the field of philosophy and which made his contribution to both French and European biology so important.

His ideas were criticized for lacking scientific credibility because they were too close to vitalist thinking. Despite this he persisted in his denunciation of what he saw as decisive defects in the natural sciences in their attempts to explain the evolution of life. In a letter written in 1912, responding precisely to one of these criticisms, Bergson stated: "It is possible that the method from *l'Évolution Créatrice* brings us, as you put it, 'outside or behind the biological field'; but since it would have no other result than to draw the biologist's attention to the insufficiency of this or that principle of explanation and in the *direction* where others should be looked for, it seems to me that it would be scientific at least from that viewpoint" (*Correspondances* 491).

And it was at this level that Bergson made the scientific community, especially during the first part of the 20th century, aware of the urgent necessity to reconsider its ideas about the evolution of life. Moreover, several biologists confirmed this in the second half of the century. Regarding

this matter, Mayr and Provine (314) state that "Before one can fully understand the intellectual milieu in France at that period [the beginning of the twentieth century] it is necessary to say a few words about Bergson, who was not a biologist but a philosopher. He wrote a whole book (based on his lectures at the Collège de France) about creative evolution. All French biologists were very heavily and directly influenced by Bergson. Arguments derived directly from Bergson occur in the writings of Grassé, Cuénot, Vandel, and even Teilhard de Chardin." Theodosius Dobzhansky praises Bergson by stating that he was the philosopher who best approximated his reasoning and, in 1967, published an article entitled "L'évolution créatrice." And Jacques Monod also confirmed the importance of this book by noting that *Creative Evolution* was essential reading for those wanting to obtain an academic degree in biology (39).

However, if from the viewpoint of the natural sciences *Creative Evolution* suggested both inevitable and innovative approaches, its main importance lay in Bergson's subtle combination of scientific data and philosophical problematization. We have to take into account the fact that his aim was not to do science, but rather he aspired to the broader goal of constructing an accurate reading of living matter, its essence and its dynamics.

According to Bergson (*Creative* 85), the scientific status of a theory restricts it to a particular point of view of the phenomena under study, but this point of view is a prerequisite for the rigor of the approach. However, in the case of natural evolution, science can only provide a partial and limited view of reality. Hence, Bergson concludes, the subject of natural evolution should also become the object of philosophical study. Because it does not seek any practical application, philosophy does not have to uphold the scientific way of looking at reality.

According to Bergson (*Creative* 29), science carries the intellectual functions to the highest degree, bringing precision and exactitude to ordinary knowledge, meaning that its goal is to foresee events and get us ready to act and *be a light for our conduct*. Since science analyzes the whole into several elements, looking for repetition, it does not see irreducibility and irreversibility in reality. It is philosophy that walks this way by accessing life as real and inner evolution, that is, as a continuous creation of unforeseeable form. Thus, Bergson does not opt for any existing scientific theories nor does he remain bound by their positive reasoning. Instead, he chooses the field of philosophy, which, being much wider, not only encompasses but surpasses all scientific theories at once.

Creative Evolution discusses, therefore, the transformist biology of the time in the context of an understanding of the very nature of life (*l'essence même de la vie*). For this reason, the essential character of Bergsonian philosophy is metaphysical, which means it is as a philosopher and not as a biologist that Bergson approaches the problem of evolution. Life is a simple and indivisible act and its nature, or essence, is described by Bergson as an inner original *impetus* (*élan*), passing from one generation of germs to the other as the cause of evolutionary variations. This impetus is incommensurable with everything else; it cannot be reduced to physical reality and, therefore, cannot be expressed symbolically. That is to say, science cannot describe it. It is only reached from within, through a form of intellectual sympathy: the metaphysical intuition.¹¹

This metaphysical context becomes clear in the first chapter of *Creative Evolution*, entitled “The Evolution of Life—Mechanism and Teleology,” which discusses the accuracy and legitimacy of the two great philosophical paradigms of interpretation of the universe, namely, mechanism and finalism. Bergson refers to them metaphorically as the two garments human reasoning uses in order to “wear” life, though he considers that, strictly speaking, neither of them fits exactly. He suggests, however, that finalism could accommodate living phenomena as long as it is appropriately “cut” and “sewn” again¹²: metaphysics works to measure in the cutting and sewing process (*La pensée* 196-97). Nonetheless, Bergson analyzes the various scientific forms of mechanism in detail.

It is in this context that the main theories of biological evolutionism emerge in his work. Bergson uses a concrete evolutionary example to point out the limits of evolutionary biology. He chose not only what he considered to be one of the greatest enigmas of living nature, but also what he saw as an essential element in explaining the secret of evolution: the reason for the emergence of identical sensory organs in two species which developed completely independently of one another. To be more precise, he sought an explanation for the presence of eyes with the same functional structures in humans and in certain molluscs. Bergson asked why the eye of a scallop is structurally analogous to the human eye, and made of the same elements—a retina, a cornea, and a crystalline lens—and why it has an identical cellular structure (*Creative* 62-63).¹³

The evolutionary theories inspired by mechanism were discredited by Bergson because they claimed that evolution would only result from the adaptation of the organism to certain external physicochemical conditions.

Creative Evolution divides the theories into three major groups: those inspired by Darwin and De Vries, which maintain that biological variations occur as the result of a purely accidental mechanism; those exemplified by Eimer, which claim that those variations follow a pre-defined path; and the theories inspired by Lamarckians and neo-Lamarckians that situate the cause of those variations in the organism itself, whether they are the result of a hereditary mechanism or of a consciously voluntary principle.

In the present context only the Bergsonian reflections on Darwinian theory matter. On the one hand, Bergson criticizes the insufficiency of the mechanisms of adaptation while, on the other, he stresses the need to compensate for the accidental dimension of variation in organisms with another type of causality.

As for issues such as the emergence and development of a complex visual system in humans and scallops, especially the process by which the evolutionary variations leading to that result came about, Darwinism introduced the notion of the adaptation of the organism to external conditions and postulated a series of unconscious accidental variations—a principle known as gradualism—maintained by natural selection and established by hereditary transmission. In other words, environmental factors favoured the best adapted specimens with small and unnoticeable modifications which occurred gradually and were maintained by natural selection. The subtlety and minuteness of the changes allowed for the preservation of harmony and coordination between the various parts that constitute the morphology of the organ in question, so its functioning is never put at risk.

However, Bergson continues, according to Darwinian principles when the newly dissimulated characteristics do not demonstrate any benefit or usefulness to the species in question, their conservation is not favored by the selective mechanism. Thus, only evolutionary changes that show a clearly utilitarian and adaptational advantage for the survival of the species would last.

As he could not conceive how modifications could be at the same time unnoticeable but useful, Bergson thought that if the fragility of the Darwinian explanation was obvious in the case of the formation of a single visual system, there would be an even greater reason for the similarity between the vertebrate eye and the eye of a mollusc to be seen as unfeasible. So how could it be proved that the same very small variations were produced in the same order in two completely independent evolutionary lines if their appearance was purely accidental?

Not even Darwin's appeal to the law of correlation can solve this problem, Bergson concludes (*Creative* 67). That principle (according to which changes are not located in a single point of the organism, but are necessarily reflected in other areas) seems to offer an insufficient explanation. It would appear that *solidary variations* are confused with *complementary variations*: the former are only simultaneous, when what matters is that several changes are produced in an organized manner so the organ does not only continue to function, but also does so in an increasingly refined way. Thus, natural selection, by itself, did not appear to be sufficient as the driving force of evolution.

Thus, Bergson can be seen to have three main criticisms of Darwinism. First, the causal dimension of the variations would imply an answer to the problem of morphological similarity between two different species through the resort to probability, which would be equivalent to recognizing that the basis of the principle of evolutionary variability was exterior to organisms, and that changes were merely random. Second, the imperceptibly small dimension of the morphological changes would make it impossible for the variations to demonstrate their utility and so be maintained by natural selection. And lastly, the appeal to the capacity of organisms to adapt to external conditions would appear to be an insufficient explanation, given that, scientifically speaking, it would lead to the necessity of chance and, philosophically speaking, it would merge two different senses of "adaptation" (one being the passive *insertion* of organic matter in a pre-existing form and the other being *construction*, in which life responds actively to external obstacles). This conceptual confusion would result, according to Bergson, in a teleological anthropomorphic discourse that gives the organism a determined causality.

Bergson concludes that Darwinism would thus need to make another non-mechanical causality intervene which, allied to natural selection, would struggle for the general conservation of the species. The stress in Bergsonian criticism was on the effective insufficiency resulting from the combining of the concepts of "unconscious accidental variation" and "natural selection." If they were to be maintained, the physiological changes, such as the ones in question in the example of ocular physiology, would have to be explained through another principle because natural selection by itself would not be sufficient. Since Darwinism made the variations depend only on random factors, Bergson considered that the

eye example demonstrated how natural selection would have to be helped by some kind of *miraculous* intervention.

The hypothesis based on an organism's tendency to change by accident was refuted by Bergson. The physiological and histological complexity present in the structure of the human eye and the eye of the scallop, allied to the complex nature of the performance of the visual function maintained throughout the evolutionary history of both species, represented the major obstacles to his acceptance of Darwinist theory. Based upon the concrete evidence of the empirical observations found in the scientific literature of that time, Bergson concluded that it was impossible to accept that chance rules the evolution of life.

Using a metaphor to express his point of view, Bergson states: "That two walkers starting from different points and wandering at random should finally meet, is no great wonder. But that, throughout their walk, they should describe two identical curves exactly superposable on each other, is altogether unlikely. The improbability will be greater, the more complicated the routes; and it will become impossibility, if the zigzags are infinitely complicated" (*Creative* 57).

The rejection of the idea of chance constitutes one of the fundamental aspects of Bergsonian evolutionism. Nonetheless, his reasoning has been criticized for its imprecision because of his omission of the doubts raised by Darwin himself concerning this aspect of his theory (see Barthélemy-Madaule). In *On the Origin of Species*, the naturalist explicitly rejects chance as the keystone of the evolutionary mechanism because of the belief that with the advancement of biological studies, in time it would be possible to understand what was really directing evolution.

However, apart from this reservation, the evolutionary biology of the next century would assume that chance played a central role in evolution. For that reason, it seems clear that what interested Bergson was not the analysis of Darwin's work itself, but the implications arising from it, which he referred to as *the spirit of Darwinism* (*Creative* 55).

What, then, did a book like *On the Origin of Species* represent for the arguments of *Creative Evolution*? It was the basic text that influenced subsequent generations of scientists and which contained a means by which to consider natural evolution. As a matter of fact, as well highlighted by P.A. Miquel, it is not from Darwin's work that Bergson selects one of the main positive aspects of his *true evolutionism* (*Creative* 367), but rather from neo-Darwinists such as August Weismann (see Miquel, "Bergson," 120).

DARWIN: INSUFFICIENT, BUT UNAVOIDABLE

Through a chronological analysis of his remaining work, Bergson's position in relation to what Darwin stood for becomes clearer.

In 1911, Bergson presented a paper at a conference at the University of Birmingham entitled "Life and Consciousness," wherein he stated that the evolution of life on earth consists of the effects of a creative force that is present in all matter. Indeed, this was the essential vein of the metaphysical evolutionism Bergson had presented three years before in *Creative Evolution*. He states: "There is no need to recall here all the facts which, since Lamarck in France and Darwin in England, have been adduced to confirm the idea of an evolution of species, that is to say, of the generation of some species from others commencing by forms probably of infinite simplicity" (*Mélanges* 928).

Bergson is only interested in taking from scientific evolutionism the positive confirmation of the variability and morphological complexity of species; this is his main goal in his readings of Darwin.

Later on, following the commemorations of Darwin's 100th anniversary and the 50th anniversary of the publication of *On the Origin of Species*, events celebrated in 1909, the American philosopher and psychologist James Mark Baldwin published the book *Darwin and the Humanities*. The French translation, *Le darwinisme dans les sciences morales*, appeared three years later and Bergson was made responsible for its presentation at the *Académie des Sciences Morales et Politiques*. He took this opportunity to repeat what he considered to be the difficulties present in the original formulation of Darwinism, especially concerning the insufficient explanation of chance as the cause of evolutionary variations. Bergson explained the necessity of complementing Darwin's initial approach with alternative formulations which allow for the exclusion of heredity of acquired characteristics. He finished his review with a statement that reveals his real motives: "We would like to point out particularly, among the first three chapters of the book, the one called 'Le darwinisme et la philosophie'. In it, Mr. Baldwin develops this idea (capital, in our opinion) that the evolutionist doctrine is not necessarily mechanistic, that there can be *more or less* in the effect than in the cause, that is to say nature produces novelties" (*Mélanges* 1023).

The attitude is, therefore, the same as Bergson had expressed in *Creative Evolution* when, after criticizing mechanist evolutionary theories, he situates himself midway between neo-Darwinism and neo-Lamarckism

(*Creative* 171-73). Bergson criticized the accidental nature of variation, but acknowledged that it was at the germinal level that evolutionary dynamics was processed. Although he criticized the individual dimension of the effort responsible for variability, he did accept its existence, but he considered it to be unconscious. In other words, it is an effort of which most organisms are unaware.

It is in this area, between neo-Darwinism and neo-Lamarckism, that Bergson developed his evolutionary hypothesis of the "élan vital," which is a vital impetus (*élan*) that does not depend uniquely on adaptation to external circumstances, nor does it have its origin in the individual organism's initiative. Although both factors contribute to the cosmic evolutionary process, priority resides in life itself as the driving principle of activity. To Bergson, this original principle has a psychological nature, which allows life to be divided into different tendencies, which, at the same time, remain part of one another.

The resort to the notion of "élan" was Bergson's solution to the problem of referring to what could not be contained in rigid concepts. For many decades, the "élan" was mistakenly understood as a sign of a sterile metaphysical vitalism and criticized as being unscientific. However, Bergson is clear when he states that this image itself has no value, and it must be used as an indication of a new evolutionary perspective (*Mélanges* 1526) that we think is bio-philosophically situated between the empirical data and metaphysical problematization.

In 1932, in his last original work, *Les deux sources de la morale et de la religion*, Bergson returns to the notion of "élan" (115-20). Twenty-five years after *Creative Evolution*, Bergson reiterates the positive and empirical character of the vital principle, an indicator that life cannot be reduced to the explanations given by physics and chemistry. Bergson returns to the main tenets of his evolutionism. He mentions only one theory of biological evolutionism, Darwinism, stressing that it is *insufficient*. The reader cannot disregard the fact that no other name or biological theory is mentioned, in contrast to the many philosophers and evolutionary scientists quoted in *Creative Evolution*. This was probably because Darwinism was by then the leading theory of evolutionary biology and because Bergson recognizes this change in Darwin's status by highlighting only this theory out of all those he had mentioned in 1907.

Furthermore, we consider it is possible that Bergson was being asked to adopt a position specifically in relation to Darwinism. It is what seems

to happen in a letter from 1935, which, as far as we can gather, consists of Bergson's last written document about Darwin. This letter reasserts unequivocally the Bergsonian position on the explanatory insufficiency of Darwinism (*Mélanges* 1525).

In this light, it is possible to understand that the insufficiency detected by Bergson in Darwinism emerges from the absence of an explanatory principle that can plainly give a satisfying account of the evolution of species, either in scientific or in metaphysical terms. Bergson's criticisms do not involve a refutation of Darwin's scientific work or the evolutionary positions based on it, but arise from the permanent interrelation that philosophical thinking must cultivate with the sciences of life. We are, therefore, facing a bio-philosophical insufficiency that leads Bergson to say regarding the reception of *Creative Evolution*: "If a book such as mine can contribute to eliminate the unconscious (and hence inconsistent) metaphysics that penetrates a good deal of our evolutionism, I would be truly happy" (*Correspondances* 160).

Bergson embodied a philosophical perspective in which scientific theories—mainly about the evolution of the natural world—are examined in such a way that a broader perspective of reality emerges. In this dialectical procedure, it is philosophy itself that succeeds when it takes into account not only the contents of scientific investigation, but the way in which some sciences are able to provide a positive picture of *the inner becoming of things*. Thus, science is not incompatible with philosophy, nor can Darwin or Darwinism be completely excluded from the understanding of Bergson's *bio-philosophical evolutionism*.

ENDNOTES

1. See, e.g., Barthélemy-Madaule; Goddard; Miquel, "Bergson et Darwin."
2. With the concept of a Bergsonian "bio-philosophy" we are not alluding to a simple "philosophy of biology," but a new reasoning paradigm built in the image of biology, that is, of the scientific works about living phenomena that emerged in the 19th century. This model of intelligibility brought from biology its experimental and factual dimensions, bringing together the positive data and grounding it in a metaphysical perspective.
3. Despite choosing "duration" as the best translation for *durée*, we think it is useful to recall the following statement by Francis Moore: "*Durée* is one of the most important notions in Bergson's philosophical position, and it is usually translated 'duration,' a translation which had Bergson's own authorization. But it seems to me that the most natural use of this word in English is to

refer to a measurable period of time during which something happens. It is perfectly true that the French word '*durée*' also has this meaning. However, my sense is that the French word can more readily be applied to *the fact or property of going through time* than the English 'duration'. ... Bergson wishes to draw attention to something close to this second sense of the term, and in fact wishes to disassociate time as measurable from time as *durée*. I have, therefore, with a little hesitation, adopted 'durance' as my translation of '*durée*' (resurrecting an obsolete meaning of this English word)" (58-59).

4. Bergson uses the expression "métaphysique positive" in a letter to William James (February 15, 1905): "Je souhaite que ces efforts convergentes aboutissent à la constitution d'une métaphysique *positive*, c'est-à-dire susceptible de progrès indéfini, au lieu d'être tout entière à prendre ou à laisser, comme les anciens systèmes" (*Mélanges* 652).

5. In the last decades of the 19th century and first decades of the 20th century, the reception of Darwin's theory in France did not undergo any significant change in relation to the preceding period and, according to Conry (45), misunderstandings and errors of interpretation of his theories have continued to occur.

6. In "La philosophie française," written in 1915 for the French representation at the Universal and International Exposition of San Francisco, Bergson dedicated a small paragraph to the consideration of Lamarck's and Darwin's works in the formulation of biological evolution. He recognized the precedence of the French naturalist's ideas concerning the transformation of the species, but stated that Darwin's glory is not diminished, since he was closer to the positive facts than Lamarck (*Mélanges* 1162-63).

7. Spencer had the most decisive influence on Bergson's ideas on evolution, but paradoxically he was also the cause of the greatest philosophical disappointment because, according to Bergson, his work didn't pay enough attention to scientific evolution.

8. Bergson read the French edition of this book: *Les expressions des émotions chez l'homme et chez les animaux*, tr. by S. Pozzi and R. Benoît in 1874.

9. The same reference reappears in 1900 in the first edition of *Le Rire (Laughter)*, a work concerning the laughter provoked by comedy. However, in a later edition, Bergson omitted the reference to *On the Origin of Species* in the bibliography subsequent to the preface. Nevertheless, since Bergson did not make any change concerning Darwinism to the contents of *Le Rire's* reedition, we think it was a matter of editorial economy rather than an act of any symbolic significance concerning the philosopher's thoughts on Darwin's work.

10. As with *The Expression of the Emotions in Man and Animals*, Bergson studied these two works in their French editions: *Les mouvements et les habitudes des plantes grimpantes*, published in 1877 by Richard Gordon, and *De la fécondation des orchidées par les insectes et des bons résultats du croisement*, translated in 1870 by Louis Rérolle.

11. In *An Introduction to Metaphysics*, Bergson gives his definition of metaphysics, saying that it is *the science which claims to dispense with symbols* (*La pensée et le mouvant* 182). True metaphysics doesn't work with ready-made conceptions, rather with a kind of *intellectual auscultation* (*La pensée et le mouvant* 196) by which one places oneself within an object in order to coincide with what is unique in it.

12. Our paper will not analyze Bergsonian finalism in depth. We will only point out that Bergson states that reality creates effects where it goes beyond itself, but he never accepts that these effects are previously given or can be deduced *a priori*. Therefore, they are not "goals." However, once produced, the mind can analyse these effects rationally and reconstruct retrospectively the course they have taken (*Creative* 52). These are the *different* and *renewed* senses of finalism proposed by Bergson (*Mélanges* 1524).

13. This example given by Bergson was already strongly disapproved of by Bernard Balan and Armand Riquès due to its lack of scientific accuracy. However, P.A. Miquel, as we have seen, argued that Bergson's example still makes sense if we consider another type of mollusc such as cuttlefish, which are cephalopods ("De l'immanence"). We also note that the example of the complexity of the eye has been often used by the creationists as a supposed demonstration of the existence of an intelligent design in nature. It is important to stress that Bergson was not interested in this kind of argument because he thought that one cannot fully understand the concept of creation if one puts it in terms of some things that are created and someone who is the creator (*Creative* 249). For Bergson, creation in nature must be seen through an interior perspective: the perspective of evolution itself. Hence the title of his book: *Creative Evolution*.

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