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Índice

Building the "True Evolutionism": *Darwin's Impact on Henri Bergson's Thought*

MAGDA COSTA CARVALHO*; M. PATRÃO NEVES**

Charles Darwin and Henri Bergson met symbolically in 1859, the year which marked the publication of *On the Origin of Species* and Bergson's birth. This coincidence of the date takes on its fullest meaning when we bear in mind that Bergson's work represents the first time contemporary metaphysics comes into dialogue with evolutionary biology.

Bergson's interest in the results coming out of the life sciences such as paleontology or embryology was due to what we call a "bio-philosophical project": the importation of the positive model of biology as a cognitive paradigm in the philosophical understanding of the underlying dynamic character of life phenomena. It was in this context that Bergson took on Darwin's work.

To study Darwin's impact on Bergsonian philosophy implies, thus, that it be taken into account that the intimate character of this thought is metaphysical, signifying that Bergson is probing the problem of evolution as a philosopher and not as a specialized biologist. In other words, Bergson's study of the scientific work of Darwin was yet another opportunity for philosophy to engage in a fruitful exchange with positive data taken from the real world.

Darwin in Bergson's work

Bergson's interest in Darwin's studies of nature is not restricted to questions of evolution; it is quite vast and diversified.

The first references to Darwin appear very early in Bergson's writings. In 1883, at only 24 years of age, he talks about "Darwin, the great naturalist". In 1889, he quotes from *The expression of the emotions in Man and animals*.

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In 1907, he makes some important references to others Darwinian studies in the field of botany: *Climbing plants* and *Fertilisation of Orchids*.

It is not with reference to Darwin as the presenter of an evolutionary theory that these observations are made. Bergson's goal was to build a natural reading of the characteristics and positive behaviours of living phenomena and, for that reason, the resort to a study of the works of naturalists and biologists of the time, including Darwin's, would have been an obvious methodological step. These first approximations toward Darwin's production were made through Bergson's bio-philosophical horizon of the consideration of reality.

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

Darwinism in Bergson's metaphysical evolutionism

After the publication of his main work, *Creative Evolution*, in 1907, what remains in Bergson's philosophy are the references to Darwinism as a theory of natural evolution. It was this book that set him philosophically in the study of life in its intimate movements, which implied the elaboration of a metaphysical evolutionism that went beyond a merely biological register. This will be the context of all latter mentions of Darwinism.

It is Theodosius Dobzhansky who affirms that Bergson was the most eminent of all the philosophers to have constructed their thought from the point of view of biological evolutionism.[1] We consider that this constitutes the principal aspect of originality of the French philosopher, which, as we have put forth, places the discussion of transformist biology of the time into the understanding of the true essence of life.

This context becomes visible when Bergson discusses the legitimacy of the two great philosophical models of interpretation of reality: mechanism and finalism.

It is in the context of mechanism that Bergson introduces the main theories of biological evolutionism. Bergson uses a concrete evolutionary example to point out the limits of evolutionary biology: the reason for the emergence of identical sensory organs in two species which developed completely independently of one another. He sought an explanation for the presence of eyes with the same functional structures in man and in certain molluscs. He asked why the eye of a scallop is structurally analogous to the human eye,

[1] DOBZHANSKY, T. – "L'Évolution Créatrice". *Diógene*, 58 (1967), pp. 64-80.

and made of the same elements – a retina, a cornea and a crystalline lens – and why it has an identical cellular structure.[2]

This being said, in 1907 (*Creative Evolution*), Bergson divides the evolutionary theories inspired by scientific mechanism 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 Lamarckian 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.

Bergsonian critiques of Darwinist theory sought to demonstrate the insufficiency of adaptive mechanisms and to give evidence of the need to fill in the gaps of the accidental dimension of an organism's variations with some other type of causality of a metaphysical nature.

As for issues such as the emergence and development of a complex visual system in man and some Molluscs, especially the process by which the 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 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 argues, 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 favoured by the selective mechanism. Thus, only evolutionary changes that show a clearly advantage for the survival of the species last.

As he could not conceive how modifications could be at the same time unnoticeable but useful, Bergson considers that if the fragility of the Darwinist explanation was obvious in the case of the formation of a single visual system, there would be an even greater reason for the example of the similarity between the human eye and the eye of a mollusc to be seen as unfeasible.

[2] BERGSON, H. – *L'évolution créatrice*, édition critique. Paris: Presses Universitaires de France, 2007, pp. 62-63. This example given by Bergson was already strongly disapproved of by Bernard Balan and Armand Riquès due to its lack of scientific accuracy. However, as the philosophical reasoning of Bergson does not rely on this aspect, this controversy will not be considered in this paper.

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?

Bergson can be seen to have three main criticisms of Darwinism. Firstly the casual 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.

Secondly, 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, positively 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 *construction*, in which life responds actively to external obstacles). This conceptional 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 physiological and histological complexity present in the structure of the human eye and the eye of some Molluscs, 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 determines the evolution of life.

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, both in positive and in metaphysical terms. We, therefore, think that Bergson's criticisms are not a pure and simple refutation of Darwin's work or the evolutionary orientations based on it, but arise from the permanent interrelation that, according to him, philosophical thinking must cultivate with the life sciences.

As we have seen, after the publication of *Creative Evolution*, in 1907, Bergson's posture toward Darwinism remains identical, revealing his effort to import the positive proof of the variability and morphological complexification of the various species from scientific evolutionism.

In 1932, in his last original work, *The Two Sources of Morality and Religion*, Bergson returns to the famous notion of "élan vital" and summarizes it as he then sees it. Twenty five years post *Creative Evolution*, the philosopher 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 and mentions only one theory of biological evolutionism, Darwinism, stressing that it is *insufficient*.

The reader cannot disregard the fact that no other evolutionary theory is now mentioned, in contrast to the many researchers and evolutionary scientists quoted in *Creative Evolution*. This was probably because Darwinism was by then the leading theory of evolutionary biology and because Bergson recognises 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 original Darwinism. At this point, we consider that for Bergson the problem does not reside in any positive insufficiency of Darwinism but in the need, guaranteed only by philosophy, to integrate any and all empirical readings of the phenomena of life in a broader perspective which goes beyond the merely naturalist register.

The *"true evolutionism"*

What motivated Bergson's readings could not be summarized in a monographic analysis of Darwin's work but rather in the assimilation of certain orientations that came out of it, or in other words, in that which Bergson named *"the spirit of Darwinism"*.

It was the neo-Darwinian theory of germinal plasma as defined by August Weismann which Bergson came closest to in scientific terms. Bergson refers to *life in general* as an energy or continuous impulse which is present in the germ cells of organisms which is passed down reproductively. The author thus accepted Weismann's theory that some morphological characteristics of living beings were transmitted through the real influence of the somatic part of individuals upon the cells responsible for reproduction.

However, the philosophical search for a theory of evolution led Bergson to take the suggestions from the German biologist and blend them with other scientific orientations, opting for a position between neo-Darwininian and neo-Lamarckian tendencies. As for the neo-Darwinian, he criticized the accidental

nature of the variations but agreed that it was at the germ cell level that evolutionary dynamics was in process; as for the neo-Lamarckian, he rejected the individual dimension of the effort responsible for variability, although he accepted that evolution was in fact due to some kind of psychological inner principle.

It is, then, in this area between neo-Darwinism and neo-Lamarckism that Bergson developed his Evolutionary hypothesis of the "élan vital", which was an inner impulse that does not depend uniquely on adaptation to external circumstances, nor has its origin in the individual organisms' initiative. Although both factors contribute to the cosmic evolutionary process, priority resides in life itself as the driving principle of a cosmic dynamic 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.

For many decades, the image of "élan vital" was mistakenly understood as a sign of a sterile metaphysical vitalism and criticised as being unscientific. However, Bergson is clear when he states that the image itself has no value, and it must be used as an indication of a new evolutionary perspective, bio-philosophically situated between the empirical data and the metaphysical problematization.

And because living organisms are distinguished from material objects by the story that they recount in each of their moments, as if it were a type of *organic memories* that keep the registry of the flowing of the past into the present, no authentic theory of evolution could neglect real time or durance in that which it affects and conditions what diverse living beings are.

For Bergson, this is the equivalent to not only the search for the traces made by the biological transformation which operates in various species, but more especially the finding of the lead-string for the life impetus which commands the diverse variations which operate in the world of life. To reconstitute the story of living nature implies considering it not only in terms of *results*, or in other words, in the perspective of various species which pass through the evolutionary process, but rather, in the first place, according to the vision of evolution or life itself, of the activity through which these particular effects were produced in an unpredictably creative way. And that is precisely what "élan vital" means.

Thus, Bergson resolves the problem of morphological similarity amongst distinct species by putting it into the perspective of the constituent interiority of reality. There are no multiple and fragmentable causes and effects in living nature, but rather the operation of the intimate causality of organisms, which, in itself, is a simple and indivisible act. Refusing the scientific mechanical reading in which Darwinism is placed Bergson demonstrates the gap which

exists in making the parts of a certain morphological effect correspond to parts of a multiple exterior cause. There is no symmetrical equivalency between the causes and their results, given that what underlies the most diverse morphological structures can not be explained by mechanism. To Bergson's mind, that which we observe in organisms is nothing more than the culmination of a long process of formation and fulfillment of certain positive exterior conditions to an original intimate effort.

Bergson considers that the relation between the complexity of the eye and the simplicity of vision can be explained in two ways: on the one hand, what exists is just a single, simple and elementary movement, with complexity coming from the practical application of human thought; on the other hand, it is the intensity of the cause which produces, in a block, the final form of the effect. If the impetus for vision is moderate, it originates a rudimentary apparatus, but if it assumes greater strength, a more complex eye will be obtained, independent of the evolutionary proximity of the species. We have thus arrived at the core which explains the special causality which governs life: for Bergson, the internal vital impulse (which is conserved and divides it self) is the deep origin of the evolutionary variation of the species.

The Bergsonian designation of this metaphysical evolutionism as being the "true evolutionism" implies, thus, that the interpreter go in search of the criterion of "truth" which underlies all of Bergson's philosophy. As we have reiterated, the author is not placed within an absolutely empirical gnoseological field and, because of this, is not limited to the positive description of organisms.

Bergsonian philosophy eludes a simple biologistic naturalism and leaves no margin for doubt about highlighting the double dimension of nature as an organic process which underlies the evolution of species (*Nature naturée*) and as the life energy which propels beings to the spiritual plane (*Nature naturante*).

Bergson's crusade centered on the search for adequate criteria for an integral discourse on natural evolution. The need to discuss some of the hypotheses that the biology of the time fed in relation to evolution brought with it the goal of revealing the bio-philosophical horizon in which all discourse about structuring evolutionary alterations of nature should be framed. When *Creative Evolution* was published, Bergson confessed to the German zoologist H. Driesch: "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."[3] Or in other words, the truth of Bergson's evolutionism lives from the interpenetration amongst positive data

[3] Translated from BERGSON, H. – *Correspondances*. Paris: PUF, 2002, p. 160.

and metaphysical problematization, with this being the authentic guarantee of a discourse made to order with reality.

We conclude with three main ideas that resume what we can learn today from Bergson's philosophy and from his dialogue with Darwinism. Firstly, evolution is not only a matter of science, but it reaches man as a whole, and that's how philosophy must think it; secondly, science allows philosophy to have access to very important data from the positive world and allows us to think the positive dynamic essence of life; and, finally, Darwin was, in the early 20th century, and is today, in the beginning of the 21st century, one of the main references in evolutionary sciences with which philosophy must dialogue.

The Reception of Darwin in Portugal (1865-1914)

ANA LEONOR PEREIRA*

1. The impact of Darwin on the portuguese science until the beggining of the 20th century (botany, zoology and anthropology)

In the area of natural science, Darwin's theory was difficult to implant in Portugal, largely due to the fact that Portuguese botany and zoology were at a stage of inventorying, description, identification and classification of the species according to Lineu and Cuvier's static models and, therefore, on the margins of genealogical problems (origins, affinities, descent, etc.) of the evolutionist code.[1] In his authorized study, Germano Sacarrão concluded that Darwinism as a unifying model and a guide to zoological and botanical scientific research did not penetrate the Portuguese university. Therefore, he states that 'in Portugal, the fundamental reality of biological evolution was never given great importance, and the fact that nothing in biology makes sense unless it is seen in the light of the evolutionist history, and of a problematic of change and adaptation was never taken seriously'.[2] If there was not a Darwinian tradition in Portuguese natural science until the latter decades of

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[1] *Vd.*: PEREIRA, Ana Leonor; PITA, João Rui – "Ciências". *História de Portugal.* Direcção José Mattoso. Vol. 5 - *O Liberalismo (1807-1890).* Coordenação de Luís Reis Torgal e João Lourenço Roque. Lisboa: Círculo de Leitores, 1993, pp. 656-658.About the state of natural history in Portugal around 1880 and 1890, *vd.*, respectively: SILVA, A. J. Ferreira da – "Exposição de história natural. Discurso d'abertura do Presidente da Secção de Sciências Physiologico-Naturaes, pronunciado no dia 16 de Outubro". *Revista da Sociedade de Instrucção do Porto* 1(11), 1 Nov. 1881. Porto, pp. 343-357; HENRIUES, Júlio Augusto – "Universidade de Coimbra, Faculdade de Philosophia, 1879-1892". *O Instituto*, 41(1), Jul. 1893. Coimbra, pp.29-49.

[2] SACARRÃO, Germano da Fonseca – "O Darwinismo em Portugal". *Prelo*, 7, April-June 1985. Lisboa, p. 10. *Vd.* also, Idem – "Pedagogia da evolução e museus de história natural. O caso português". *Prelo*, (16), July-Sept. 1987. Lisboa, specially p. 19; Idem – *Biologia e sociedade I. Crítica da razão dogmática*. Mem Martins: Publicações Europa-América, 1989, pp. 282-286.