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BERGSON'S ENCOUNTER WITH BIOLOGY
thinking life

> *The status of life* in nature . . . is the modern problem of philosophy and of science.
> *A.N. Whitehead*, Modes of Thought, *1938*

I

Within Anglo-American commentary *Creative Evolution* (1907) appears to have the status of an optional text in Bergson's oeuvre, with the result that a crucial aspect of his attempt to reform philosophical thinking is ignored.[1] We know that figures such as Canguilhem and Merleau-Ponty undertook close readings of the text, whilst Deleuze's philosophy of internal difference was initially developed from his reading of CE.[2] In this essay I would like to correct the current neglect of Bergson's great text. I shall be guided by two questions: what did Bergson think philosophy had to learn from the new biology? What is the philosophy of life that he wished to develop in rapport with it?

The importance of biology is stated by Bergson in a number of essays. In an essay of 1922, for example, he argues that "In the labyrinth of acts, states and faculties of mind, the thread which one must never lose is the one furnished by biology. *Primum vivere*" (O 1295; CM 53). In the essay of 1904 on Ravaisson he speaks of the mind having a natural proclivity to always turn in the direction of materialism and to imagine it can persist in such a direction: "It seeks quite naturally a mechanical or geometrical explanation of what it sees" (O 1467; CM 237). Such an attitude Bergson regards as a survival of preceding centuries, one that harks back to an epoch when science was conceived largely as geometry. The significance of the science of the nineteenth century is that it places at the centre of its inquiry the "study of living beings." He concedes that even here science may still be governed by mechanics but, as he makes clear a few years later in *Creative Evolution*, what we are dealing with here is a mechanics of transformation, which is a mechanics that cannot be developed by relying upon geometrical and spatialized schemas of thought. Change, transformation, and evolution are bound up with living and open systems, and the features of novelty that characterize such systems will always elude a mathematical treatment.

Bergson may well be the most important philosopher of life in the twentieth century, the one most seriously committed to it. *Creative Evolution* is an attempt to show that the problem of knowledge, the problem of accounting for the faculties of intellect (*intelligence*) and intuition, is one with the metaphysical problem, the problem

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of gaining access to the real: the two form a circle, the centre of which is "the empirical study of evolution." The double form of consciousness (intuition and intellect) is shown to be "the double form of the real" itself. The attempt to demonstrate this constitutes what we might choose to call the "Bergsonian revolution." It is an effort to enter "into life's own domain," conceived as "reciprocal interpenetration, indefinitely continued creation" (O 646; CE 178). Life is to be approached as a "current of creative energy . . . precipitated into matter" and that endeavours "to wrest from it what it can" (O 1152–53; TSMR 209).

In his thinking of life Bergson is pursuing a "superior" positivism and empiricism. He conceives metaphysics – the field of informed vision and of speculation – as a form and mode of knowledge that can advance by the gradual accumulation of obtained results. In other words, metaphysics does not have to be "a take-it-or-leave-it system" that is forever in dispute and forever doomed to start afresh, thinking abstractly and vainly without the support of empirical science. Not only is it the case for Bergson that metaphysics can be a true empiricism, but it can also work with science in an intellectual effort to advance our knowledge of the various sources, tendencies, and directions of life. Bergson outlines what I have called his "superior positivism" in his Huxley lecture of 1911 on "Life and Consciousness": ". . . we possess now a certain number of *lines of facts*, which do not go as far as we want, but which we can prolong hypothetically."[3] This is taken up again in the *Two Sources*, where he states that the different lines of fact indicate for us the direction of truth but none go far enough; the attainment of truth can be achieved only when the lines are prolonged to the point where they intersect (O 1186; TSMR 248). He makes it clear that the conception of a vital impetus and of a creative evolution was arrived at only by following the evidence of biology. Furthermore, he stresses that his conception is not simply a hypothesis of the kind that can be found at the basis of all metaphysical systems; rather, it aims to be "a condensation of fact, a summing up of summings up" (O 1187; TSMR 249). The knowledge we wish to develop and advance concerning evolution – of life and of the human – must "keep to ascertained facts and the probabilities suggested by them" (O 1207; TSMR 273). Let me show how this gets worked out in *Creative Evolution*.

II

Creative Evolution is a text that engages with the history of philosophy and the history of science and in terms of their ancient and modern aspects. The two key philosophical figures engaged with in the text are Aristotle and Kant (though there are also important engagements with the likes of Spinoza and Fichte).[4] With respect to modern science, the key intellectual figures and developments are Galileo and Kepler, modern mathematics, the theorists of thermodynamics such as Carnot and Clausius, and modern biology, with Bergson engaging with the arguments of both Lamarckism and Darwinism in a precise and incisive manner (Bergson had already spoken of Darwin as the greatest of all modern naturalists in his commentary on Lucretius' *De rerum natura*). *Creative Evolution* is an extraordinarily bold and ambitious work that seeks to reform philosophy through an encounter with modern evolutionary theory. At the same time, however, it does engage with a number of key problems in modern biology, including the issue of convergent evolution and the problem of homology, and the nature of variation, and these are issues that continue to fuel some of the most important inquiries and debates in evolutionary theory today. Bergson's arguments find an echo in contemporary work.[5] The book is made up of four main chapters, and what we find is that the book moves progressively from biology to philosophy as it unfolds: chapter 1 is on the "evolution of life," considering mechanism and finalism as the two main forms of biological thinking (Darwinism and Lamarckism); chapter 2 is on the "divergent directions of the evolution of life" (instinct and intelligence, plant and animal); chapter 3, the subject of a close reading by Canguilhem in the 1940s, is on "the meaning of life and the order of nature." It is in this chapter that Bergson begins to lay out in a concerted manner the philosophical task as he conceives it, hence the crucial argument on the

need for a double genesis of matter and intellect which is developed in the wider context of his argument on the need to view the problem of knowledge through the lens of the phenomenon of life; chapter 4 is on the "cinematographical mechanism of thought," and through an outline of the history of philosophy and science, covering Plato and Aristotle, Descartes, Spinoza and Leibniz, Kant and Spencer it seeks to show the nature or character of "real becoming" in contrast to the "false evolutionism" that Bergson regarded as prevailing in his own time.

In the years of preparation leading to the writing of the book Bergson has familiarized himself with the biological literature, reading extensively across languages, in journals, and key book publications. Some of the key figures he read and then discusses in his book are: J.M. Baldwin (the "Baldwin effect"), William Bateson, Hans Driesch, Theodor Eimer, Hugo De Vries, and August Weismann. These are figures well known to evolutionary theorists and received a renewed treatment by Stephen Jay Gould in his last magnum opus, *The Structure of Evolutionary Theory*, published in the year of his death in 2002. In the opening chapter there are numerous references to Darwin's *Origin of Species*, with Bergson paying special attention to the chapters devoted to variation. *Creative Evolution* is written in the wake of the neo-Darwinian revolution associated with Weismann's work on the germ-plasm and it comes several decades before the "modern synthesis" of the 1920s and 1930s. The context, then, is Darwinism's break with, and disentanglement from, its Lamarckian inheritance. The break is carried out in the work of Weismann who is accorded a privileged place in Bergson's treatment. When Bergson refers to the modern theory of evolution he does so with the name "transformism," which is the term coined by Lamarck. As Jay Gould noted, in an essay entitled "Darwin's Dilemma: The Odyssey of Evolution," the key nineteenth-century evolutionists of England, France and Germany, namely Darwin, Lamarck, and Haeckel, did not use the word "evolution" in the original editions of their main works. Darwin speaks of "descent with modification," Lamarck of "transformism," and Haeckel of "transmutation and descendence-theory."[6] Bergson, of course, will complicate the sense of evolution through his notion of tendencies, signalling with it the irrevocable break with Aristotle that modern biology insists upon, and making it compatible in some respects with the doctrine of modern evolution in its neo-Darwinian variant. It is now impossible, for example, to construe evolution in terms of a single tendency that would reach its culminating point or apotheosis with the appearance of intelligent forms of life. Having noted this, however, it is clear that Bergson still wishes to pose, albeit in a specific manner, the question of the "significance" of evolution. Indeed, the whole of chapter 3 is devoted to this topic and I shall say something about it towards the end of the essay.

A number of widely held prejudices stand in the way of an effective encounter with Bergson's text. Chief among them, of course, is Bergson's reputation as a vitalist. For many working in evolutionary theory the label is sufficient to discredit his contributions. However, in making such an assessment little attempt is made to comprehend the field of problems that Bergson was seeking to open up by deploying the notion of a vital impulse. If vitalism entails an appeal to some mysterious vital "stuff" that is then held to be the transcendent motor or agent of evolution, then Bergson is no vitalist. Bergson explicitly eschews any appeal to a vital force or principle, noting that when the mind considers the infinity of infinitesimal elements and causes that come together in the genesis of a living being, in which the absence or deviation of any one of them would ruin everything, its first impulse is to take "this army of little workers as watched over by a skilled foreman, the 'vital principle,' which is forever repairing faults, correcting effects of neglect or absentmindedness, putting things back in place . . ." (O 686; CE 225). But then he states there is no such foreman and neither are there any workers that need such supervision. Furthermore, "the position of vitalism is rendered very difficult by the fact that, in nature, there is neither purely internal finality nor absolutely distinct individuality" (O 530; CE 42). Life is being spoken of in terms of an impetus, says Bergson, simply because "no image borrowed from the physical world can give more nearly the

idea of it'' (O 713; CE 257). An image borrowed from psychology provides us with insight into life as the enfolding of a plurality of interpenetrating terms and tendencies. He stresses that:

> The elements of a tendency are not like objects set beside each other in space and mutually exclusive, but rather like psychic states, each of which, although it is itself to begin with yet partakes of others, and so virtually includes in itself the whole personality to which it belongs. (O 595; CE 118)

A tendency can be conceived as the push or thrust (*poussée*) of an ''indistinct multiplicity,'' which is indistinct only when considered in retrospect, for example when the multitudinous views we take of its past undivided character enable us to see it composed of elements created by an actual development (O 1225; TSMR 294). Forms of life (groups and species) should be defined not by the possession of certain characters but by their tendency to emphasize them: ''taking tendencies rather than states into account, we find that vegetables and animals may be precisely defined and distinguished, and that they correspond to two divergent developments of life'' (O 585; CE 106) (e.g., the divergence shown in the method of alimentation). He states specifically that in accounting for the dissociation of tendencies there is no need to bring into the picture ''any mysterious force'' (O 591; CE 113). Bergson's conception of life in these terms draws heavily on his notion of a virtual multiplicity, which is a multiplicity made up of heterogeneous elements in which the relations between them are ones of fusion and interpenetration. Considered in terms of its contact with matter, life can be likened to an impetus or an impulsion that in itself ''is an immensity of potentiality (*virtualité*), a mutual encroachment of thousands and thousands of tendencies,'' which are such only when spatialized (O 714; CE 258). It is matter that carries out in actuality the division of this virtual multiplicity, and individuation is to be treated as in part the work of matter and in part the result of the inclination of life.

In the opening part of *Creative Evolution* Bergson states that there is no universal biological law which applies ''precisely and automatically to every living being.'' Rather, ''there are only *directions* in which life throws out species in general'' (O 508; CE 16). This seemingly innocuous statement provides the key to understanding Bergson's attempt to stage an encounter between the discoveries of modern biology and an enlarged perception of the ''whole'' of life and evolution, one that endeavours to go beyond the uncritical assumptions of ''evolutionist philosophy'' (the reference is, of course, to Herbert Spencer).

III

What challenge did Bergson think the new biology presented? Firstly, and most obviously, there is the rejection of Aristotle's thinking. In his discussion of the development of animal life in chapter 2 of *Creative Evolution* he says that the cardinal error which has vitiated almost all philosophies of nature from Aristotle onwards lies in seeing in vegetative, instinctive, and rational life successive degrees in the development of one and the same tendency. In fact, they are ''divergent directions of an activity that has split up as it grew'' (O 609; CE 135). This is in accord with one crucial aspect of his conception of ''life,'' namely that it does not proceed by the association and addition of elements but by dissociation and division. Later in the chapter Bergson argues that one of the clearest results of modern biology is to have shown that evolution has taken place along divergent lines (O 643; CE 174). This means that it is no longer possible to uphold the biology of Aristotle in which the series of living beings is regarded as unilinear. Aristotle belongs to the science of the ancients which rests, he says, on a ''clumsy interpretation of the physical in terms of the vital'' (O 689; CE 228). All of this is of no small concern to Bergson given that in his essay on Ravaisson he clearly sympathizes with his preference for Aristotle over Plato. Indeed, he even describes Aristotle as the founder of metaphysics and the initiator of ''a certain method of thinking which is philosophy itself'' (O 1454; CM 224).

Secondly, there is the significance of the modern doctrine of ''transformism,'' a doctrine which Bergson says he accepts ''as a sufficiently exact and precise expression of the facts actually known'' (O 513; CE 23). The language of

"transformism," he writes, "forces itself now upon all philosophy, as the dogmatic affirmation of transformism forces itself upon science" (O 516; CE 26). On the one hand, it shows us that the highest forms of life – highest in terms of complexity – emerge from a very elementary form of life, thus "the most complex has been able to issue from the most simple by way of evolution." On the other hand, it shows that life can no longer be treated as an abstraction. Life can now be described in terms of the continuity of genetic energy that cuts across the bodies "it has organized one after another, passing from generation to generation, [and that] has become divided among species and distributed amongst individuals without losing anything of its force, rather intensifying in proportion to its advance" (ibid.).

I have given two illustrations of the significance of the new biology for Bergson with respect to our thinking life. In addition, he insists that we need to display a readiness to be taken by surprise in the study of nature and life and learn to appreciate that there might be a difference between human logic and the logic of nature: "What is absurd in our eyes is not necessarily so in the eyes of nature" (O 1438; CM 206). We cannot approach nature with any a priori conceptions of parts and wholes or any a priori conception of what constitutes life, including how we delimit the boundaries of an organism and hence define it. We must resist the temptation to place or hold nature within our own ideas or shrink reality to the measure of them. We should not allow our need for a unity of knowledge to impose itself upon the multiplicity of nature. To follow the sinuosities of the real means that we cannot slot the real into a concept of all concepts, be it Spirit, Substance, Ego, or Will. Bergson notes that all thought becomes lodged into concepts which congeal and harden and we have to be aware of the dangers presented by this. He regarded Schopenhauer's "will to life," which we might think of as a precursor of the *élan vital*, as an empty concept supported by a barren theory of metaphysics. It is in *Creative Evolution* that Bergson proposes the need for thought to undergo a fundamental reform and education. "It is not enough to determine, by careful analysis, the categories of thought; we must engender them" (O 671; CE 207). This statement comes in the wake of an engagement with Kant, one of several that feature in the book. Bergson asks: "Created by life, in definite circumstances, to act on definite things, how can it [the logical form of thought] embrace life, of which it is only an aspect?" (O 489–90; CE x). Life challenges the essential categories of thought: unity, multiplicity, mechanical causality, intelligent finality all fall short. A consideration of life in its evolutionary aspects makes it virtually impossible to say where individuality begins and ends, whether the living being is one or many, whether it is the cells which associate themselves into an organism or the organism which dissociates itself into cells. "It would be difficult to cite a biological discovery due to pure reasoning." All the "molds" in which we seek to force the living "crack": "They are too narrow . . . too rigid, for what we try to put into them" (ibid.). Unity and multiplicity, or the one and the many, are categories of inert matter; the vital impetus can be conceived neither as pure unity nor pure multiplicity. If we take as an example the most rudimentary organisms that consist of only a single cell we find already "that the apparent individuality of the whole is the composition of an *undefined* number of potential (*virtuelles*) individualities potentially (*virtuellement*) associated" (O 716; CE 261).

The "Understanding," as Bergson repeatedly names the human intellect, can only give us a construction of "life" that is ". . . artificial and symbolical, since it makes the total activity of life shrink to the form of a certain human activity, which is only a partial and local manifestation of life . . ." (O 491; CE xii). He seeks to make clear his innovation in the introduction to the book, namely to show the inseparability of a theory of knowledge and a theory of life. On the one hand, a criticism of knowledge is required in order to show that the way in which the intellect encloses the facts in pre-existing frames is not ultimate; on the other hand, by situating the intellect itself in the context of the evolution of life we will be able to see how the frames of knowledge have been constructed and how we can enlarge and go beyond them. This requires the "collective and progressive effort of many thinkers, of many observers also, completing, correcting, and improving one another" (O 493; CE xiv; see also O 657–58; CE 191–92).

What is at stake is the manner in which we articulate the domain of knowledge. Bergson's view is that this cannot simply be left to science as its special task, with physics and chemistry occupied with matter and the biological and psychological sciences occupied with life. On this basis, all that is left to the philosopher is to engage in a critique of the faculty of knowing and advance a conception of metaphysics that has been decided upon by accepting the construction of knowledge given to him from science (O 660; CE 194). Philosophy then comes to resemble a "registration court" (O 661; CE 195). Furthermore, the desire to end the conflict between science and philosophy results in a sacrifice of philosophy "without any appreciable gain to science" (O 663; CE 197).

Bergson does not accept the thesis that knowledge is relative to our faculties of knowing. Neither does he accept the claim that metaphysics is impossible on the grounds that there can be no knowledge outside of science or that science has correctly determined the bounds of metaphysics. In short, Bergson does not accept Kant's delimitation of metaphysics, bounded as it is by the privileging of Newtonian mechanism. A new relation between philosophy and science is called for and knowledge of the absolute is to be restored. Bergson speaks of his new method of thinking as follows:

> This method claims to escape from the objections which Kant had formulated against metaphysics in general, and its principal object is to remove (*de lever*) the opposition established by Kant between metaphysics and science, by taking account of the new conditions in which science works. If you read the *Critique of Pure Reason* you see that Kant has criticized not reason in general, but a reason fashioned to the habits and exigencies of the Cartesian mechanism or the Newtonian physic . . . The doctrine that I defend aims to rebuild the bridge (broken down since Kant) between metaphysics and science . . . (*Mélanges* 493–94)

Bergson makes two major claims contra Kant: the first is that the mind cannot be restricted to the intellect since it "overflows" it; and second, that duration has to be granted an "absolute existence," which requires thinking time on a different plane to space. According to Bergson, Kant considered only three possibilities for a theory of knowledge: (i) the mind is determined by external things; (ii) things are determined by the mind itself; (iii) between the mind and things we have to suppose a mysterious agreement or pre-established harmony. In contrast to these three options Bergson seeks to demonstrate the need for a double genesis of matter and the intellect. It is not that matter has determined the form of the intellect or that the intellect simply imposes its own form upon matter, or even that there is some curious harmony between the two that we can never explain, but rather that the two have, in the course of evolution, "progressively adapted themselves one to the other" and so attained a "common form" (O 670; CE 206).

Bergson accepts Kant's demonstration that time and space, understood as homogeneous media and situated on the plane of action, cannot be viewed as properties of things themselves, since this leads to the "insurmountable difficulties of metaphysical dogmatism." However, instead of resting content with this critique of the dogmatic tendency of metaphysics, and uncritically privileging Newtonian mechanism, the effort should be made to recover the mind's contact with the real. This requires providing a generative account of the Understanding, which would serve to show that homogeneous space and time are neither properties of things nor essential conditions of our faculty of knowing these things; rather, their homogeneous character expresses

> the double work of solidification and division which we effect on the moving continuity of the real in order to obtain there a fulcrum for our action, in order to fix within it starting points for our operation, in short, to introduce into it real changes. (O 237; MM 211)

In other words, Kant's conception of space and time as forms of sensibility is shown to have an interest, one that is "vital" and not merely "speculative."

Two essential points need to be appreciated. Firstly, Bergson's conception of metaphysics is not the same as Kant's in that it does not suppose that there is a completed task of knowledge

(any system of knowledge open to experience and observation is necessarily, and positively, incomplete). Secondly, the empirical study of the organic changes of life needs to concern itself not with the spatial results of the change but with the time taken by the change. Bergson writes:

> After having proved by decisive arguments that no dialectical effort will ever introduce us into the beyond and that an effective metaphysics would necessarily be an intuitive metaphysics, he added that we lack this intuition and that this metaphysics is impossible. It would in fact be so if there were no other time or change than those which Kant perceived . . . (O 1364; CM 128)

In this recovery of intuition, Bergson aims to save science from the charge of producing a relativity of knowledge (it is rather to be regarded as "approximative") and metaphysics from the charge of indulging in empty and idle speculation.

The new metaphysics that Bergson proposes will operate via "differentiations and qualitative integrations," and in an effort to reverse the normal directions of the workings of thought it will have a rapport with modern mathematics, notably the infinitesimal calculus:

> Modern mathematics is precisely an effort to substitute for the *ready-made* what is in process of *becoming*, to follow the growth of magnitudes, to seize movement no longer from outside and in its manifest result, but from within and in its tendency towards change, in short, to adopt of the mobile continuity of the pattern of things. (O 1422; CM 190)[7]

Metaphysics differs from modern mathematics (the science of magnitudes), however, in that it has no need to make the move from intuition to symbol. Its understanding of the real is potentially boundless because of this: "Exempt from the obligation of arriving at results useful from a practical standpoint, it will indefinitely enlarge the domain of its investigations" (O 1422; CM 191). Metaphysics can adopt the "generative idea" of mathematics and seek to extend it to all qualities, "to reality in general" (O 1423; CM 191). The aim is not to bring about another Platonism of the real, as Bergson finds at work in Kant's system, but rather to enable thought to re-establish contact with continuity and mobility.[8] A form of knowledge can be said to be relative when it ignores the basis of symbolic knowledge in intuition and is forced to rely on pre-existing concepts and to proceed from the fixed to the mobile. Absolute knowledge, by contrast, refuses to accept what is pre-formed and instead cultivates "fluid concepts," seeking to place itself in a mobile reality from the start and so adopting "the life itself of things" (O 1424; CM 192) and to follow "the real in all its sinuosities" (O 801; CE 363).[9] To achieve this requires relinquishing the method of construction that leads only to higher and higher generalities and thinking in terms of a concrete duration "in which a radical recasting of the whole is always going on" (ibid.).

The need for a thinking of life arises for Bergson, therefore, out of the deficiency of the intellect and its inability to think duration:

> The more duration marks the living being with its imprint, the more the organism differs from a mere mechanism, over which duration glides without penetrating. And the demonstration has most force when it applies to the evolution of life as a whole . . . inasmuch as this evolution constitutes, through the unity and continuity of the animated matter which supports it, a single indivisible history. (O 526; CE 37)

Time is written, marked, and engrafted – it is inscription. "*Wherever anything lives, there is, open somewhere, a register in which time is being inscribed*" (O 508; CE 16). Bergson insists that this is no metaphor; rather, it is of the essence of mechanism to consider as metaphorical every effort to ascribe positive attributes to time. For mechanism, change is reducible to an arrangement or rearrangement of parts, while the irreversibility of time is depicted as an appearance relative to our ignorance. But if there is no direction of time for physics, this cannot be the case for biology. On every level we care to examine it, be it embryology, morphology, or the process of evolution itself, time is the indicator of life and of individuated living systems. This inscription and recording of time is, in fact, the time and place of the vital:

> . . . what is properly vital in growing old is the insensible, infinitely graduated, continuance of the change of form . . . The evolution of the

> living being, like that of the embryo, implies a continual recording of duration, a persistence of the past in the present, and so an appearance, at least, of organic memory. (O 510; CE 19)

While the laws that govern an unorganized body or unorganized matter can be expressed, at least in principle, by a set of differential equations in which time plays the role of an independent variable, this cannot be the case, Bergson insists, with the "laws of life." If one of the central tenets of a vitalist position is to insist on a radical distinction between living and inert matter then Bergson is no vitalist. He clearly states that he does not question the fundamental identity of inert matter and organized matter. He then articulates his critique as follows:

> The only question is whether the natural systems which we call living beings must be assimilated to the artificial systems that science cuts out within inert matter, or whether they must not rather be compared to that natural system which is the whole of the universe. That life is a kind of mechanism I cordially agree. But is it the mechanism of parts artificially isolated within the whole of the universe, or is the mechanism of the real whole? (O 520; CE 30–31)

For Bergson the "whole" is never given or giveable because it is not the whole of space.

Although in *Creative Evolution* Bergson will champion the "empirical study of evolution," he also insists that while science and philosophy have the same "object" (life), they each approach it in a very different manner and expect different results from their encounter with it. The difference of method between science and metaphysics has to be upheld (O 1285–86; CM 43). They present us with two halves of the absolute; it is certainly not the case that for Bergson metaphysics is the "superior of positive science" which would come after it and obtain a higher knowledge of the same object (ibid.). If we conceive the relation between the two in this way we will wrong both and metaphysics will inevitably be construed as a vague and solely hypothetical type of knowledge. In the case of philosophy, "intuition may bring the intellect to recognize that life does not quite go into the category of the many nor yet into that of the one; that neither mechanical causality nor finality can give a sufficient interpretation of the vital process" (O 646; CE 177). The ambit of thinking cannot be determined solely by the requirements of science, however, simply because for Bergson its own praxis is an approximation of the real and not the whole explanation of it. In *Creative Evolution*, for example, Bergson outlines an appreciation of life in which the duty of philosophy is said to be one of examining the living without any interest in practical utility: "Its own special object is to speculate, that is to say, to see [*Son objet à elle est de spéculer c'est-à-dire de voir*] . . ." (O 661; CE 196).[10]

IV

Perhaps the most extraordinary aspect of *Creative Evolution* is that in the midst of the turmoil created for thought by the new biology Bergson committed himself to soberly unfolding a thinking of life. His challenge to modern evolutionary theory is stated at the start of chapter 2. Here he begins on a highly provocative note, claiming that while adaptation can well explain the sinuosities of the movement of evolution, it is less able to explain its general directions and the movement itself. What is the distinction Bergson is making here? The point is crucial to his attempt to actually come up with an adequate conception of evolution. The "unity" of life is something given at the start as a common impulsion and not a common attraction. The principal features of evolutionary life are the divergence of its lines and that it has been marked by a dissociation of tendencies. Bergson warns the philosopher, however, to be aware of imposing a false coherence and a false unity on the evolution of life:

> The philosopher, who begins by laying down as a principle that each detail is connected with some general plan of the whole, goes from one disappointment to another as soon as he comes to examine the facts; and, as he had put everything in the same rank, he finds that as the result of not allowing for accident, he must regard everything as accidental . . . We must recognize that all is not coherent in nature. By so doing, we shall be led to ascertain the centres around which the incoherence crystallizes. This crystallization will clarify the rest; the main

> directions will appear, in which life is moving whilst developing the original impulse. True, we shall not witness the detailed accomplishment of a plan. Nature is more and better than a plan in the course of realization. A plan is a term assigned to labor: it closes the future whose form it indicates. Before the evolution of life, on the contrary, the portals of the future remain wide open. (O 583–84; CE 104–05)

In *Creative Evolution* Bergson rejects both mechanical causality and finality since both are, at bottom, "only standpoints to which the human mind has been led by considering the work of man" (O 571; CE 89; and yet he (a) adheres to mechanism in another sense (the mechanism of the Whole) and (b) he advocates finality in a "special sense"; O 541; CE 54).[11] In the claim that both mechanism and finalism are conceptions of evolution too closely implicated in the habits of the human mind, there lies concealed one of the most important challenges to be laid down to any thinking, be it science or philosophy, which takes as its special object of inquiry the evolution of life.[12] Furthermore, we must always read Bergson's own text in accordance with this task of thinking evolution outside the enframing terms and scope of the human mind, something that Darwin himself sought to accomplish with his theory of natural selection and which is an aspect of his theory that Bergson perhaps underestimates. It is not without good reason that Levinas located in *Creative Evolution* the beginnings of Heidegger's articulation of the question concerning technology.

For Bergson the key move for thought to make lies in the direction of "sympathy." By means of science, intelligence does its work and delivers to us more and more the secret of life's material or physical operations. But this gives us only a perspectivism that never penetrates the inside, going "all round life, taking from outside the greatest possible number of views of it . . ." (O 645; CE 176). By contrast, metaphysics can follow the path of intuition, which is to be conceived as "instinct that has become disinterested, self-conscious, capable of reflecting upon its object and enlarging it indefinitely" (ibid.). Bergson has recourse to the example of the aesthetic to develop this insight. It is the "aesthetic faculty," he says, which gives us something other than what is given for us by normal perception. The eye, he notes, perceives the features of the living in terms of an assembling and not as something involving mutual organization and reciprocal interpenetration: "The intention of life, the simple movement that runs through the lines, that binds them together and gives them significance, escapes it" (O 645; CE 177). It is just this "intention" that the artist, he says, seeks to regain, "placing himself back within the object by a kind of sympathy . . . by an effort of intuition." Indeed, it is in *Creative Evolution* that Bergson poses the question: what is the *time* of a work of art, that is, what is the time of its creation of form? (O 783; CE 341; see also the important critical note on Seailles' *Genius in Art*, O 518–19; CE 29). In the essay on Ravaisson, Bergson had alluded to the importance of art for metaphysics: "The whole philosophy of Ravaisson springs from the idea that art is a figured metaphysics, that metaphysics is a reflection on art, and that it is the same intuition, variously applied, which makes the profound philosopher and the great artist" (O 1461; CM 231).

For Bergson, however, aesthetic intuition has a limited character, which resides in the fact that it gives us only the individual case. He thus invites us to pursue an inquiry that is turned in the same direction as art but "which would take life *in general* for its object, just as physical science, in following to the end the direction pointed out by external perception, prolongs the individual facts into general laws" (O 645; CE 177). He concedes the obvious point, namely that such a philosophy of life will never obtain a knowledge comparable to that which science acquires: "Intelligence remains the luminous nucleus around which instinct, even enlarged and purified into intuition, forms only a vague nebulosity" (ibid.). In default of knowledge properly so called, however, intuition provides us with a supplement that enables us to grasp that which intelligence fails to give us. More than this, it is intuition that can disclose to us in a palpable form what the discoveries of modern biology have established.

At the end of chapter 3 Bergson turns his attention to a consideration of the question of the "significance" of evolution (*signification*, translated in the English edition as "meaning"). In the

context of a treatment of the part played by contingency in evolution, something he takes to be enormous and regards as extending as far as life assuming a carbonic form and being developed and concentrated in organisms, a discussion of what is not accidental in life (namely the double direction of individuality and association), and a consideration of energy, Bergson states that it is in a "quite special sense that man is the 'term' and 'end' of evolution." Bergson accepts that "there has not, properly speaking, been any project or plan" (O 720; CE 265). The evolution of life "takes directions without aiming at ends" (O 582; CE 102). Indeed, it is a crucial aspect of his conception of a creative evolution, be it a question of a work of nature or a work of art, that forms are created without an end in view. How, then, is this "special sense" to be understood?

Bergson argues that consciousness – and what he calls "supra-consciousness" (*supraconscience*) – lies at the very origin of life. By this he means an "exigency of creation" that can only become manifest to itself where creation is possible: "It lies dormant when life is condemned to automatism; it wakens as soon as the possibility of a choice is restored" (O 716; CE 261). He is not, of course, claiming that the phenomenon of human consciousness mysteriously lies at the very beginning of the evolution of life, as if it were its concealed destiny. His point is that what we take to be consciousness – indetermination, hesitation, delay, the quantity of choice with respect to a field of action and which has its seat in the nervous system, and so on – is a tendency and potentiality of life itself (life is a current of "creative" energy). Moreover, he is not suggesting that the actual evolution of life on the planet has been able to miraculously transcend the domain of contingency and accident in order for consciousness to realize itself. Evolution is contingent in every aspect. Nevertheless, he wants to maintain, and on the basis of all the claims made thus far in the book with respect to his core concepts and insights, that with the human animal the life of consciousness reaches its highest state of emancipation from the restricted movement of matter. He argues, for example, that the difference between animal consciousness and human consciousness is a radical one. From the fact that the brains of human and ape are alike, "we cannot conclude that consciousnesses are comparable or commensurable" (O 718; CE 263). The essential difference of Bergson lies in the number and range of motor mechanisms that have been set up in the human brain, which serve to give an almost unlimited field of choice in their release. He insists that from the limited to the unlimited there is all the distance between the closed and the open (in fact, what we have here is a difference of kind and not merely degree). Unlike the case of the animal, the powers of invention within the human are not simply variations on the theme of routine. Rather, we have a machine that has the potential to triumph over mechanism and closure. The human is not a captive of the mechanisms its brain has set up. It is as a complex, open machine, therefore, that the human can be said to be the "interesting" animal. Bergson then duly notes the importance of the role played by language, social life, and technics in the creation of this "exceptional life" of the human animal (elsewhere Bergson calls man "the sporting animal" and conceives the brain as an organ of sport).[13]

A couple of points are worth stressing so that Bergson is not misheard when he advances these kinds of insights. Firstly, if there has not been any project or plan in the evolution of life, which is his position, then we cannot regard the rest of nature as if it existed for the sake of the human. Humankind is not prefigured in the evolutionary movement and cannot be said to be the outcome of the whole of evolution since this has been accomplished on several divergent lines, and the human species is simply at the end of one of them. Although man is the being in whom the vital movement of life is continued indefinitely, "he does not draw along with him all that life carries in itself" (O 721; CE 266). Rather, it is as if "*a vague and formless being*" (*un être indécis et flou*) – call it, Bergson says, man *or* superman – had sought to realize itself but could succeed in this effort only by abandoning parts of itself in the process (such losses are represented by the animal and vegetable worlds and what is positive in them). Secondly, once we acknowledge the tremendous role played by contingency and accidents in evolution it is entirely conceivable that we could have evolved in ways that would make us physically and morally

different to what, in fact, we are. The empirical details of evolution must, therefore, constitute the factual basis for any speculation regarding the evolutionary – or post-evolutionary – nature and fate of the human.

In subsequent essays and texts, however, Bergson will think outside the restrictions he himself had placed on speculation in *Creative Evolution*, speaking of the appearance of the human – "or of some being of the same essence" – as the "*raison d'être* of life on our planet" (O 1301; CM 59; see also O 1192–93; TSMR 255–56). However, we should not suppose that the metaphysician in Bergson has simply got the better of him and now overrides the stress he had previously placed on the empirical study of evolution. He still maintains that "experience is the only source of knowledge" (O 1186; TSMR 248), and he seeks to develop his insights on the basis of a synthesis of an intellectual cognition of facts and the accumulation of probabilities. With the word "experience" Bergson means something very rich and varied, but the objects of experience we refer to must be ones that can become objects of scientific inquiry and research. Bergson's thinking of life and of creative evolution culminates in a conception of "creative emotion" and the claim that philosophical certainty, which admits of degrees, requires the extension of intuition – supported by science – by "mystical intuition." He ends his final book, *The Two Sources of Morality and Religion* (1932), by describing the universe as a machine for the production of gods and declaring that the task now facing human beings is whether or not they wish to go on living (which is Nietzsche's question too). The fact that the human animal faces this question indicates that it is confronted with the most burdensome freedom of the living conceivable (in man the *élan vital* attains self-consciousness). To ask whether the human animal can become equal to the freedom it embodies and is responsible to is to pose a question that has the power to push thinking to its limits and defeat it. This is why the "spiritual reform" offered by mystical intuition needs to be appealed to, for it is this mode of intuition that promises the practice of *joy*. In order to address the tremendous social, political, and international problems of the planet we need to refine the "spirit of invention" that to date has been cultivated largely on the basis of mechanism. It is not more and more reserves of potential physicochemical energy that need releasing but those of a moral energy: ". . . the body, now larger, calls for a bigger soul" and "mechanism should mean mysticism" (O 1239; TSMR 310). One might conclude with the following pithy claim: humanity is the contingent and unforeseeable product of the evolution of life at its deepest level and is *the living form for whom "life" is in question.*

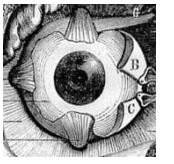
V

My aim in this essay has not been to undertake a critical reading of Bergson's text but simply to offer the beginnings of a reading of it. We remain in the grip of too many ill-founded prejudices concerning the philosophy of life. As a result we find it difficult to encounter Bergson's text and incorporate his mode of thinking within our conception of the scope of philosophy. My view is that Bergson's thinking on life offers the possibility of a fundamental reform of philosophy and contributes to the advancement of human knowledge in the direction of a genuine intellectual maturity.

Bergson's text is obviously limited by its time and place, which is prior to the revolution in genetics and molecular biology and the emergence of information theory. Bergson's thinking on life needs opening up to these developments. We can perhaps begin this task by taking cognizance of the work of Canguilhem who notes, in a consideration of information theory, for example, that Bergson is unable to account for the stability and reliability of living structures.[14] What is noticeable about Canguilhem's work, however, and is a feature that connects it with Bergson's approach, is that in spite of its departure from Bergsonism it remains attached to the idea that the project of knowledge is one with thinking life.[15] For example, Canguilhem writes: "What, then, is knowledge? If life is concept, does recognizing that fact give the intelligence access to life? What, then, is knowledge? If life is meaning and concept, how do we conceive of the activity of knowing?"[16] This is another attempt to enter "life's own domain."

Canguilhem's point is that conceived as the quest for the "greatest possible quantity and variety of information," this a priori is in things and the concept is "in" life. Although there is a shift here from intuition to concept, with the emphasis placed on intelligence, we should not overlook the continuity with Bergson's project in *Creative Evolution*, for example, the stress of the "meaning" (*sens*) of life and the commitment to the idea that contemporary biology "is, somehow, a philosophy of life." It is this commitment to a philosophy of life, which is necessarily to speak of a scientific knowledge (*Wissenschaft*) of the different modes and forms of the living, which should compel our attention and inspire us to return to Bergson. Foucault suggested, contra phenomenology, that it is not in terms of lived experience that we should expect to supply the originary meaning of every act of knowledge but in the living itself.[17] It should no longer be the fashion, however, to construe Bergson as a simple-minded intuitionist and a thinker who is contra the concept, as Foucault might appear to be doing in his championing of Canguilhem and of the concept. What Bergson's superior positivism and empiricism demonstrates is that any simple-minded opposition between intuition and concept is to be rejected on the grounds that it presents us with a spurious choice and is a positive hindrance to the advancement of a new and expansive *Wissenschaft*. We can empathize with Foucault's distrust of "lived experience" and share his desire to overturn its hegemony. Bergson's great lesson, however, is that genuine knowledge has its basis in experience, that experience has several sources, and that the human sources intersect with all the other sources. Bergson's mode of thinking purports to penetrate so deep into the sources and movements of experience that for it the positing of a schism between the human being and the cosmos in which the former gets lost in the immensity of the latter is revealed to be otiose.

The philosophy of life needs to continually commit itself to the *joyful* science, which is a knowledge that fuses artistic energy, mystical intuition, practical wisdom, and science, and leads to formation of what Nietzsche called the "higher organic system." It is still this future of the over-human and superhuman that awaits us and that promises, monstrously and mystically.



bergson editions and translations cited, with abbreviations

CE *Creative Evolution*. Trans. Arthur Mitchell. Lanham, MD: UP of America, 1983.

CM *Creative Mind*. Trans. Marbelle L. Andison. Totowa, NJ: Littlefield, Adams, 1965.

Melanges. Paris: PUF, 1972.

MM *Matter and Memory*. Trans. Nancy Margaret Paul and W. Scott Palmer. New York: Zone, 1991.

O *Oeuvres*. Paris: PUF, 1959.

TSMR *Two Sources of Morality and Religion*. Trans. R. Ashley Audra and Cloudsley Brereton with the assistance of W. Horsfall Carter. Notre Dame, IN: U of Notre Dame P, 1977.

notes

1 In Leonard Lawlor's recent fine study, *The Challenge of Bergsonism* (London and New York: Continumm, 2003), for example, CE is the only text not to receive any reading or utilization. It does contain, let it be noted, a quite superb reading of TSMR.

2 See G. Canguilhem, "Commentaire au troisième chapitre de *L'Évolution créatrice*," *Bulletin de la faculté des lettres de Strasbourg* 21 (1943): 126–43; M. Merleau-Ponty, *Nature: Course Notes from the College de France*, trans. Robert Vallier (Evanston, IL: Northwestern UP, 2003), esp. 51–70; G. Deleuze, "Bergson's Conception of Difference" (1956) in *Desert Island and Other Texts: 1953–74*, trans. Michael Taormina (New York: Semiotext(e), 2004) 32–52.

3 Bergson, *Mind-Energy*, trans. H. Wildon Carr (New York: Holt, 1920) 3–37 (7). See Deleuze, "Bergson's Conception of Difference" 33.

4 Curiously there is no engagement in Bergson's text with Kant's critique of teleological judgement. For insight into Bergson and Kant on finality see chapter 5 of my *Philosophy and the Adventure of the*

Virtual: Bergson and the Time of Life (London and New York: Routledge, 2002).

5 For example, in his text *The Structure of Evolutionary Theory* (Cambridge, MA, and London: Harvard UP, 2002) Stephen Jay Gould argues that: "the extensive 'deep homology' now documented in both the genetic structure and developmental architecture of phyla separated at least since the Cambrian explosion (*c.*530 million years ago) should not, and cannot, exist under conventional concepts of natural selection as the dominant cause of evolutionary change" (1065).

6 Stephen Jay Gould, *Ever Since Darwin* (London: Penguin, 1991) 34.

7 Compare Bergson (MM 185): "the task of the philosopher . . . closely resembles that of the mathematician who determines a function by starting from the differential. The final effort of philosophical research is a true work of integration."

8 Bergson's contention is that Kant's first *Critique* continues the old dream of approaching the real in terms of a universal mathematics:

> In short, the whole critique of pure reason leads to establishing the fact that Platonism, illegitimate if Ideas are things, becomes legitimate if ideas are relations, and that the ready-made idea, once brought down from heaven to earth, is indeed as Plato wished, the common basis of thought and nature. The whole critique of pure reason rests upon the postulate that our thought is incapable of anything but Platonizing, that is, of pouring the whole of possible experience into pre-existing molds. (CM 197)

9 Kant, of course, sought to show in precise terms that his project amounted to an *epigenesis* of pure reason and *not* "a kind of *preformation-system* of pure reason" (*Critique of Pure Reason* B 167). The problem being confronted in the *Critique* is that of how to account for a *necessary* agreement of experience with the concepts of the objects of experience, and Kant's solution is to favour the system which will demonstrate that it is the categories of the understanding which make experience possible. This system of epigenesis is quite different from a preformation one in which the agreement between experience and concepts would be explained in terms of a subjective disposition implanted in us by a Creator. A preformation-system would have the effect of making the necessary agreement an arbitrarily subjective one: we are so constituted that we cannot think our representations in any other way than how we actually do. Kant has no desire to satisfy the sceptic on this issue and insists that the objective validity of our judgements does not rest on an illusion. However, Kantian critique must forever be running the risk of slipping back into preformationism, not because it proposes that the human condition is predisposed to intuit and think the way it does for transcendent reasons (implantations from God, for example), but because of its uncritical privileging of Newtonian mechanism. This concern over the fate of an epigenetic critique in Kant is most apposite, I believe, in the case of finality and teleological judgement. See especially the movements at play in Kant's thinking in §§ 81 and 82 of the "Critique of Teleological Judgement."

10 There is clearly a Schellingian ring to Bergson's stress on "seeing." However, whilst it would be a worthwhile and interesting exercise to relate Bergson's conception of creative evolution to Schelling's *Naturphilosophie*, it would be an error to conflate the two (the "Bergsonian" innovations need to be taken into account, for example the argument on the double genesis of matter and intellect). Still, if we wish to place Bergson as a "post-Kantian," a consideration of his relation to Schelling is probably the best place to start. Bergson himself notes the influence of Schelling on Ravaisson but argues that it should not be exaggerated. See also the concluding remarks in Deleuze's essay "Bergson's Conception of Difference."

11 Bergson also holds that if finality is to be posited it can only be in the sense of "the whole of life in a single indivisible embrace."

12 This is something picked up on by Canguilhem with regard to natural selection in the first edition of *The Normal and the Pathological* (1943), written around the same time as his reading of the third main part of Bergson's *Creative Evolution* 129–30, trans. Carolyn R. Fawcett with Robert S. Cohen (New York: Zone, 1991).

13 See H. Bergson, "Psychophysical Parallelism and Positive Metaphysics" in *Continental Philosophy of Science*, ed. G. Gutting (Malden, MA, and Oxford: Blackwell, 2005) 59–69 (68).

14 *A Vital Rationalist: Selected Writings of Georges Canguilhem*, ed. Francois Delaporte (New York: Zone, 1994) 87.

15 See also the point made by Jean Gayon is his excellent essay "Bergson's Spiritualist Metaphysics and the Sciences" in, *Continental Philosophy of Science*, ed. G. Gutting (Malden, MA, and Oxford: Blackwell, 2005) 43–59. Gayon provocatively, but astutely, interprets Bergson as a "spiritualistic positivist," and notes: "Bergson's reflection on biological facts closely resembles Canguilhem's notion of normativity of the [living] being" (57). This is to claim that the "facts" of biology are facts "intended" by nature; in short, norms are rooted in life and the living. Gayon is correct, in my view, to locate the beginnings of Canguilhem's insight in Bergson.

16 Canguilhem, *Vital Rationalist* 318–19.

17 M. Foucault, "Life: Experience and Science" in *The Essential Works, Volume Two (1954–84)* (London: Penguin, 2000) 465–79 (475).

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