

HENRI BERGSON AND THE MIND BODY PROBLEM: OVERCOMING CARTESIAN DUALISM

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ABSTRACT: There are few philosophers who have been so influential in their own lifetimes and had so much influence, only to be subsequently ignored, as Henri Bergson (1859-1941). When in April 1922, Bergson debated Einstein on the nature of time, it was Bergson who was far better known and respected. Now Einstein's achievements are known to everyone, but very few people outside philosophy departments have even heard of Bergson. Following Friedrich Schelling and those he influenced, Bergson targeted the Cartesian dualism that permeates the culture of modernity. In doing so, he challenged deep assumptions rooted in and cemented in place by Descartes' philosophy. In this article I will argue that Bergson made considerable progress in this attack on Cartesian dualism, and diverse philosophers subsequently built on his ideas. However, failure to appreciate the source of these ideas has weakened their impact, being scattered among different disciplines by diverse philosophers and scientists who drew upon Bergson's work while forgetting details of his philosophy. This article is an effort to rectify this situation.

KEYWORDS: Henri Bergson; Cartesian Dualism; Mind; Matter; Memory; Temporality; Process Philosophy

INTRODUCTION

Inspired by a tradition of thought going back to Friedrich Schelling, Henri Bergson's central concern was to overcome the Cartesian tradition of thought. This not only had rendered the relationship between mental and physical existence unintelligible but had engendered within philosophy the dualism between idealism and materialism. To this end, Bergson proposed not only a radically new conception of both the nature of mind and the nature of matter, but also a radically new conception of philosophical method. His work has been profoundly influential, although his influence is seldom fully acknowledged. Those strongly influenced by him include William James, John Dewey, Conwy

Lloyd Morgan, A.N. Whitehead and thereby those indirectly influenced by him, Aleksandr Bogdanov and Mikhail Bakhtin in Russia, Wilhelm Dilthey, Edmund Husserl and Martin Heidegger in Germany, in France, Gabriel Marcel, Gaston Bachelard, Maurice Merleau-Ponty, Gilbert Simondon, Gilles Deleuze and Cornelius Castoriadis and those influenced by them, and Jean Piaget, Louis de Broglie, Ilya Prigogine and Karl Pribram among leading scientists. Failure to acknowledge Bergson's influence is evident in the development of German philosophy where Bergson's insights on temporality were appropriated without acknowledging them,¹ and in French philosophy where Bergson's insights on embodiment had a major influence on phenomenologists without their source being acknowledged. As the phenomenologist Richard Zaner observed in the epilogue to his work on embodiment:

Although neither Marcel, Sartre nor Merleau-Ponty has apparently noted this, it was Bergson who first saw, with great insight, the genuine significance and peculiarity of the body, and the necessity of re-formulating the question of the relations between mind and body in terms of an analysis of the human body.²

This failure is also evident in some of the scientists and mathematicians who were directly or indirectly influenced by Bergson, although original scientists have been more generous in paying respects to Bergson.³

To properly appreciate the achievements of those who Bergson influenced and their contributions to philosophy, and thereby to challenge the ways of thinking currently dominating our culture more effectively, it is necessary to properly understand Bergson's own philosophy. Bergson claimed to be developing a new method. What was this new philosophical method? Did it enable Bergson to reconceive mind and matter in such a way that their relationship could be made intelligible? I will suggest here that to a considerable extent, it did.

¹ See Theodore Kisiel and Thomas Sheehan, eds. 'The Concept of Time', in *Becoming Heidegger: On the Trail of His Early Occasional Writings, 1910-1927*. Evanston: Northwestern University Press, 2007, ch.16.

² Richard M. Zaner, *The Problem of Embodiment*, 2nd ed. The Hague: Martinus Nijhoff, 1972: 243

³ See P.A.Y. Gunther, ed. *Bergson and the Evolution of Physics*, Knoxville: The University of Tennessee Press, 1969; Milič Čapek, *Bergson and Modern Physics*. Dordrecht: Reidel, 1971; and Andrew C. Papanicolaou and Pete A.Y. Gunter, eds. *Bergson and Modern Thought*, ed., Chur: Harwood Academic Publishers, 1987.

TOWARD A POST-CARTESIAN METHOD

For Bergson, the dualism between mind and body is unavoidable so long as we follow Descartes in viewing matter as extended while denying extension to the mind. There is no conceivable way that mind could influence matter if this is the case. It is this impossibility which has led people to uphold an idealist or materialist monism, denying reality to the material world or to the realm of experience. The core belief of materialist monism, which presently prevails, is that there is one order of events, the physical, and that mental phenomena are either unreal, causally inefficacious or another way of looking at physical processes. Bergson argued that the differences between these positions are trivial:

For whether, indeed, thought is regarded as a mere function of the brain and the state of consciousness as an epiphenomena of the state of the brain, or whether mental states and brain states are held to be two versions, in two different languages, of the same original, in either case it is laid down that, could we penetrate into the inside of a brain at work and behold the dance of the atoms which make up the cortex, and if, on the other hand, we possessed the key to psycho-physiology, we should know every detail of what is going on in the corresponding consciousness.⁴

There is no place for consciousness to influence the course of events.

However, for Bergson, the intractability of the problem rests not with the empirical data, nor the lack of internal consistency in these explanatory schemes, but in the method of inquiry itself. This method of inquiry privileges logico-mathematical thought. Logic is essentially a finite set of rules which operate on and strictly determine the behaviour of symbols characterized by discreteness, simplicity and permanence. The discreteness of symbols enables them to be rearranged in imaginary space, while their simplicity and permanence renders them immutable and timeless. While the rules of logic allow for infinite rearrangement of symbols, the system of all possible logical relations is given timelessly. All of the infinitely many possible permutations and combinations are strictly determined and contained in the rules and elements of the system. Privileging this logic and applying it rigourously to physical and experiential phenomena requires that genuine temporality in which there is real creativity in

⁴ Henri Bergson, *Matter and Memory*, [1896] trans. Nancy Margaret Paul and W. Scott Palmer, London: Allen & Unwin, 1911, xi.

becoming, qualitative heterogeneity and freedom from necessity, must be denied categorically. Time is reduced to a dimension of space.

Applying this logic to psychological phenomena requires the identification of discrete, simple and permanent components: affective states, percepts, concepts, memories, 'overt, discriminant responses', 'subliminal experiential infinitesimals', phonemes, sememes, or whatever. These are required to apply mathematics to explore the realm of possibilities and to make predictions among these possibilities. But the simplicity of these elements is problematic. How can a percept such as 'blue', a concept such as 'above', and an affection such as 'anxiety' be reduced to different configurations of the same fundamental units? To solve this problem, we are led to a reductionism which explains the apparent qualitative multiplicity of psychological states in terms of distinct configurations of homogeneous physico-chemical events located within the brain. As far as memory is concerned, either the brain manufactures and then stores percepts in the way space contains objects, or it manufactures and then stores patterns of electrochemical activity to which epiphenomenal percepts accrue as mere shadows. Effectively, conscious agency disappears.

Bergson saw the model for an alternative philosophical method in the development of the infinitesimal calculus. Embracing 'infinite regress', quantities that 'tend toward zero', 'passages to the limit', mathematical forms banished as impurities by the Ancient Greeks, 'becoming', 'change' and 'process' were incorporated into mathematical thought. The calculus introduced a new manner of thinking. Instead of employing static concepts, static concepts are represented as a limiting case of the calculus. The straight line becomes a particular case of the curve, the circle a particular case of the ellipse, each number becomes a value obtained by reduction through an infinity of processes. Movement is taken directly into account rather than being a 'by-product' of stability. And since there can be no motion without unfolding in time, this is a temporal rationality. Reflecting on calculus, Bergson wrote:

To philosophize is to invert the habitual direction of the work of thought. ... The most powerful method of investigation which the human mind possesses, the infinitesimal calculus, is born of this very inversion. Modern mathematics is precisely an effort to substitute that which is *making itself* for that which is *already made*, to follow the generation of magnitudes, to seize motion, no longer from without and in its completed result but from within and in its tendency to change,

finally to adopt the mobile continuity of the outline of things.⁵

However, Bergson did not conclude from this that through mathematics we could grasp the reality of time. Even the calculus ultimately reduces the world to discrete, simple and permanent components. The infinitesimal units of time, the 'dt's', are intervals consisting of an infinity of mutually external instants. Time is geometrized and motion is visualized as a static series of points. This leads back to a deterministic, 'block' universe in which real time, time as durational becoming, is eliminated. So, Bergson argued, metaphysics 'in no way will move by this [method] towards a universal mathematics, that chimera of modern philosophy. Quite the contrary, the farther it will go on this path the more it will re-encounter objects still more untranslatable into symbols.'⁶ What is called for, according to Bergson, is a radicalization of this method, to call into question all fixed concepts and objects and to think in fluid concepts and follow the contours of temporally unfolding reality.

Bergson called this method 'intuition' as opposed to analysis, a term for which he was condemned by Bertrand Russell and others as anti-intellectual. While analysis grasps reality from the outside through comparisons and ratios, intuition attempts to grasp reality from the 'inside'. Contrasting the two, Bergson wrote:

By intuition is meant the kind of *intellectual sympathy* by which one places oneself within an object in order to coincide with what is unique in it and consequently inexpressible. Analysis, on the contrary, is the operation which reduces the object to elements already known, that is, to elements common both to it and other objects. To analyse, therefore, is to express a thing as a function of something other than itself.⁷

From this it should be clear that 'intuition' is not anti-intellectual but amounts to a generalization of the notion of 'empathy' thereby corresponding to Michael Polanyi's notion of 'indwelling'. However, Bergson also made the point that this method is 'autological', that is, understanding things in their own terms rather than 'heterological': explaining things through something else, and that such autological understanding involves (as Dilthey came to realize in his last works) appreciating things in their durational becoming, thinking 'in duration'.

⁵ Bergson, *The Creative Mind*, N.Y.: Philosophical Library, 1946, p.224-225.

⁶ Ibid. p.225f.

⁷ Henri Bergson, *An Introduction to Metaphysics*, trans. T. E. Hulme, Indianapolis: Bobbs-Merrill, 1955.

MIND

Bergson first applied such 'intuition' to the mind. To begin with, conscious experience appears to form a series of states, distinct from previous and subsequent ones to which it is linked by external associative links. But such discreteness is an illusion created by projecting onto it the logical assumptions and symbolic diagrams deriving from language, diagrams which have become for us reality itself. Intuitive effort reveals behind such discrete states successive phases of psychological becoming flowing smoothly into one another in a way which cannot be decomposed into a series of juxtaposed motionless moments. The content of experience is then revealed by greater intuitive effort to be pure temporality, a temporality in which the past survives in the present. As Bergson put it:

[C]onsciousness signifies, before everything, memory. At this moment that I am conversing with you, I pronounce the word 'conversation'. Clearly my consciousness presents the word all at once, otherwise it would not be a whole word, and would not convey a single meaning. Yet, when I pronounced the last syllable of the word, the three first have already been pronounced; they are past with regard to the last one, which must then be called the present. But I did not pronounce this last syllable 'tion' instantaneously. The time, however short, during which I uttered it is decomposable into parts, and all of these parts are past in relation to the last among them. This last would be the definitive present, were it not, in its turn, decomposable. So that however you try, you cannot draw a line between the past and the present, nor consequently between memory and consciousness.⁸

Since 'immediate' 'recent' and 'remote' are relative terms, it is evident that it is not only the 'immediate' past which is preserved in the present, but the whole past merges with the present.

The present in turn is new and absolutely unique, creatively advancing into the future. As Bergson suggested:

Let us seek, in the depths of our experience, the point where we feel ourselves most intimately within our own life. It is into pure duration that we then plunge back, a duration in which the past, always moving on, is swelling unceasingly with a present that is absolutely new. But, at the same time, we feel the spring of our will strained to its utmost limit. We must, by a strong recoil of our personality on itself, gather up our past while it is slipping away, in order to thrust it, compact and undivided,

⁸ Bergson, *Mind-Energy, Lectures and Essays*, London: Macmillan, 1920, p.69

into a present which it will create by entering.⁹

Such coincidence of oneself with itself admits of degrees, and we never completely possess ourselves. But to the extent that we do so possess ourselves, we are truly free.

MATTER

For materialists, such reflections have nothing to do with reality which, if it can be known at all, can only be known through the logico-mathematical methods of science. In opposition to this sentiment, Bergson suggests that we should also apply the method of intuition to the realm of matter. Physical processes are characterized by histories which coincide with portions of physical durations. If the essence of duration in consciousness is memory, might not memory also be involved in material processes?

Traditionally, duration in the physical world has not been taken seriously, and no need has been felt to postulate such a memory. If sugar dissolves in water, the time which elapses is nothing more than the time it takes for the sugar atoms to rearrange themselves. Time is an artifact of the rearrangement of the immutable elements. But this way of thinking again follows from the projection onto nature of the logical order defining the relations between discrete, simple and immutable symbols. But through intuition, grasping matter from the inside, particles cannot be seen as immutable and their movement a succession of immobilities. Their endurance requires explanation, and the only possible explanation is recourse to some type of memory.

To justify this view, Bergson critically examined the prevailing conception of the physical world. At that time, continuity was attributed to energy only. The cohesion of matter was attributed to energy or immaterial forces. Such continuity was seen as spatial, downplaying the temporal continuity associated with wave motion of light. Corpuscles, despite their hypothetical status, were taken to be the true constituents of physical reality rather than wave motion. Bergson rejected the bias in favour of corpuscles and defended the priority of wave motion, heralded the equivalence of matter and energy and asserted the

⁹ Henri Bergson, *Creative Evolution*, trans. Arthur Mitchell, Lanham: University Press of America, 1983, p.199-200.

historical continuity of nature implicit in the undulatory conception of energy and consequently of matter. He argued that:

...the atom dissolves more and more under the eyes of the physicist.... We may still speak of atoms; the atom may even retain its individuality for our mind which isolates it; but the solidity and the inertia of the atom dissolve either into movements or into lines of force whose reciprocal solidarity brings back to us universal continuity.... For Faraday the atom is a centre of force. He means by this that the individuality of the atom consists in the mathematical point at which cross, radiating throughout space, the infinite lines of force which really constitute it: thus each atom occupies the whole space to which gravitation extends and all atoms are interpenetrating. ... [V]ortices and lines of force ... show us, pervading concrete extensity, *modifications, perturbations*, changes of tension of *energy*, and nothing else.¹⁰

Where the wave replaces the corpuscle as the ultimate constituent of the material universe, space or extension, central to the definition of a corpuscle, has become somewhat nebulous, while time, irrelevant to the definition of a corpuscle, is indispensable for the definition of the wave. In order to obtain the equivalent of the classic corpuscle one has to consider the whole duration of an undulation as it develops diachronically. Time, no longer the abstract mathematical time of classical physics, enters into the definition of substance. There are a number of implications to this vision of matter. The spatiality of matter is no longer equivalent to geometrical extensity - matter can never become momentarily stationary. Also, where time is concrete, embedded in different strata of matter each of which may exhibit its own tempo of motion, the notion of a present moment that extends simultaneously throughout the universe is inapplicable to reality. And since perfect deducibility of effects from anterior causes presupposes discrete and homogeneous quantities which do not exist in the probabilistic, continuous universe with qualitatively heterogeneous aspects, determinism must be rejected. Finally, there are no discrete macroscopic objects which could be posited as the objective reality against which percepts could be measured. Percepts could not be pictures of objects because objects as such do not exist. So how can the becoming of a wave or the becoming of all matter be conceived? How can the 'before' and 'present' of the universe be asserted without the eternity of its constituents? It is here that the notion of memory must be

¹⁰ Bergson, *Matter and Memory*, pp.263-267.

invoked as an explanatory principle.

A wave unfolding in time occupies a certain depth of duration. For it to exist its immediate past must persist into the present to conjointly define it. This is a form of proto-memory. To construe a wave as involving a proto-memory in this way is not to project psychic qualities onto the physical world or to invoke the notion of an omniscient spirit which beholds the history of things. It is required to make sense of the notions of before and after; that is, to make sense of time. As Bergson put it: '[I]t is impossible to distinguish between the duration, however short it may be, that separates two instants and the memory that connects them, because duration is essentially a continuation of what no longer exists into what does exist.'¹¹

MATTER AND MIND

For Bergson, pure extension without duration and pure duration without extension are two unrealizable limit cases. All that exists can be characterized in terms of its participation in both extension and duration. And with matter and consciousness no longer defined in mutually exclusive terms, the relationship between them can be made intelligible. Inert matter corresponds to maximum extension and a minimum of what Bergson calls 'durational tension'. Extension becomes progressively less significant and duration progressively more central in organic matter, primitive sensory-motor activity, concrete human perception, abstract thinking and then with various levels of intuition where we approach maximum durational tension. Bergson identified duration with spirit.

In such a world sentient organisms can no longer be described as perceiving an external world by a sequence of transformations beginning with stimuli input, which is a code on the real object, and ending with an extensionless picture of that object in the brain. From a Bergsonian perspective, the distinctness, individuality and reality of objects becomes nebulous; they dissolve into a spatio-temporal process of universal becoming. The problem of perception has to be reconceived as, How are objects as perceived carved out of this universal, durational becoming? And how does personal consciousness arise in the midst of impersonal universal becoming?

¹¹ Henri Bergson, *Duration and Simultaneity*, New York: Bobbs-Merrill, 1965, p.49.

Any hypothetically isolated region of matter is present in that it enters into calculable relations with all other regions similarly isolated. Correspondingly, it may be said that the region 'perceives', or that the totality of the universe is represented for that region, in that within its duration, the action of all other regions is momentarily incorporated. It can be called conscious representation in that the diverse rhythms of duration which co-exist in nature are momentarily incorporated in, or adapted to, the durational rhythm that characterizes the region in question.

For Bergson, living organisms are not merely hypothetical segments of the universal becoming but true individuals. To the degree they partake of matter, their conduct towards any other part of the world is identical to that of any other region. However, living organisms are defined by their ability to exclude most types and favour other types of environmental influence, and then to respond selectively to these. Such responses are not instantaneous but are characterized by hesitation or delay which at times can be indefinitely prolonged, and organisms are able to respond differently to the same stimuli while responding identically to different stimuli. The organism thereby becomes a centre of novelty, placing it in a variable rather than constant relationship with the world.

These three attributes are aspects of the one fundamental property: organisms are centres of greater 'durational tension' involving greater 'mnemic span'. The selected region of becoming that is called the stimulus aggregate is condensed by the organism and transformed to follow the existential rhythm of the organism's duration. The distinction between and relationship between subject and object becomes temporal rather than spatial. As Bergson put it:

In the space of a second, red light ... accomplishes 400 billions of successive vibrations... In short, then, to perceive consists in condensing enormous periods of infinitely diluted existence into a few more differentiated moments of an intenser life, and in thus summing up a very long history. To perceive means to immobilize.¹²

Representations are not pictures of reality but that part of the totality, being of vital importance to the organism, which is delineated, immobilized and detached from the rest of reality as a percept.

The representation of the influences to which a primitive organism such as

¹² Bergson, *Matter and Memory*, p.275.

an amoeba selectively responds according to their importance to its survival is not inside the membrane but is extended over the surface which constitute the limits of its body. Representation is equivalent to this discernment; the detachment of these influences from the continuity of the world effected by the selective action. According to Bergson, the relationship between presence and representation is not fundamentally different when organisms have complex cerebral centres. Complex cerebral centres generate a greater tension of duration which separates the organism further from the immediately surrounding world and from immediate action. Perception is still a process of selective action which immobilizes the duration of processes and disengages them from the totality of the universe. That is, the brain functions as an instrument of selective activity which limits rather than produces percepts. A percept is still defined as that part of the universal becoming that interests the vital function of the perceiver; it is still part of the present world although it now owes its particular form to the more complex selective action made possible by the brain. Through such increased selectivity the distance and the number of regions of reality that can appeal to the perceiver's action are increased, and reaction, instead of being actually materialized as movement, can dissipate as a nascent plan of movement. This involves active attention as compared to the automatic mode of perceptual activity which is pre-attentive.

The many qualities which cohere to form a percept for people, such as texture, colour, smell etc. are held by Bergson to be properties of the external world, and the cerebral mechanism simply condense these qualities and adapt them to the specifically human rhythm of duration. As he put it,

my perception is indeed truly within me, since it contracts into a single moment of my duration that which, taken in itself, spreads over an incalculable number of moments.... In just the same way the multitudinous successive positions of a runner are contracted into a single symbolic attitude, which our eyes perceive, which art reproduces, and which becomes for us all the image of a man running.¹³

How could this interpretation allow for diverse specialized organs within the brain? According to Bergson, the purpose of the different sensory mechanisms, including the peripheral organs, the cortical projection areas, and their

¹³ Ibid. p.p.276-277.

connections, is to accommodate distinct sets of qualities, already present as so many existential rhythms co-existing in nature, to durational rhythms which characterize the various percept types, whether visual, auditory or whatever. To account for how each sensory mechanism contributes to the coordination of these qualities such that a cohesive percept may arise, Bergson suggested that an organ of sense 'is constructed precisely with a view to allowing a plurality of simultaneous excitants to impress it in a certain order and in a certain way, by distributing themselves, all at one time, over selected portions of its surface.' He went on: 'It is like an immense keyboard, on which the external object executes at once its harmony of a thousand notes, thus calling forth in a definite order, and at a single moment, a great multitude of elementary sensations corresponding to all the points of the sensory centre that are concerned.'¹⁴

MEMORY AND MIND

So far we have been only considering what Bergson calls 'pure perception', the type of perception associated with being 'absorbed in the present and capable, by giving up every form of memory, of obtaining a vision of matter both immediate and instantaneous.'¹⁵ The abstraction from memory was designed to reveal how perception in general is possible without being subjective; to show that living matter is capable of achieving without the benefit of personal, conscious, memory images ad to reveal the limits and specify the role of the nervous system as a material organ in actual perception. But this is an abstraction. As Bergson argued, 'Perception is never a mere contact of the mind with the object present; it is impregnated with memory-images which complete it as they interpret it.'¹⁶ It is through memory that past actions guide what is selected by present perception. And it is through memory impregnating actual perceptions that the qualities of objects appear to be ours, and perception takes on its subjective quality. For Bergson, memory is the key to understanding mind, and it is perhaps no coincidence that, as Karl Pribram has noted, the English word 'mind' is derived from the same root as is 'memory': 'mynden'.¹⁷

¹⁴ Ibid. p.165.

¹⁵ Ibid. p.26.

¹⁶ Ibid. p.170.

¹⁷ Karl H. Pribram, 'Bergson and the Brain', in *Bergson and Modern Thought*, ed. Andrew C. Papanicolaou and Pete A.Y. Gunter, Chur: Harwood Academic Publishers, 1987, p.164.

Pure memory, memory associated with the durational becoming of the universe, cannot be known directly but only through intuition of one's own duration. Bergson is opposed to the idea that memory must be spatialized' that is, that memories must be seen as located somewhere in space. He accepted that the nervous system in being adapted to life can store within itself past sensori-motor sequences as functional or structural modifications. However, rejecting the reduction of all memory to such modifications, Bergson hypothesized a distinction between habit memory and image memory. 'The past', he wrote, 'survives under two distinct forms: first, in motor mechanisms; secondly in independent recollections.'¹⁸

Habit memory is memory associated with motor mechanisms. Examples include not only practical skills, but also verbal material learned by rote. Habit memory is acquired by repetition to become an automated sequence and requires effort. It is not subject to arbitrary abbreviations. Although one might have an abbreviated image of this automated sequence, this image belongs to the memory proper and is not part of the mechanism itself. Habit is a property of the nervous system and subject to all the perils to which sustaining the system is exposed.

Representational memories, on the other hand, are single-trial acquisitions. A percept at any given portion of psychological duration is a unique and non-repeatable phenomenon. Although recollections appear distinct and external to each other, they are inextricably embedded in the totality of memory much like external objects are encased in the continuity of the material universe. The immobilization and the disengagement of both percepts from the material universe and recollections from memory is, according to Bergson, the work of the nervous system. In fact, it is the only contribution of the nervous system to the genesis of percepts and recollections. Forgetting indicates the inadequacy of the nervous system to sustain the carving-out of concrete recollections within the ever-evolving totality of pure memory.

Underlying both habit memory and representational memory is the capacity to recognize. Recall is a doubtful form of knowledge of the past; but recognition is much more persuasive because all learning, all conscious perception and all concept formation would be inexplicable in its absence. Without recognition, past

¹⁸ Bergson, *Matter and Memory*, p.87.

experience would be absent. Basic to any epistemology must be an account of the mechanism of recognition. Prior to Bergson most philosophers were either nominalists, treating concepts as developing through comparison to reveal what is common in percepts, or 'conceptualists' treating concepts as given *a priori* to be discovered as part of reality or revealed as built into the apparatus of perception. Bergson developed a new theory, rejecting the spectator view of percepts and concepts he saw these as developing through the organism's effort to adapt to its world. Objects perceived or percepts are not 'inside' the perceiver. What is inside the brain is the neuroelectric diagram which prolongs the influence of the world. This diagram is neither the code on the object nor the code on the response but an amalgam of both. There is only one pattern, one diagram which is evoked by a variety of external sources of influence to the degree that these are selected from the continuity of the world process by virtue of their being relevant to the same vital need. So, while concepts emerge from percepts, as the nominalists argued, there is no question of comparisons between percepts. As Bergson argued:

It is grass *in general* which attracts the herbivorous animal: the colour and smell of the grass, felt and experienced as forces, (we do not go so far as to say, thought as qualities of genera) are the sole immediate data of its external perception. On this background of generality or of resemblance the animal's memory may show up contrast from which will issue differentiations; it will then distinguish one countryside from another, one field from another; but this is, we repeat, the superfluity of perception, not a necessary part.¹⁹

Concrete objects are the end product, not the point of origin, of the perceptual process. Recognition of the similarity of objects should not be treated as a psychological process. As Bergson continued:

...there is not essential difference between the process by which this acid picks out from the salt its base, and the act of the plant which invariably extracts from the most diverse soils those elements that serve to nourish it. Make one more step; imagine a rudimentary consciousness such as that of an amoeba in a drop of water; it will be sensible of the resemblance, and not of the difference, in the various organic substances which it can assimilate. In short, we can follow from the mineral to the plant, from the plant to the simplest conscious beings, from the animal to man, the progress of the operation by which things and beings seize from out their

¹⁹ Ibid. p.206.

surroundings that which attracts them, that which interests them practically, without needing any effort of abstraction, simply because the rest of their surroundings takes no hold upon them.²⁰

In human consciousness, the differences leading to separation and solidification of objects-as-perceived are developed as a habit memory, are only noticed after pre-attentive recognition has taken place. Notice of these objects involves representational memory and attentional effort, leading to memory-images (episodes) 'recorded' in the course of their formation. According to Bergson it is through such reflective perception, reflection on the objects-as-perceived, that we have developed logic and mathematical thought.

This whole process has been studied by Piaget who received his basic ideas from Bergson, without properly acknowledging the source of his research program. Following Bergson, Piaget argued that the cognitive system is a specialized instrument of adaptation and that it is a direct extension of other biological instruments of adaptation. The newborn infant's environment and self form an uninterrupted continuity which is severed later in development and is followed by the compartmentalization of the environment into a multitude of discrete and permanent objects. Piaget asserted the active nature of early perceptual achievements, showing how the ability to experience the world as a world of objects emerges through interaction with the world. Objects are first defined with reference to motor schemata and there is no separation of the sensory and motor components of the perceptual act. Manipulable objects, including the self, are then seen to arrange themselves in a common space and to remain invariant therein unless their configuration and position is modified by an action or through the application of a force external to them. The properties of these objects and the regularity of their modifications first comprehended with reference to concrete perceptual-motor operations are subsequently internalized. In this way the concrete operations are idealized into abstract logical rules. The perceptual relations among real objects become logical relations of possible objects which people are able to explore through formal logic and mathematics. It is this that Piaget regarded as their highest form of intellectual development, the stage of 'formal operations'.

²⁰ Ibid. p.207f.

But while Piaget fully developed Bergson's insights into the practical source of logic-mathematical thinking, he did not draw Bergson's conclusion from this, that such logico-mathematical thinking, while being eminently adapted for action and for controlling the world, tends to hide the true nature of reality. He gave no place to 'intuition' or 'empathy' or to the creative becoming revealed through such intuition. Bergson, by contrast, saw the higher stages of intellectual development as habit memory being conjoined with memory images associated with duration. For Bergson, when mental images partaking of pure duration interact with cerebral automatisms or habit memories, we have an attentive recognition which can interrupt or arrest automated habitual activities, allowing for real freedom of thought and action. According to Bergson, concepts are not preserved either by motor habits or in duration, but are created anew each time by the confluence of verbal automatisms and images which, increasing perpetually in number and variety, make for their contextual, inter-personal, and age-dependent variability. In short, Bergson gave a place to the creative diversity of human thought.

To justify the distinction between habit memory and image memory associated with duration and to show the autonomy of image memory from the brain and thereby to justify his notion of human freedom, Bergson made a study of aphasias and other psychological disorders. According to Andrew Papanicolaou, Bergson's analysis of these disorders still stands up, and Bergson's theory accounts for the phenomena at least as well as any other theory and better than most.²¹ However, it is not the empirical studies which have raised questions and doubts, but what Bergson means by an episodic image memory associated with duration relatively free from cerebral activity, and explaining how such an image memory could affect cerebral activity and affect what people do.

To comprehend Bergson's claim, it is necessary to consider again his notion of durational tension defining the different levels of becoming. For Bergson, different durational tension is a measure of the power of acting.²² Greater tension is also associated with greater mnemonic span. The immateriality of image-memory or memory proper consists in the enormously higher tension of the same species

²¹ Andrew C. Papanicolaou, 'Bergson's Psycho-Physical Theory' in *Bergson and Modern Thought*, pp.56-128.

²² Bergson, *Mind Energy*, pp.16-17.

of duration which defines matter in general and cerebral automatisms in particular. If material processes themselves are essentially durational, to say that memory can affect cerebral automatisms is analogous to claiming that a magnetic fields can affect the atoms of iron rods, except that instead of interacting by virtue of both partaking of spatiality, memories and cerebral automatisms interact by virtue of both partaking of duration. What is involved is evident if we consider how the thoughts and actions of a person awake are temporally ordered in contrast to their thoughts when asleep when their tension of consciousness is at a minimum. The absurdities and contradictions of dream images are realized only *after awakening*, i.e., with the restoration of the normal tension of consciousness and mnemic span. In waking life, the longer mnemic span associated with a higher durational tension orders the becoming of their lives so that actions or utterances cohere.

CONCLUSION

Bergson wrote his major works more than a century ago, before the development of relativity theory, quantum theory and non-linear thermodynamics, at least on some interpretations, confirmed his characterization of matter. Since then the ideas he put forward have been further developed, both by those directly or indirectly influenced by him, and also by people who have developed similar ideas independently. By virtue of these developments it is possible to reformulate many of Bergson's ideas into a more cogent form. However, it is in Bergson's writings that the problems of Cartesian thought were most fully confronted and the relationship between the ideas needed to overcome them most clearly indicated. My contention is that whatever problems there are in Bergson's philosophy, his work provides a reference point which enables us to relate and understand the significance of the most vital developments in the humanities and both the natural and the humans sciences at the beginning of the new millennia.

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