



From the Philosophy Auditorium to the Neurophysiology Laboratory and Back: From Bergson to Damasio

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Abstract

Henri Bergson (1859–1941) was probably the most influential French philosopher at the turn of the twentieth century. In 1927 he was awarded the Nobel Prize for literature. Far beyond the restricted academic philosophical milieu, the impact of his thinking reached personalities as diverse as Claude Debussy, Marcel Proust, George Bernard Shaw, and the impressionists. His essay *The Laughter (Le Rire)* is one of the most profound and original ever written on the sense of humor. Bergson's opinions, with their emphasis on life, instinct and intuition, represented a deviation from the rationalist mainstream of western philosophical tradition. In some circles he was received with skepticism and irony, as in Bertrand Russell's *History of Western Philosophy*. Today, unbiased by theoretical "bergsonism," neurophysiologic research – as undertaken mainly by Antonio Damasio's team at Iowa University – confirms many of his hypotheses and elucidates their mechanisms. In this new light, intuition and "recognition by the body" should not be seen as the personal fantasy of an original thinker but as fundamental cognitive tools.

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As we start the new millennium, it may be useful to remember that 100 years ago, the turn of the century witnessed manifold discoveries and sparkling debates in the field of neuroscience. At that time, Broca, Dejerine, Wernicke, Westphal, Lissauer, Kussmaul, and of course Charcot and his school, "recreated" neurology. At the same time controversies between those supporting localization and those opposing it [1] went far beyond the boundaries of the strict clinical milieu.

A key figure in this process was the French-Jewish philosopher Henri Bergson (1859–1941), Nobel Prize laureate for literature in 1927. A Socratic figure and captivating speaker and writer, Bergson was the father of a new "philosophy of life" [2]. He proposed that philogenetic evolution at its highest point produced human intelligence that must be seen as a biological tool. Our representation of the external world is an instrument of more accurate adaptation; it allows the reaction to external stimuli to be delayed and selected rather than immediate and automatic [3–5]. Time and choice were central themes for Bergson, hence the law proposed in his *Matter and Memory*: "the larger the space scrutinized

by our perception, the longer the possible latency of our responses" and the more diverse their repertoire [3]. Bergson's time is not mathematical but of "biological duration" [3,4]. It is not empty but filled with screening processes of multiple reactions and evaluation of their possible consequences. Bergsonian "duration" has metaphysical meaning, and to some extent is synonymous with awareness. In other words, it is the light projected on the scene of original decision making; and another name for original decision making is liberty. In other words, a vital impulse (*l'elan vital*) causes life to progress and diversify. At the peak of evolution (*evolution creatrice*) the most sophisticated biological instrument, human intelligence, creates liberty [4].

The above, very simplistic sketch of bergsonism may explain why it was considered a reaction against rationalism [2]. Reason is no longer "pure" but filled with subjective impurities and is biologically biased; in short, it is life's humble servant. Bergson's *cogito* is so remote from his Cartesian pedestal that another critic of Descartes comes to mind – Antonio Damasio, a neuroscientist and the author of the essay *Descartes' Error* [6]. This is one reason for attempting to establish some affinities between these thinkers. There are two others: Bergson authored four main works; chronologically the second of them, *Matter and Memory (Matiere et memoire, 1896)* is deeply rooted in the neurologic research of that time. Its first chapter makes direct reference to clinical cases and research by Lissauer, Pierre Marie and Charcot, and contains many original "neurospeculations." It is interesting to review some of them through the lenses of modern thinking on high mental functions, of which Damasio is an exponent. The other reason for juxtaposing Bergson and Damasio is the similarity between the former's "immediate recognition" and the latter's "somatic markers." Somatic markers are the affective reactions accompanying images and scenarios in the mind. Orchestrated by the ventromedial prefrontal cortex, and "played on the body," they act as biological alarms signaling possible outcomes of different options [6]. Because Damasio does not include Bergson in his notes or references and is unfamiliar with his work (personal communication to S.C.B.), it may be an intellectually enriching experience to follow their parallel journeys in the respective fields of philosophical speculation and scientific experimentation.

Two levels of recognition

A central idea in *Matter and Memory* concerns the dispersion of afferent stimuli through endless efferent networks. We continuously experience an exchange of energy with the environment. At lower levels of the phylogenetic evolution as well as at the spinal level (which repeats phylogenesis), the organism's reaction is immediate and predetermined. However, at higher levels, the incoming impulse makes its cerebral detour, where the possible reactions are evaluated and often postponed. According to Bergson's very pragmatic view on perception, this cerebral detour, which initiates representation, is not merely a free subscription to life's theater but rather the invitation to more precise, intricate and original reactions – i.e., more useful reactions. The main point is that incoming stimuli may be either directed to a specific efferent channel or dispersed through endless effector pathways, or both. The result of this dispersion is not a definite movement but a tendency to react, an attitude, a certain "body state" [3].

Today, the previous statement makes us already "feel" the prefrontal cortex at work and here we meet Damasio's "somatic marking" [6].

But this *body state*, created by the dispersion of the incoming impulse, is for Bergson the first level of recognition, the immediate one. It may be recalled by subsequent exposure to similar stimuli, or it may be reenacted by memory. Whether we call it *body state* like Bergson, *gut feeling* or *somatic marker* like Damasio, it is much the same. Moreover, it has the same adaptive task: it is the emotional radar helping us navigate through the labyrinth of endless possible decisions [6].

The second level of recognition occurs when appropriate memories are inserted into the framework of the newly created body state; this is the cognitive stage of recognition. Bergson maintains that clinically different recognition disturbances will result from impairments in each of these stages. Translated into modern terminology, "aperceptive agnosias" are failures at the first level of recognition, whereas "associative agnosias" are failures of the second. Interestingly, for both Bergson and Damasio a major field of experimentation was that of visual agnosias. To make his point, Bergson compares Lissauer's patient who has severe orientation problems and probably "simultanagnosia" (inability to grasp the whole picture) to Charcot's patient who clearly has "prosopagnosia" (inability to recognize familiar people from their faces despite adequate vision and judgment) [3]. Bergson maintains that the latter must retain early recognition abilities; although it is not explicitly stated, it is understood that the "recognition by the body" is preserved.

It is the very thing demonstrated by Tranel and Damasio 90 years later in their landmark paper: *Knowledge without awareness; an autonomic index of facial recognition by prosopagnosics* [7]. They showed that patients with prosopagnosia generated electrodermal skin conductance responses (a signal of autonomic nervous system activation), only after exposure to faces of persons they have previously known but were now unable to *recognize*. Tranel and Damasio suggested that "an early step" of recognition is still taking place [7,8].

We stated elsewhere that Bergson is the philosopher of gradual transitions and evolution [9]. The relationship between afferent and efferent is not an exception: the impulses are continuously transmitted and it is impossible to say where perception ends and (preparation for) movement begins. Sometimes, as in "thorough perception," there is an ongoing feedback: early perception → reactive movement towards the perceived object → more accurate perception → refined movement, and so on. This was written in 1896. Thirteen years later, Balint described a syndrome that combines visual inattention with optic ataxia (the failure to precisely grasp an object "under visual guidance"), "psychic" paralysis of gaze, and occasional simultanagnosia [10]. In Bergson's words, this syndrome will signify impairment at the transition level between perception and early (recognition) movement. The finding of efferent fibers inside sensory nerves supported Bergson's view of perception as an active process. Damasio, when writing: "perceiving is as much about acting on the environment as it is about receiving signals from it" [6] probably does not disagree.

About psychopathology and social influences

We have seen that Bergson and Damasio, from different starting points and with different intellectual instruments, reached similar views on the mechanisms of recognition and choice. Does their resemblance go beyond that? We suggest it does.

First, they have similar interpretations of some mental disorders. For Bergson, a key aspect of life is the ongoing pressure to react to external stimuli. A prerequisite for appropriate reaction is reaching the body state (emotional state), which allows immediate recognition of the situation. The French philosopher calls the ability to do this "attention to life," which is lost in many psychiatric cases [3]. If we now translate "attention to life" into "ability to perform appropriate somatic marking," we see that this is the very process that cannot be performed by developmental sociopaths and psychopaths [6]. Bechara, Tranel, Anderson and the Damasio elegantly demonstrated the inability of patients with prefrontal lesions to generate skin conductance responses (one measure of the emotional reaction) when exposed to disturbing stimuli. Moreover, one patient stated that he *understood* the picture was disturbing but he did not *feel* disturbed [6,11]. The social consequences of this impairment may be ominous [6,11,12].

Second, Bergson and Damasio have a common and highly esteemed friend: the American philosopher and psychologist William James. This association did not happen by chance. Apart from being extremely warmhearted, William James provided profound insights into the mechanisms of emotion and its significance. The world of Bergson and Damasio is populated by passionate people who have drives, feelings and creativity, rather than by cool robots. In such a world William James could be nothing but a leader.

Third, both Bergson and Damasio are humanists. Clinical cases, experimental results and brain strategies are for them the starting point to a higher level of life's understandings, extending to its

social organization. Bergson achieves this in his last major work, *Les deux sources de la morale et de la religion* [13], and it remains an issue for Damasio in *Descartes' Error*. The authors of the present report were much pleased to read about the possible cultural influences on the process of somatic marking [6]. Damasio's examples are highly pertinent: regimes like Hitler's Germany, Stalin's Soviet Union or Pol Pot's Cambodia were deliberately blunting the natural process of somatic marking under the cynical name of reeducation. Social and cultural experiences create new somatic markers. Personally, we don't have to hear a covert xenophobe speaking about Jews, races or minorities; it is enough to hear some of his or her ideas on economics or other apparently remote subjects for a somatic marker (healthy intuition, gut feeling) to tell us he is a strong candidate to be an anti-Semite. Similarly, for those who have experienced a totalitarian regime, a certain kind of discourse on patriotism or about creating "a new kind of human being" will suffice to signal to their minds images of censorship, prisons and forced labor camps.

The differences in style and method are inherent – Bergson was a philosopher while Damasio is a neurologist and researcher. Nonetheless, their ways converge, and a passage from *Descartes' Error*, like – "...long before the dawn of humanity, beings were beings. At some point in evolution, an elementary consciousness began. With that elementary consciousness came a simple mind; with greater complexity of mind came the possibility of thinking and, even later, of using language to communicate and organize thinking better. For us then, in the beginning it was being, and only later was it thinking" – could be inserted in Bergson's *Evolution Creatrice*. Later, when reading – "It is as if we are possessed by a passion for reason, a drive that originates in the brain core, permeates other levels of the nervous system, and emerges as either feelings or nonconscious biases to guide decision making" – one cannot help feeling that Bergson's "elan vital" is just around the corner.

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