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Bergson and Technical Creativity

Julius Telivuo

Introduction

- 1 Bergson's approach to technology is ambivalent. As a rule, he tends to regard technology as a problematic phenomenon, although he does grant it a pivotal role in human culture and creativity. The chief motivation for this paper is that Bergson expresses important insights concerning the vital role of technics and the nature of invention and creativity, but the overall theme of technical creativity remains only implicit in his work and should be elaborated further. The goal of this article is to provide an analysis of technical creativity within Bergson's philosophical framework.
- 2 Bergson mainly assimilates technicity to the mechanical instrumentality of human intelligence. By contrast, I will argue that technology cannot be reduced to a mechanistic and material degeneration of life, but it is profoundly linked to human creativity, including a wide range of artistic pursuits. Indeed, this creative aspect of technology can also be found in Bergson's writings, and I will develop a Bergsonian analysis of technology based on three principal themes. First, I will discuss Bergson's idea of mechanism in relation to materiality and intelligence. Second, I will elaborate his theory of technology as a vital and societal phenomenon. Third, I will analyse Bergson's conception of creativity and of the possibility of technical creativity.
- 3 I will argue that technical creativity requires the kind of insight and approach Bergson refers to as *intuition*. However, I also argue that Bergsonian intuition should be reinterpreted as being essentially immersed in a material context and working interactively within this context. I will propose a materialist and interactive notion of intuition, based on an affective concept of materiality. Put briefly, the concept of *material affects* is key in capturing the dynamism and behaviour of a material entity in interaction.
- 4 My materialist reading of Bergson's concept of intuition is based on Gilles Deleuze and Félix Guattari's analysis of technics and materiality in *A Thousand Plateaus* (Deleuze and Guattari 1980). While Deleuze and Guattari's analysis is rooted in Bergson's philosophy

and his concept of intuition, it also provides a novel conceptual framework for analysing the nature of technical creativity. I argue that they introduce two important reinterpretations of Bergsonian concepts. First, they analyse technical creativity as an active, materially affective form of intuition. Second, with their concept of *machinic phylum* they develop Bergson's analysis of evolution and of the creative impetus of life (*élan vital*) in a socio-technological context. These developments demonstrate the fruitfulness of Bergson's thought in view of an analysis of technicity, but they also enable us to recognise and overcome certain limitations in Bergson's account, especially with regard to the creativity and materiality of technics.

Mechanical matter

- 5 For Bergson, the materiality of our surroundings is primarily a counterpart of our utilitarian, goal-oriented endeavours. Most notably in *Creative Evolution*, he sees action as determining the content of intelligence and perception and says: "We regard the human intellect [*intelligence*] [...] as relative to the needs of action. Postulate action, and the very form of the intellect can be deduced from it" (Bergson 2007, 153/168).¹ It is a constant pragmatist theme in Bergson's thought that our concrete activities and practical needs determine our perceptions to a significant degree. Out of the flow of phenomena we distinguish only the strands that are relevant for our actions and the rest remains a fuzzy background. From this point of view, our intelligence is essentially a problem-solving mechanism processing the challenges we meet in our activities (see Bergson 2019, 34-35).
- 6 According to Bergson, inorganic or at least *inert* matter is the primary and ideal material for technological activities due to its simplicity and homogeneity (Caeymaex 2013, 58). If our life is in danger, we first seek the most obvious and simple solutions: shelter, weapons, and warm clothing. While nature is complex, abundant, and voluminous in its workings, equipping its creations with seemingly superfluous features, man-made mechanisms are in their essence simplified and streamlined versions of natural processes. Human intelligence is essentially economical. The simplicity and the reduced variety of properties of a material make it more predictable and better suited to precise functions. On the other hand, the *homogeneity* of matter means more mouldability and versatility – it makes it possible to use the same kind of substance for all instances of a particular artefact. What also attests to the convenience of homogeneity is the pervasiveness of certain materials for weapons and tools defining whole technological ages: stone, bronze, iron. The essential simplicity of technical materials is also showcased by the fact that the development from bronze weapons to iron weapons was driven essentially by a single factor: the hardness of the material.
- 7 Even with the more recent advances of technology, the intellectual outlook of technics remains mechanistic, only becoming more complex and varied, for instance in the form of artificial intelligence and genetic engineering. Here, the simplicity and homogeneity of mechanisms takes the form of replicable processes based on programming and on systematic bio-chemical processes. Admittedly, genetic manipulation modifies biological, living processes, and is thus more subtle than the manipulation of inert substances. However, from a Bergsonian point of view, we can say that instead of truly creating new forms of life, gene technology simply isolates manageable genetic processes within the complex and interconnected functioning of the cell and modifies

them. Genetic manipulation is based precisely on the discovery of an already existing *mechanism* within vital processes, which can be replicated and manipulated.

- 8 Bergson stresses the importance of action and activities as part of human experience and as the primary purpose for the use of intelligence. However, he frames technical action in terms of a kind of schematic hand-eye coordination where action and perception simply mirror each other. Here we can already note Bergson's tendency to take perception as the primary framework of consciousness. That is, the nature of consciousness is determined by the kind of perception it involves – mechanistic or intuitive, spatial or durational. Furthermore, together the mechanistic, scientific use of intelligence, concrete actions and material objects form a kind of system of instrumental rationality which is Bergson's principal object of criticism. His critical stance towards instrumental rationality is first based on the insight that intelligence reduces the multiplicity of real dynamisms to simpler, easily manageable chunks. In the context of life and its evolution, Bergson argues that this mechanistic point of view makes it impossible to grasp the vital creativity of living processes. Furthermore, he sees the mechanistic approach of intelligence as abiding by the mechanisms of material processes and consequently, the movement of intelligence itself deviates from the creative movement of life (Bergson 2007, 267).
- 9 For Bergson, intuitive consciousness is always the primary medium of human creativity. While the mechanistic intellect, utilitarian actions and material instruments are potential allies and aids to this creative movement, ultimately, they are expressions of an opposite process of conservative, material degeneration. I argue that due to this emphasis on the purely conscious and sensory nature of intuition, concrete actions appear in an extrinsic, subservient relation to creativity. That is, Bergson offers no distinction between creative action and mechanical action, but their difference is based solely on the kind of perception and consciousness they involve – durational intuition or spatial representation. The basis of human creativity is intuition and the primacy of perceptive consciousness in Bergsonian intuition makes both the technical activity and materiality appear in an uncreative light, as Bergson classifies them among spatial, mechanistic phenomena. On the other hand, scientific intelligence is for him a mechanistic form of consciousness, as it is governed precisely by spatial schemata.
- 10 I argue that it is the materiality of technics that leads Bergson to portray it as uncreative. Technics is essentially manipulation of matter and Bergson primarily sees matter as the inert, spatial counterpart of the utilitarian, mechanistic needs, and representations of our intelligence. This view of matter thus makes technics the mere realisation of utilitarian needs. It is true that in *Matter and Memory*, Bergson develops a much more subtle theory of matter. He envisions matter as the totality of dynamic processes, matter in motion, which we can perceive correctly only by strongly limiting and filtering this multiplicity of material flows. Outside our habitual schemas of perception, matter is for Bergson a kaleidoscope of interlinked motion:
- Matter thus resolves itself into numberless vibrations, all linked together in uninterrupted continuity, all bound up with each other, and travelling in every direction like shivers through an immense body (Bergson 2012a, 234/276).
- 11 He also specifies *intuition* as the immediate mode of experiencing this ultimate nature of material reality (Bergson 2012a, 203). Here, Bergson thus associates matter in itself with the pure immediacy of physical dynamisms, underlying the artificial divisions and

accentuations of our perception. He also elaborates the immediate nature of this materiality at great length.

- 12 However, as noted above, Bergson defines perception as our body's virtual field of possible actions. This perception is, according to him, dominated and even structured by our hard-wired habits, which stem from our vital needs. I argue that the bottom line in Bergson's theory of materiality remains that human perception conveys material processes according to its habitual, practical interests, and matter predominantly constitutes the medium of these human (pragmatic, utilitarian, vital) concerns. This is what I refer to as his "mechanistic conception of matter."
- 13 Furthermore, in *Creative Evolution*, Bergson presents the creative movement of life precisely as moving away from and liberating itself from the shackles of matter, "the movement that is the inverse of its own" (Bergson 2007, 252/274; see also 264, 267). Merleau-Ponty also argues that Bergson replaces the initial monism of the vital impetus by a dualistic opposition between the conscious, active creativity of life and the dead passivity of matter (Merleau-Ponty 1961, 93). In *Matter and memory*, Bergson does speak of matter as the immediate object of intuition and the true content of pure perception, thus giving it a certain privileged position (Bergson 2012a, 203-204). But why does he place this immediacy on the side of consciousness, rather than on the side of matter? That is, it would seem that immediate consciousness precisely discloses material reality in a mode of being different from the one of the objects of mediated, spatial representations. I argue that if we define the immediacy of consciousness only in terms of the nature of the consciousness involved (durational instead of spatial), then our conception of materiality remains an external one.
- 14 Bergson's chief strategy for uncovering "the pure perception" of material processes is to curb the effects of human utilitarian *intelligence*, instead of finding a criterion based on the intrinsic nature of materiality. Arguably, Bergson brings consciousness and matter very close to each other in *Matter and Memory*, and one could make the case that pure intuition and matter in fact coincide perfectly in a kind of metaphysical sympathy, as do all their characteristics (e.g., "undivided continuity"). Still, Bergson's later analyses of creativity make it clear that for him, *consciousness* is the essential medium of creativity, with its intuitive relation to reality. Matter itself is rather the obstacle and problem that foremost limits the mind and creates the need for intuitive creativity, at best complying with the creativity of life and human intelligence: it is either an instrument or an obstacle (Bergson 2013, 118; 332). In any case, a mechanistic conception of matter dominates Bergson's accounts of technics and thus precludes any idea of technical creativity based intrinsically on its materiality.
- 15 For a similar reason, while Bergson develops a powerful theory of the active relation between perception and matter, I argue that this theory also leads him to consider action as uncreative in itself. That is, just as matter can be part of a creative process only as the object of intuition (or a medium of the vital impulse of life), only an action inspired by intuition can be creative. I argue that in this way, both matter and action in themselves appear in a predominantly instrumental light. True creativity is for Bergson the priority of conscious intuition. Conversely, intuition is predominantly immaterial and independent of concrete action. Admittedly, Bergson does consistently link movement and action to intuition and to the vital impetus, but as I will argue later, he does not establish the positive nature of these dynamisms, distinct from the mechanistic forms of movement and action. Instead, the difference between intuition

and mechanism is always based on the kind of perception and consciousness they involve.

- 16 By contrast, I will argue further down that *affectivity* is the intrinsic mark of dynamic materiality, which binds together activity and immediacy, and constitutes the positive material basis of creativity, essential for an analysis of technical creativity.

Instrumental science and technics

- 17 Bergson is well known for his critique of the intellectual, mechanistic outlook of the natural sciences. The crux of this critique is that the natural sciences and mathematics view reality only in *spatial* terms, ignoring its real duration. Science analyses reality in quantitative terms, and Bergson defines quantity as essentially spatial, or indeed, as *space* itself (cf. Ruse 2005). More precisely, these quantities are laid out in a homogeneous grid of extrinsic relations, or space.
- 18 By contrast, for Bergson, each being exists as a processual duration, to which the quantitative relations and generalisations of science are superficially applicable but essentially foreign. Science projects reality as an external, mechanistic entity, estranged from the multiplicity and continuity of its processes and duration. Our technical inventions and activities are for Bergson the primary expression of our practical, mechanising, spatialising tendency that has also given rise to science. Caeymaex points out that for Bergson, science is born of the extension of the mechanistic outlook of our intelligence beyond immediate experience and its practical interests to cover all of reality, albeit from a limited point of view (Caeymaex 2013, 58; Bergson 2007, 152). Bergson sees human technicity as the primary source that has brought forth natural science as its intellectual and symbolic extension. That is, as with technics, the goal of science is “to enlarge our influence over things” but the clearest expression of its more general and abstract nature is that it does not operate directly with matter, but with *signs* (Bergson 2007, 328-29; cf. 139-40).
- 19 However, it is worth noting that while human technicity shares this mechanising root with the natural sciences, technicity also links us to other animal species, while science clearly does not. Indeed, technics is for Bergson a natural tendency also present in the activities of other species. It would seem to be closer to vital processes and activities than science. Science is an utterly human and intellectual phenomenon, based on quantitative abstractions expressed in symbolisms.
- 20 The first paradox or ambiguity in Bergson’s account of technology concerns the tension between its mechanistic nature and its natural, prehuman origins. Namely, both technics and science are primarily mechanistic phenomena, but technics also stems from a more primordial, less intellectual animal source. Science, on the other hand, is a distinctly intellectual human phenomenon. Furthermore, according to Bergson, animal technical inventions tend toward the human ones:
- Invention becomes complete when it is materialized in a manufactured instrument. Toward that achievement the intelligence of animals tends as toward an ideal. And though, ordinarily, it does not yet succeed in fashioning artificial objects and in making use of them, it is preparing for this by the very variations which it performs on the instincts furnished by nature (Bergson 2007, 139/152).
- 21 Technics thus has for Bergson an instinctual animal root, but it also marks the gradual emergence of intelligence. Merleau-Ponty also notices this link and argues that for

Bergson, human action, work and construction always respond to a primitive, vital need (Merleau-Ponty 1942, 176).

- 22 As Bergson notes, the lives of other animals are dominated by instincts, which manifests as a relative lack of freedom and creativity compared with human intelligence (Bergson 2007, 142, 264). While animal technics is instinctual and requires specialised organs performing very precise functions, human technics is essentially versatile: human instruments are external to their bodies and more importantly, humans are able to invent and make ever new instruments. Aristotle already saw the human hand as the embodiment of human versatility: the hand is not ideal for any particular function, but it can learn a multitude of functions (Aristotle, 1983, 687b-88a). Human instruments are also external to our bodies and thus they enlarge the scope of our action in an open-ended fashion. Namely, this externality of inorganic tools means that each tool and machine is as if imperfect and their use must be learnt. This open-endedness of technics leads to spiral of invention and to the development of ever new needs (Zanfi 2013, 285-87).
- 23 Due to their intelligence, human beings are thus relatively alienated from their natural instincts. However, this downplaying of our instincts and impulses does not so much lead to an upsurge in true creativity, but rather in intelligent mechanisation. Through using technical instruments, we acquire new artificial habits, which are not at core instinctual, but mechanical all the same. Technical intelligence frees us from the immediate exigencies of nature, but still by subjecting itself to its material mechanisms. According to Bergson, our freedom is constantly haunted by the constraints of material automatism, which tends to stifle each creative spark (Bergson 2007, 128).
- It seems that to conquer matter, and to reconquer its own self, consciousness has had to exhaust the best part of its power. This conquest, in the particular conditions in which it has been accomplished, has required that consciousness should adapt itself to the habits of matter and concentrate all its attention on them, in fact determine itself more especially as intellect (Bergson 2007, 268/291).
- 24 Nevertheless, in the context of evolution, according to Bergson, advances in intelligence generally mean more freedom and creativity, and less instinctual behaviour. Higher brain capacity makes it possible to envisage a larger variety of possible actions and reactions (Bergson 2007, 180-83). However, Bergson also argues that human intelligence to a significant degree takes this virtual space of possible actions for reality itself. Thus, while extremely useful and adaptable, intelligence in a sense distances us from reality in its immediacy and, in particular, from the creative movement of life. Thus, in the human context, in spite of the progress associated with intelligence, following the creative movement of life does not for Bergson require more intelligence but rather a step away from intellectuality towards *intuition*. Intuition is the re-emergence of instinct within intelligence, which allows us to perceive the intrinsic movement of life and duration surpassing the generalising, inflexible schemas of intelligence (Bergson 2007, 177-83; Bergson 2009, 27-30).
- 25 Bergson's concept of intuition is a fruitful conceptualisation of creativity, and I argue that the source of technical creativity can also be found in Bergsonian intuition. However, if we are to analyse technical creativity as flowing from Bergsonian intuition, then contrary to Bergson's own inclination, our idea of technicity must be broadened beyond the mechanical and instrumental use of intelligence. Furthermore, nor can

matter be confined to being the object of instrumental intelligence, as in *Creative Evolution*, but as Bergson hints earlier in *Matter and Memory*, material dynamisms are also possible objects of intuition. In what follows, I will demonstrate that technicity is an essential element in the discovery of the full nature of this intuitive creativity and its material basis.

Vital technics

- 26 In *Creative Evolution*, Bergson stresses the importance of technics as a factor in human evolution. The emergence of technics and language are what seem to mark a kind of threshold in the transition from apes to humans. Also, it is important to note that our ancestors first became manual and technical before they were linguistic. Bergson himself associates the emergence of humans with the invention of tools and proposes *homo faber* as a more appropriate name for us than *homo sapiens* (Bergson 2007, 138-40; Bergson 2009, 91-92; cf. Zanfi 2013, 285; Le Roux 2018, 67). “To what date is it agreed to ascribe the appearance of man on the earth? To the period when the first weapons, the first tools, were made” (Bergson 2007, 138/151).
- 27 The intelligent technical conquest of inorganic nature is for Bergson an expression of the vital impetus (*élan vital*). However, while he describes the faculty of intelligence as a vital creation leading to more freedom, its *modus operandi* of manipulating the material world also runs against the grain of the creative movement of life which gave rise to it (Bergson 2007, 264-67). Thus, intelligence is also profoundly alienated from nature as a living, processual, conscious duration: “consciousness, in shaping itself into intelligence, that is to say in concentrating itself at first on matter, seems to externalize itself in relation to itself” (Bergson 2007, 183/200). What makes Bergson’s analysis of technics so ambiguous is that while the interaction with matter is governed by principles foreign to the pure creativity of vital processes and consciousness, he does see the presence of matter as ubiquitous, inevitable and characteristic of human and animal life.
- The impetus of life, of which we are speaking, consists in a need of creation. It cannot create absolutely, because it is confronted with matter, that is to say with the movement that is the inverse of its own. But it seizes upon this matter, which is necessity itself, and strives to introduce into it the largest possible amount of indetermination and liberty (Bergson 2007 252/274).
- 28 This ambiguity in Bergson’s view of technics can also be seen in his conception of “invention”, which is a relative form of creativity but obeys the requirements of intelligence and conforms to the mechanisms of the material world. According to Clarizio, “invention is not the pure creation of a free mind, but the shaping of matter subjected to determined conditions, which are the environmental and technical conditions with which the living must confront itself to satisfy its requirements” (Clarizio 2023, 28; 2021, 100). However, what shows the vital importance of technics for Bergson is that, as Clarizio notes, Bergson defines both intelligence and the more spontaneous animal faculty of instinct in technical terms: instinct as “the faculty of using and even constructing organized instruments” and intelligence as “the faculty of making and using inorganized instruments” (Clarizio 2023, 26-27; Bergson 2007, 141/155). Thus, both human intelligence and animal instinct are profoundly shaped by their active relationship with matter.

- 29 While instincts require specialised organs in order to function successfully, the proper application of intelligence is to fabricate external instruments, or “artificial organs” from inert matter and to learn how to use them expediently (Bergson 2007, 162; Caeymaex 2013, 58). Canguilhem called the idea of analysing technology based on the functioning of biological organisms “organology”, which Guchet rephrases as “biological philosophy of technology” (Canguilhem 1992, 102; Guchet 2021, 174; Clarizio 2023, 22; Zanfi 2013, 285). However, while Bergson does describe human technology in terms of organic projection, as we have seen, his conception of the vital, evolutionary source of technology stretches beyond this idea: more generally, technics is for Bergson a comprehensive mode of vital adaptation to the environment and to its challenges by external means. Leroi-Gourhan draws on this Bergsonian idea of the vital and evolutionary function of technics and analyses further the development of technics as a continuation and modification of the evolutionary process (See e.g., Leroi-Gourhan 1974, 336-40).
- 30 With its technical creations, intelligence thus paradoxically at once surpasses its own organic nature by instrumentalising inorganic nature, but in so doing, it also erects inorganic nature and inert matter as the paradigm of nature. In *The Two Sources of Morality and Religion*, Bergson also says of the human condition: “He must use matter as a support if he wants to get away [*se détacher*] from matter” (Bergson 2013, 329/298). Thus, in liberating itself from the primitive urgency of the elements with the help of technology, human intelligence paradoxically thereby also submits itself to the requirements of material mechanisms. Nevertheless, according to Bergson, the relative freedom of human technical intelligence makes it in practice the master of nature: whatever the problem presented by nature, humans can come up with a technical solution of some kind. Furthermore, this proliferation of inventions acquires a kind of life of its own. Bergson assimilated tools to artificial organs and by the same logic he reasons that with modern machinic industry humankind has built itself a veritable artificial organism. Thus, technology also acquires for a Bergson a distinctively social role.

Technics and Civilisation

- 31 In addition to granting technology a central role in human evolution, Bergson also points out the impact of technology on society and its workings. In *Creative Evolution* from 1907 he writes:
- A century has elapsed since the invention of the steam engine and we are only beginning to feel the depths of the shock it gave us. [...] In thousands of years, when, seen from the distance, only the broad lines of the present age will still be visible, our wars and our revolutions will count for little, [...]; but the steam engine, and the procession of inventions of every kind that accompanied it, [...] will serve to define an age (Bergson 2007, 139-40/153).
- 32 For Bergson, technology articulates two dimensions of the human condition: the biological and the socio-political one (Loeve et al. 2018, 10). From the biological perspective, technics is primarily a continuation of evolution by external means as a kind of prosthetic addition. On the other hand, from the societal perspective, through industrialisation in particular, technics has become a central socio-political factor. It

sets up its own mechanisms with certain economic and social advantages, but which also produce new social and moral problems.

- 33 In *The Two Sources of Morality and Religion* from 1932, before the Second World War and the development of nuclear arms, Bergson expresses the threat of ever more destructive warfare due to technological development (Bergson 2013, 305; cf. Guchet 2018, 245). However, Bergson's societal criticism of technology does not focus on the dystopian potential of modern weaponry as much as on the capitalistic drive of industrialism. By and large, while modern technology could ideally be at the service of fighting poverty and hunger, in reality, its chief occupation is to produce luxury items associated with a wealthy lifestyle.

Without disputing the services [mechanization (*machinisme*)] has rendered to man by greatly developing the means of satisfying real needs, we reproach it with having too strongly encouraged artificial ones, with having fostered luxury, with having favoured the towns to the detriment of the countryside, lastly with having widened the gap and revolutionized the relations between employer and employed, between capital and labour. These effects, indeed, can all be corrected, and then the machine would be nothing but a great benefactor (Bergson 2013, 327/296).

- 34 This human penchant for developing technology to match ever new artificial needs would seem to spring logically from the limitless inventiveness Bergson also finds in human intelligence. Human technical intelligence and capacity for invention are liberated from the immediate urgencies of survival characterising most natural life. This lack of urgency entails a greater range of freedom but also detachment from and forgetfulness of the bare necessities of life. In a nutshell, this explains the fact that although humans collectively possess the knowledge and means to feed and medicate the whole global population, this developed culture has also led to intricate local habits of consumption and lifestyles the people enjoying them want to maintain instead of solving these more urgent global problems.
- 35 Bergson claims that the modern, pervasive machinism requires a matching spiritual or moral supplement, which would counterbalance its detrimental consequences and steer it towards a more beneficial path (Bergson 2013, 330-31). Thus, the harmless technics of tools has gradually expanded into an uncontrollable, societal force of machinism. According to Bergson, the socio-political problems of a mechanised, technological world result from the gap between technological expansion and the lack of a matching moral and spiritual plasticity and creativity. It is as if a widespread technological development had followed its own course for centuries, without human mental life taking any significant steps matching this technological progress. According to Bergson, such a spiritual or moral supplement would enable us to be mentally on top of the situation.
- 36 But what kind of spiritual compensation has Bergson got in mind exactly? Gouhier and Deleuze refer to *creative emotions* as Bergson's liberating solution from societal, mechanical constraints (Gouhier 1952, 77; Deleuze 1966, 115-18; Bergson 2013, 35-36). Bergson himself speaks of "new emotions", feelings and sensibility originating in an open, creative mind (Bergson 2013, 40). According to Bergson, this active creativity is the essence of emotions: they spread infectiously among people, sparking off action. Deleuze distinguishes creative emotions from *representational emotions*, emotions "attached to a representation" (Deleuze 1966, 116). That is, the core of emotions for Bergson is their driving force leading to action, and not the mental image or

representation associated with an emotion. Rather than springing from ideas, creative emotions create new ones (Bergson 2013, 40-41).

- 37 In *The Two Sources*, Bergson thus emphasises the active nature of intuition in the human social context. This emphasis of action is a radical change for him, as in his earlier thought he equates action with the utilitarian functioning of reason. However, here, the vital, active intuition is manifested by the mystic. Mysticism is for Bergson the open form of religion and of morality, which channels the vital impetus in the human, social context. He defines religion as a spiritual organisation of human activities (Bergson 2013, 211-212; 223-225). What sets mysticism apart from organised religion is its radical universality which starts with inspired individuals, while essentially transcending them (Zanfi 2009, 19). Bergson's concept of mysticism has its roots primarily in Christian mysticism. While this tradition is often associated with a contemplative life in seclusion, for Bergson true mysticism is essentially active (Bergson 2013, 240). That is, a true mystic lets her intuition continue its vital movement in action.
- 38 Bergson primarily suggests creative emotions as an antidote to closed morality and society and to the conflicts and wars resulting from this local and closed social existence. Also, he does not portray technology as an oppressive force in itself and even accords to it a certain emancipatory potential. Nevertheless, for him, technology reflects and catalyses the dominant social dynamics and desires of a society. Consequently, an open, active and creative humanitarian spirituality, which Bergson refers to as *mysticism*, is his solution both to more purely social problems of a closed society and to the exaggerated role technics occupies in the modern world.
- 39 Caeymaex argues that the apparently destructive and constraining forms of technology are precisely the effects of a closed society and of its characteristic dichotomies, not of technics in itself. By contrast, the emergence of open, active and creative spirituality would in the contemporary world also require the radical transformation of our technologies. (Caeymaex 2003, 117) However, although Bergson holds that true mystics as he has defined them are extremely rare in history, he does conceive of them as concrete individuals, who spread their creative spirituality piecemeal, locally (Bergson 2013, 225; 249). That is, what is essential in Bergsonian mysticism and the creative emotions it expresses is the kind of affective and liberating movement it immediately inspires, not primarily its eventual large-scale impact on society.
- 40 Bergson thus finds spiritual void in modern industrialism, but he nonetheless also sees this technological development as necessary for a more general progress of the human race. First of all, he argues that historically, industrialism and democracy have stemmed from a shared, progressivist root (Bergson 2013, 328). Moreover, he argues that any universalist project of improving the human condition also requires a material, technological basis making the improvements concretely possible. In sum, material technological development and spiritual, humanitarian development are for him immanent poles in a single dynamic system, which however has for a long while been dominated by the technological pole. (Bergson 2013, 328-30) Zanfi points out that technology thus falls between the general Bergsonian dualism of the open and closed society: it is the instrument both of open universalist humanitarian endeavours as well as of the closed interests of national war campaigns (Zanfi 2013, 276). However, this ambiguity of the role of technology in Bergson's thought would seem to precisely underline its instrumental aspects, as it can be adopted by conflicting tendencies.

- 41 For Bergson, creative emotions are expressions of the vital impetus that creatively neutralise the tension between restrictive social forces and individual minds, thus revitalising the society. Emotions are affective, activating powers and art may also wield a similar, affective force. (Bergson 2013, 265-70) Deleuze suggests that the creative emotion is the “genesis of intuition in intelligence” (Deleuze 1966, 118). This means that the intrinsic perspective of intuition has an affective source, and Bergson also suggests that this might be the source of all creativity, artistic, scientific or technical. Most importantly, creative emotions incite immediate action which continues the movement of the emotion.

Creative, artistic intuition

- 42 Bergson sees the faculty of intuition as the vital, instinctive, and creative form of consciousness (see Bergson 2009, 27). He defines it as an intrinsic perspective on experience:

But it is to the very inwardness of life that intuition leads us – by intuition I mean instinct that has become disinterested, self-conscious, capable of reflecting upon its object and of enlarging it indefinitely (Bergson 2007, 178/194).

- 43 In *The Creative Mind*, he describes intuition as immediate consciousness, coinciding with its object (Bergson 2009, 27/30). Intuition allows us to perceive and experience reality more directly, but only locally. By contrast, the use of intelligence leads to scientific theories that express global, general, and extrinsic representations. These features of scientific theories mean that they are detached from immediate experience, but they are also precisely what makes them applicable and effective in controlling and manipulating the material world. Science enables us to control reality at a more general level, as its approach is based on homogenising reality and treating it in terms of approximations and averages.

- 44 On the other hand, for Bergson, art is the primary mode of disclosing this world of immediate experience in intuition:

What is the object of art? Could reality come into direct contact with sense and consciousness, could we enter into immediate communion with things and with ourselves, probably art would be useless, or rather we should all be artists, for then our soul would continually vibrate in perfect accord with nature (Bergson 2012b, 115/150).

- 45 Our everyday perception is structured by generalisations, clichés and prejudices. The point of these limitations is that they are *useful*: out of the immense flow of our sensations it is useful to perceive the things we need in our daily activities. However, this also means that we become literally blind to most of the phenomena around us. For Bergson, a work of art expresses a direct vision of reality, which it seeks to convey to others. This direct, immediate insight into reality is precisely what Bergson calls intuition:

Our eye perceives the features of the living being, merely as assembled, not as mutually organized. The intention of life, the simple movement that runs through the lines, that binds them together and gives them significance, escapes it. This intention is just what the artist tries to regain, in placing himself back within the object by a kind of sympathy, in breaking down, by an effort of intuition, the barrier that space puts up between him and his model (Bergson 2007, 178/194).

46 We can again note Bergson's focus on receptive observation instead of action: art is essentially capable of making us see and perceive things as if intrinsically, in their duration. It is true that Bergson speaks of intuition as "sympathy" with the durational movement of life. Indeed, he does formulate intuition as the capacity of consciousness to receive and continue the movement of duration. However, this intuitive sympathy is essentially conscious and thus remains detached from action and materiality.

47 Immediate intuition of reality is the essence of artistic inspiration, its medium and mode of experience. Furthermore, according to Bergson, intuition and artistic intuition in particular mediates and channels the creative, surprising spontaneity of nature. All artisanal fabrication, while according to Bergson in some sense more fundamental than art, is based on the projection of a kind of repetitive protogeometry onto matter. Thus, artisanal fabrication moves away from the spontaneous creativity of life, towards the spatial repetitiveness of the material world:

In so far as we are geometricians, then, we reject the unforeseeable. We might accept it, assuredly, in so far as we are artists, for art lives on creation and implies a latent belief in the spontaneity of nature. But disinterested art is a luxury, like pure speculation. Long before being artists, we are artisans; and all fabrication, however rudimentary, lives on likeness and repetition, like the natural geometry which serves as its fulcrum. Fabrication works on models which it sets out to reproduce; and even when it invents, it proceeds, or imagines itself to proceed, by a new arrangement of elements already known (Bergson 2007, 45/52).

48 So, Bergson generally portrays art as the intuitive, immediate conveying of the creative, irregular and singular phenomena of reality. However, as we mentioned above, later in *The Two Sources*, Bergson explains the nature of artistic inspiration as well as art's affective power in the more active terms of creative emotions. Although the religious mystic is for Bergson the paradigmatic creator of new values, he also mentions artistic creation as an important model for these creative emotions. Indeed, Bergson uses music as an example of the literally moving nature of creative affectivity (Bergson 2013, 36, see also 268). When we are affected by music, it modifies our inner mode of being. Bergson argues that truly affective music is not a mere externally suggestive cause of our emotions, but rather, we are immersed in its affective workings.

We feel, while we listen, as though we could not desire anything else but what the music is suggesting to us, and that that is just as we should naturally and necessarily act did we not refrain from action to listen. Let the music express joy or grief, pity or love, every moment we are what it expresses. [...] When music weeps, all humanity, all nature, weeps with it. In point of fact it does not introduce these feelings into us; it introduces us into them, as passers-by are forced into a street dance. Thus do pioneers in morality proceed. Life holds for them unsuspected tones of feeling like those of some new symphony, and they draw us after them into this music that we may express it in action. (Bergson 2013, 36/31-32).

49 Thus, Bergson acknowledges, on the one hand, the affective origin of artistic creativity and also, on the other hand, the affectivity of the work of art itself. Still, this affectivity refers to a kind of spiritual inspiration, which does give rise to action but is not essentially related to the material side of the artwork. I would argue that the affectivity of music is indistinguishable from its materiality as a sensuous process, but again, Bergson focuses on the point of view of consciousness.

50 Despite its possibility of also serving emancipatory causes, technics is primarily for Bergson a product of the spatialising, homogenising, material tendency of human intelligence. Thus, it cannot be a positive source of vital creativity. For him, true

creativity emerges in the spiritual realm of intuition, as an expression of spontaneous movement of life. While I argue that the material context of creativity must also be considered an integral, immanent part of the creative process, Bergsonian intuition does seem to capture something essential about creativity. Indeed, the most impressive human inventions and creations are undoubtedly based on a minute consciousness of phenomena and not on mere trial and error. Creative people often emphasise the importance of hard work, but still, the intricate spark of insight would seem to be what distinguishes an inventive process from mere mindless drudgery. This seems intuitive in the case of artistic work, but is technical inventiveness any different? Even the most mechanical and repetitive machines and forms of heavy industry are ultimately based on an invention and inspiration at some point of their development. But could this creativity be seen as intrinsic to technics itself and to its materiality? Could creativity spring directly from technical interaction with matter, without recourse to a chance stroke of genius in pure intuition?

Material intuition: immersion, affectivity and interaction

- 51 While Bergson acknowledges the importance of technicity for human creativity and cultural development, I argue that Bergson overlooks the specific, material nature of technical creativity. It would seem that the true source of technical inventions is for Bergson always human intelligence, and the artefacts and machines it produces are in themselves mechanical. We saw that for Bergson, intelligence in itself is a utilitarian, mechanistic faculty, while creativity is essentially an act of intuition, an intrinsic insight into reality. Indeed, Bergson seems to make a subtle distinction between creations and inventions, creations being the purer products of the vital impetus, while inventions manifest a more relative and goal-oriented kind of creativity (see above, Clarizio 2023, 28). The paradigm of intuition is artistic creation, which consists in a direct, disinterested, and inactive perception of reality. On the other hand, an important part of technics deals with *actions* directed at *materials* and *material objects*, which seem to go against the grain of the spiritual and perceptual model of Bergsonian creative intuition.
- 52 However, the problem in developing a Bergsonian theory of technical creativity is not Bergson's intuitive basis of creativity as such. On the contrary, I here seek to develop a concept of intuition that would also account for technical, material creativity, and not only for spiritual and spontaneous creativity, limited to the realm of consciousness. The main limitation of Bergson's concept of intuition would seem to be its ultimate focus on perception and receptivity. Admittedly, Bergson later describes artistic creations in affective terms, which implies a more dynamic point of view on intuition. Still, this affectivity is essentially conscious and not material, despite its activating character. In *Laughter*, Bergson also expresses a somewhat romantic idea of the artist as essentially expressing and developing different parts of her personality in her work. Thus, art for Bergson is not a mere case of mediating experiences to others but the artist also actively modifies her own experiences for instance by selecting, combining, and intensifying them (Bergson 2012b, 128-29).
- 53 An important change in Bergson's thought concerns the role of affections from primitive reactions and impurities of perceptions to a positive source of intuition and

creativity. Earlier, in *Matter and Memory*, Bergson describes affections as immediate sensations in the bodies which are connected to real actions. By contrast, perception for him constitutes the body's virtual field of possible action. Affections, such as the feeling of pain, emerge within the body and lead to immediate actions and reactions, while perception merely invokes what we *could* do in each given situation – the possible objects and framework of our actions. Bergson argues that there is a difference in kind between affection and perception. This difference hinges on the body as the source of action. Affections happen in the body and move it immediately, thus being intrinsically active. On the other hand, while perceptions are schematised according to our habits and practical needs and actions, perceptions are in themselves *inactive*, as they only mediate a field of possible action (Bergson 2012a, 57-58).

54 Perception thus does not engage the body immediately, albeit it does gravitate towards the body as its centre, from which the field of possible action is projected. Hence, according to Bergson, our habitual perceptions are not pure, as they are filtered from a chaotic flux of experience according to our practical and vital interests. However, despite their immediacy, neither are affections a source of pure perception, as they on the contrary contort our image of reality. Bergson thinks here of extremely disturbing sensations of pain and fear, and indeed, in such cases it is difficult to pay attention to anything else but the extreme sensation and its immediate cause. So, Bergson refers to affections as a kind of impurity added to pure perception (Bergson 2012a, 56; 59; cf. Deleuze 1966, 16; 116).

55 On the other hand, Bergson models intuition on visual perception and passive, receptive consciousness. The primary object of intuition is *duration*, the intrinsic, immediate unfolding of reality. Thus, intuition is essentially consciousness of duration and only secondarily linked to action. This is understandable, as intuition is for Bergson also the method of philosophy (Bergson 2019, 25; Deleuze 1966, 1-3). Indeed, at face value, philosophising would seem to be detached from concrete action. Yet, while intuition has the duration of reality as its immediate object, it also extends beyond the immediately given (Deleuze 1966, 18-19). This is what makes intuition creative, while it remains bound to particular, real durations. Furthermore, according to Deleuze, intuition cannot be simply assimilated to the deployment of duration:

Intuition is rather the movement by which we emerge [*nous sortons*] from our own duration, by which we make use of our own duration to affirm and immediately to recognize the existence of other durations, above or below us (Deleuze 1966, 24-25/32-33).

56 But is this movement of intuition not a kind of action? Intuition follows traces of other durations in our own duration, thus going beyond it. Conversely, is intuition not at work in various different contexts and forms of activity? Bergson's example of the artist's creative work could be a case of intuition literally in action, even if he stresses its perceptual and mental character. Furthermore, he presents music as a privileged example of the dynamism of creative affectivity. Above, we saw how Bergson compared the effect of creative emotions to that of hearing music, and he also refers to the affectivity of emotions as the driving force for the composer:

But all through the labour of arranging, rearranging, selecting, carried out on the intellectual plane, the composer was turning back to a point situated outside that plane, in search of acceptance or refusal, of a lead, an inspiration; at that point there lurked an indivisible emotion which intelligence doubtless helped to unfold

into music, but which was in itself something more than music and more than intelligence (Bergson 2013, 268/241).

- 57 Here, the actively creative nature of intuition is evident, even if it is still intelligence that does most of the work, “arranging, rearranging, selecting.” In the same context Bergson also accords the affectivity of emotions a kind of creative impulse, while in his early work he describes affections as bodily, instinctive reactions tied to our primitive needs (see Bergson 2012a, 58; Bergson 2007, 2; cf. Deleuze 1966, 116).
- 58 Bergson’s acknowledgment of the creative role of affectivity is crucial for our considerations of technical creativity. In addition, there are two other implicit elements in Bergson’s account of artistic creation that must be carried over to the analysis of technical creativity: an external material as the medium of creativity, and the action of modifying and transforming the material. However, in Bergson’s account these are only secondary elements of artistic creation, at the service of intuition. His stress on the perceptual and conscious aspects of intuition as the essence of creative work downplays the fact that we are always actively immersed in a material world, a milieu, which affects us and with which, or rather, *within* which we interact.
- 59 Bergson does present as a general insight that experience does not simply happen in our minds but first and foremost in our bodies and senses. A kind of material immersion of experience is indeed a basic starting point for all Bergsonian analyses. However, I argue that his account of this material immersion remains in many respects extrinsic, and this becomes especially clear in the case of technical creativity. For instance, he describes technical fabrication in very classical terms as the imposition of form on matter:
- Now, fabricating consists in carving out the form of an object in matter. [...] In other words, an intelligence which aims at fabricating is an intelligence which never stops at the actual form of things nor regards it as final, but, on the contrary, looks upon all matter as if it were carvable at will. [...] But action, and in particular fabrication [...] makes us consider every actual form of things, even the form of natural things, as artificial and provisional; it makes our thought efface from the object perceived, even though organized and living, the lines that outwardly mark its inward structure; in short, it makes us regard its matter as indifferent to its form. The whole of matter is made to appear to our thought as an immense piece of cloth in which we can cut out what we will and sew it together again as we please (Bergson 2007, 156-57/172).
- 60 Here Bergson again considers intelligence, action, fabrication, and matter all in very mechanistic and utilitarian terms, which I referred to earlier as a system of instrumental reason. In this perspective, action and fabrication appear as simple instruments of intelligence, while matter appears as the external, concrete receptacle, whose only function is to embody the projects of the intelligence. While Bergson criticises the narrowness of this perspective from the point of view of life and vital processes, it nevertheless does provide the model for his own general conception of matter and action.
- 61 However, it would seem that technical creativity cannot be understood without accounting for the impact of the material on the creative process. Consider one of the first truly transformative technical inventions: the kindling of fire. The early humans who discovered the art of fire-making were already familiar with wildfires and were able to conserve it, but they could have no preconception of how to bring it about themselves. They certainly did not have the idea or “form” of making fire first and then

find the material for implementing their idea.² Rather, the firstly discovered methods based on friction and striking off sparks essentially involved material interaction and affectivity that were not apparent at first sight but required experimentation. Here, affectivity is to be understood in the wider sense given to it by Deleuze and Guattari as the immediate interactive behaviour of a material, sensuous being, expressing what it is capable of (see Deleuze and Guattari 1980, 313-314, 505-506, 508). Affective interaction with a material gives us an intrinsic perspective on material dynamisms and consequently, also on technical creativity.

- 62 The use of a material can be creative only if we are fully attentive to its behaviour – otherwise we are indeed blindly following a scheme existing in our mind or simply taking the material as it is, not experimenting with it. Thus, the bodily experience of a material in a creative process cannot merely be schematic nor receptive but involves constant interaction. It is easy to forget this when we are admiring works of art as spectators. Indeed, at galleries, we are not allowed to touch artworks, and at classical concerts, the audience is supposed to remain silent during the performance. A spectator’s point of view naturally invokes a passive and external idea of an artwork. Also, the discourse on art still centres on ideas, intentions, and symbols rather than the material aspects of artworks and their creative process. But the artist at work is necessarily immersed in the material she is using. This material immersion is perhaps even more evident for the artisan and for manual and physical workers in general. It is this perspective of material immersion that we must incorporate in our conception of artistic and technical work to fully account for its creativity.

Experimental following

- 63 But how is technical creativity distinguished from mechanical, uncreative toiling? How does the Bergsonian creative intuition differ from merely being conscious of a mechanical process? In their *A Thousand Plateaus*, Deleuze and Guattari develop the Bergsonian concept of intuition as a kind of *following (suivre)* of a process or of a trace – a *flow of matter*.

We will therefore define the artisan as one who is determined in such a way as to follow a flow of matter, a *machinic phylum*. [...] It is intuition in action (Deleuze and Guattari 1980, 509/452).

- 64 The creative artisan follows the varying texture of the material, its singularities, and its affects. I argue that “a flow of matter” (*flux de matière*) primarily refers to a material, affective *dynamism* and only secondarily to a material *process* in the usual sense (e.g., the flowing of a river, or the streaming of an electric current). Namely, from the affective point of view, each material is alive and in process due to its interaction with its environment. The hardness and resistance of iron appears when it is touched or hit with something, it becomes malleable when it is heated, it can be sharpened, and it can cut through things. The affectivity of a material only appears in interaction, and the potentialities of a material can only be actualised by following them and reacting to them attentively, in interaction with them. Consequently, the affectivity and interactivity of a material would seem more fundamental for its dynamic nature than its movements and processes as such, which must be understood in light of these two perspectives.

- 65 Bergson speaks of intelligence and of intuition as always immersed and embedded in a material environment. However, I argue that this relation between intuition and its material context remains extrinsic in his writings. In short, materiality is a *de facto* condition for all human conscious activity, but *de jure* intuition for Bergson is immaterial. We saw earlier that in *Matter and Memory*, Bergson does suggest pure matter in motion as a possible object of intuition, but he does not provide a positive criterion for this kind of material intuition. Indeed, his method for finding the intuition of matter consists in subtracting or bracketing the effects of our habitual, spatialising intelligence.
- 66 I propose affectivity as such a positive criterion of pure materiality, which distinguishes it both from our habitual perceptions and from pure consciousness. Incidentally, Deleuze suggests that in *Matter and Memory*, where Bergson develops his most monistic and immanent account of the relation between thought and materiality, he already gives affectivity a mediating role between the two main tendencies of subjectivity: (1) the more objective and bodily tendencies of needs and selective power of the brain, and (2) the more intellectual tendencies of recollection and of the experience of qualities (Deleuze 1966, 47-48). Indeed, I argue that affectivity is where “mind touches matter” (cf. Deleuze and Guattari 1973, 26). Affectivity is not material objectivity in itself, nor is it a subjective experience concerning matter.³ Affectivity consists in dynamisms that are expressed in material interaction and in our interaction with matter. This affective materialism is also the sense in which I argue Deleuze and Guattari’s materialism should be understood and the sense in which the term is used in this article.
- 67 If we extend the concept of affectivity to matter itself, it becomes a possible object – or rather, a theme – of intuition and a source of creativity. The attentive following of material affectivity takes place in a heterogeneous context of materials, tools, the artisan’s own body, other people, socio-economic structures and practices etc. The artisan who is attentively following material, dynamic variations in her working environment is not merely passively observing, but she is experimentally combining different dynamic elements of the situation. However, it would also seem possible to attentively observe and follow processes that are not experimental in any relevant sense or that simply reproduce a certain pattern. Indeed, the choice of process is immanent to the working of a material: shall I follow a straight, common path, or a more aberrant, deviant one? Experimentation for Deleuze and Guattari is not something random or *ex nihilo*, as it is always based on an already existing process, material potential or line of action that one starts to follow. Thus, the materials for creative experimentation are an intrinsic part of the experimental process. But in the context of an affective, dynamic material, I argue that experimentation and creativity consist in choosing novel, divergent lines of action instead of habitual and conventional ones (see Deleuze and Guattari 1980, 326-27, 460-64).

The creative tension between a social assemblage and a technical lineage

- 68 The artisan-artist creates by attentively following affective, material flows, but this does not make technical, material creativity an ahistorical, private matter. Deleuze and Guattari describe the development of a technological lineage or “machinic phylum”

through different social contexts or “assemblages” (*agencement*) (Deleuze and Guattari 1980, 507). They thus take up the two Bergsonian perspectives on technology: primitive, vital technics on the one hand, and an industrial technology of developed societies on the other. However, they reformulate the nature of both dimensions and their inter-relation in particular. First, while Bergson describes contemporary industry as our artificial organism, “distended out of all proportion”, Deleuze and Guattari regard technology as a relatively autonomous part of a historical and changing, social machinic assemblage (Bergson 2013, 330/298; Deleuze and Guattari 1980, 495-97). What defines the nature and function of a given technological appliance is the dynamics of the surrounding assemblage. The assemblage is essentially a dynamic collection of heterogeneous elements, whose contingency is more apparent than in the Bergsonian idea of technology as our extended artificial organism created and governed by technical intelligence.

- 69 However, for Deleuze and Guattari, the technological development is not entirely determined by social conditions of different assemblages. Namely, they explain technical creativity by referring to a material continuum of evolving technology, which they call “a machinic phylum.” A machinic phylum is a material, inorganic and creative technical lineage. Thus, Deleuze and Guattari portray the materiality of technics as an autonomous line of development, not merely as a prosthetic extension of the human organism or as a simple reflection of the needs of a society. Their concept of phylum is inspired by Leroi-Gourhan’s work and his Bergsonian idea of a “universal tendency,” guiding technological development (Deleuze and Guattari 1980, 507).
- 70 The machinic phylum represents the autonomous, creative dimension of technics and its development through time. Experimentation with materials follows a course of its own, leading, for instance in the case of iron, first to the invention of the dagger, then of the sword. At the same time, however, the different forms within a phylum do respond to the needs of particular societal situations. The key idea here is the coexistence of the creative, material lineage of technics with the social assemblages, neither being reduced to the other. For Deleuze and Guattari, a social assemblage is a relatively conservative whole, which nonetheless also contains creative and subversive tendencies. By contrast, a machinic phylum is a succession of material forms, which crystallises changes in social assemblages through time as a kind of experimental and creative undercurrent.
- 71 Deleuze and Guattari present the machinic phylum as a form of inorganic evolution. The lineage of biological evolution is a continuous, creative process distinct from the environment to which it responds and on which it thus depends despite its distinctness from it. Similarly, the technological evolution of a machinic phylum is for Deleuze and Guattari a relatively autonomous lineage of technical creations. However, this technical lineage is always conditioned by its social environment, just as biological evolution is conditioned by its environment. The assemblage gives the technical invention its purpose and function, but the machinic phylum accounts for its creation and emergence in the first place. Accordingly, engaging with the inorganic technical lineage of the phylum involves true exposure to its material potentials and affects, instead of mechanically serving the utilitarian calculus of the needs of a society.
- 72 In fact, Deleuze and Guattari themselves also assimilate the technical development of a machinic phylum with the Bergsonian creative evolution of *life*:

It is thus necessary to take into account the selective action of the assemblages upon the phylum, and the evolutionary reaction of the phylum as the subterranean thread that passes from one assemblage to another, or quits an assemblage, draws it forward and opens it up. *Vital impulse?* [*Elan vital ?*] (Deleuze and Guattari 1980, 507/407).

- 73 Thus, with the concept machinic phylum Deleuze and Guattari radically reformulate Bergson's idea of vital technics by claiming that it constitutes, not just an artificial extension of our body in response to vital needs, but in itself an expression of inorganic life. Seeing the development of technology as part of human evolution and as an expression of vital creativity would seem a logical step from the Bergsonian point of view, even if it involves the idea of inorganic life. Indeed, we saw above that Bergson does think of the emergence of technics as a product of evolution, but also as a point where "the evolution of life stopped" (Bergson 2013, 333/301). That is, the emergence of versatile technical intelligence is for him an expression of the creativity of life, but after its emergence, the application of intelligence is essentially helps us to adjust to the material mechanisms of nature, not to create of something truly new. This adjustment is occasionally aided by flashes of inspiration from "the fringe of intuition" surrounding our intelligence, but this only leads to inventions of relative creativity serving the domination of the material world, not the creative movement of life.
- 74 The tension between a social assemblage and the machinic phylum sheds light on the dual nature of technics: technics is a fundamentally creative activity, but it is also quickly stabilised into manageable processes and mechanisms. We can think of these two dimensions as the supply (phylum) and demand (assemblage) of technology. However, Deleuze and Guattari stress the heterogeneity and autonomy of the two co-existing dimensions, which makes their encounter much more fortuitous than economic model would have it. A developmental lineage of technics has a life of its own, but not in complete isolation from social circumstances: technical inventions die out in the absence of an accommodating social assemblage where they are useful. On the other hand, neither is a social assemblage determined by its technology, as an assemblage is composed of various heterogeneous tendencies. Still, technology is the central material expression of the tendencies of a particular assemblage and a dominant technology of an age usually corresponds to a dominant dynamism of its assemblage. We can again think of the materials that define whole ages: the material, technological remains of a culture give us a fairly rich picture of its mode of life. With later examples of 19th century industrial factories and contemporary information technology it is even easier to see that technology usually depends on relatively autonomous technical creativity but then becomes inseparable from its respective social assemblage and its dominant mode of life.

Conclusion

- 75 There is a fruitful variety of conceptual elements concerning technical creativity in Bergson's work. We have followed two principal threads of his thinking relevant for an analysis technical creativity. First, we have seen that Bergson portrays technics as an expression of vital creativity in human evolution. Second, we have discussed the importance of artistic creativity as an important and recurring Bergsonian example of the creative work of intuition.

- 76 My first aim has been to develop the concept of intuition in the material context of technical creativity. While I have sought to showcase all the relevant elements in Bergson's thought in view of an analysis of technical creativity, I have also pointed out several elements in his thought which implicitly and almost imperceptibly predispose it negatively towards the very idea of technical creativity. First, he depicts matter as an inert spatial object, which intelligence seeks to control according to prevailing needs and interests, by means of technology. In so doing, he tacitly frames both the material object of technics and technical activities as primarily mechanistic and uncreative. Second, I have argued that – due to his mechanistic conceptions of matter and of the technical intelligence – Bergson models his concept of intuition on pure consciousness and receptive observation, and this brings creativity further away from anything related to action and materiality.
- 77 However, we found a guiding thread for an understanding of technical creativity in Bergson's own thought, in *The Two Sources*. There he sees affectivity and creative emotions as an essential inspiration for social action as well as for artistic creativity. I have suggested that to account for technical creativity, we must extend this perspective of affectivity also to matter. Accordingly, we must also acknowledge the primacy of a material environment as the immediate context of creative intuition in general. In a single stroke, by adopting this affective point of view on materiality, it becomes easier to see matter as an essential element in an experimental and creative process, and technical experimentation also becomes a plausible instance of Bergsonian intuition. Material affectivity links together materiality and spontaneous, creative action, while Bergson in his earlier works tended to view action as the realisation of the utilitarian interests of the intellect. As we have seen, later he described creative emotions as essentially active, but the source of this action remained within the bounds of immaterial consciousness.
- 78 We also found important insights concerning material affectivity in Deleuze and Guattari's analysis of technical creativity. What makes their analysis particularly interesting with regard to Bergson is that they frame it as a reinterpretation of Bergson's concepts of intuition and vital impetus (*élan vital*). Their way of modifying these Bergsonian concepts can be summed up as "affective materialism". I have argued that Bergson's concept of intuition can account for technical creativity if it is developed in a more materialist direction. The three new features of such a materialist concept of intuition are (1) its material immersion, (2) the affectivity of matter and (3) interactive operability. These aspects are all expressed in Deleuze and Guattari's concept of attentive following (*suivre*), which they define as "intuition in action". In this sense, the artist is closer to an *artisan* than to a creative demiurge or to a spiritual visionary. An artisan is precisely immersed in material flows, interacting with their affectivity. On the other hand, assimilating the artist with the artisan not only brings out the essential materiality of all artistic activities, but it also underlines the creative dimension of the artisan's work. Furthermore, *experimentation* rather than spirituality or conscious insight thus appears as the hallmark of creativity.
- 79 Admittedly, high cognitive capacity plays a key role in the evolution of human creativity and is thus not to be over-looked in favour of the mere manipulation of matter. However, I have argued that in order to be creative, our consciousness and thinking always need to interact with their material, sensuous environment.

Furthermore, this immediate, interactive relation to a material is always marked by affectivity.

- 80 Bergsonian intuition is a cognitive perspective which approaches phenomena immediately and intrinsically, from within, as in hearing a melody. Deleuze and Guattari suggest that technical creativity is in fact a prime example of such intuition with respect to material processes and variation. This extension of Bergsonian intuition as attentive *following* also binds it to *action*: when we are following a material variation, we also actively participate in this variation. Thus, Deleuze and Guattari challenge the Aristotelean dichotomies of form and matter, activity and passivity, which prioritise the point of view of our conscious representations instead of articulating real differences within phenomena. By contrast, they emphasise the importance of the immersion in a material, affective context, within which we select from various bifurcating and diverging processes and lines of action.
- 81 As Bergson himself points out, the activity of our intelligence is not inherently creative. It is just as prone to repetitive, conservative habits as are our more basic activities, which literally require little thought. Accordingly, I argue that the creativity of an activity (e.g., thinking) is not automatically determined by its type (e.g., intuition), but creativity is an intrinsic potential of every concrete activity, which can only emerge gradually from the activity. Thus, I have suggested that Deleuze and Guattari's reformulation of the Bergsonian concept of intuition as experimental interaction with a material gives us a sufficient criterion of technical creativity.
- 82 In the Deleuzo-Guattarian perspective, creative experimentation is essentially a *material* endeavour. But Bergson tends to define matter from a pragmatic and mechanistic point of view in terms of its spatiality and inertia, as opposed to duration and processuality. What then distinguishes Deleuze and Guattari's material of experimentation from a mere simple receptacle of human designs, mechanical operations and processes? Most importantly, we have seen that the perspective of *material affectivity* involves a dynamic and interactive approach to matter. Indeed, I argue that when technical creativity is open to the immediate effects of a material and of its environment, it becomes indistinguishable from artistic creativity and also from Bergsonian intuition as an intrinsic perspective on reality. In creative experimentation, matter is not the external object of intelligence, but appears as the immediate, affective, and interactive environment of intuition.
- 83 Furthermore, Deleuze and Guattari's analysis of the tension between a social assemblage and the lineage of technical creativity ("the machinic phylum") provides an insightful conceptual basis for understanding the historico-social significance of technical creativity. Thus, they extend Bergson's theory of the creative evolution of the vital impetus to a socio-technical context and re-interpret it in terms of the idea of inorganic life. That is, technological development resembles an evolutionary process which however happens outside of organic bodies, largely within inorganic material processes.
- 84 Bergson acknowledges the centrality of technics as an expression of human creativity and inventiveness. However, he does not formulate a specific analysis of technical creativity and I have argued that this is due to his overly mechanistic conception of technics and materiality. Nevertheless, as we have seen, Bergson's concept of intuition is a fruitful basis for a theory of technical creativity, once the affective, material

context of intuition in action is understood as an integral part of an experimental, creative process.

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NOTES

1. All the references are to original works (in French e.g., in the cases of Bergson and Deleuze). After direct quotations, I first indicate the page in the original, then the page in the translation, for instance here: 153/168.
2. Canguilhem points out that the example of fire, essential for the transformation of materials, also shows the limitations of the "theory of organic projection." This is the idea, professed by Kapp and Espinas, but to some extent also by Bergson, that tools and technology are external and artificial extensions and projections of our organs (Canguilhem 1992, 123).
3. Al-Saji finds a similar idea in Merleau-Ponty's philosophy: "Merleau-Ponty searches in *The Visible and the Invisible* for the pre-objective (and pre-subjective) affective ground that links the body to the world, and that gives rise to both" (Al-Saji, 2001).

ABSTRACTS

Bergson portrays technics as a central expression of human creativity, but he also describes it as degenerating, mechanistic instrumentality. Can technics be truly creative or is it bound to the mechanistic processes of matter? In this paper, I develop a Bergsonian analysis of technical creativity based on two main reformulations of his ideas. First, I extend the Bergsonian theory of *creative emotions* presented in *The Two Sources of Morality and Religion* to technical creativity, as material affectivity. Second, I develop a materialist reading of Bergsonian *intuition*, based on Deleuze and Guattari's formulations in *A Thousand Plateaus*. Through these reformulations, we can indeed find in Bergson's thought a fruitful ground for an analysis of technical creativity. For this, we need to develop an affective conception of materiality and, in addition, acknowledge the importance of a material context for Bergsonian intuition.

Quel est le rôle de la technique dans la pensée bergsonienne ? Bergson reconnaît l'importance des inventions techniques comme expressions de la créativité humaine, mais le plus souvent, il assimile la technique à l'instrumentalité mécanique de l'intelligence humaine. La technique peut-elle être créative en elle-même, ou est-elle profondément soumise aux mécanismes de la matière ? Je développe une analyse de la créativité technique à travers deux reformulations des idées bergsoniennes. En premier lieu, je propose une extension de l'idée d'*émotions créatives* présentée dans *Les deux sources de la morale et de la religion* afin d'appliquer cette idée à la créativité technique, en tant qu'affectivité matérielle. En second lieu, je propose une interprétation matérialiste du concept bergsonien d'*intuition*, suivant les formulations de Deleuze et Guattari dans *Mille Plateaux*. Après ces modifications, nous trouverons dans la pensée bergsonienne une base féconde pour l'analyse de la créativité technique. Pour cela, il faut développer une notion affective de la matérialité et de plus, reconnaître l'importance d'un milieu matériel pour l'intuition bergsonienne.

INDEX

Mots-clés: Henri Bergson, technique, créativité, matérialité, affectivité, intuition

Keywords: Henri Bergson, technicity, creativity, materiality, affectivity, intuition

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