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Technique/Discourse: When Bergson Invented His Cinematograph

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Résumé de l'article

Le modèle cinématographique de la pensée est développé par Bergson dans *L'évolution créatrice* en 1907 à partir des Cours au Collège de France donnés entre 1902 et 1903. Cette appropriation bergsonienne d'un appareil de la modernité n'est certes pas passée inaperçue. Le discours bergsonien a nourri tout au long du XXe siècle des positions souvent opposées sur le cinéma qui imposent à l'historien de s'interroger sur le statut du dispositif cinématographique de Bergson. Relevant purement du discours philosophique, ce dispositif renvoie à un appareillage et à des procédures dont le mécanisme est bien reconnaissable et ne se résume certes pas au cinématographe inventé par Lumière. Il faut donc se confronter à la dimension technique de ce dispositif pour en interroger le caractère très particulier. Qu'est-ce qui fait la technicité du dispositif de Bergson? Comment se joue le passage de la référence technique à son appropriation par le discours dans des stratégies démonstratives qui en transforment la valeur? Il s'agira d'interroger frontalement, à partir d'une étude de cas, le devenir de la technique dans les discours. En empruntant à l'histoire des techniques en dehors de la littérature spécialisée du cinéma, cet article tente de redessiner l'entrelacement du discours et du fait technique. Il propose de réfléchir à ce qu'on peut appeler un discours utilisateur dans son rapport au discours spécialisé et met en évidence la prédisposition des discours, quels qu'ils soient, à une osmose des concepts dont peut rendre compte l'épistémologie des dispositifs de vision.

Technique/Discourse: When Bergson Invented His Cinematograph

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To this day, Bergsonism has directly or indirectly fueled theories of art and film, as the examples of André Bazin and Gilles Deleuze famously illustrate. Therefore, it ought to prove interesting to return to the founding principles of this philosophy and to investigate its ties to a certain idea of "cinema", one often cast aside in order to better defend Bergsonism. Bergson himself spoke of "cinema" not so much because he readily admitted to attending movie theaters in an oft-quoted interview (Georges-Michel 2011 : 79-82)[1], nor because, in *Creative Evolution*, he wrote about the Lumière *cinématographe* – a machine that was his contemporary –, nor even because he was to turn it into a metaphor of scientific thought. Rather, he talked about "cinema" because he turned the cinematograph into a theoretical model. Indeed, Bergson engaged with the cinema by referencing this "device" [*appareil*] belonging to the technology of film and by offering an analysis of its dispositive, all the while developing a particular conception of it. There is a famous passage in the fourth chapter of *Creative Evolution* where Bergson "presents" the cinematograph, dialectically connecting his philosophy and thought to the new medium. But exactly what is the status of Bergson's cinematograph for the historian of cinema? How can it be grasped and known for cinema studies, beyond the mere mention of it or the acknowledgment and prestige which philosophy as a discipline may bring to it?

One way to acquire historical knowledge of Bergson's *cinematograph* is through discourse analysis. Indeed, this dispositive can be said to "function" inasmuch as it assumes a specific role within Bergsonian discourse, where it is associated a battery of concepts and a number of other dispositives, and because its very description contributes to the production of meaning. In short, it can be redeployed as a dispositive

by taling an *epistemological approach.*[2] Bergson's own cinematograph, like the other cinematographs or machines and dispositives found in traditional film histories, features a mechanical element, or "machinery", that relies on a "device". This is not necessarily the case for all viewing dispositives, however : the exhibition of a painting in a museum, for instance, does not require a device. In Bergson, though, the technical nature of the cinematograph is evident. Not that the technical fact should be reduced to the mechanical or the mechanistic : rather, we should recognize with Jacques Ellul that "the machine provides the ideal toward which technique strives" (1967 [1954] : 4).[3] Of course, the devices of the "Machine Age" elicited all sorts of remarks and debates as the subject impassioned both fierce advocates and staunch opponents. The cinematograph was perceived as an emblematic "machine" of modernity on the eve of the twentieth century, just as the train, with which it was often associated, had come to embody nineteenth-century industry. Histories of cinema (and by cinema I also mean what is often called "pre-cinema") usually devote much space to technical issues and problems when discussing the medium's early years. For the most part, these are histories of devices, inventions and patents : outright technical histories. This attitude changes from the moment the history of cinema becomes a history of *films*, and cinema institutionalizes itself; suddenly, technical considerations become embedded in – and even dependent on – aesthetic problems : definitions of works, authors, styles, schools, etc. But even then, history simply sheds a different light upon the cinema, since the technical fact remains at the heart of the larger ensemble that forms the cinematographic dispositive. What I call the "technical fact" determines both Bergson's dispositive and the various dispositives of film historians. However, this technical fact acquires a specific value in the work of the French philosopher.

The critique of science advanced by Bergson through his theory of knowledge is integral to the context of mechanization. For Bergson, the cinematograph stands for the limits of science; it is the model for its operations, which do not allow access to real duration as grasped by intuition. Bergson therefore turns to this cinematographic "machine", showing in the process that he too can draw on the technical means of his time. Nonetheless, he assigns to this cinematograph a rather peculiar finality relative to his philosophical argument. The status of the technical aspect of the cinematographic dispositive in Bergson's discourse warrants elucidation; like the various dispositives of film historians, it too demands that we question its "technicity" [*technicité*]. This is a required detour if we are to delineate the status of Bergson's dispositive for the film historian. However, in order to investigate the technical "being" of a discursive object, to observe the technicity of this specific *discursive dispositive*, one must first elucidate the relations that exist between the technical and the discursive – since they manifest themselves well beyond the technical history of cinema. Only then can we hope to grasp,

in a concrete manner, the process of "discursive transmutation" that plays itself out in Bergson.

The Discursive Genesis of the Technical Object

Wordplay provides a first line of approach. Within the history of techniques, the relation between discourse and technique can be understood as the articulation of two closely connected terms, "technique" and "technology". Technology, as the etymology of the term goes, is defined as a discourse (*logos*) about technique. Maurice Daumas refers to this definition in a small book that serves as a compendium to his great work, *Histoire générale des techniques (1962-1979)* : "For us, the term 'technology' means the same as it did when it first appeared in the seventeenth century, namely, the reasoned science of different techniques" (1981 : 4).[4] André Leroi-Gourhan uses the term similarly when he writes of the "technology of trends" (1971 [1943] : 28-29).[5]

Technology should therefore be understood as discourse, science, theory. In the context of Daumas's and Leroi-Gourhan's historical approaches, "discourse" legitimately develops *a posteriori*, *i.e.*, after technique. Technique itself then assumes a positive, concrete value, even when conceived as a historical "reconstruction".

But how exactly should we understand the term "technique"? It is beyond the breadth of this essay to exhaust the wealth of issues raised by this question, though I will chance an answer with regard to the epistemology of viewing dispositives. Two complementary domains or "orders" of definition seem useful to me in grasping the relations between technique and discourse : on the one hand, there is the order of action, of "making" (referring to either human actions or the workings of devices that do not require a subject); on the other hand, there is the order of the object understood as an "entity", yet one whose definition is problematic. These two orders can be found in different discourses bearing on technique, but they give rise to definitions that greatly vary from one author to the next. I will list them under the general rubric of the "technical fact", a term used very openly to mean anything that possesses a technical character, a technicity. Technical facts thus include :

1. *Processes, procedures or methods of fabrication.* This happens to be Daumas' definition. He writes :

> For the purposes of this study, techniques are understood as the processes and methods used for the fabrication of material goods – consumer, capital or communication goods – whose free disposal has determined and still determines the evolution of mankind's mode of existence (1981 : 4).

Gilbert Simondon proposes a different version when he claims that "[P]rior to the tool, there is method, which consists in provisionally or definitively modifying the environment" (2005 : 86). Therefore, while *procedures* belong to fabrication or "making", they may also determine

how the tool is used. Conversely, a tool's use may be considered as part of the overall process of fabrication – that is to say, the very same process in which the tool itself is used for specific procedures.

2. *The technical objects that have themselves been made and also serve to make*. These include tools, instruments, utensils, devices, machines. The list is Simondon's; the connection he establishes between them is based on the systematized logic of their internal coherence. The Lumière *cinématographe* as *technical object (1)* may thus be understood as the result of *procedures (2)* that make its fabrication possible; it may also be grasped as a "device" that "acts" or "operates" according to a set of *internal procedures (3)* in order to produce images when used in a certain way. Furthermore, the cinematograph can also be understood as a dispositive : it will then be considered *as a device, itself part of a dispositive* which sets up a number of *procedures (4)* that involve the technical object (1) and the above mentioned procedures (2 and 3). Admittedly, the procedures *(4)* of the viewing dispositive, which render possible the projection of moving images for a spectator, are many : for example, they control the making of the representation relative to numerous aesthetic issues (such as choosing how to frame the image) or determine how the spectator gains access to the representation through any number of social codes (these include various behavioral conventions, but also the economic conditions required to attend a screening, etc.).

At the heart of the definition of the technical object we find the problem of "invention". All discourses on technique end up engaging with it, whether to assert, relativize or redefine it. For instance, Leroi-Gourhan's distinctive use of the term "technical fact" may stand for "invention" or else it may refer to the "plain and simple borrowing from another people" (1971 : 27; see also 1973 [1945] : 376-95).[6] From a different perspective, Simondon's work on the technical object defines invention by reference to an object's "genesis" as a way of determining its degree of individuation (2012 [1958] : 22).[7] As for Daumas, he defines "technical creativity" as an alternative to invention. (1996 [1979] : IX).[8] Still, the issue of technical invention will not be my focus here; instead, I will endeavour to examine the *genesis of the discursive technical object* in a rather particular instance of discourse (*viz.*, Bergson's philosophy).

The articulation technique/technology conceals what neither Daumas nor Leroi-Gourhan or Simondon ignored : the mixed character of discourse and technique (1993 [1978] : 1150).[9] In a sense, the question should be rephrased as follows : which discourses *blend with* technique? There are many kinds of discourse. One kind of discourse orders, demands, formulates a need or spells out the problem to be solved : it is found among craftsmen, scientists, engineers formulating what they want or seek. Another type of discourse belongs to the individual who makes, invents, creates, organizes in reports, notes, patents, letters; an individual who writes words as well as numbers and equations. Yet

there is also the discourse of those who imagine, fantasize, entertain themselves, who project the impossible or what does not yet exist in literary fiction, in poetry. Still another discourse explains, describes, represents, displays, shows (the manual, instructions for use) : didactic discourse, synthetic discourse, expository discourse. There is the discourse of whoever uses or operates the tool, the machine, who performs work according to an order, a guild, an association or an organization, *i.e.*, the discourse of corporations, industrialists, trade unions. There is also the discourse of the individual who studies, writes history, develops a knowledge (Albera & Tortajada 2010 : 45-58; *cf.* also Le Forestier & Morrissey 2011 on the discourse of "technical trades").[10] All these discourses, taken together, *make up* technique, they *say* what the technical object is, they *define* the procedures involved, in their own way and following their own codes. In short, the distinction between discourse and technique may not be reduced to a mere opposition : "technique" itself is an active part of discourse, and vice versa.

The inventor's "discourse" which accompanies the invention belongs *as much in "technique" as the technical, material object* with which it is concerned. This may seem obvious, but it does not go without saying for all the discourses already mentioned. One type of discourse in particular appropriates techniques and seizes them within its own logic : the discourse that *uses* the technical fact. Bergson's discourse belongs to this large ensemble, as a philosophical, conceptual discourse with its own finality, first ushering in the cinematograph as an example or term of comparison, then giving it the status of a model. Such discourse does not *make* the object, so to speak, nor does it *apply* the procedures that determine it (*e.g.*, putting it to use in a material, mechanical sense), but it apprehends that object as a technical fact and assigns a role to it as such. This discourse, which did not yet exist at the time Bergson was writing, is heterogeneous with regard to the institution of "cinema" : it does not claim to write the history of a device or a contemporary practice (in the way, for instance, that Étienne-Jules Marey, as inventor and scientist, presented his chronophotography), rather it "operates" the cinematograph in its own way, appropriating it in the process. The issue may be raised in terms of "advent" : how does technique *come into* discourse? How does the cinematograph "turn up" in Bergson?[11] Or, to put it differently, how does reference to a contemporaneous dispositive of vision gets introduced into Bergson's philosophical discourse, where it produces epistemic effects extending to philosophy, art and the field of cinema itself? The issue is not to trace "influences", but rather to locate traces of dispositives or devices inside philosophical discourse and assess their degree of technicity – to see the constitution of the technical fact in its discursive specificity.

Technicity is defined by Simondon as "the *degree* to which the object becomes concrete" (2012 [1958] : 89-90. My emphasis), which means – if one is to qualify the level of technicity – that not only the form and the

material of the object should be taken into account, but also the stage of development of the procedures and elements involved (ensembles) to obtain the object (a given form out of a given material). This conception of technicity may still be complemented by yet another essential aspect in the definition of the technical object, which concerns the correlation of its constitutive elements. The technical object, Simondon writes, "'works' within itself", putting into play, as well as can be, the interdependence of the various elements. This is what Simondon calls "self-correlation" (2005 : 91-2).[12] Levels of technicity may then be defined with accuracy :

> It is the increase in self-correlation that is key to the progress in technical objects. The simpler the object, the more functions it concentrates in a small number of parts and the more perfectly the compatibility between functions will have been organized. It is the most stable and coherent object, not the most complex, which for a given functioning involves the highest genuine technicity and may serve as a scheme for other realizations (*Ibid.*: 92).

However, it would be fruitless to seek in Bergson's discourse and in his technical references a degree of technicity that could meet Simondon's definition. For Simondon's concern is with technical knowledge, both discursive and non-discursive, both specialized and scholarly. Still, it can serve as a limit model against which to test the degree of specification of technical objects and dispositives from the perspective of their *use* – provided the definition is refurbished to some extent, by which I mean respectfully simplified and generalized. In short, this will imply observing the technical objects as they are put to use within discourse, examining their form, their various elements, the coherence of their relations while taking stock of what may pertain to their operating procedures.

To summarize : my concern is not so much with what technique does to discourse but rather with what the *discursive appropriation of use does to technique.*[13] If the technicity of the discursive dispositive is to be defined, then its discursive transmutation ought also to be examined. This will lead me to refer to "invention" : to be sure, this is not the invention of the technical object per se, defined and circumscribed in the real world, either through its use (the province of the history of trades or professions) or the identification of its genesis (as in Simondon, for instance). Rather, "invention" refers here to the *discursive engendering* of the technical object. Bergson's *cinematograph* may well be called "*cinématographe*", but it is not the equivalent of the Lumière *cinématographe*, nor that of the various chronophotographs or devices manufactured by Éclair, Pathé and others. As it happens, if one can say that discourse *makes* (in the sense of creating or inventing) by enunciating, it is because discourse itself belongs to technique, that it is in itself a procedure or a set of procedures for fabricating an object – whether discursive, verbal, oral, written, visual, sonic, etc. This technique, then, is determined by the very nature of discourse – and in the case that interests me, the functioning and finality of a philosophical

discourse around 1900.[14] In a discourse such as *Bergson's*, the degree of technicity will be low. However, the value of this discourse lies in how it appropriates and transforms the technical fact, integrates it into a new cluster of concepts and turns it into a new dispositive : "Bergson's (rather than Lumière's) cinematograph".

The Technicity of Bergson's Cinematograph

In *Creative Evolution* (1907), Bergson explicitly appropriates a modern dispositive, the cinematograph, so as to exemplify how thought, perception and scientific knowledge operate; but also to critique such a mode of cognition, to which he opposes intuition. He writes :

> Now, there is another way of proceeding, more easy and at the same time more effective. *It is to take a series of snapshots of the passing regiment and to throw these instantaneous views on the screen, so that they replace each other very rapidly*. This is what the cinematograph does. With photographs, each of which represents the regiment in a fixed attitude, it reconstitutes the mobility of the regiment marching. It is true that if we had to do with photographs alone, however much we might look at them, we should never see them animated : with immobility set beside immobility, even endlessly, we could never make movement. In order that the pictures may be animated, there must be movement somewhere. *The movement does indeed exist here; it is in the apparatus* [appareil]. *It is because the film of the cinematograph unrolls*, bringing in turn the different photographs of the scene *to continue each other*, that each actor of the scene recovers his mobility; *he strings all his successive attitudes on the invisible movement of the film*. The process then consists in extracting from all the movements peculiar to all the figures an impersonal movement abstract and simple, *movement in general*, so to speak : we put this into the apparatus, and we reconstitute the individuality of each particular movement by combining this nameless movement with the personal attitudes. Such is the contrivance of the cinematograph (1911 : 321-22).[15]

The passage pertaining to the "cinematograph" goes on for much longer. Centering on the question of change, it first examines the transformation of qualities in an object before taking up the question of movement and thus proceeding with a first presentation of the cinematograph by way of a commentary on Zeno's paradoxes and on the workings of ancient and modern science. The cinematographic dispositive is not exactly the "cinematographic model" of thought : while the former exemplifies the functioning of the latter, the qualities of the one may equally apply to the other. In short, they enrich each other throughout Bergson's text. While the section on Zeno emphasizes the importance of the interval, the part on modern science introduces the notion of any-moment-whatever, associated with what Bergson calls "the cinematographical method". Quite evidently, concepts inform this "cinematograph", from the "instantaneity" of the film frame, to that of "change" involved in the interval between stops, to mention but two. But what is the degree of technicity of the dispositive being set up by

the philosopher?

We could approach the question by identifying the technical fact, wondering whether it refers to a specific object. It is a "cinematograph", Bergson tells us, and naming is usually a path toward identification. Yet the fact of the matter is that such a designation can actually refer to quite a few technical objects : the Lumière brothers' reversible appliance, but equally any other dispositive of recording and projection (reversible or not) in the "family" of cinematographs. In that case, the cinematograph does not refer to a single device alone, but to the entire technical array that makes up cinematographic practice. At any rate, for our purpose it can be said to concern a mechanical assemblage capable of synthesizing movement out of stills (or snapshots) when they are projected. At once, then, Bergson captures *the technical configuration* known as the "cinematograph" both in its constitutive structural elements and in its functioning. The structural elements are the serialized still images, the strip of film, and also the screen. Nothing is said, however, of the cogwheels, the various internal mechanisms or the energy source that allows the device to work. As for the functioning, it involves taking a series of instantaneous photographic images as a strip of film is set in a rotative motion. The movement makes it possible for the photographs "to continue each other". These essential, yet only minimally descriptive elements, take us far from the complete "self-correlation" of parts involved in the functioning of the assembled whole – Simondon's condition to qualify an object in its technical identity. The few elements mentioned by Bergson as an account of the cinematographic dispositive are merely a few relevant selections, culled by discourse, of a technical assemblage otherwise defined by its own internal logic and the reciprocal relation of its parts of which Bergson's text gives no account at all. We thus have a "technical object" that appears to be an abstraction. And yet, it still, "works".

The functioning of this "cinematograph" rests on a different level of technical specification. It can be understood in relation to a conception of the entire process at stake, which allows for identifying the technical assemblage better than nomination can. There is, *first of all*, the instantaneous "capturing" of a series of stills; this is *followed*, secondly, by the recomposition of movement at the time of their projection. With the description of this dual process, we come to what is an essential aspect of the device : what we have here no longer appears as the mere mention of a few selected elements from the device, but rather the technical process as a method to account for the coherence of the whole. Bergson takes this step when he rephrases the process that defines "perception, intellection, language" : "We may therefore sum up what we have been saying in the conclusion that the *mechanism of our ordinary knowledge is of a cinematographical* [sic] *kind*" (Bergson 1911 : 323). A few sentences further, he refers to it as "the cinematographical method" (*Ibid.*), which defines science itself : "Modern, like ancient, science proceeds according

to the cinematographical method. It cannot do otherwise; all science is subject to this law" (*Ibid.* : 347).

The dual process (the capturing of stills, the recomposition of movement) situates Bergson's dispositive in a larger set of processes that are contemporary with it, historically speaking, but which the appellation "cinematograph" may somewhat obscure today. This set includes various sorts of spectacles, devices and scientific research all pertaining to chronophotography, with the main one, of course, being Marey's own "chronophotographic method". It is explicitly called "method", as it was developed in the context of scientific experimentation and was founded on the use of a specific technical equipment; it also refers to the two moments of analysis and synthesis, the study of a series of photographic stills as well as that of the synthesized moving image.[16] That the notion of a cinematographic method would be advanced by Bergson to qualify science is therefore not unrelated to the prior existence of a scientific method that Marey called the "chronophotographic method". It also happens that both dispositives rest on the same two-step process and on the technical qualities of those devices that Marey ceaselessly imagined and perfected. In fact, the Lumière *cinématographe* was included in the list of "chronophotographs" drawn by Marey at the time of the 1900 World Fair. Bergson thus offers us a generalization of sorts : to describe the functioning of scientific knowledge in general, he uses the two moments of the procedure involved in a specific scientific research project, namely Marey's chronophotographic method, which aims to study locomotion. With Bergson, such generalization is called the "cinematographical method", whose two-step procedure belongs to Marey's chronophotographic method.[17]

The Technical Fact and Discursive "Transmutation"

While the technical fact has a value for the discourse using it, that of belonging to the world of experience and to contemporary discourses, entry into discourse still requires that it undergo a *re-appropriation*, which is really a *reconstruction*. Technicity does indeed develop in discourse, as the latter proceeds with (a) *naming* (the *cinematograph*); (b) the *selection* of a number of constitutive elements of the technical object, taking into account experiential as well as discursive knowledge of the object (*e.g.*, the selection of instantaneous stills, strip of film, but not of sprockets, sprocket holes or reels, etc.); (c) the *emphasis on procedures* (the two-step process of photographic recording and synthesis of movement); and finally (d) the *re-naming* of operating procedures, on the model – not mentioned but described in actuality – of the "chronophotographic" method, now re-named by Bergson "the cinematographical method".

There is more still. The genesis of the discursive object by Bergson turns the cinematographic dispositive into an object whose relation to the technical fact proves surprisingly problematic. Illusion lies at the

heart of Bergson's demonstration. The illusion of reconstituted move-
ment is the philosopher's object of study throughout these pages : it
is one of the two "theoretical illusions" dealt with in chapter IV, "The
Cinematographical Mechanism of Thought and the Mechanistic Illu-
sion". The first illusion "consists in supposing that we can think the
unstable by means of the stable, the moving by means of the immobile".
And we fall prey to the second illusion when we "make use of the void
in order to think the full" (Bergson 1911 : 287-89). The illusion should
be understood as a deceiving effect : the demonstration starts from this
premise. In the order of Bergsonian discourse, the cinematograph starts
off as an example of the first illusion, which concerns movement : the
mechanical functioning is the analogon of the operation of thought. Only
once this is established does the cinematograph acquire the status of
a generalizable model, of a mode of knowledge. In short, it becomes a
machine for the production of "theoretical illusions". As such, it can be
understood once its technicity is exposed in the production of an ersatz
movement : synthesized movement.

In the articulation of the discourse, the key to the illusion lies in a
specific movement : "In order that the pictures may be animated, there
must be movement somewhere. *The movement does indeed exist here;
it is in the apparatus*" (*Ibid.* : 322. My emphasis). Everything seems to
play out around the movement specific to the cinematographic machine,
essentially defined by the running of the film strip. The idea that there
is movement in the machine is evidence that it is functioning, a com-
monplace of sorts whose technical basis may be the importance of the
wheel, the basic principle in the mechanical development of machines.
As Simondon explains :

> The machine tool and the machine develop around a central system of self-
> correlation that may either be an adjustable source of energy or a device
> such as the wheel. Specifically, the very important role of the wheel in me-
> chanical machines has to do with the fact that, besides their applications
> for vehicles, wheels and rotation provide a system of self-correlation between
> the different phases of functioning and between the different organs put into
> play through cyclical functioning. The wheel is the organ that indefinitely
> recycles the commands and the effects; it becomes the basis of automatic
> functioning (the internal programming of the cycle) [...] (2005 : 96).

Rotation is central to the machinery of cinema : such movement
is involved in the shutter, the cam, the reels, as the strip of film winds
up and unwinds. Even though the reference to rotation does not recur
systematically in Bergson's text, it emphasizes an important element
which points to technicity in the context of this device : the reel and the
run of the film are a condition of possibility for chrono-cinematographic
technique, conditioning for instance the duration of the recorded scene.
Let us return to the passage already quoted :

> It is because the film of the cinematograph unrolls, bringing in turn the
> *different photographs of the scene to continue each other*, that each actor of

the scene recovers his mobility; he strings all his *successive attitudes on the invisible movement* of the film (1911 : 322).

Bergson is interested in unrolling (or unwinding), for this movement determines the relation between images – substituting for, or "continuing" each other. This choice of words to designate synthesized movement is surprising, however, since two images succeeding each other without a scheme to establish continuity cannot produce an impression of continuous movement. Bergson focuses his explanation of the illusion of movement on this relation of succession, that is, on the physical relation images have with each other, whether projected or inside the machine.[18] In so doing, he confines himself to the mechanical dimension of the synthetic process, skillfully leaving the technical fact at hand incomplete.

Indeed, for the illusion to be understood, an essential moment in the technical process of production of images as it was understood at the time is missing : namely, persistence of vision. The discourse insists on technicity, the object, the procedure that deals with the object (what takes place inside the device), but excludes the phenomenon of perception without which the illusion cannot be understood, and without which the succession of images does not produce anything except… succession itself. This omission is all the more remarkable since the concept and practice of stroboscopy were widely known and much discussed in the nineteenth century. Plateau's experiments, on which Marey based his work, were founded on the idea of persistence of vision (1894).[19] The phenomenon was also germane for the optical toys that became so common in salons during the period. According to Marey, the illusion produced by persistence of vision was necessary for obtaining the synthesis of movement. And following Marey in this regard, articles in popular science magazines and journals that dwell on technical processes all discussed persistence of vision when the time came to present and explain the cinematograph. The topic was known widely enough to even find its way in aesthetic theories such as Eugène Véron's, for example (Véron 2012 [1878]).[20] Yet Bergson holds on to the purely mechanical aspect which alone serves to represent the epistemic process (in everyday and scientific matters alike) : the synthesis of movement is therefore literally excluded from his account.

Another essential technical dimension for the functioning of the device is equally omitted : the *intermittent* motion of the film. When Marey evoked the Lumière *cinématographe* in 1900, he did not insist at all on the movement inside the machine. However, he did stress the importance of the intermittent motion of the film and emphasized how long each film frame must be kept immobilized in front of the lens before a new film frame can replace it and be exposed to light : "In terms of duration, the stop represents two thirds of the total time" (Marey undated : 22)[21]. As Marey saw it, the cinematograph as a machine involved

more immobility than movement. So did *La Nature* as it presented the Lumière device (August 1895 n°. 1159 : 216).[22] And in fact, in accounting for the synthesis of movement, scientific explanations correlated the immobilization of the film to persistence of vision (*Ibid.*; *cf.* also Marey 1894-95, §xviii : 314-15)).[23]

Therefore, a double absence characterizes the Bergsonian explanation of the synthesis of movement, from a technical standpoint : that of persistence of vision and that of the specific technical movement tied to the intermittent movement, or stops, of the film strip. For Bergson, there is only movement in the device : he disregards any immobilization of the film. This "oversight" actually belongs to the discursive staging of movement.

The idea that "things are moving" inside the machine is one that Bergson shares with other sources, such as the popular scientific press, for instance, who sometimes depicted an entire dramaturgy of mechanical movements inside the device. Yet, instead of explaining the production of movement as the joint effects of persistence of vision and the intermittent motion of the film strip, both of which would require looking at the inner workings the machine (as popular science would have it), Bergson's machine is inscrutable. Thanks to the cinematograph, he writes, a man who is filmed"[…] strings all his successive attitudes on *the invisible movement* of the film" (1911 : 322. My emphasis). However, the philosopher imparts an extraordinary power on this movement. Everything happens as if the invisibility of the movement and its mechanical nature accounted for its abstraction, which he denounces.

Everything is in place, then, for a new explanation of the phenomenon. The discursive technical fact undergoes a reformulation when discourse *enacts the analogy* between the cinematograph and the process of thought and science :

> The process then consists in *extracting* from all the movements peculiar to all the figures an impersonal movement abstract and simple, *movement in general, so to speak : we put this into the apparatus*, and we reconstitute the individuality of each particular movement by combining this nameless movement with the personal attitudes. Such is the contrivance of the cinematograph (1911 : 321-22).

In short : such is the principle of the cinematographic illusion. The two moments of the technical procedure are reformulated in a way that transforms its value. Indeed, the notion of movement has become a malleable concept that no longer applies to any technical understanding of the production of synthesized moving images. The explanation appears instead to present the *transformation* of movement, and Bergson provides us with the formula : first comes the movement proper to each figure that belongs to the filmed spectacle, "extracted" as a substance might be; then, once "extracted", it becomes "abstract", a movement "in general". A second moment consists in "put[ting] this [movement] into the

apparatus", Bergson writes, before *combining* this "nameless movement", general in nature, with "personal attitudes". "The individuality of each particular movement" – that is to say, the equivalent of the synthesis of movement – is then obtained. We have witnessed the *transmutation* of movement, as in a process of *transformation* of matter. This is a stylistic effect and a metaphor, but the discursive transmutation of the technical fact does indeed occur in this passage. It is so radical, in fact, that the double technical procedure, shooting a series of still images and synthesizing movement, becomes barely recognizable in the process.

What does it mean – concretely, technically –, *to extract movement* out of figures, as though movement enjoyed an autonomous materiality, as if it could be subject to a chemical transformation that would make it pure, abstract, freed from bodies? What could this correspond to in chronophotographic practice? Certainly not the shooting of a series of photographic stills. And what is a movement "in general", from a technical standpoint? The concept of movement has shifted here. Accordingly, what should be understood in the phrase "put[ting] this [movement] into the apparatus"? Could this be achieved by means of an engine or a crank? Would it be the outcome of some work and the exertion of a force? Again, certainly not here, for how would this movement, first mechanical, then "in general", turn into an individual movement by merely assembling movement and figures? Or by "combining" them, as Bergson has it? The movement would then have to be imagined as self-articulating, the way a mechanical part is articulated to still snapshots or, to extend the metaphor of transmutation suggested by Bergson, as producing a sort of mix whose result is a transmutation of movement :

Mechanical movement → Movement "in general" → Particular movement

In fact, what we have here is a radical transformation of concepts that possess a technical reference *into* Bergsonian concepts. Indeed, the above series of questions only serve to underline the discursive *tour de force* playing itself out here, namely the (total) liberties taken with the technicity of the cinematographic term of comparison.

While the precision of the technical reference to the decomposition of movement may compensate for the discursive transmutation at the moment of analogical shift, it is not the case at all for synthesis. With regards to the first part of the process, mention of the notion of still snapshots in Bergson's technical description points to several facts which may be clearly identified. The photographic snapshot presupposes the use of specific techniques and procedures : a quick shutter, a sensitive medium involving gelatin and silver bromide, a set of high-quality lenses allowing the concentration of light, to name a few. As for the *series* of snapshots, it points to the rotating special shutter of chronophotographic practice, which was based on the model of the phenakistiscope. When Bergson describes synthesis, however, this link to technique proves too limited to provide an understanding of the procedure needed in the production

of the illusion. The moment of the synthesis of movement is presented without the essential reference to persistence of vision, excluded from Bergson's text, which draws the reader's attention towards the movement that cannot be seen, at the centre of a process of transmutation.

Indeed, "combining" elements into an artificial movement seems to consist of a mere addition :

movement in general + figures = particular movement.

It comes to supplement the essentially mechanical explanation of the link between images, but evidently it cannot possibly convey the process of synthesizing movement. The explanation of the illusion, then, can only rest on what is given as a hidden process, using artifice, alchemy or trickery.

Bergson sets up a philosophical fiction founded on conjuring away two dimensions : first, a technical fact (the immobilization of the film in the intermittent transport, the scientific explanation of the production of an illusion of movement) for which he substitutes the construction of an *idea of a machine* he calls "cinematograph"; second, the demonstrative and explanatory function of the example – the cinematograph, precisely. The value of an analogy comes from the correspondence between what serves as a reference in the comparison and what one wants to demonstrate about the elements being compared. In this case, the processes involved in the decomposition and synthesis of movement have to match the intellectual process described by Bergson through the example. With regards to synthesis, this no longer works. It is no longer the cinematograph that gives us to understand Bergson's philosophy, but rather Bergson's philosophy that puts together a cinematograph with its own logic, where the mechanical amounts to an abstraction and the movement in the machine has to remain dominant and mysterious at once. Bergson's philosophy *invents* a cinematograph.

The legitimacy of this "invention" for the history of cinema is then in question. The problem may be approached from two sides : the status of what I have referred to as *user* discourse, or the object of study of the history of cinema. This article has attempted to investigate the issue of technicity with regard specifically to Bergson's discourse. Yet the link between discourse and technical fact is not valid merely for a "user discourse" such as Bergson's, which remains peripheral to the environment of production and technical thinking. Any discourse on technique, it must be acknowledged, *uses* the technical fact. *Inventor discourse*, for instance, models what it deals with, staging the technical fact, describing and using it with a given aim, re-developing it for its own needs according to its own rules. *Discursive genesis* is not limited to discourses that are "extraneous" to the technical fact, which includes Bergson's philosophical discourse for example. The specialized discourse that invents the technical fact, comments or popularizes it, writes its history, also defines and stages what technicity is, from its own stand-

point. Such discourse equally constructs the technical fact in a use determined by its own genre and finality. This also holds, of course, for discourses on the technique of cinema, accepted as sources by film historians. There is no such thing as a neutral, transparent discourse, identified with its object, whether in the order of imagination or in the order of the specialized discourse of technique and science. All these discourses use the technical fact, even though their methods differ. And in terms of discourses and their ability to model technical facts, any technical object is worthy of an analysis. If the order of discourse imposes the description, the presentation, the elaboration of its own object, such order is also conducive to the movements (shifts, migrations, circulation) of concepts and technical facts from one discourse to another, *whatever these discourses are.* To be sure, this osmosis between concepts is hindered by whatever institution serves to regulate the objects and practices that it considers relevant. But the epistemology of dispositives cannot be satisfied with simply respecting the institutional historiography of media or technical objects, for the discursive occurrences of dispositives do not stop at these limits. Epistemology has to question these very boundaries in order to enrich history and to encourage it in adjusting its scope.[24]

Though not specialized in the area of film technique, Bergson's discourse still borrows from chronophotography which furnishes it with a ground for its technical and scientific referencing. But Bergson does more : he positions his cinematograph in a network of key notions constitutive of the idea of cinema from its very advent – with the invisible as the rule and the alternation of appearance/disappearance as a permanent principle. Movement and its discursive transformations perfectly illustrate this. Bergson thus combines the scientific and technical reference with a spectacular practice close to the conjuring trick. This association points to the circulation of models and representations (or imageries) of "cinema" across different fields circa 1900. To know what cinematographic dispositives were at the turn of the century, it is therefore important to take these various occurrences into account, whether they are embodied in concrete technical objects or only belong to the order of discourse, specialized or not. These occurrences are understood in relation to others, and all have effects on practices and theories informing the very idea of "cinema".

In the end, what is the status of Bergson's "cinematograph" for the historian of cinema? In the context of an epistemology of viewing and listening dispositives, the answer is obvious : Bergson's "cinematograph" is a "device" that "functions" "as a dispositive" within a discourse whose scope extends far beyond philosophy and has contributed to knowledge about the "cinema". This discursive dispositive without material or physical existence still presents a crucial interest for the history of cinema : it participates in the definition of a certain idea of cinema and in the determination of the conditions of possibility for this "historical

cinema", with its multiple forms and movements. In short, there is the Lumière *cinématographe*, and then there is Bergson's cinematograph, among many others. The former assumes a discursive as well as material form. The latter shines only in discourse and, for over a century, has produced multiple representations of what cinema is. It is an object for the history of cinema.

Translated by : Franck Le Gac with the assistance of Martin Lefebvre

Notes

1. Georges-Michel recounted his "conversations" with Bergson in "Le cinématographe et la philosophie de M. Bergson", *Paris-Midi* 23 Jan. 1918, as well as in the collection of interviews with different personalities, *En jardinant avec Bergson* (Albin Michel 1926).
2. Here "dispositive" refers to the whole set of relations between a spectator, a representation and a "machinery" : that is, everything that gives the spectator access to the representation. For a definition of the epistemological method, see François Albera and Maria Tortajada, "The Dispositive does not Exist!" in *Cine-Dispositives. Essays in Epistemology Across Media* (forthcoming).
3. Ellul continues : "The machine is solely, exclusively, technique; it is pure technique, one might say. For, wherever a technical factor exists, it results, almost inevitably, in mechanization : technique transforms everything it touches into a machine" (1967 [1954] : 4).
4. Daumas also notes a contemporary use of the term to refer to "'advanced' domains for which the scientific support of technical creation is extremely developed". English usage defines technology as the totality of scientific applications to technique. On the subject, see Jacques Guillerme et Jan Sebestik, "Les Commencements de la technologie" (1968), as well as Benoît Turquety's arguments concerning cinema in "Qu'est-ce que l'innovation technologique en cinéma?" Talk given at the conference on "The Impact of Technological Innovations on the Historiography and Theory of Cinema", Montréal, Cinémathèque québécoise, 1 - 6 November 2011, publication of the proceedings forthcoming. [Translator's note : where no English edition is referenced, the translation is my own].
5. Leroi-Gourhan refers to the method that consists in re-elaborating on major lines in technical evolution (1971 [1943] : 28-9).
6. See also the chapter "invention", in *Milieu et technique* (1973 : 376-95).
7. "[...] the individuality and specificity of the technical object may be defined out of the criteria of genesis : the individual technical object is not this or that thing, given *hic et nunc*, but that whose genesis happens" (Simondon 2012 [1958] : 22).
8. Daumas objects to the idea of invention as relevant, arguing that it is an isolated idea born in "an inventive brain". Lewis Mumford, in an approach external to the history of techniques, emphasizes the hold of the "duty to invent" in the history of scientific breakthroughs (2010 [1934]: 52). On the question of invention in relation to the idea of cinema, see Benoît Turquety, "Qu'est-ce que l'innovation technologique en cinéma?" as well as his article "Charles Cros et le problème 'cinéma'. Écrire l'histoire avec Bachelard et Simondon", *1895*, no. 72 (Spring

2014).

9. See also Bertrand Gille, who insists on the necessary relation between words and things in his reflection on technical denomination in his edited volume, *Histoire des techniques. Techniques et civilisations* (1993 [1978] : 1150).

10. See François Albera, "Projected Cinema. A Hypothesis on the Cinema's Imagination", *Cinema Beyond Film*, Amsterdam, François Albera and Maria Tortajada, eds. (2010 : 45-58); and, on the discourse of "technical trades", "Histoire des Métiers du cinéma en France avant 1945", Laurent Le Forestier and Priska Morrissey (2011).

11. The answer to this question also requires an analysis of Bergson's lectures at the Collège de France in 1902 and 1903, which are not dealt with here, but in Maria Tortajada, "Bergson au croisement des dispositifs de vision", talk given at the conference "Le cinéma de Bergson. Image-affect-mouvement", organized by Elie During and Ioulia Podoroga, 16-18 May 2013, Ecole normale supérieure, Paris. A publication of the proceedings is forthcoming.

12. "[...] the tool 'works' within itself, between its different parts, which act upon one another; and it is perfected either through the improvement of extreme terms (a handle that the hand holds better, a sharper iron) or through progress in self-correlation (on scythes, wedges between the snath and the tang have been replaced with screw hoops, less responsive to humidity and allowing a more precise angular setting)". Simondon, *L'Invention dans les techniques* (91-92).

13. This matter was central to the Montreal conference, and this article is indeed a re-elaboration of the talk I gave there.

14. I will not deal with the huge area of the technique of discourse here, and will only mention Leroi-Gourhan's ethnological analysis, which ties the evolution of artisanal technical progress to that of language. This is the driving principle of both *Technics and Language* (1964) and *Memory and Rhythms* (1965), published together as *Gesture and Speech* (1993).

15. On Bergson's cinematographic dispositive, see Dominique Chateau (2003); Paul Douglass (2006 : 118-34); and Elie During (forthcoming).

16. The synthesis of movement is most often described as second with regard to Marey, as it serves to verify results. For my part, I argue in favour of a much wider appraisal of the synthesis of movement in Marey's practice. See Maria Tortajada, "The Reconstruction of a Concept : Marey and the Synthesis of Movement", *Ciné-dispositives*, François Albera and Maria Tortajada, eds. On the importance of synthesis for Bergson, and in the same volume, see Elie During, "Notes on the Bergsonian Cinematograph".

17. Anson Rabinbach (1992 : 146-205), and Marta Braun (1992 : 264-318) after him, have argued that the implicit reference to Marey runs through the Bergsonian approach.

18. On the relation between images, see Maria Tortajada (forthcoming).

19. See the presentation of the persistence of vision in Étienne-Jules Marey ([1894]1895).

20. In his *Aesthetics* (2012), historian, philosopher, journalist and art critic Eugène Véron (1825-1889) developed a scientific aesthetic based on physiology, psychology and anthropology.

21. An English translation of the text appeared as "History of Chronophotography" in the *Smithsonian Report for 1901* (1902 : 326-28).

22. "The mechanism is laid out so that the film remains immobile for two thirds of the time; over the last third it goes down". "Le cinématographe de MM. Auguste et Louis Lumière", *La Nature* (1895 : 216). The Lumière patent did not phrase things quite this way, but the issue of pausing obviously remained essential : "The strip is carried downwards as these teeth go down, while the same teeth going up

are lifted to leave the film still". See Auguste Lumière and Louis Lumière's "Appareil servant à l'obtention et à la vision des épreuves chronophotographiques. Demande formulée par MM Auguste Lumière et Louis Lumière" reprinted in J. Deslandes (1966 : 309).

23. The article published in *La Nature* explains that, while the immobilization of the strip prevents "light streaks" on film frames during the photographic shoot, it also explains the illusion : "It follows from this that only immobile prints succeeding each other are projected on the screen, at the pace of 900 per minute for instance. Due to the persistence of the impression of light on the retina, the eye does not see at all the blacks separating each projection […]". "Le cinématographe de MM. Auguste et Louis Lumière", *La Nature* 17 August 1895, p. 216. Illusion, immobility of the film frame and the "black" of the interval during which the strip moves are thus related here. See also Étienne-Jules Marey, *Movement*, (1895 : 314-15, chap. XVIII). Online version available at https://archive.org/details/movement00mare, (last accessed on Feb. 27, 2014).

24. On the link between epistemology and history, see François Albera and Maria Tortajada, "Une épistémologie des dispositifs de vision pour repenser la notion de média", paper presented at the international conference "At the Borders of (Film) History – Temporality, Archaeology, Theories", Film Forum Udine 2014, proceedings forthcoming.

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Abstract

The "cinematographic model of thought" was developed by Bergson in *Creative Evolution* (1907) after his 1902-1903 lectures at the Collège de France. His appropriation of this device of modernity certainly didn't go unnoticed. Throughout the twentieth century, Bergsonian discourse produced frequently opposing positions on the cinema, making it necessary for the film historian to question the status of Bergson's cinematographic dispositive. This dispositive, which strictly belongs to philosophical discourse, refers to equipment and procedures whose mechanism is quite recognizable and isn't solely confined to the device invented by Lumière. Scholars thus need to confront the technical dimension of this dispositive if they are to examine its very singular character. What makes Bergson's dispositive technical? How does the shift occur from the technical reference to its appropriation by discourse in demonstrative strategies that transform its value? Starting from this case study, this article seeks to address the following question as directly as possible : what does technique become once it enters (philosophical) discourse? Borrowing from the history of techniques outside the specialized literature on cinema, the article also attempts to redefine the web of relations between discourse and technical fact. Finally, it raises the issue of what may be called a user discourse with respect to specialized discourse, emphasizing the predisposition of any discourse for an osmosis of concepts which the epistemology of viewing dispositives can account for.

Résumé

Le modèle cinématographique de la pensée est développé par Bergson dans *L'évolution créatrice* en 1907 à partir des Cours au Collège de France donnés entre 1902 et 1903. Cette appropriation bergsonienne d'un appareil de la modernité n'est certes pas passée inaperçue. Le discours bergsonien a nourri tout au long du XXe siècle des positions souvent opposées sur le cinéma qui imposent à l'historien de s'interroger sur le statut du dispositif cinématographique de Bergson. Relevant purement du discours philosophique, ce dispositif renvoie à un appareillage et à des procédures dont le mécanisme est bien reconnaissable et ne se résume certes pas au cinématographe inventé par Lumière. Il faut donc se confronter à la dimension technique de ce dispositif pour en interroger le caractère très particulier. Qu'est-ce qui fait la technicité du dispositif de Bergson? Comment se joue le passage de la référence technique à son appropriation par le discours dans des stratégies démonstratives qui en transforment la valeur? Il s'agira d'interroger frontalement, à partir d'une étude de cas, le devenir de la technique dans les discours. En empruntant à l'histoire des techniques en dehors de la littérature spécialisée du cinéma, cet article tente de redessiner l'entrelacement du discours et du fait technique. Il propose de réfléchir à ce qu'on peut appeler un discours utilisateur dans son rapport au discours spécialisé et met en évidence la prédisposition des discours, quels qu'ils soient, à une osmose des concepts dont peut rendre compte l'épistémologie des dispositifs de vision.

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