The Intention in Invention: A Philosophy of Technical Imagination

Jessica Lombard

Abstract:
To reflect on imagination today is not to revisit an exhausted theme, but to re-engage a philosophical question that continues to unsettle inherited epistemologies and ontologies. Our article focuses on one specific regime of imagination: the relation between imagination and technology, approached through the lens of invention. As we explore the particular regime of *technical imagination*, we aim to overcome the idea that invention should be treated as a purely productive process, a functional response to material needs or economic constraints. We rather argue that invention, as a technical activity, mobilizes a specific form of imagination; one that requires a rethinking of *technicity* itself. We therefore examine how technical imagination engages with the virtuality and potentiality of matter, as it schematizes possibilities and projects relations before they are actualized. In doing so, our main hypothesis is the need to explore the temporal structure of imagination through the concept of *technical intention*. We argue that *in the process of invention, the very operativity of technical imagination depends on intention*. As such, technical intention is the structure that makes technical imagination an active and operative process, during the process of invention, and from what emerges the actualization of a concrete technical individual. Within this gesture, the investigation of imagination calls for a form of responsibility adequate to the transformations it sets into motion, grounded in an awareness that invention is never neutral, but always intervenes in the becoming of reality and consequently in the shaping of our societies. It is in this sense that invention must be understood as inherently grounded in technical imagination, and that both of them reclaims their aesthetic, ethical and political stakes.

Keywords: *Bergson, Simondon, Imagination, Invention, Technology*

CONTACT: Jessica Lombard, Lecturer and researcher at the Centre de Recherche en Histoire des Idées – Université Côte d'Azur. Associate researcher at the Institut d'histoire et de philosophie des sciences et des techniques – Université Paris 1 Panthéon-Sorbonne.
Email: jessicalombard.univ@gmail.com.

Résumé:
Réfléchir à l'imagination aujourd'hui ne revient pas à épuiser un thème ancien, mais à réengager une question philosophique qui continue d'ébranler les épistémologies et ontologies dont nous avons hérité. Cet article se concentre sur un régime spécifique de l'imagination : son rapport à la technique, envisagé à travers le prisme de l'invention. En explorant ce que nous appelons le régime de *l'imagination technique*, nous cherchons à dépasser l'idée selon laquelle l'invention ne serait qu'un processus productif, une réponse fonctionnelle à des besoins matériels ou des contraintes économiques. Une telle conception réduit l'imagination technique au cadre du solutionnisme technologique ou de l'innovation considérée comme marchandise. À l'inverse, nous soutenons que l'invention, en tant qu'activité technique, mobilise une forme spécifique d'imagination, qui exige de repenser la technicité elle-même. Nous examinons ainsi comment l'imagination technique engage la virtualité et la potentialité de la matière, en schématisant des possibilités et en projetant des relations avant même leur actualisation. Ce faisant, notre hypothèse centrale est qu'il faut explorer la structure temporelle de l'imagination à travers le concept *d'intention technique*. Nous défendons l'idée que, *dans le processus d'invention, l'opérativité même de l'imagination technique repose sur l'intention*. En ce sens, l'intention technique désigne la structure qui rend l'imagination technique active et opératoire au cours du processus d'invention, et d'où émerge l'actualisation d'un individu technique concret. À travers ce geste, l'analyse de l'imagination appelle à une forme de responsabilité à la hauteur des transformations qu'elle met en œuvre, dans la conscience que l'invention n'est jamais neutre, mais intervient toujours dans le devenir du réel et, par là même, dans la configuration de nos sociétés. C'est en ce sens que l'invention doit être comprise comme intrinsèquement fondée sur l'imagination technique, et que toutes deux engagent des enjeux esthétiques, éthiques et politiques.

***Keywords**: Bergson, Simondon, Imagination, Invention, Technologie*

Introduction

To reflect on imagination today is not to revisit an exhausted theme, but to re-engage a philosophical question that continues to unsettle inherited epistemologies and ontologies (Prigogine & Stengers, 2016; Renauld, 2017; Jørgensen, 2017). Evidently, imagination is not merely enclosed in the space of fiction and its etymological *fantasia*, but is also a stake for social sciences (Zittoun & Glăveanu, 2017), as it opens a domain of anticipation, projection and consequently transformation, wherein possibility inflects reality. What we call imagination does not manifest uniformly across all domains. It may operate as aesthetic contemplation and oneiric

drift, speculative logic, or literary creation (Glăveanu and al., 2017) — but also as technical invention. It is thus possible to speak of multiple configurations, regimes or "culture" of imagination at stake. As such, how a society organizes, privileges, legitimates or constrains these different cultures of imagination plays a key role in how it anticipates its futures, considers its development or progress, and determines what may count as possible or desirable.

Our article focuses on one specific regime: the relation between imagination and technology, approached through the lens of invention, or what the philosopher Emilien Dereclenne (2025) calls "enaction". We thus explore a particular regime of imagination — technical imagination (Simondon, 2017 [1958], p. 74) — as it operates within processes of fabrication and anticipation. In doing so, we aim to discuss how imagination is a mode of relation to technology that reorganizes its contours and conditions of emergence, a hypothesis that carries profound implications for how we conceive of our current relationship to the world.

Indeed, invention is often treated as a purely technical or productive process that results from a functional response to material needs or economic constraints, as Thierry Ménissier (2016, p. 47) underlines: innovation is mostly "shaped by technological invention, correlated with the adoption by consumers of the objects and services produced through the continuous emergence of new tools, processes, and methods". Limiting invention to what we could call *fabrication* alone — understood as the production of technical individuals, such as objects, ensembles or systems — risks reducing imagination to an instrument of efficiency or utility. Such a reduction not only obscures its epistemic depth but also carries political weight: it aligns invention with a technocratic rationality, thereby obscuring the dimension of imagination that lies in it. Plus, as it focuses on invention as the result of social contingencies, it forecloses its capacity to reconfigure our societies by opening future alternatives and challenging existing orders of possibility. In this context, we may be at risk to render technical imagination legible only within the parameters of technological solutionism or innovation-as-commodity. Because it would exclude speculative or emancipatory configurations within invention, we consequently argue that technical activity should not be reduced to fabrication or production, but understood as an epistemic operation in its own right.

Therefore, we propose the hypothesis that invention, as a technical activity, mobilizes a specific form of imagination; one that requires a rethinking of *technicity* itself. We will thus examine how what we call *technical imagination* engages with the virtuality and potentiality of matter, as it schematizes possibilities and projects relations before they are actualized. In doing so, we aim to discuss how invention involves a speculative or anticipatory gesture: one that does not merely fabricate objects but configures new horizons of intelligibility and consequently of care for our world and existence. It is in this sense that invention must be understood as inherently grounded in technical imagination, and that imagination, in turn, reclaims its

aesthetic and political stakes as a force of world-formation. Within this gesture, the investigation of imagination enriches itself and plays a central role, as such a reconfiguration shifts imagination away from the status of a faculty of representation and toward its function as a vector of *ontogenetic individuation*; i.e., a dynamic through which we will discuss how new symbols, functions and relations take shape.

Our article develops its argument in three stages. We begin by examining the epistemic specificity of technical activity itself, rather than approaching imagination as an isolated faculty. Through a critical reading of Henri Bergson, particularly his distinction between instinct and intelligence, we highlight how technical engagement with the world inaugurates a distinctive epistemic relation. Here, Bergson opens a space in which imagination is not a pre-defined faculty but a problem in formation, that emerges where the human relation to matter, things and tools exceeds both the material sphere of instinct and the formal one of intelligence.

We then turn to Gilbert Simondon, whose work allows us to name and conceptualize this emerging epistemic figure more precisely. We show how Simondon's notion of imagination operates as a structuring and ontogenetic way of anticipating the evolution and formation of our reality. As imagination is examined in its ability to schematize, relate and configure the potentialities of matter in view of invention, Simondon foregrounds its role as an operative force that mediates between disparate elements to give rise to technical individuation.

Finally, we explore the temporal structure of imagination through the concept of *technical intention*. We argue that imagination is not only a bridge between instinct and intelligence, nor a disposition that articulates the properties of material objects in their associated milieu, but a force of temporal projection that organizes reality and configures enactments through how it structures the potentialities of our present. By underlying the transition from virtuality to actuality, we aim to show how imagination becomes the epistemic condition of both technical invention and human individuation, where the act of imagining anticipates the emergence of the technical individual and, by extension, of the human as a being that also dwells through technology.

Taken together, these three moments compose a trajectory that reaffirms imagination as a fundamental vector of technical thought and action. Far from being reducible to a secondary faculty, imagination appears here as a structuring force of invention, creation and possibly evolution. We aim to demonstrate that the distinction between instinct, intelligence and imagination — reinterpreted through the prism of technology — thus outlines not two cultures of imagination, but a complex ecology of imaginative operations that mediate between the living, the symbolic and cultural and the material. This ecology demands philosophical attention not only because it challenges our categories, but because it opens a space in which human beings and technology are co-constituted in and through imagination.

Beyond intelligence and instinct

The question of imagination is often approached as a faculty that must be examined. But what happens when imagination is more specifically approached through its impact on how we consider invention, as a technical activity relaying on a specific mode of knowledge? This first stake returns to Henri Bergson's conceptual framework, particularly his distinction between two modes of knowledge, *instinct* and *intelligence*, although we do not aim to reinforce an opposition between instinct and intelligence within a taxonomy of living beings. Rather, this distinction helps us understand how, through a particular kind of relationship to the world, the possibility of invention as a modality relying on imagination emerges. In other words: under what conditions can a technical activity be said to involve a specific mode of knowledge, that would be invention, rather than being reduced to mere instrumental fabrication?

The philosopher Henri Bergson (1998 [1907], p. 133) distinguishes intelligence from instinct, calling them "two powers, immanent in life and originally intermingled." His analysis aims to remedy a certain lack or misinterpretation within metaphysics as it pertains to the theory of knowledge. His critics aims at philosophical systems that differentiate humans from animals by asserting that the former possess and exercise reason, which the latter lack, and which, in turn, situates them within a hierarchical and vertical order. Bergson, by contrast, holds that the differences among natural orders stem from a horizontal plane, that is, from a difference in kind, not one of degree.

> The cardinal error […] is to see in vegetative, instinctive and rational life three successive degrees of the development of one and the same tendency, whereas they are three divergent directions of an activity that has split up as it grew. The difference between them is not a difference of intensity, nor, more generally, of degree, but of kind[1].

For Bergson, the distinction between intelligence and instinct has guided the evolution of the animal kingdom along different paths. He delineates these two notions to highlight their specific characteristics, although he simultaneously affirms, on the one hand, that every instinct is tinged with intelligence and vice versa and, on the other, that both are difficult to define as they are "tendencies, and not things" (*Ibid.*, p. 136). As such, Bergson's philosophical perspective aims not to establish a hierarchy between species, or a binary opposition between humans and non-humans based on each mode of knowledge, but to articulate the conditions under which emerges a reflexive and structurally mediated relation to reality.

According to Bergson, *instinct* is the capacity for immediate use of the real, that is already present and situated. It tends to cancel out both schematization and planning. Hadi Rizk (2018, p. 90) defines Bergsonian instinct as:

[1] (Bergson 1998 [1907], p. 135)

> [That which] possesses a form of immediate knowledge of its object, which directly resolves itself in an adequately adjusted action that does not proceed from any prior representation of the possible realizable options. Everything occurs as if the execution of the act took precedence over representation, which it tends to cancel out[2].

As an example, organic mediation is instinctual; movement or gesture in themselves are part of the very structure of the living beings.

As for *intelligence*, for Bergson it is the capacity to extrapolate from the virtuality of matter in order to vary its modalities, to structure and organize its components, and so particularly through the creation of artificial objects. Bergson (1998 [1907], p. 139) explains that intelligence, "considered in what it seems to be its original feature, is the faculty of manufacturing artificial objects, especially tools to make tools, and of indefinitely varying the manufacture." Bergson emphasizes that animals are not foreign to intelligence, for they can engage in fabrication; primarily through the use of a pre-existing tool or the shaping of a rudimentary one and secondly because they are also capable of recognizing a manufactured element (for example, the fox that recognizes a trap for what it is). As such, instinct and intelligence both imply different relationship to the thing (material or formal) they help conceive: "Instinct is therefore innate knowledge of a *thing*. But intelligence is the faculty of constructing unorganized — that is to say artificial — instruments. […] What is innate in intellect, therefore, is the tendency to establish *relations*[3] *" (Ibid.*, p. 150).

Instinct is indeed a form of knowledge, but one that is direct: such is the relation that is established when a living being jumps into a body of water to extinguish flames, if it caught fire. Intelligence, by contrast, is a faculty for the creation of mediation that is focused on relations and forms; it apprehends them and extends them in order to generate the schematic structures that are particularly necessary to the activity of fabrication. Such would be the relation instituted when one creates a human chain to carry water from a spring to a burning house — and more so still with the fabrication for instance of a hose. Indeed, the full concretization of a technical being occurs through invention — that is, through the fabrication of the technical individual (be it object, machine, etc.) and the endless evolution of this fabrication. Bergson (*Ibid.*, p. 149) latter precises that "intelligence […] is the knowledge of a form; instinct implies the knowledge of a matter", effectively equating in his vocabulary thing and matter; and relation and form.

Then, for Bergson, intelligence and instinct represent two orders of evolution, which initially overlap but progressively diverge as a species becomes increasingly specialized in one or the other of these directions. As noted above, the difference between these two modes of knowledge does not imply any hierarchy or primacy

[2] Our translation.
[3] We underline.

in value, even if this should obviously be discussed through a more comprehensive approach within current researches in ethology and biosemiotics, as we previously argued by rereading the Heideggerian commentary on Uexküll's concept of *Umwelt* (Lombard, 2024a). However, the innate possession of those two divergent modes of knowledge (instinct and intelligence) entails biological consequences and, notably insofar as intelligence is linked to the act of fabrication, transforms the relationship between knowledge and life. The mode of knowledge becomes a dimension of life and integrates itself into it in a singular manner, which makes it a non-negligible stake in anthropology and epistemology, as it leads to a distinction between the development of the *anthropos* and that of the animal, a distinction that is not unrelated to the work of Leroi-Gourhan.

> It seems that very early on, Homo sapiens made full use of his psychic capacities to probe the immaterial, and that he then had only to wait for the drift of evolution to slowly lead him toward clearer perspectives. If intellectual progress exists, it remains biologically imperceptible and it concerns […] the expansion of means and fields of speculation[4].

In this context, the human being's capacities to establish a schematic and, thereby, fabricating relationship with matter are already fully operative from the very beginnings of hominization. Hominization then allows for an expansion of programmatic and logical relations, but also a very concrete expansion of material capacities. For Leroi-Gourhan, the anthropological evolution of creative intelligence is inseparable from the development of technical means and domains; for instance, the discovery of new materials and chemical reactions. Quantum physics or genetics — like metallurgy or mechanics before them — mark not simply fields of knowledge but fields of application, whose intelligibility depends on a fundamental and originary technical and epistemological relation to the world. Technical activity, in this sense, does not simply derive from biological structures but establishes a specific regime of access to matter.

Yet, this intelligence capable of schematization is based on a specific relationship to matter that remains marked by limitation. Intelligence, as Bergson (1998 [1907], p. 165) sees it, does not engage matter in its fullness, but only selects those aspects that lend themselves to manipulation; it is "at ease in the discontinuous, in the immobile". When intelligence takes material objects into account, it only does so within the framework of their relation — or their potential relation — with one or more other objects. Intelligence here is objectifying, insofar as it carves out from the world a set of objects under the form of discrete elements: "Suffice it to say that the intellect is characterized by the unlimited power of decomposing according to any law and recomposing into any system." (*Ibid.*, p. 157). It isolates, abstracts and

[4] (Leroi-Gourhan 1965, p. 244) Our translation.

combines, but only on the basis of a partial engagement with reality, as it "is characterized by a natural inability to comprehend life" (*Ibid.*, p. 165). Intelligence selects relations of form and quality in order to produce new configurations between things and to concretize them through technical activity and the becoming of the technical individual. Fabrication, then, imposes form upon matter by reducing its richness to what is functionally useful.

However, even if from the standpoint of fabrication, matter appears restrictive and discontinuous, our technical activity retains only that aspect of matter which makes fabrication possible, as Bergson (*Ibid.*, p. 151) highlights:

> This entirely *formal* knowledge of intelligence has an immense advantage over the *material* knowledge of instinct. A form, just because it is empty, may be filled at will with any number of things in turn, even with those that are of no use[5].

Intelligence as this formal knowledge liberates us from immediate necessity, by opening the range of our activity. Indeed, the instrument (constructed by intelligence) "is made of unorganized matter, it can take any form whatsoever, serve any purpose, free the living being from every new difficulty that arises" (*Ibid.*, p. 140). But this freedom is also what defines the limit of intelligence: it does not spring from an absolute principle, but from the constraints of matter itself, and the same instrument is necessarily "an imperfect instrument [which] costs an effort" (*Ibid.*). Intelligence, for Bergson, is not an autonomous power of the mind; it is derived from the demands of reality and can only operate within the formal conditions instituted by it.

According to us, this dual nature of intelligence, which is liberating in its versatility yet constrained by the very material it manipulates, underscores a deeper tension in Bergson's analysis. Intelligence, while it expands the realm of possible actions through the schematization of form, remains dependent on pre-existing conditions and cannot generate its own ends. It seems to operate reactively, structuring responses to material constraints rather than reconfiguring those constraints themselves. In this sense, the limit of intelligence lies in its derivation from matter: it is not a faculty of projection in itself, but of adaptation. This tension sets the stage for the emergence of another modality; one capable not just of selecting from given possibilities but of anticipating new ones. Neither reducible to the immediacy of instinct nor to the formalism of intelligence, technical activity opens a space for another mode of engagement with reality; and invention, which entails the using of both things and relations, or both matter and form, unveils here an important framework; i.e. the question regarding technical imagination.

[5] The author underlines.

Imagination and invention

While Bergson's analysis of instinct and intelligence enabled us to identify the limits of existing categories for grasping technical activity, it is in Simondon's work that the intuition of a third term takes its full conceptual form. To address the complexity of invention, we must shift toward a framework in which imagination becomes epistemologically active in the very structure of technical activity.

First of all, we must remind that, while Simondon's lesson *Imagination and invention* (1965–1966) offers a powerful conceptualization of invention as the resolution of incompatibility — whether between a milieu and an organism or among the internal components of an action — it treats invention in a broad sense, as any operation that overcomes an obstacle. In this framework, invention may include improvisation, collective action or problem-solving strategies that do not necessarily involve any technical activity. The often-cited example of travelers moving a rock that individually blocks their path but can be shifted collectively illustrates the idea that invention lies in the emergence of a functional compatibility, not in the production of a new technical object. In fact, in his lesson, Simondon underlines that:

> The imagination as anticipation is thus no longer a function severed from reality and deployed in unreality and in fiction; it triggers an effective activity of realization […]. The modality of the imaginary is that of potentiality; it only becomes the modality of unreality if the individual is deprived of access to the conditions of realization[6].

In this more general sense, the capacity for imagination is not the exclusive privilege of the human being; rather, it is a possibility inherent to all living beings, insofar as each is an individual carrying and shaping its own associated milieu, as Simondon (2017 [1958], p. 60) highlights: "The reason the living being can invent is because it is an individual being that carries its associated milieu with it." Consequently, invention does not refer solely to construction or fabrication, but also to any capacity for problem resolution, in the sense of inventing a solution to a situation. It is a faculty observable across the entire spectrum of living beings: in humans, but also in animals (escaping or confronting a predator, finding shelter, etc.) and even in plants (drawing water from deep sources, seeking light, etc.). Inventive behavior, in its basic sense, does not mark a strict threshold between humans and other living beings. However, and more narrowly, the present article bases its focus on invention as it manifests specifically in technical activity, that is, in the fabrication and enaction of objects, operations or systems. Simondon's theory of technical imagination allows us to make this shift, as it redefines imagination as a modality of knowledge that is productive and anticipatory. With technical imagination more precisely, what is at stake currently is its operative role in shaping not just solutions, but new objects and *forms*,

[6] (Simondon 2022 [2008], p. 55)

that can hold within being and restructure the very conditions of further actions.

As such, the epistemological framework laid out by Bergson provides a fruitful contrast through which to grasp the distinctive nature of what Simondon (*Ibid.*, p. 74) names *technical imagination*[7]. Situated between the poles of instinct and intelligence, Simondon's notion of imagination introduces a third modality: it is capable of intellectual schematism, yet remains instinctive; that is, material. It allows Simondon to theorize his concept of technical imagination as a process of *anticipation*, thereby linking it to invention, which adds an objective reality as soon as the conditions for the emergence of that reality are fulfilled.

We encounter here a fundamental divergence between *technical imagination* in Simondon's works and *formal knowledge (or intelligence)* in Bergson's ones. As mentioned, for Bergson, intelligence (when it is oriented toward fabrication) affects matter in a reductive way, selecting from it only what will prove useful. As Rizk (2018, p. 93) explains, it "circumvents the question concerning the essential nature of matter, its mode of generation or its relation to life — that is, to information". In this framework, complexity and plasticity are sidelined in favor of instrumental extraction. Water, for instance, is subsumed under characteristics such as liquidity or non-flammability, which are later exploited for practical use.

By contrast, for Simondon, *technical imagination* reveals a dimension of matter beyond the material characteristics of the thing. It opens up the unrealized potential and flexibility of a being in the process of becoming. Technical imagination thus incorporates the persistence of representations, of meaning within matter itself; it is a mode of attunement to the potentials immanent in the material world. For Simondon (2017 [1958], p. 74), it is defined as "the capacity of the prediction of qualities that are not practical in certain objects, that are neither directly sensorial nor entirely geometric, that relate neither to pure matter nor to pure form, but are at this intermediate level of schemas."

This ontological question is also an important stake within the field of semiotics, as Simondon (*Ibid*., p. 74) underlines that imagination, presupposes the prior existence (within the aforementioned ground) of *dynamic "symbols"* — that is, symbols that admit their own plasticity and are capable of assuming multiple forms. Their dynamism derives from the ability of things to present themselves under various modalities and give rise to a broader range of possible invention — water, for example, can be compressed, vaporized, channeled, conducted, etc. — each becoming a possible axis for technical concretization. At the same time, Simondon (*Ibid.,* p. 74) insists that technical invention also presupposes the existence of static or systematic symbols — symbols whose "pre-existence and coherence of representations" ensures that technical projections can stabilize, take hold and be shared. These symbols

[7] We also find "creative imagination" (*Ibid.*, p. 60) and "inventive imagination" (*Ibid.*). It is important to underline that image and imagination are major concepts in Simondon's work; for more information about them: (Duhem 2019; Simondon 2013; Simondon 2022 [2008]).

are not fixed by nature but by consistency: they support the reliability of physical and mathematical laws without which invention could not operate. In this sense, water's conductivity, though dependent on certain physical conditions, is regular and dependable enough to enter into circuits, to be modeled, to be inscribed in a predictive system of relations. Despite their plasticity, the physical attributes of water possess systematic coherence.

At stake is the idea that representation, when understood as projection within a system of coherent anticipation, is not an abstraction detached from reality but a way of entering into the symbols underlined in invention. This is why Hadi Rizk (2018, p. 92) underlines that the mind "exists as a creative void that freely conceives relations among objects, or unprecedented configurations of reality[8]". Even something as seemingly stable as water becomes, under technical imagination, a vector of transformation. It is not only what it is; it is what it may become, depending on the relations in which it is inscribed. In this sense, technical imagination suspends fixed identities and opens onto a domain where matter becomes modifiable and relationally plastic. In short, water is not necessarily liquid and non-flammable; it is so, let us say, by virtue of a selection among its material characteristics. But *technical imagination* can render water something non-liquid, or flammable, or semi-liquid, or conditionally flammable, because it enters into a relation of free association with the object's qualities. This allows us to freely reconfigure our representations, in order to exercise this modulation upon a world in which matter, thus in a constant process of restructuration and reshaping, becomes itself as plastic as the mind. This capacity to form unprecedented configurations is not rooted in a power of abstraction that would be separated from the world, but in a situated entanglement with what Simondon (2017 [1958], p. 59) calls the "*associated milieu"*, where the individuation of a technical object is based on the causality and recurrence that "the technical object creates around itself and that conditions it, just as it is conditioned by it" (*Ibid.*). For it is indeed within the *associated milieu*, which is both a natural and technical milieu, that both creative (technical) imagination and human activity can operate. They are not static faculties but ongoing mediations, that guarantee that technical imagination is a proper "culture" in the sense of a concrete mode of engaging with reality.

> The compatibility of elements in a technical individual presupposes the associated milieu: the technical individual must therefore be imagined, which is to say presupposed as already being constructed in the form of an ensemble of ordered technical schemas; the individual is a stable system of the technicities of elements organized as an ensemble[9].

Let us remind that for Simondon, technical individuals are coherent system of in-

[8] Our translation.
[9] (*Ibid.*, p. 74)

terrelated technical elements. A motor, for instance, is composed of springs, shafts, cylinders: each is a technical element whose properties and potentialities must be understood not separately, but within a system. Consequently, *technical imagination* is the modality that enables invention, considered as a technical activity, through the knowledge of the technicity of elements; it becomes a vector of potentiality, enabling configurations that are not yet actually material. Yet this openness does not imply autonomy: Simondon's concept of imagination relies on proper elements in order to catalyze the emergence of new configurations.

This example underscores a key shift: technical imagination is not simply directed toward the material object (as would Bergson's instinct) nor toward the properties or relations of matter (as would Bergson's intelligence), but toward the relations among those properties and their capacity to be reconfigured in new contexts, i.e., the knowledge of their technicity. The human being does not merely recognize matter, in that it possesses embedded forms, but configures it according to schemas that precede its manifestation. In this sense, technical imagination differs from both instinct and intelligence: it is an anticipatory modality that engages with the technicity of matter, not merely with its properties, or with things themselves. Let us consider a simple example. At the outbreak of a fire, a person searching for water in the form of a garden hose already knows that this tool (traditionally used for gardening) can be used to fight the flames; and so even before having actually spotted the hose. The hose is not sought as an object already defined, but as a bearer of a function that is linked to its potential to channel water. Technical imagination thus configures relations in advance of perception, articulating material affordances before the object is even located in the field of experience. Strangely, that means we have placed the property of non-flammability *in* the garden hose and not only in the water; not because the hose itself possesses the property of being non-flammable, but because it carries precisely *that which carries* non-flammability (i.e., water). The diversity of an element's use does not derive solely from knowledge of its technical characteristics and forms, but from the knowledge of its *interconnections* among other elements of the world, based on its associated milieu. Technical imagination helps us articulate the conditions under which invention becomes a reflexive and structurally mediated relation to reality — a mode of projecting and actualizing potentials through tools, obviously, as instinct does, through operations, forms or relations, indeed, as intelligence does, but also through schemas and representations, i.e., through the knowledge of the technicity of technical elements and individuals themselves, as Simondon (*Ibid.*) underlines: "Invention, which is a creation of the [technical] individual, presupposes in the inventor the intuitive knowledge of the element's technicity[10]". To invent such a system as a motor, for instance, requires not only knowledge of how a spring compresses or a shaft rotates, but an ontological awareness of technicity itself — the

[10] Our translation.

idea that elements can be schematized, composed and transformed, that a spring and a shaft *can do things*, can be articulated, before even realizing how they can be articulated. The distinction that we could underline here, between the idea of a mind that projects forms and one that co-evolves with matter's technicity and the relations of its associated milieu, sets the stage for understanding technical imagination as a force that is both anticipatory and representative on the one hand, and embedded in concrete structures on the other.

This final insight leads us back to the specificity of human imagination in Simondon's account: it is not that we know how things work, but that we intuitively recognize that things *can* work — that they are structured by a potentiality that imagination reveals and organizes. In this way, technical imagination becomes a productive force, rooted in an ontological openness to reality. In this context, invention itself is reframed, as it is approached not merely as a functional modality, but as an *ontogenetic* one: no longer the mere application of pre-existing knowledge and relations, invention implies the transformation of reality through the modulation of matter, grounded in the affordances of a given milieu. In this sense, technical imagination does not simply support transformation; it enables it, by embedding technical activity within a process of ontogenetic becoming. In this singular function – imagination as an ontogenetic modality – the human being knows *intuitively* the *ontological technicity* of elements or rather we know that elements are *technical*, meaning that they open onto a potential for the actualization and transformation of matter. One might recognize here a philosophical intuition already suggested in reflections on hominization: for instance in Sloterdijk's work (1999, p. 124-125) where he writes, that "with the stone, the fundamental trait of the instrument's *handleability* takes shape for the first time in the world of existence" – as such, we could say that the technicity of the stone emerged as a moment in which the stone ceased to be merely a thing and became something else, such as a tool, but also the bearer of relations and of properties and extensively the bearer of schemas and representations, such as those grounded in the simple fact that it could be held in our hand. This anthropological shift signals not merely the birth of instrumentality but the inauguration of a new epistemic regime, one in which being and knowledge enter into a co-constitutive relation.

This transformation marks a decisive inflection in our inquiry. It no longer concerns only the link between a mode of knowledge and human life (with Bergson) or between a mode of knowledge and more precisely technical activity (with Simondon), but also — and most critically — between a mode of knowledge and the ontological status of things themselves. In other words, technical imagination is not simply a way of engaging with the world; it is a mode through which the world, and things within it, becomes expressible and consequently transformable.

In this light, technical imagination opens onto a deeper question concerning the relation between epistemic plasticity and ontological openness — that is, between

the ability to configure and reconfigure relations among beings and the structure of reality that allows such reconfigurations to take place. As such, technical knowledge becomes a site of encounter between human individuation and material individuation, a crossing point where invention ceases to be a merely anthropological gesture and becomes an ontogenetic process, by which both beings and relations emerge.

This is why the question of technicity, as understood here, acquires an onto-anthropological scope: it enables us to examine not only the distinction between different types of fabrication, but between different regimes of epistemic access to reality. To understand how imagination operates as an ontogenetic modality, it becomes necessary to explore not only its relation to an associated milieu, but also its temporal weight: imagination is not only anticipatory but projective in that it configures what has not yet come into being by schematizing causal relations in advance. Technical imagination consequently implies a relation to anticipation and representation, so that it can really be understood as something that organize our relation to the future and the modalities of transformation within our reality. Simondon (2017 [1958], p. 58) also suggests that what mediates the relation between humans and the world is neither the imitation of nature nor the mechanical reproduction of existing technical forms, but this operative structure of anticipation, that requires "the use of an inventive function of anticipation, which cannot be found in nature or in already constituted technical objects." In this view, it is not a question of precedence but of co-constitution: the technical individual and the function of invention emerge together, as part of a shared ontogenetic process.

> Only a thought that is capable of foresight and creative imagination can accomplish such a reverse conditioning in time: the elements that will materially constitute the technical object and which are separate from each other, without an associated milieu prior to the constitution of the technical object, must be organized in relation to each other according to the circular causality that will exist once the object will have been constituted; thus what is at stake here is a conditioning of the present by the future, by that which is not yet[11].

As such, we must take into consideration, in this function of anticipation based on the technicity of technical elements and their associated milieu, the weight of the movement of invention itself, that works to actualize a virtuality: and that we define as *intention*.

The futural function of technical intention

Having clarified the epistemological grounding from which the technical imagination at the heart of invention emerges, we now turn to a fundamental aspect of this

[11] (*Ibid.*, p. 60)

dynamic that has so far remained implicit: namely, that the relation of anticipation and representation that grounds invention (still considered as a technical activity involving the production of objects, systems, machines, etc.), and that Simondon (*Ibid.*, p. 58) calls here the "*inventive* function of anticipation" must be conceptualized in itself.

In order to discuss the operativity that lies in invention and that actualize the representations of technical imagination, we name this phenomenon *technical intention*. Our hypothesis is that intention is not a secondary concept, but the operative expression of imagination itself. It marks the threshold where imagination is no longer merely a faculty of representation of the technicity of elements and individual, to become the structuring principle of transformations in the world.

More precisely, we propose that*, in the process of invention, the very operativity of technical imagination depends on intention*. As such, technical intention is the structure that makes technical imagination an active and operative process, during the process of invention, and from what emerges the actualization of a concrete technical individual. It is what lies under technical enaction.

As it concretizes the temporal logic of invention, the concept of technical intention allows us to extend the discussion beyond the proper intuition of technicity that Simondon underlines, in order to explore how technical imagination engages with time, virtuality and the material conditions of its concretization. Here, as argued, imagination does not only operate as an act of representation, but becomes in itself the vector of a process through invention. When Jean-Yves Château (2010, p. 32), while re-reading Simondon, emphasizes that "technical invention is an ontogenetic function[12]", he means that it is neither an act of mere discovery (of possibilities or properties) nor of speculation, but a process of actualization: "It brings forth an unprecedented being, which is neither discovered nor merely imagined, but viable: an object that holds itself technically in being" (Château 2010, p. 32). Any technical individual brough about by a technical invention — whether it be an object, a system, a machine and independently of its degree of complexity — must be understood as the actualization of a prefigured yet undetermined configuration. We propose that such a movement requires what we called technical intention. In this context, a proper technical intention is the condition of possibility for the actualization of an invention. It helps the concretization of the technical imagination's schemas into a proper technical invention. We could say that it is imagination as it organizes itself into a project for the transformation of reality (i.e., invention).

Consequently, we argue that it is through intention that imagination acquires the concrete modality that Château and Simondon both underlines, by opening a relation both spatial and temporal to the world, in which transformations become possible. Indeed, the notion of technical intention is here of major importance, as it makes

[12] It is important to underline that Simondon mainly discuss the notion of ontogenesis at length (Simondon 1995).

it possible to articulate how the human being does not simply imagine objects by composing with their relations, but participates in a more complex operation: that of modulating future realities by drawing on the virtual affordances of the present. As imagination's active function, technical intention concretizes representations and coordinates elements toward an end that did not yet exist. In this sense, imagination becomes a mode of ontological configuration; it is not just an antecedent to fabrication, but the matrix within which technical activity becomes thinkable and realizable. As such, imagination becomes both projective and productive as it configures new modalities within which invention can explore. If invention is the concretization of a virtuality into actuality, it can also lead to the transformation of the conditions of reality itself.

This introduces a crucial articulation between space and time: technical imagination draws upon reality not just retrospectively, but prospectively. It stretches reality forward into new arrangements by actualizing latent potentialities within a given milieu. Consequently, as we aim to examine technical imagination insofar as it operates through invention, this entails foregrounding the question of virtuality as an operative dimension within technical imagination itself. Indeed, we must underline the *temporal component* of our reality, upon which the *virtuality* of matter depends. As such, invention constitutes the passage from virtuality to actuality, epistemologically initiated through the intentional and operative modality of imagination.

This is where Simondon's critique of Aristotelian hylomorphism[13] becomes especially illuminating. It helps us explore what is precisely at the heart of this phenomenon of actualization. For Aristotle, the form of the work first exists "in the mind of the artist[14]", which implies that form is a content, that informs passive matter. However, Simondon confronts this Aristotelian hypothesis by articulating form to the dynamics of individuation, as a logical sequence among actualized realities, in which each form arises from a system of forces and relations that are situated in time. For him, it is the *ground* (or "content[15]") that holds potentiality, that is, that comes into act only at the precise moment of enactment — and that has always been present at the very moment it ceases to be a future potentiality. We might say, then, that for Simondon, virtuality does not prefigure actuality, but coexists with it in a regime of tension. His notion of *ground* holds potentiality not as something to be projected or represented, but as something to be enacted — something that is present only at

[13] Mainly in his first work on individuation (Simondon 2013).

[14] (Aristote 2014, p. 153, Livre VII, Z, 7 (1032a-1033a) < Analyse du Devenir – Ses différentes espèces) Our translation.

[15] We reproduce here part of the traductors' note regarding the translation of the French concept of "fond" into *ground* in the English version of the *Mode of Existence of Technical Objects*: "The phrase 'fond et forme' nearly always means 'content and form', and […] Simondon is here employing this typical expression, but changing the content of its meaning […]; 'fond' here and throughout is rather used in the sense, taken from *Gestalt* theory, of a 'ground' or 'background' against which a form or figure can emerge — the constant with reference to which a variable can emerge." (Simondon 2017 [1958], p. 59, TN)

the moment of its actualization and whose existence collapses the distance between future and present.

> The relation of participation that links forms to ground is a relation that bestrides the present and diffuses an influence of the future onto the present, of the virtual onto the actual. For the ground is the system of virtualities, of potentials, forces that carve out their path, whereas forms are the system of actuality[16].

This context has strong implications for the fabrication of any technical individual: its concretization does not emerge *ex nihilo*, nor only based on associations of previous relations that were existing in other things. It arises from a field of compossibility[17] — of potential futures that coexist without mutual exclusion — i.e., a field of virtuality, a ground composed of compossible elements and latent potentials that precede the actuality of the object. Here, the notion of invention regains all its epistemological stakes. The *form* that the technical individual ultimately adopts distinguishes it from this *ground* by its determinacy, its fixation in reality. Here, the act of concretization marks a threshold: the passage from the fluidity of virtuality to the structured specificity of form. It is this transition that technical intention mediates by bringing into the present a form that, until then, remained suspended within a regime of potentialities.

To illustrate with an example, consider the case of the automobile. The technical principles underlying it — energy transfer, mechanical rotation, gear systems, etc. — are not created e*x nihilo*, but assembled from a field of already existing relations. This is a transductive system, which means "a process of ongoing individuation" characterized as the "correlative emergence of dimensions and structures within a being in a state of preindividual tension — that is, a being that is more than unity and more than identity, and that has not yet undergone a phase shift in relation to itself across multiple dimensions[18]" (Simondon, 2013, p. 33). Yet this field of already existing relations or "preindividual tension" (*Ibid*.) was not actualized until the object came into being. Technical imagination operates here as a mediating schema, not a blueprint imposed from an external source, but a configuration that emerges from within the tensions and compatibilities of virtuality. The result is not predetermined, but oriented; it is a trajectory or a correlation rather than a plan. In this sense, technical imagination does not command concretization, but summons it, by activating a structure of potentiality without closing it in advance.

[16] (*Ibid.*, p. 61)

[17] Compossibility refers to the set of possibilities understood as innumerable, unpredictable and continuously existing. It can be grasped through Plessner's definition of an "effective possibility, a power that is, [bearing] a relation to the modalities of the present and of the future. [It has] the meaning of a not-yet that lingers within the now" (Plessner 2017 [1975], p. 295). Our translation.

[18] Our translation.

Therefore invention, as made possible by *technical imagination,* occurs both temporally and spatially; by drawing on the plasticity of properties and the virtuality of matter, technical individuals are extracted from a kind of transductive *emptiness or "void", to bring back the word of Hadi Rizk* (2018, p. 92)*,* to which it seemed not to preexist — unlike other natural and/or living beings. The technical individual does not emerge from a pre-given "lineage" (Leroi-Gourhan 1971 [1943], p. 14) or deterministic sequence, nor from those technical families whose exploration was the goal of Laffite's mecanology (Lafitte, 1933; Simondon, 2009), but from a contingent recomposition of elements whose assembly was not inherent to their prior state.

As such, we argue that *technical intention* must strongly be examined as a "futural function" (Simondon 2017 [1958], p. 60) in relation to *time,* not merely in a psychological or representational sense, but as what configures the preconditions for invention. This anticipatory function is capable of coordinating multiple elements, way before assembling them into a coherent totality. This modality to foresee, arrange and modulate the interactions among potentialities before and during the act of fabrication is not simply about forming representations but is about projecting a reality that is not yet, and that becomes possible through the structuring action of intention. It has an epistemological and ontological weight.

In this context, technical imagination plays a transformative role. It does not merely select among pre-existing futures; rather, it draws forth and activates compossibilities that had not yet been actualized. The field of virtuality from which an invention emerges is not a deferred future waiting to arrive, but a present structure of intentionality, that we could describe as a set of relational possibilities that anticipate concretization without being subordinated to a linear temporal unfolding. The technical individual, once realized, retroactively appears to have "always" existed, insofar as its conditions of existence were already latent within the structure of reality.

This latency, however, should not be mistaken for passivity. What is at stake in this structure of virtuality is not just a reservoir of actualizable forms, but a dynamic field whose tension and plasticity open the real to transformation. It is precisely this dynamism of the real — its capacity to be structured otherwise — that Simondon foregrounds in his distinction between form and ground, that must also be understood as a distinction between actuality and dynamism. Forms, he writes, are "passive insofar as they represent actuality" and become active only "when they organize in relation to this ground, thereby bringing prior virtualities into actuality" (*Ibid.*, p. 61). That is of paramount importance as an ontological stake, as we contend that the field of virtuality from which invention emerges is not a passive reservoir of possible configurations, waiting to be realized; it is a structured yet open ground that is tense, plastic and responsive to intervention. It is therefore from this ground of potentialities that technical intention brings forth and thereby dynamizes a form in the sense of its physical concretization — as a technical individual. In this sense, the act of

invention does not simply instantiate a form within reality but participates in the transformation of what reality can become. The act of invention, understood here as the outcome of technical imagination, emerges as a point of articulation between the abstract and the concrete. It realizes a mode of ontological bridge or passage, as in Simondon's (*Ibid.*, p. 61) terms: "Invention is the taking charge of the system of actuality through the system of virtualities, the creation of a unique system on the basis of these two systems." This passage is not a simple transfer, but a synthesis that gives rise to a new unity: a technical individual that came-into-being from a choreography of virtual elements and actual constraints. As such, technical activity engages reality not passively, but transformatively or dynamically, through a technical intention. It absorbs the surrounding field of actuality and reconfigures it in light of what could or ought to be altered. And in this sense, imagination is no longer a representation of the not-yet, but the mode by which the not-yet is made thinkable and eventually, actual.

The ontological point at stake in the distinction between actuality and virtuality is not merely about the emergence of concrete forms, but about affirming the dynamic structure of reality itself. To conceive of the virtual as more than a passive background to be actualized is to reject a static view of reality as inert matter awaiting form. Instead, reality is here understood as inherently charged with tensions, potentials and of course a plastic openness to transformation.

More importantly, what is at stake here is not only an ontological question, but an ethical one. If we conceive invention only in terms of fabrication — as efficient production of usable forms — we risk reducing the world to a stock of resources waiting to be exploited, organized or instrumentalized, and reducing imagination to a tool aiming at this extraction, as we articulated in previous works (Lombard, 2023). But if we understand technical imagination as a mode of engagement with the virtual structure of reality, then invention becomes something else: a way of shaping futures and societies, of dwelling in the world otherwise. In this light, technical imagination is not only productive; it can be caring and responsive. It calls for a form of responsibility adequate to the transformations it sets into motion, as that is grounded in an awareness that technical intention is never neutral, but always intervenes in the becoming of reality. This helps us to de-essentialize technical invention as mere alienating production and to reconsider technical activity not just in terms of efficiency or utility, but as a mode of engagement with the becoming of the world.

Conclusion

Throughout this reflection, imagination has progressively emerged as a modality of relation, i.e., an epistemic force embedded in our engagement within the domain of technical activity. By attending to imagination in its operative connection to (technical) invention, we have aimed to clarify how it functions as a condition for the emergence of technical individuals. By tracing a philosophical path from Bergson

to Simondon, our inquiry has traced a conceptual arc in which imagination becomes thinkable as a generative dynamic at the heart of invention. It is through imagination that new technical forms are produced, not by imitation or extrapolation, but through the activation of latent potentialities within matter. It is imagination that mediates between disparate elements — between form and material, between problem and resolution — by projecting relations where none are yet actual. And it is through this capacity to project and reconfigure that imagination contributes to an ontogenetic transformation: not only of materials or tools, but of the human itself, as a being shaped by its relation to technology.

This sense of anticipation, of engagement with virtuality, gains further complexity when understood through the notion of intention. No longer just an epistemic mode of knowledge, imagination appears as the interface of dispersed potentialities and their actualization into forms. This trajectory of becoming, strongly embedded in the intention that allows for technical invention, allowed us to describe technical imagination not simply as a faculty, but as a relation to time and to matter that affirms its full philosophical force.

Our inquiry has allowed us to approach technical imagination not as a static concept, but as a dynamic structure unfolding across instinct, intelligence and intention, that takes on specific contours in the context of technical individuation and could be called one among the "culture" of imagination. But it has also open major ethical issues. First, on the role of imagination in shaping the future of societies. If technical imagination constitutes a mode of ontological transformation, then it plays a foundational role in how futures are conceived, projected and made real. As we increasingly intertwine with complex technical systems, it becomes urgent to understand how imagination operates within and through these systems — not only in producing new tools but to frame the path for the evolution of our societies. Second, we must ask whether imagination is exclusively human, or whether it can be extended — conceptually or functionally — to non-human beings; both for animals as we briefly discussed, but also for technical objects themselves, as they (and mostly with deep learning technologies in artificial intelligence) now open new avenues to think about the categories we constitute around us (Lombard and al., 2024b). If technical imagination is situated within a milieu of associated elements, as Simondon suggests, then the autonomy of certain technical systems may eventually support modes of anticipation, schematization or projection that bear a structural resemblance to what we call imagination — mostly as a cognitive function. This possibility is not to be affirmed lightly, but neither can it be dismissed without closer philosophical scrutiny. What are the criteria for developing imagination? Must it be reflexive, embodied? Or can a system capable of generating and selecting among virtual relations to the world — however minimally — participate in the field of imagination?

Bibliography

Aristote, 2014, *Métaphysique*, Les Échos du Maquis.

Bergson, H., 1998 [1907], *Creative Evolution*, translated by Arthur Mitchell, Dover publication, Mineola, New York.

Château, J.-Y., 2010, « La technique. Genèse et concrétisation des objets techniques dans Du mode d'existence des objets techniques de Gilbert Simondon », *Philopsis*, 2010 p. 1-36.

Dereclenne, É., 2025, *Technics and Enaction: A Philosophy of Imagination*, Bloomsbury Academic, London.

Duhem, L., 2019, « La théorie du cycle de l'image de Simondon » dans *L'Histoire du concept d'imagination en France (de 1918 à nos jours)*, Paris, Classiques Garnier (coll. « Rencontres »), p. 233-246.

Glăveanu, V. P., Karwowski, M., Jankowska, D. M., et de Saint-Laurent, C., 2017, « Creative Imagination », in Zittoun, T., et Glăveanu, V. (éd.), *Handbook of Imagination and Culture*, Oxford University Press, Oxford. https://doi.org/10.1093/oso/9780190468712.003.0004

Jørgensen, D., 2017, « The Philosophy of Imagination », in Zittoun, T., et Glăveanu, V. (éd.), *Handbook of Imagination and Culture*, Oxford University Press, Oxford. https://doi.org/10.1093/oso/9780190468712.003.0002

Leroi-Gourhan, A., 1965, *Le Geste et la Parole I. Technique et langage*, Albin Michel, Paris.

Leroi-Gourhan, A., 1971 [1943], *Évolution et techniques I. L'homme et la matière*, Albin Michel, Paris.

Lombard, J., 2024a, « A Foray into Welt and Umwelt: Rereading the Onto-Ethological Discussion between Heidegger and Uexküll », *Biosemiotics, Umwelt Theory and Phenomenology*, Springer, vol. 17, p. 273 296. https://doi.org/10.1007/s12304-024-09570-1

Lombard, J., Sueur, C., Capra, O., Beltzung, B., et Pelé, M., 2024b, « Exploration of the creative processes in animals, robots, and AI: who holds the authorship? », *Humanities and Social Sciences Communications, vol. 11 (1)*, Springer Nature. https://doi.org/10.1057/s41599-024-03125-y

Lombard, J., 2023, « De la chose sensible à la chose esthétique. Le passage de l'instrumentalisation à la configuration du monde », *Itinera*, 8 août 2023, nº 25, p. 401-417.

Ménissier, T., 2016, « Innovation et Histoire. Une critique philosophique », *Quaderni*, *91*, p. 47 59. https://doi.org/10.4000/quaderni.1009

Plessner, H., 2017 [1975], *Les degrés de l'organique et l'Homme. Introduction à l'anthropologie philosophique*, Gallimard, Paris, (coll. « NRF »).

Prigogine, I., et Stengers, I., 1980, « Le problème de l'invention et la philosophie des sciences », *Revue Internationale de Philosophie, vol. 34, n° 131/132*, p. 5 25.

Renauld, M., 2017, « L'invention philosophique : penser, concevoir, imaginer ? », *Phantasia, 4*. http://popups.uliege.be/0774-7136/index.php?id=544

Rizk, H., 2018, *La technique. L'activité technique et ses objets*, Librairie philosophique J. Vrin, Paris, (coll. « Questions et Raisons »).

Simondon, G., 2022 [2008], *Imagination and Invention*, translated by Joe Hughes and Christophe Wall-Romana, A Univocal Book, Minneapolis, London.

Simondon, G., 2017 [1958], *On the Mode of Existence of Technical Objects*, translated by Cecile Malaspina and John Rogove, Univocal Publishing, Minneapolis.

Simondon, G., 2013, *L'Individuation à la lumière des notions de forme et d'information*, Jérôme Millon, Grenoble.

Simondon, G., 2009, « Entretien sur la mécanologie », *Revue de synthèse, vol. 130 (1)*, Springer.

Simondon, G., 1995, *L'Individu et sa genèse physico-biologique*, Millan, Paris.

Sloterdijk, P., 1999, *Règles pour le parc humain. Une lettre en réponse à la Lettre sur l'Humanisme de Heidegger ; suivi de la Domestication de l'Être. Pour un éclaircissement de la clairière*, translated by Olivier Mannoni, Mille et une Nuits, Paris.

Zittoun, T., et Glăveanu, V. P., 2017, « The Future of Imagination in Sociocultural Research », in Zittoun, T., et Glăveanu, V. (éd.), *Handbook of Imagination and Culture*, Oxford University Press, Oxford. https://doi.org/10.1093/oso/9780190468712.003.0016