Book Symposium on The Philosophy of Simondon: Between Technology and Individuation

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Introduction: Rediscovering Gilbert Simondon

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Although the term "revival" is perhaps an overstatement, there is certainly a current renewed interest in one of the early French philosophers of technology, Gilbert Simondon. Simondon (1924–1989) is one of those philosophers who almost silently disappeared in history because his writings were not accessible to an international audience. Until recently, his most important works were available in French only. Not only were his own works not translated, but also no books were written about him. This, too, is changing now. The book that will be discussed in this book symposium is an example of that. In 2003, Pascal Chabot's *La Philosophie de Simondon* was

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published and now, more than 10 years later, an English translation by Graeme Kirkpatrick and Aliza Krefetz came out under the title *The Philosophy of Simondon. Between Technology and Individuation*. The translation of Chabot's book almost coincided with the publication of two other books on Simondon in the English language. In 2012, the book *Gilbert Simondon and the Philosophy of the Transindividual* by Muriel Combes (also a translation from French, by Thomas Lamarre) was published, and in 2013, Arne De Boever, Alex Murray, Jon Roffe, and Ashley Woodard brought out their *Gilbert Simondon*: *Being and Technology*, an original English publication.

Most of these books focus on one and the same issue in Simondon's philosophy, namely the connection between the two topics in the two parts of his doctoral thesis: his reflections on technology and his concept of individuation. In Chabot's *The Philosophy of Simondon*, this is the very basis of the structure of the book. Obviously, this issue also plays a vital role in this book symposium. The concept of individuation has much wider implications than for the philosophy of technology only. In this book symposium, we have kept in mind that this journal is one on philosophy of technology, and for that reason, we have focused particularly on that domain of application for the concept of individuation. This is also in line with Chabot's book.

Gilbert Simondon (1924–1989) studied at the École Normale Supérieure and later at the Sorbonne in Paris. In 1958, he got his Ph.D. with a thesis in two parts. The main part was titled *L'individuation à la lumière des notions de forme et de l'information* and the title of the second part was *Du mode d'existence des objets techniques*. The order of appearance was as follows: the second part was published first (in 1958) and the first part was published in two phases (in 1964 and 1989). The first part had a major influence on other French philosophers such as Deleuze, Latour, Stengers, and Stiegler. The second part is particularly of interest for the philosophy of technology, but of course, must be read against the background of the first part. In that part, the concept of individuation is introduced and in the second part, this is used to introduce Simondon's second main concept, i.e., concretization.

In a period in which most philosophy of technology was about the impact of technology on society, with a certain bias towards its negative impacts, Simondon wrote analyses of the nature of artifacts and the nature of technological knowledge. For instance, in *Du Mode*, Simondon wrote an extensive analysis of the pentode, an invention that was made by Tellegen in the Philips Electronics company in the Netherlands (de Vries 2005). Simondon's analysis reveals in-depth and detailed knowledge of the device, both its function and its structure. The nature of technical artifacts and of technological knowledge were themes that would only much later become important issues, particularly in the philosophy of technology that is more oriented on "analytical philosophy" literature. Two examples are the "dual nature" program at Delft University of Technology (Kroes and Meijers 2006) and the "Norms in Knowledge" program at Eindhoven University of Technology (de Vries et al. 2013), research programs focused on the ontology of technical artifacts and the epistemology of technological knowledge. Not that Simondon stayed away from the social aspects of technology in his analyses. On the contrary, he took part in that discourse, but with a particular and novel contribution, not by treating technology as a black box, but by showing that the very nature of artifacts and technological knowledge has explanatory power for analyzing the way technology impacts society, and vice versa. In that respect,

Simondon can be compared with an early Dutch philosopher of technology, Hendrik van Riessen, whose writings were available in Dutch only and because of that, he was also forgotten for some time, like Simondon (de Vries 2008).

Simondon's analyses of technical artifacts and technological knowledge resulted in a number of intriguing concepts, starting with the idea of *individuation*. Simondon uses this term to indicate the process character of individual entities, humans as well as artifacts. An "*objet*" in Simondon's approach is an evolutionary development more than a fixed and stable "thing." Objects are becoming. This process of individuation takes place while a *metastable* situation is present. Metastability means that there are still unresolved tensions. The system has as it were "potential energy." Through individuation, there tensions are resolved, but as a result, new tensions emerge. What further drives the process of individuation is what Simondon calls *transduction*: a process of adaptation of a structure to its environment (Simondon uses the example of a growing crystal to illustrate this). For technical artifacts as "objects," something specific happens: more and more functions are integrated in the objects along the road of individuation. In the case of the pentode, this resulted in a sequence of grids being added to an originally fairly simple construction because more functions were added to the device. This is what Simondon calls the phenomenon of *convergence* (sometimes the alternative term *condensation* is used). Although one can challenge the universality of this phenomenon, it does play an important role in contemporary product development and has resulted in numerous "hybrid" products, of which, perhaps the radio alarm clock we have at home is the most commonly known example. When one part of the artifact combines different functions, it is "over-determined" in Simondon's terminology. Simondon also characterizes the process of becoming in the case of a technical artifact *concretization* as it entails going from abstract to concrete. In the early phases of concretization, the object is described mainly in terms of requirements, vague sketches, and suggestions. Later on, the description becomes more in terms of concrete materials and shapes. In principle, the process never ends, because even in a fairly concrete phase, the artifacts remain in a dynamic mode of further sophistication when more functions are integrated. This "organic" approach to conceptualizing artifacts made some people call Simondon a neo-Aristotelian (see, for instance, Schmidgen 2004). Simondon also reflected on the way the artifact interacts with its environment. For that purpose, he introduced the term *hypertelie* to indicate that each product functions at a cutting edge between its internal structure and its external environment. Literally, the word *hypertelie* means the growth of an organ to extraordinary proportions. Simondon uses the example of an electric train to illustrate this. The train can only function between two worlds: the internal structure of the train in which electrical energy is converted into mechanical energy, and the external environment from which the train can derive its energy. This has resulted in the pantograph on top of the train that connects it with the electrical power supply above the railway. This pantograph can be compared with the dear's antlers. Thus, Simondon developed a whole new vocabulary to support his analysis of technical artifacts. As stated earlier, Chabot's book concentrates mainly on the concepts of individuation and concretization.

In the second half of *Du Mode*, we find some reflections on the nature of technological knowledge. Here, Simondon introduces a distinction between two categories of knowledge: the knowledge belonging to a state of childhood and knowledge belonging to a state of adulthood. In the first state, knowledge of technology is intuitive, focused on operating the devices and without insight into the working principles. We find this knowledge

mainly with non-expert users and in craftsmen. This knowledge is not necessarily "primitive," as even a device as sophisticated as a steam engine was largely developed without a good understanding of the thermodynamic processes in the engine. In adulthood knowledge, though, knowledge of the working principles is present. That is the kind of knowledge that engineers have. Such knowledge transcends the particular device and can be applied to other devices also. Simondon uses the term *technicity* to indicate this universal character of adulthood technological knowledge. The same knowledge that explains the working of steam engines also applies to the working of heat air engines.

In the opening pages of *Du Mode*, Simondon emphasizes that his purpose in making people understand the nature of technology is not in the least to free them from unnecessary technophobia. Technology is something very much similar to, and integrated in, the way humans become and therefore not to be feared. People are, as it were, the "conductors in the world orchestra of technology around them." Although today, perhaps, philosophers of technology will not per se see that as the purpose of their work, a good understanding of the nature of technology can still contribute to wise decision-making and policy development concerning technological developments. Simondon's contribution in that sense can still be valuable and worth making available to a wider audience than the French reading scholars.

Three reflections on Chabot's book are offered in this book symposium. Andrew Feenberg takes up an issue in Chabot's analysis of Simondon, namely, his tendency towards technological determinism. Feenberg shows that a combination of constructivism and Simondon would open a more fruitful perspective than each of these separately. A similar issue is autonomy in technology, not autonomy towards society but to the user. Aud Sissel Hoel challenges Chabot's analysis on this point by showing that Simondon's ideas are not identical to the proponents of cybernetics. De Boever's review of Chabot's book focuses on *technical mentality*, an idea presented in a text that was discussed only briefly in Chabot's book, but according to De Boever, deserves our attention as it could almost be used to characterize the totality of Simondon's philosophy of technology. Thus, the three reviews nicely complement each other and yet have some clear intersections.

This book symposium, in a way, has a double bottom. The reviews deal primarily with the way Chabot has presented Simondon's ideas. But as for many readers, no doubt, Simondon is fairly unknown; we also want to introduce the readers to Simondon's ideas directly, without Chabot's interpretation. There is a danger in trying to do that. Both aims may not be reached by the book symposium falling in between the two. We hope, though, that we have succeeded in showing that both reading Simondon in the rapidly growing number of his translated publications and reading Chabot are rewarding for all those who are interested in early philosophical reflections on the nature of technology, technical artifacts, and technological knowledge.

A final remark: readers of Chabot's introduction to Simondon may also be interested in the documentary on Simondon, titled *Simondon du desert* (*Simondon of the desert*) produced by Francois Lagarde, in close cooperation with Chabot (http://www.hors-oeil. com/index.php? option=com_content&task=view&id=67&Itemid=1).

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Simondon and Constructivism

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Pascal Chabot has written an excellent introduction to the thought of Gilbert Simondon, ably translated into English by Graeme Kirkpatrick and Aliza Krefetz (Chabot 2003, 2013). The text covers the full range of Simondon's thought. His two main projects are an original theory of technology and a philosophy of becoming, which he calls the process of ontogenesis or individuation. I will briefly review some salient points of Chabot's reading, which accords in important respects with the mainstream view of Simondon, and then point out ambiguities in Simondon's text. He was not a systematic writer and there are passages where he seems to contradict that view. These ambiguities open up possible connections between Simondon's thought and other approaches in philosophy of technology.[1]

Technology and Individuation

Chabot rehearses the commonly understood bases of Simondon's unique approach as presented in his classic *Du Mode d'Existence des Objets Techniques* (Simondon 1958).

1. The concept of technicity as the internal law of action and development of technology, clearly distinguished from social influences and utilitarian demands.
2. The central concept of concretization which describes the development of internal coherence of technologies through the increasing multi-functionality of their structures.
3. The distinction, based on these ideas, between extrinsic and intrinsic factors of development.
4. The "technical mentality" which responds to the potential technical ordering of the world.

With this as a basis, Chabot grants Simondon an "epic" vision of technology as a force in its own right, developing according to an internal logic. This is one version of

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[1] I first made such a connection in *Critical Theory of Technology* (1991). See for example pp. 193–195. The argument is developed further in the second edition of that book, *Transforming Technology* (2002), pp. 186–190.

technological determinism as it is often understood (Stiegler 1994).[2] It differentiates Simondon's theory from Marxism, at least as Simondon interpreted it. Chabot explains at length Simondon's rejection of what he saw as Marx's utilitarian view of technology as subservient to human needs. Rather, Chabot writes, "For Simondon, the individual invents… because, fundamentally, he must invent in order to establish coherence in the world" (Chabot 2013, p. 20).

The vision of technology as a factor of coherence depends on Simondon's theory of individuation which Chabot explains in the second part of his book (Simondon 1989). This is Simondon's unique attempt to revolutionize the philosophical tradition in terms of modern concepts of knowledge and action. We have gone beyond the Aristotelian heritage, specifically, the substance metaphysics that still characterizes both philosophy and common sense. It is this aspect of Simondon's contribution that has attracted the attention of more recent critics of the heritage such as Deleuze and Stiegler. Their acknowledgement of their debt to Simondon has finally brought his work to the attention of philosophers and a wider educated public.

Simondon's theory of individuation as Chabot explains it can also be summarized, although with more difficulty, in several propositions.

1. Things are not composed of matter and form since these are merely abstractions from their already constituted structure.
2. That structure must be explained in its origination out of a "pre-individual" undifferentiated mass of potential.
3. The differentiation or emergence of the thing always corresponds to the emergence along with it of its specific milieu with which it has essential links. As Chabot puts it, "To exist is to be connected" (Chabot 2013, p. 77).
4. Relations are thus "real," not just contingent encounters of pre-existing things.
5. Things are not stable and self-contained but "metastable" in the sense that they may tip over into a further process of transformation based on the continuing presence within them of the pre-individual potential haunting them from their origin.

The basic connection between Simondon's philosophy of technology and his theory of individuation lies in the claim that individuation is a response to a "problem" of some sort. But Chabot sees a deeper connection. Simondon's critique of traditional philosophy and indeed of psychology and social science is intended to clear a path to a re-evaluation of the significance of the technical relationship to the world. Chabot quotes Simondon to the effect that technology is the "condition of individuation" (Chabot 2013, p. 119).

We can interpret this proposition as Chabot does, in terms of Simondon's idealization of the individual technical creator. He is a model of authenticity in a world of inauthentic conformism and adaptation to circumstance. Chabot attributes this heroic image of the technologist to the influence of Jules Verne.

But there is also a more strictly philosophical sense in which individuation depends on the technical relation to the world. Individuation responds to the problem posed by the environment by reconfiguring the structure of both subject and object. But the

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[2] Not all definitions of technological determinism agree but at least one basic feature of them all is the notion that technology has an internal logic that determines its development independent of society. For an argument against determinism in Simondon's case, see (Barthélemy 2012).

archetype of such a response to problems is the act of invention, which alters both individual and milieu. With this, we have the deepest root of Simondon's technological determinism. Technology is access to a world that splits in the course of ontogenesis into individual and milieu. Chabot again quotes Simondon, who says that "the technical being is 'the correlative of the self-creation of the individual'" (Chabot 2013, p. 120). Technology has thus a transcendental origin, prior to the second order problems reflected in social demands and human needs that arise from the individuation process.

Chabot's book concludes with interesting reflections on the humanistic implications of Simondon's philosophy. He sees in Simondon a critique of the impoverished rationalism of modern society and its technology, detached from any integral relation to the world. This rather typical critique of rationalization and technification issues in a utopian hope in a reconciled technology. Chabot calls this "eschatology," and indeed, it implies a break in the continuity of history (Chabot 2013, p. 135).

Simondon's Ambiguities

Rather than pursuing these reflections on Simondon's limitations, I would like to pose a different sort of question. I am interested in the relationship of Simondon's philosophies of technology and individuation to social constructivist science and technology studies (STS), and of both, these theoretical approaches to the politics of technification in modern societies. For the purpose of this discussion, I will consider STS to have made three main contributions to the understanding of the society-technology relationship.

1. Alongside the causal properties of technologies, STS has emphasized the importance of interpretation in the identification of problems and the understanding of artifacts.
2. STS has explained the role of social actors in selecting among under-determined alternative designs (Pinch and Bijker 1987).
3. In its actor-network version, STS has introduced the notion that the formation of social actors is contingent on the technologies that bind their members together with each other through mediating their relations (Latour 1987).

These are important contributions obviously incompatible with Simondon's tendency to determinism. But STS has not taken full advantage of its social conception of technology. It has been criticized for failing to engage politically with the world created by the objects it studies. Simondon's politics is even more overshadowed by his vague appeal to future cultural change (Hottois, 1993, p. 78). Can a combination of Simondon and constructivism help to provide a critical dimension to their thought?

There is a curious symmetry in the relationship between these two approaches to technology. Each constitutes its domain by excluding what the other valorizes. I call these acts of exclusion "épochès." Simondon's approach is based on an épochè of the social, which he casts into outer darkness as merely extrinsic, a "parasite" on the technical proper (Simondon 2005, p. 284).

Correspondingly, STS will have nothing to do with a pure technicity that would have an independent logic entirely separate from the social. It attempts through various rhetorical strategies and descriptive techniques to convince us that the technical is homogenous with other familiar forms of action. The specificity of the technical is eliminated in favor of an emphasis on interpretation and meaning. This épochè of the technical leads STS away from politics. Ever since Marx and Weber, the mainstream of

social critique of modernity has emphasized technification, the cultural generalization of what can be loosely described as technicity, i.e., procedures such as quantification and the pursuit of efficiency. If these procedures are reduced to everyday modes of action, the critique collapses.

Rescinding the two épochès would make possible communication between the approaches and cancel Simondon's determinism while STS would gain a critical focus it lacks. But this is a venture that risks distorting each approach to the point where it is no longer recognizable. STS is a complex and potentially adaptable field in which many voices contend, so there is less risk of throwing the baby out with the bath water, but Simondon's work appears finished and complete. By what right do we disturb its placid surface? In fact, I argue that Simondon's work too is a complex and potentially adaptable "field," by no means unified in opposition to a social account of technology as is usually supposed on the basis, to be sure, of extensive textual evidence.

I will organize my demonstration around a series of quotations which reveal an interesting inconsistency.

The basis of the constructivist approach is the notion of underdetermination, by which is meant that technical artifacts cannot be fully explained by the technical logic of their functioning because their designs result from socially determined choices between multiple viable paths of development. Documenting these choices in case studies is the privileged strategy employed by constructivism to refute technological determinism. It often seems that Simondon rejects the very idea of multiple technical solutions. He appears to be advocating a history of technology in which there is a unique path of concretization at each stage. Yet, he also writes that "l'invention intervient quand le *filtre social* la laisse passer" (Simondon 2005, 312).[3] This could, of course, be interpreted to mean that progress is contingent on social acceptance of the one unique path of development, but it is equally compatible with the notion of underdetermination.

That latter interpretation gains some reinforcement from a passage of his 1965–1966 course on "Imagination et Invention" which seems to contradict the distinction between extrinsic society and intrinsic technicity, Simondon argues that "la pluri-fonctionnalité d'usage correspond à une des fonctions essentielles de l'invention comme créatrice de compatibilité." And he goes on to say that "L'objet peut totaliser et condenser les prises d'information exprimant les besoins, les désirs, les attentes; la circulation récurrente d'information entre la production et l'utilisation virtuelle fait communiquer directement l'image et l'objet créé, permettant l'invention compatibilisante…" (Simondon 2005, 298).[4] Here, Simondon criticizes only the attempt to restrict invention to a single purpose, rather than allowing it to flow from an unpredictable combination of technical logic and a variety of social demands.

This essentially constructivist view of development corresponds to Simondon's rejection of the substantialization of the machine. He argues that the principal error of our usual understanding of technology is to treat the machine as a closed and consistent entity, a kind of mechanical organism. In fact, the machine is a concatenation rather than

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[3] "Invention intervenes when the social filter allows it."

[4] "the pluri-functionality of usages corresponds to the essential function of invention as the creator of compatibilities…The object can totalize and condense the informational element expressing needs, desires, expectations; the recurrent circulation of information between production and virtual usage communicates directly between the image and the created object, enabling the compatibilizing invention."

a unified totality: "ce n'est pas en bloc qu'elle est en rapport avec l'homme; c'est dans la pluralité libre de ses éléments, ou dans la série ouverte de ses relations possibles avec d'autres machines à l'intérieur de l'ensemble technique" (Simondon 1958, p. 146).[5]

Indeed, he also writes that "La relation de l'être individuel à la communauté passe par la machine, dans une civilization fortement industrialisée" (Simondon 1989, p. 227).[6] And he goes on to define an ideal of this relation in terms that resonate with constructivism: "Dans la véritable relation complémentaire, il faut que l'homme soit un être inachevé que la machine complète, et la machine un être qui trouve en l'homme son unité, sa finalité, et sa liaison à l'ensemble du monde technique….*il y a chiasme entre deux univers qui resteraient séparés…*" (Simondon 1989, p. 278, my italics).[7]

Here, Simondon introduces a normative aspect lacking in STS. He imagines the integration of humanity, nature, and the machine in a future society that has freed itself from the ills of blind technification. What Simondon here expresses in normative terms corresponds to Latour's descriptive notion that each technology draws together a "sociogram" of alliances of social interests around a specific configuration of technical elements, which he calls the "technogram." He argues that "Every piece of information you obtain on one system is also information on other" (Latour, 1987, p. 138). Sociogram and technogram are essentially just two sides of the same coin, each technical configuration reflecting the influence of a specific network of actors.

My quasi-constructivist reinterpretation of Simondon has political implications neither Simondon nor STS draw out. If the chiasmus of the technical and the social joins the life world with specifically technical modes of thought and action, then we need to know how the conflicts of interest and the differences in power of the one are reflected in the other. The thesis of technification developed in the various theories of modernity rarely descends to the level of social and political specificity, but allows only for a one-way determination of society by technology. STS, with its épochè of technicity, loses the other aspect of the problem, the specific impact of technification. What Simondon offers is a much clearer and more detailed focus on the technical aspect of the relation. That in turn suggests a perspective on progress closed to STS and to most modernity theory.

Concretization and the Future

Heidegger's *Gestell*, Weber's rationalization theory, and the Frankfurt School's related critique of instrumental rationality have dystopian implications. They seem to exclude all reasonable hope in the future of modern society. No doubt the picture today really is bleak, but a uniformly negative critique leads to a tediously abstract and repetitive refrain contradicted more and more by actual experience with technologies. Since the 1960s, new social movements have emerged which target technological change, precisely what was supposed to be impossible in the dominant modernity theories.

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[5] "It is not as a whole that it relates to man; it is in the free plurality of its elements, or in the open series of his possible relations with other machines within a technical ensemble."

[6] "The relation of the individual human being to the community is mediated by the machine in a highly industrialized civilization."

[7] "In the authentic complementary relation, man must be the being that the machine completes, and the machine a being that finds in man its unity, its finality, and its connection to the whole of the technical world… They is a chiasmus between two worlds that would be separate…"

There is increasing mobilization and activism in the technical sphere which has brought about significant progress, notably in response to environmental critique and demands for freedom of communication on the Internet.

Simondon's central concept of concretization can be adapted to understand these movements in terms of the imbrication of the social and the technical. Technical artifacts start out as loose assemblages of parts in which each function is served by a separate structure. As they evolve, ways are found to combine many functions in each structure and to integrate the technology to its associated milieu. The outcome is a quasi-organic unity, a "concrete" technology in contrast to the "abstract" beginnings. This internal logic of technical development justifies Simondon's hope in the future.

Chabot comments: "Problems are resolved without the need to directly oppose or contradict them. Their solution again emerges at a higher level, a network of solutions into which can be integrated separate and isolated elements, whose potential functions cannot be known as long as they remain outside this network. The inventor works to establish communication, to recover a complete universe that is not lost in a mythic past, but is projected in a still unrealized future. Invention functions as a promise of pacification without war…" (Chabot 2013, p. 21). But what is lacking in this theory of concretization is a concrete analysis, "concrete" in the usual sense, of the social forces involved.

Those social forces polarize around an established technical system with its associated technical disciplines and public needs articulated in the public sphere discursively and sometimes expressed also in protests, demonstrations, lawsuits, and political choices. The tension often reflects conflicts between the public interest and the interests of corporations or powerful government agencies. Technological determinism plays a key role in these conflicts. The established system is usually defended as the only efficient one. Demands for change are dismissed as impractical "ideology." But we have seen proof to the contrary over and over again. What is the meaning of these surprisingly successful reforms of technology?

Simondon's concept of concretization offers a solution once freed from the deterministic assumption of a unique path of progress. Then, the social "filter" could take advantage of the existence of multiple paths of concretization, corresponding to different social demands, in order to orient progress toward the representation of a wider range of interests. Technical politics stimulates the search for the appropriate concretizing advances through ideological demands that, at first, appear impractical but soon reveal unsuspected potentials within the technical system. This approach does not resolve all the problems that have been attributed to technification by critics of modernity, but it does suggest the possibility of progressive struggle within a technified world.

At the end of his book, Chabot attempts to make sense of Simondon's philosophy of history. Simondon worked with big categories and attempted to reconcile technology, esthetics, and the sacred. The result is unconvincing for many reasons as Chabot shows. It is not easy to find a concrete answer to contemporary problems in Simondon's theory. But perhaps, there is another possible ending to the story if we take the detour through constructivism, as I suggest. Then, the project of reconciliation appears as a political project. It is pursued in struggles that inspire the reconstruction of the technical system inherited from the industrial era to make of it "un être qui trouve en l'homme son unité, sa finalité."

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High-Tech Mentality: On Pascal Chabot's *The Philosophy of Simondon*

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Pascal Chabot's book, *The Philosophy of Simondon*, is subtitled "Between Technology and Individuation." While the subtitle seems to mark out two areas of focus—technology and individuation—the "between" it mentions should in fact be taken as an area its own right: Chabot dedicates to it the entire third part of his book, titled "The Bridges" (Parts 1 and 2 are on "Technology" and "Individuation"). Indeed, anyone who wants to do justice to the philosophical but interdisciplinary thought of Simondon will have to think not only technology and individuation but their relation—a key notion in Simondon's thought—, the ways in which the two are bridged (Part 3 of Chabot's book could have been titled "Relations," but "Bridges" of course evokes a technical object that Simondon has written about—the Garabit viaduct). Since its original publication in 2003, Chabot's book has become justly recognized as one of the best introductions to Simondon's thought. Graeme Kirkpatrick and Aliza Krefetz's translation now makes the French original available in English, and with interest in Simondon on the rise throughout the world, one can expect Chabot's book to expand its status as a title of reference for anyone interested in the thought of this enigmatic French philosopher.

The longest part of Chabot's book is titled "Philosophy of Technology." Simondon is presented there as a philosopher of technology. But it may be worth asking what is

meant by that phrase: "philosopher of technology." In Simondon's case, it is clear that it does not simply refer to someone who thinks, philosophically, about technology or what is often called "the question of technology." Taking Simondon as an example, a philosopher is also someone who thinks about the relations of thought—philosophical thought—to technology. It's someone who thinks technically, develops a technical thought, and practices a technical thinking. Someone who doesn't just change our thought about technology but in whom thought changes through its confrontation with technology, which is, of course, itself already a product of thought (though not only of thought—experience too is important!). A philosopher of technology would thus be someone in whom thought and technology enter into a relation, which would not leave the philosopher unaffected. A philosopher of technology operates, in other words, just as much on technology as s/he operates on thought, and on her- or himself. It's in this way that s/he can be said to develop something like a technical mentality.

Although Simondon's text "Technical Mentality" remained unfinished and was never meant to be published (Chabot spends only a page and a half on it in his book), the notion of a "technical mentality" can arguably be used to sum up the contribution of Simondon's entire oeuvre. Chabot does not state this explicitly, but the ways in which the term "mentality" circulates in the book reveals as much.

It appears, for the first time, in Part 1, Chapter 2, titled "Technological Encyclopaedism," in which Chabot discusses the importance of Diderot and D'Alembert's *Encyclopaedia* for Simondon's thought. For Simondon, Chabot writes, the book championed "a new mentality" (p. 25), the "universalizing mentality" that is "characteristic of the Enlightenment," and thus it becomes "the symbol of mature, or 'adult' technology" for Simondon (p. 26). As Chabot points out, Simondon's choice for a book "to represent the birth of a new system of technology … is telling: it expresses the fact that technologies outlive their technicians and that they are ultimately dependent upon the discourse that emerges concerning them" (p. 26). There is a *technology effect* that takes priority here over actual technological inventions like the steam engine. Ultimately, Simondon emerges in Chabot's book as a historian (or perhaps, better: a genealogist) of the ways in which human beings have thought about technology. Simondon "valued the *Encyclopaedia*" for "the mentality it represents" (p. 32).

As a thinker who operates not just on technology but on the thought of technology itself and on the technology of thought itself, Simondon is presented again and again in Chabot's book as someone who "goes against the current" (p.135; p. 152) and aims to bring about a sea-change in thought, a "change of mind-set" (p. 33), an epistemic shift. A good example is Chabot's chapter on Marx and Simondon. Towards the end of the chapter, Chabot writes that Simondon "wished for a change of mentality concerning consumption, the commercialization of objects, and utilitarianism. The new mentality would be characterized by a respect for labor as the source of value in each object and an intuitive appreciation of the natural and technological cycles at the origin of any production process" (p. 45–6). Marx was ultimately only able to assess technology's role in consumption, commercialization, and utilitarianism through an economic lens. As Chabot points out, Simondon thought this was a reductive approach: it wasn't capable of thinking technology as such, instead, it's throwing out the baby—technology—with the bathwater—economy. Simondon's "anti-Marxism rests on the idea that technological progress is too profound to be limited to the commercial sphere" (p. 47). Instead, "it is capable of changing mentalities,

perceptions, ways of life, and even the human body. It carries the seeds of a 'new' humanity" (p. 47).

This last quote reveals another surprising, but key element of Simondon's thought on technology, namely, that it is essentially an esthetic thought. When Chabot moves from mentalities into perceptions, we are in the realm of *aisthèsis*: perceiving, sensing, and feeling. By aiming to accomplish a change in our technical mentality, Simondon was aiming to "redistribute the sensible," to use Jacques Rancière's phrase. If we follow Rancière's philosophy on this count, this means that for Rancière, Simondon would be a political subject: someone who attacks the police order of thinking about technology, singles out the wrong that marks it, and acts in such a way as to overcome it. With Rancière, one could speak of a politics of technology in Simondon's work, in the same way that Rancière speaks of a politics of esthetics in his.

In Part 3 of his book, Chabot discusses the notion in Simondon's work that brings technology and esthetics together: the techno-esthetic. As Chabot points out, Simondon uses this term—techno-esthetics—in a letter to Jacques Derrida (which, incidentally, was never sent; Simondon's wife found it amongst his papers after he had died and passed it on to Derrida, who published it through the Collège Internationale de Philosophie, something that was apparently not entirely to the liking of the Simondon family—but one can only be grateful to Derrida for having made this important document public). In the letter, Simondon fuses technology and esthetics, writing about technicians whose esthetic reveals technology rather than hiding it: Le Corbusier, for example, whose architectures reveal "the pipes, the metal bars within the concrete" (p. 141). The techno-esthetic, for Simondon, "is not contemplative" (p. 142): it thrives in action, transformation, and mutation—in a change that Simondon does not hesitate to describe as "orgasmic." "The technoaesthetic prefers the surprising to the predictable," Chabot writes: "this is why it is diametrically opposed to technocracy" (p. 142), which Simondon rejects in his philosophy of technology.

But to come back to that earlier quote about what philosophy is capable of: if Simondon's philosophy is capable of changing "ways of life," as Chabot argues, that means ethics is involved in it as well. However, Chabot points out that it ranks lower than esthetics, and he questions Simondon on this count. "A dagger is only truly beautiful when it is in the hand that holds it" (p. 143), Simondon writes. However, Chabot asks: "Is the beauty of the gesture sufficient to prevent a crime?" (p. 143) The question reintroduces ethics into the argument. "It is impossible", he writes later on, "to conceive of a political system based on esthetic impressions that emanate from the contemplation of a means to an end" (p. 144). Simondon may be, as a redistributor of the sensible, a political thinker; but Chabot charges him with overvaluing esthetics at the cost of ethics and politics.

The main point of Simondon's philosophy of technology is well known: when considering a technical object, Simondon does not so much see a stable identity or substance, but something that is the result of (and often still involved in) a process. That process involves some of the key terms of Simondon's thought: invention, for example, and concretization. The key bridge between Simondon's thought on technology and his thought on individuation lies here. In his theory of individuation as well, Simondon "is more interested in this transformative process than in nominal identities" (p. 73). "Identity," he writes in *Psychic and Collective Individuation*, "is a poor relation." As Chabot puts it: "His is a philosophy of genesis. In each order of reality, he challenges

notions of identity and substance. He presents a 'doctrine' based on one idea: the individual is not a substance, but the result of a process of individuation" (p. 73). His thought of individuation will challenge, for example, what Chabot calls the "mentality" of hylomorphism (p. 78): the thought that "each being is composed of matter and form," and that "[f]orm is the determining principle of matter" (p. 75). Simondon looks at the process of making a brick to reject this mentality: "form is not a determining principle, and matter is not indeterminate" (p. 76). The clay used for the brick "is not indeterminate matter… it has already been formed"; "as for the mold, it is by no means pure form. …The form is itself matter that has been treated" (p. 76). And so once again, a change of mentality, and a move towards what Simondon calls a "technical mentality," which is a mentality of individuation.

Chabot's book was originally published in 2003, just about 15 years after Simondon's death, and almost half a century after Simondon's book *On the Mode of Existence of Technical Objects* first appeared ("Technical Mentality" and the letter on techno-esthetics date from much later and take into account more recent technological developments). It is worth asking, from a contemporary perspective, about Simondon's technical mentality, and about its importance—its continued relevance?—in the time of high technologies. Chabot embraces the contemporary moment in the closing chapter of his book, when he turns to the Wachowski brothers' *The Matrix* trilogy in the final paragraph of the book (the film should, perhaps, not have been part of the chapter title, given that not that much attention is paid to it). What about the state of the mind, the spirit, or even the soul in the age of high tech apparatuses, social media networks—in the time of a capitalism that has, in the thought of contemporary Marxist thinkers (not so much French but Italian) turned cognitive? Franco "Bifo" Berardi, Maurizio Lazzarato, Yann Moulier Boutang, and Bernard Stiegler have been asking this question in their work (Simondon is a major influence on several of these thinkers, in particular, on Stiegler). Of course, it would be a mistake to think technology today *only* through the lens of cognitive capitalism—that would mean not to think technology at all. But then what thought of technology remains?

According to the theorists of cognitive capitalism, the state of the mind in contemporary, cognitive capitalism is dire: indeed, we have the psychopathologies to prove it. Burn-out (the topic of Chabot's most recent book, in which Simondon is quoted), attention deficit disorder, anxiety, widespread depression, and so on. Much of these afflictions are due, the philosophers argue, to the developments of technology—to the intensification of high technologies, and to the saturation of our lives with apparatuses that divide and claim our attention. The impulse behind this is, according to these thinkers, economic: it is about putting minds to work and without compensating them for it. While you are doing your late-night searches on Amazon.com, for example, you are shaping the stores buying suggestions for other searchers. And you get nothing for it in return! At the same time, however, sociologist Manuel Castells is writing about "communication power," and the ways in which these same attention-grabbing and exploitative technologies are driving political campaigns, and were instrumental, for example for the election of Barack Obama. So is this the "old story" as Chabot puts it, of the good and the bad, of the pharmacology of technology? Part remedy, part poison?

It partly is, no doubt. But my suggestion is that there is also more going on here. If Simondon, and Chabot's book on Simondon, are drawing attention to the technical mentality, the mentality linked to technology, the philosophy of technology—

technology proper, not eclipsed by economy—then, this philosophy has become more important than ever. Simondon's work opens up onto these contemporary questions. The "Technical Mentality" essay and the letter on techno-esthetics are good places to start thinking about network culture, for example; for object-oriented theory too, they could be interesting (Simondon theorizes "open objects" in these texts). Simondon's work makes us attentive to the state of the mind, the high-tech mentality, today. If this sounds almost spiritual, this is not a bad thing. Simondon had, as a philosopher of technology, a very deep interest in spirituality, in the Ancient practice of yoga, for example, and in ancient wisdom. I noted earlier on that a philosopher of technology is also always, inevitably, doing a work on her- or himself. A philosophy of technology is thus, in this sense, always also a technique of the self, a thinking technique of self-governance.

François Lagarde's film, which was made in close collaboration with Chabot, begins and ends with some peculiar information about Simondon: his Italian biographer and translator, Giovanni Carrozzini, mentions his difficult relation to his colleagues; Anne Fagot-Largeault suggests that Simondon may have been autistic. Chabot is interested in the lives of philosophers, and in how we may see these lives reflected in their work. Perhaps Simondon was so fascinated by mentality, and by changing mentalities, because he was also at work on himself; through philosophy, and the philosophy of technology.

Technical Mediation: Review of Pascal Chabot's *The Philosophy of Simondon*

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Pascal Chabot presents Gilbert Simondon as philosopher of technical mediation (Chabot 2013, p. 40), and Simondon's contribution to the philosophy of technology will also be the main focus in this review. What sets Simondon apart as a philosopher of technology is that his conception of technology is formulated against the backdrop of his double rejection of both the substantialist's viewpoint and the hylomorphic viewpoint of the Western philosophical tradition. For Simondon, the question concerning technology is a profound question of ontological proportions. The ontology he proposes, however, is relational and dynamic all the way down, granting primacy to processes of becoming over static being. Simondon's ontology is a ontology of emergence, or in his own terms, a philosophy of individuation. In accordance with this, he approaches technology as a mode of existence that is subject to genesis. Further, he considers technology, not as a static being, but in its efficacy or operative functioning.

Simondon's writings on being and technology are peppered with concrete examples. One of the great merits of Chabot's book is that it actively uses a selection of these examples to help explicate the key terms of Simondon's philosophy. In the first part of the book, which concerns technology, Chabot expounds the genesis of the technical object—what Simondon refers to as the "process of concretization"—through detailed accounts of the wheel and the locomotive. The development of the wheel is

characterized by phases where more and more functions have come to be integrated into its structure. The process is "autocorrelative," which means that the functions that the wheel has fulfilled act upon its own structure, allowing it to fulfill it again but now in a new and more integrated way. "The wheel," Chabot explains, "is a mediation which, through a system of internal bearings, perpetuates its own mode of existence" (Chabot 2013, p. 12). The locomotive, likewise, is understood by Simondon as a technical object that has been subject to an internal process of refinement (concretization), where each element acquires a plurality of functions. Through the process of concretization, the locomotive, or any invention, acquires an internal coherence (what Simondon refers to as a "concrete" character), which simultaneously allows for multifunctionality. Chabot quotes Simondon: "Concretization brings not only new properties, but complementary functions, beyond those sought after, which we might call 'superabundant' functions." (Simondon in Chabot 2013, p. 15). Through this mediation, the technological object gains in autonomy in the sense that it acquires functions going beyond the expectations and purposes that went into its invention. In fact, as Chabot makes clear, the mediation in question "cannot be summed up in terms of either human intentions or natural processes" (Chabot 2013, p. 16). At this point, I want to warn against a possible misunderstanding: that the technical object gains in autonomy, does not mean that the process of refinement or concretization tends towards automatism. As Iris van der Tuin and I have argued, such an assumption would be mistaken because, in Simondon's view, a machine that is completely automatic would be severely limited in its functional possibilities and potential uses (Hoel and van der Tuin 2013, p. 196). In contrast to a completely automatic machine, which would be closed upon itself and predetermined in its functioning, a highly evolved and sophisticated machine would be an open machine, characterized by "a certain margin of indetermination" (Simondon (1958), p. 4). In the important first chapter of his book, Chabot makes a further point worth mentioning: Simondon sought to overcome the ingrained tendency to conceive technology as a source of artifice, and hence as an adversary of life. Thus, even if it starts as artificial, as foreign and disconnected (in Simondon's terms, as "abstract"), the technical object acquires, through the process of concretization, a mode of existence that "approximates the mode of existence of natural objects" (Simondon quoted in Chabot 2013, p. 17). For all that, Chabot reminds us, Simondon never goes so far as to identify the mode of existence of technologies with that of living beings.

Many of the chapters in Chabot's book are set up so as to contextualize Simondon's work both historically and conceptually. The chapter comparing Marx and Simondon is particularly noteworthy in that respect (chapter three); but in this review, I want to draw attention to another key chapter, that on cybernetics (chapter four). Simondon's philosophy was deeply influenced by cybernetics, and as Chabot points out, he adopted its vocabulary: communication, control, relations, functions, actions, and reactions. Cybernetics was defined by Norbert Wiener as "the study of control and communication in the (human) animal and the machine" (Wiener quoted in Chabot 2013, p. 51), and it proceeded by banishing imprecise terms like "life" and replacing them with univocal information functions. Chabot calls attention to two points of relevance to the contemporary interest in Simondon's thought: first, cybernetics was an early example of an intentionally techno-scientific enterprise, where one realized that theorizing a phenomenon was to modify it. Second, as conceived by cybernetics, the technical

object was not alone: cybernetics emphasized connections; cables and wires connected machines to each other and to the environment, each machine responding to the signals received from the machine preceding it in the chain. The chapter also convincingly accounts for the craze stirred by cybernetics at the time, which Chabot explains by the convergence in information machines of the logical and the material. He goes on to make a historical excursion, giving earlier examples of intersections between the material tradition and the logical tradition (Raymond Lull, Leibniz, Pascal, and Turing). What Chabot does not mention, however, is the influence on both cyberneticists and Simondon of thermodynamics, from where another key concept is drawn, namely "metastability" (for an explication of this important term in Simondon's philosophy, see Barthélémy 2012, p. 217). A more unfortunate omission concerns Simondon's use of the notion of information, and the fact that he developed his approach not simply adopting the views of cybernetics but in critical response to it. As noted by Anne Sauvanargues (2012, p. 64), Simondon does not conceive information as a defined, quantifiable, and stable magnitude (as in cybernetics) but as a relation, as a moment of individuation. What is more, Simondon rejects the reductionist tendencies of cybernetics, and sees it as a major flaw of cybernetics that it tends to treat self-regulated technical objects and living beings as identical (Simondon (1958), p. 49).

The second part of Chabot's book concerns individuation, and again, as in the first part, Chabot starts out explicating key terms of Simondon's philosophy by way of Simondon's own examples: the brick, the crystal, and coral colonies (chapters five, six, and seven). Simondon's philosophy challenges received notions of identity and substance, insisting that the individual is the result of a process of individuation. This includes challenging the hylomorphic schema, which conceives form as an active determining principle and matter as indeterminate and passive. Simondon rejects this schema by means of a close analysis of brick making, which shows that clay and mold acts one upon the other as forces. The relation between clay and mold is real, material, and operative from the start. As Chabot puts it: "The relation is becoming in action" (Chabot 2013, p. 77). The crystal and coral colonies exemplify physical and living individuation, respectively. The hylomorphic schema cannot explain the genesis of the crystal, and Simondon's analysis of the process of crystallization (see Chabot 2013, p. 83–84) serves in his writing as a paradigm of individuation as such. As Chabot remarks, like the cyberneticists, Simondon conceived information as an operation, and he replaced the received concept of form with a new theory of information. Coral colonies are an interesting example, since they raise questions concerning the defining criterions of individuality (is a coral colony a unique being?). Chabot also uses this example to discuss Simondon's repudiation of materialism, which seeks to reduce living systems to simpler, purely "material" systems. In Simondon's view, materialism is based on an impoverished notion of matter, where matter is divested of its potential energies and relations. "Materialism does not take information into account" (Simondon quoted in Chabot 2013, p. 92). However, for all its qualities, also in this chapter (as well as in the preceding chapter dealing with the crystal) I am concerned by Chabot's lack of differentiation between Simondon's views and the views of the cyberneticists.

Chabot's book consists of two further chapters that elucidate Simondon's notion of individuation ("Psyche and Society" and "Imagination"), and a third and final part where Chabot's aim is to bridge the two pillars of Simondon's philosophy: technical concretization and individuation. In this part, Chabot draws on sources that may have

influenced Simondon—conceptual, religious, and esoteric. A whole chapter is devoted to Carl Jung and depth psychology (chapter ten), and the chapter that follows takes its point of departure in the last section of *Mode d'existence d'objets techniques*, where Simondon "provides his vision of the history of the universe" and "speaks of the place of religions and technologies, of science and ethics" (Chabot 2013, p. 130). The final chapter further contextualizes Simondon's philosophy through a discussion of three philosophers (among them Bergson), and the 1999 movie, *The Matrix*. In the following section of this review, I will not enter into a detailed discussion of the third part of Chabot's book, but suggest instead some other candidates for "bridges," and some other likely conceptual sources of influence not mentioned by Chabot. The two sources I want to draw attention to were in fact Simondon's teachers and supervisors: George Canguilhem and Maurice Merleau-Ponty.

That being is relational "all the way down" means that the individual is never self-identical but is what it is only in terms of its relations to some specific milieu. Simondon, therefore, speaks of "the individual-milieu dyad" (see for example Grosz 2012). These ideas are reminiscent of the way that Canguilhem conceived of the relations between the organism and its environment (Canguilhem 2001). Simondon, however, divested his account of the vitalist tendency to conceive of the organism as a center of absolute reference (Lecourt 2012, 179). The Simondonian idea of a dynamic and interdependent relationship between individual and milieu is beautifully elucidated by Sauvanargues' discussion of membranes (Sauvanargues 2012). Merleau-Ponty also drew inspiration from the idea of a biologically founded individuality propounded by thinkers like Kurt Goldstein and Canguilhem, emphasizing the structuring roles of the living organism and the interdependencies between the lived body and its surrounding. It is in the later thinking of Merleau-Ponty, however, where Merleau-Ponty's investigations of the perceiving body converge on an ontological exploration, that the resonance with Simondon's work starts to grow stronger. Instead of focusing on incarnated meaning, Merleau-Ponty now emphasized the expansive and expressive dynamic of "flesh" (Saint Aubert 2008, p.10, p.14), which is conceived in terms of distributed systems (see for example Merleau-Ponty 1968). There is no space here to go into details; it suffices to point to some concepts from Merleau-Ponty's later work that it would make sense to elucidate and further develop in and against a Simondonian framework: flesh, reversibility, écart, chiasm, and the body as the measurant of things.

Chabot presents Simondon as a technological optimist that denounces the wide-spread idea of technology being a source of alienation. He refuses, for example, the idea that technology can be reduced to questions of profit (Chabot 2013, p. 47). The analysis of technology must focus on technology's internal layer, its technical nucleus (Chabot 2013, p. 69). These ideas bring to mind another philosopher who also insisted that technology be understood on its own terms, and who, like Simondon, is currently being subject to renewed interest (probably for many of the same reasons), namely Ernst Cassirer. Cassirer, too, has been characterized as a technological optimist, and like Simondon, he, too, rejected the ideas of technology as a source of alienation and as an adversary of life. Technology should not be judged by purposes that are "foreign to technology's pure formative will and power" (Cassirer 2012, p. 12) and when charges are raised against technology, it should not be "brought before the wrong court" (Cassirer 2012, p. 41). Statements such as these have an essentialist ring to them, but if we take the ontological outlook of Simondon and Cassirer's work into account, other

interpretations open up. Cassirer too, again like Simondon, developed a philosophy that granted primacy to becoming an over static being, and conceived of relations as real, material, and operative. The point I want to make here is that ontologies like these open up further possibilities beyond the now familiar alternatives: essentialist versus anti-essentialist and determinist versus socially constructivist (see Hoel and van der Tuin 2013 for an elaboration of this argument). Chabot notes that Simondon, in his interpretation of the history of technology and in his conception of technical progress, is ambiguous in relation to these received positions. Even so, Chabot ends up by characterizing Simondon as a philosopher of progress (Chabot 2013, p. 67); and at one point, he even identifies Simondon's distinction between the technical object's internal and external layer with Descartes' distinction between primary and secondary qualities (Chabot 2013, p. 69; an identification I disagree with on the grounds of the different ontological outlook of the two philosophers). Technological progress is conceived by Chabot in two ways, as epic or contingent (chapter four) and as comparative or superlative (chapter eleven); no third options are explored. Here, I want to give an example of a contemporary philosopher of technology who does explore a third option, namely Don Ihde, who develops an alternative account of technological development using notions like "multistability" and "trajectory" (Ihde 2012).

In the third chapter of his book, Chabot introduces an idea that I find extremely productive, and which resonates with the current attempts, across disciplines, to reinvent matter and rethink ontology in dynamic terms (see for example Barad 2007, Bennett 2010, Dolphijn and van der Tuin 2012): ontology as critique (Chabot 2013, p. 48). Such a critique would be hard to envision within a substantialist or hylomorphic framework; it would be absurd even. But for a philosophy that conceives all individuals as metastable, and all identities as born out of tensions that sustain them, it makes perfect sense.

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Simondon's Topicality: A Response

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(translated by Aliza Krefetz)

To Graeme Kirkpatrick, who is at the origin of this translation.

The book symposium on *The Philosophy of Simondon*, initiated and coordinated by Marc de Vries, testifies to the growing interest that philosophers from a wide variety of backgrounds have in Simondon's philosophy. This can only be a cause for celebration. This great French thinker was relegated to obscurity for so long, from the publication of his writings in the 1960s until the early 2000s, that the current resurgence of interest feels like compensation for a historical injustice. Indeed, the period during which Simondon wrote was dominated by Marxism and psychoanalysis. A free thinker, Simondon remained unconstrained by the codes of these two dominant disciplines, devoting his attention to technical objects, with a focus far removed from class conflict or the exploration of the unconscious; his marginalization during these years was all but guaranteed.

The current resurgence of interest confirms, first of all, that the concepts of concretization, of individuation and of the transindividual resonate with the problems of our modern world. These concepts have the capacity to elucidate our ambiguous situation, between modernity and postmodernity, between technological desire and concern for the preservation of nature. Above all, more than the concepts of any static ontology, they offer us tools with which to describe our world in a state of constant mutation, and thus, of constant becoming. It has been said that certain thinkers "made the mistake of being right too early." This pronouncement, which is not without harshness, or irony,

could certainly be applied to Simondon: it has taken 50 years for him to find his true audience.

When I began my research on his philosophy, only a handful of monographs about him existed, including those of Gilbert Hottois (Hottois, 1993) and Muriel Combes (Combes, 1999). Not a single doctoral thesis had been devoted to him, which is why I decided to commit myself to the first such undertaking, with the goal of clearly presenting the totality of his philosophy, while also highlighting his most innovative concepts through an analysis of their implications and an evaluation of the difficulties they raised. It was an auspicious time for such an endeavor: the Simondon family archives were still accessible, and I remember leaving the Palaiseau residence in 1998 (Simondon had died in 1989) carrying in my arms an entire case full of unpublished manuscripts that the philosopher's widow had entrusted to me so that I could photocopy them before giving them back to her. The emotion I felt on that day, rendered material by these texts so rich with insight and which so few people had, at that point, read, has remained for me a symbol of the unsuspected richness of this philosophy. I hope that I have successfully communicated this emotion in my book.

Response to Andrew Feenberg

The ideas developed by Andrew Feenberg seem to me extremely pertinent, due to the way in which he brings Simondon's thought to bear on the current problem concerning the role of technology, and on what he rightly describes as "technological determinism" in the contemporary debate. I very much appreciate the approach he takes toward the principal theses presented in my book, which is intended to be as much an introduction to this difficult but important system of thought, as a reflection on its impact on modern ways of thinking about our technological universe; but this universe is not only technological, as Feenberg makes clear.

The ambiguities of Simondonian thought are numerous, and rather than explain them away, I did my best to expose them. But Feenberg goes one step further by exploring the implications of this thought for STS (social constructivist science and technology studies) and for constructivism. Admittedly, these issues are not directly addressed in my book. But Feenberg is right to pose "a different sort of question," as he puts it; the question of possible reconciliation between Simondon and constructivism is a fundamental one; it allows us to better understand whether Simondon is "compatible" with today's decidedly constructivist mentality.

To accomplish this, Feenberg describes a double "épochè", and it is true that the blind spot of each of these approaches (that of Simondon and that of constructivism) is the focal point of the other. Under these conditions, one might conclude that technological determinism and social constructivism are mutually incompatible. This is an oft-heard, and evidently well-founded interpretation. But instead of emphasizing their differences, Feenberg seeks to bridge the gap between these two approaches. Having myself entitled the final section of my book "The Bridges," I am very receptive to this way of looking at things. His approach unquestionably casts this debate in a new light, and I would like to both thank and congratulate him for it. Indeed, the interpretation of technical concretization that he puts forth is particularly relevant, and to my mind, very novel. Concretization has, in fact, often been used as justification for technological determinism. Andrew Feenberg shows, nonetheless, that this concretization should be understood not as a singular process, but as a plural process, with multiple paths toward concretization, and thus multiple modes of technological

development for a given situation or problem. This concept of pluralism is assuredly the strongest point of his interpretation, and it seems to me, in fact, that it is this multiplication of modes of development that allows us to conceive of their connection to the social domain and to constructivism. I have not often seen this proposition put forward so persuasively. It seems to me that Feenberg has found a real path towards conceptualizing the compatibility between two domains that appear to be at odds with one another, but which analysis of concrete situations reveals to be indelibly intertwined.

Finally, I appreciate the fact that this interpretation leads to the question of politics, because that question is at the crux of this debate. It is barely touched upon in Simondon's writings—much like the economic question, about which, as we have already noted, he is curiously mute, even though it might seem to be an issue for determinism—the restoration of this political question seems to me fundamental. Without it, we are limited to studying the history of philosophy, a bad habit to which the French are at times too susceptible… But in looking for a path toward conceptualizing a successful coupling between humans and their machines, Feenberg situates his reflection—and, at the same time, Simondon's—at the center of the current debate, and through this understanding of the multiplicity of the processes of concretization, he grants more freedom to the social actors, giving them greater autonomy to choose what best suits them; for technology has no meaning if it does not serve human development.

In his final paragraph, Feenberg writes: "It is not easy to find a concrete answer to contemporary problems in Simondon's theory." I could not have put it better myself; I would only add that it is in the nature of philosophy to present itself as a purveyor of questions rather than answers, a sort of immense matrix of inquiries, far more powerful than the scattered certainties that this matrix may occasionally bring into being. In this sense, the greatness of Simondon's thought is due not so much to the answers he provides (which condemns any dogmatic and excessively reverent interpretations of Simondon), but rather to the concepts he developed in order to ask questions about our world. The transindividual is one of these concepts. By describing a relation between two people that side-steps the conventional positions dictated by social forces in favor of the authenticity of a free and mutually respectful relationship, Simondon gives us the possibility of introducing a new concept into the realm of political thought, one that offers a path forward without providing a definitive answer.

Response to Arne De Boever

The deeply insightful pages that Arne De Boever devotes to *The Philosophy of Simondon* deserve a lengthy commentary, for the questions raised by this fine connoisseur of Simondon are numerous. It must be noted that he is one of the first pioneers to introduce this philosophy to the American public, through his personal efforts, as well as his translations. One of the most important contributions that he offers in his response to my book is to show that the idea of a "technical mentality," as developed, notably, in Simondon's manuscript of that name, is one of the most fertile notions through which to understand this philosophy. I can only voice my agreement and align myself with his point of view. The technical mentality is indeed one of Simondon's most profound contributions. This notion is of particular interest in that it is both a philosophical concept (which designates a subjective conglomerate of values, knowledge, and thought processes) and a descriptive notion in which Simondon, the individual, is present. For Simondon was not only a thinker: he had his

own laboratory where he devoted himself to experiments in physics, acoustics, and mechanics. He was a tinkerer who repaired his own instruments and constructed one of the first television receivers in France. Thus, for him, the technical mentality is not an abstract notion. It is instead the translation of an authentic, concrete experience, which, in his view, had been unfairly neglected by the history of philosophic thought. The mentality that Simondon promoted was his own: he universalized his own mind-set, in a very philosophical gesture of individuation. As Arne De Boever repeatedly emphasizes, this mentality informs his work as a whole and, even when he is at his most speculative, anchors him concretely in the world of experience.

Arne De Boever also insists, and rightly so, on the ambiguity of the respective roles of ethics and esthetics in Simondon's philosophy of technology. In his discussion of the chapter that analyses the relations between Simondon and Marxism, as well as in his references to the chapter on techno-esthetics, he shows that the ultimate choice concerns whether ethics or esthetics is given primacy. I am in agreement with him as regards to this question, but I think it is important that I clarify my position here. It is absolutely clear that there exists a Simondonian ethics, one that it is developed at multiple points in his œuvre; it is an ethics of becoming, and thus an open-minded ethics, opposed to dogmatism and insularity. This ethics very much complements and completes his philosophy of technology. Alongside this, Simondon also developed an esthetics of technology, which could be called a "techno-esthetic" and is of undeniable interest to contemporary thinkers. This techno-esthetic is one of the concepts that best expresses the value judgments of a man driven by the technical mentality described above. Thus, ethics and esthetics are necessary counterparts to one another, and to the philosophy of technology.

If I sought to go further in my analysis, perhaps at the risk of raising certain ambiguities, which I will now attempt to resolve, it is for the following reason: the relations between ethics and esthetics, as Simondon presents them, exist in peaceful equilibrium as long as "all goes well." And certainly, Simondon's is a philosophy in which the tragic is not manifest, in spite of the pages he devotes to *l'angoisse* (anxiety or fear). However, if we consider things carefully, the relations between ethics and esthetics can become unbalanced under the influence of two spheres of activity that Simondon never considers, despite their critical importance to the way we think about technology: economics and war. Neither of these two notions is addressed by Simondon, even though their impact on technological progress is well-known: even if technology comes into being within a technical nucleus devoid of outside influences, its development is nonetheless motivated by military or commercial interests. This type of disequilibrium problematizes Simondon's thought, and often necessitates a choice between the ethical sphere of moral judgment and the esthetic sphere of judgments of taste. It seems to me that in such judgments, the ethical sphere must have absolutely primacy (over the technophile's fascination with futurism, over the fascination with war that crops up among certain German thinkers and writers of the 1930s, and likewise, over the excessively positive value judgments that are sometimes directed at contemporary phenomena of acceleration). I tried to emphasize this, not as a reproach against Simondon—for it would be absurd to demand a system of thought so all-encompassing that it takes into account every sphere of activity—but in order to reflect on a way to bring this system up to date and connect it to our own problems, which are often rooted in the inflation of economic and financial spheres.

This question of bringing Simondon's thought up to date is also present in the reflections of Arne De Boever, who seeks to connect it to "cognitive capitalism." This is indeed, to my mind, one of the major challenges of contemporary thought. It seems, to me, appropriate to say that Simondon's thought, and in particular, his reflections, on the way in which psychic individuation may be realized by means of concretized objects, allows us to move in that direction. But such individuation can also be effected upon oneself, taken as a subject in a perpetual state of becoming. The example of yoga that Arne De Boever cites is perfectly in line with this idea. It brings to mind a quotation from Robert Pirsig, another great proponent of the technical mentality, who points out in *Zen and the Art of Motorcycle Maintenance* that "the real cycle you're working on is a cycle called yourself." How better to describe the inextricable connections between individuation and concretization?

Response to Aud Sissel Hoel

Aud Sissel Hoel, in her incisive and well-informed article, notes more than once that one of the merits of *The Philosophy of Simondon* is its extensive use of examples that vividly elucidate Simondon's thought. I happily accept the compliment, but must immediately pass it on to its intended recipient, namely Simondon himself. All of his readers have been similarly surprised to open a philosophy book and find it illustrated with photographs of telephones, technical schemas that explain the workings of a diode, and even genealogies of objects. His thought is, above all, based in empiricism, if, by that, we mean a philosophy that leans toward experience, with no preconceived notions other than the desire to understand it. Simondon's philosophy is thus deeply rooted in the concrete. It is in this respect that it contrasts radically with the philosophy of Heidegger, whose examples of technical objects—the hammer, the tractor in a field, or the hut in the Black Forest that protects its inhabitants from the snow—are not examined technically, but in terms of the relations that can be established with them. In comparison with those that illustrate Simondon's philosophy, these are impoverished examples that never get as far as the true "technical layer" which is the nucleus of concretization. In this sense, Simondon's objection to the philosophical thought of his era, which in his estimation lacked technical knowledge and considered objects from either a utilitarian or an esthetic point of view, applies most of all to the philosophers themselves. Since Simondon's time, empty, ideological rhetoric on the subject of technology has become a serious problem.

Another movement which draws upon a multiplicity of approaches (philosophical, scientific, and technological) is, of course, cybernetics. This brings me to one of the primary criticisms that Hoel levels at my book. Specifically, Hoel laments certain gaps in my analysis of the relation between Simondon and cybernetics. With regards to some of these, I must concede that she is right, but for others, I would like to clarify my position, since a central issue is at stake. One relation whose absence from my book Hoel finds regrettable is the influence of thermodynamics both on cybernetics and on Simondon. Making this connection explicit would have allowed me to more precisely describe the concept of metastability. While this concept is defined and discussed at multiple points in the book, I agree that for a clearer explanation, it would have been instructive to trace the concept back to its origins in thermodynamics, and I am grateful to Hoel for making this observation.

On the other hand, in regards to my interpretation of the relation between Simondon and cybernetics, I am obliged to clear up a misunderstanding. Simondon was, as I point

out, profoundly inspired by the field of cybernetics. He was one of the first to bring it to France, and to draw inspiration from it. The interdisciplinary spirit of cybernetics had a lasting influence on him and it was with a similarly systematic perspective that he conceived his own attempt to transduce certain key concepts from different domains of knowledge. Nevertheless, while the influence of cybernetics was significant, it was never my intention to assert that Simondon did not differentiate his own thought from the discipline founded by Norbert Wiener. On the contrary, he made considerable efforts to enrich, transform, re-purpose, and improve upon the concepts of cybernetics in order to make them compatible with his own philosophy. It must be noted, in order to elucidate this point, that Norbert Wiener was not a philosopher but a mathematician, which explains why his concepts sometimes lack sufficient plasticity to be integrated into ontology. In contrast, Simondon, trained as a philosopher at one of the most prestigious educational institutions in France (the *École Normale Supérieure* in Paris), and above all, a great reader of Plato, who, more than anyone, embraced the dialectical spirit, could never be satisfied with a philosophy that consisted only of technological and mathematical concepts, such as those of cybernetics.

Hoel is thus right to maintain that Simondon rejects the reductionist tendencies of cybernetics. I myself sought to demonstrate this, and I regret that I was undoubtedly not clear enough on this point. Simondon's conception of cybernetics is genetic, that is, it takes into account the individual's process of becoming. As Barthélémy astutely suggests, universal cybernetics is the analogue of what Simondon calls "allagmatics," namely, a general theory of operations (Barthélémy, 2013, p. 113 and Barthélémy, 2008). The most profound transformation that Simondon imposes on cybernetic theory concerns the notion of information. Cybernetics conceived of it in a probabilistic and technician like manner, as quantities of information. In this context, information and meaning were completely dissociated. Simondon's conceptual gambit was to preserve the notion of information, but to connect it with notions of meaning. This leads him to speak of a "quality of information," which in turn, allows him to apply the notion not only to the material world, but also to biology, and to psychic and collective individuation. The quality of information also plays a part in the Simondonian concept of singularity, which has the capacity to provoke individuation in a metastable milieu. It is this notion of singularity, so transformed by Simondon that its origins in cybernetics are, by now, barely identifiable, that Gilles Deleuze would borrow from the author of *L'individuation psychique et collective*, to treat as a fundamental concept of his own ontology in *Difference and Repetition* and *The Logic of Sense*. In conclusion, it is highly appropriate that Hoel emphasizes the distance between Simondon's thought and cybernetics.

The question of the relations between the technical sphere and human existence is one of the most central issues for our time. In his own way, Simondon showed this. But one of the central ideas of my book is to encourage every reader of Simondon to construct new bridges between the spheres of individuation and concretization. These are the bridges that connect us to our future. For my own part, the philosophical endeavors that followed this study of Simondon, including the books *After Progress* (*Après le progrès*), *The seven stages of philosophy* (*Les sept stades de la philosophie*) (Chabot, 2011), and *Global burn-out* (Chabot, 2013), could be presented as reflections on ways of establishing relations between these two general dimensions. So, it is with pleasure and interest that I greet Hoel's suggestions of candidates toward whom we can

extend new bridges. She cites Merleau-Ponty, Canguilhem, and Cassirer, all with good reason, as all three are philosophers of relations, and would not have disapproved of the fundamental statement that underlies Simondon's philosophy: "The relation has the value of being."

To conclude, I would like to give my heartfelt thanks to Marc de Vries, Arne De Boever, Andrew Feenberg, and Aud Sissel Hoel, as well as, of course, Graeme Kirkpatrick, who was at the origin of this translation, and Aliza Krefetz, who brought about the concretization of this project by finding *les mots justes* in English. They, themselves, have served as bridges for this philosophical thought which has now been "transduced" from France into the Anglo-Saxon realm. This can only be a cause for celebration. Simondon is not a thinker contained by boundaries. His writing reflects a universalist spirit, open and pragmatic, and on this account, it is sure to meet with many like-minded thinkers in Anglo-Saxon philosophy.

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