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Philosophy of/as Information

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In this chapter I will explore the nature and function of philosophy in Simondon from a single perspective, that of information. The recent development of a branch of philosophy named "Philosophy of Information" allows the framing of this perspective: it permits us to take a retrospective look at Simondon's work from our current situation, and to appreciate what, in this remarkable work, continues to speak to us with great force and urgency today.[1] Simondon, of course, who died at the end of the 1980s, did not see the recent fruits of the information revolution, but his writings were deeply inspired by cybernetics and the theory of information at its heart. Accordingly, we can readily see Simondon as one of the earliest philosophers of information, who reformed philosophy on the basis of the notion of information in multiple key areas. In what follows, after a first discussion of Simondon's notion of information and its place in his thought, I will focus on reforms in two main areas: a new *image* of philosophy (thought as individuation), and a new *task* for philosophy (the integration of philosophy and culture). Throughout, what I wish to emphasise – as my title indicates – is that for Simondon, information is not simply an object for philosophical study, but a notion that comes to reform what philosophy itself is and how it is done. In other words, for Simondon, philosophy *of* information is also philosophy *as* information.

1. Why information?

It is remarkable that information has long remained one of the more opaque notions in the developing understanding of Simondon. Its centrality in his work can hardly be denied, and is indeed glaring; it is one of the main terms in the

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1   The most influential of current philosophers of information is Luciano Floridi, who has mapped out new understandings of key philosophical coordinates inspired by information technologies as they have been taking shape since the 1990s. See for example Luciano Floridi, *The Philosophy of Information*, Oxford, Oxford University Press, 2011 and Idem, *The Fourth Revolution*, Oxford, Oxford University Press, 2014. In situating Simondon with Floridi and contemporary philosophy of information, I follow Andrew J. Iliadis, "Informational Ontology: The Meaning of Gilbert Simondon's Concept of Individuation", in: *Communication+1*, vol. 2, issue 1, 2013, Article 5 and and Jean-Hugues Barthélémy, "Gilbert Simondon and the Philosophy of Information. Jean-Hughes Barthélémy interviewed by Andrew Iliadis", in: *Journal of French and Francophone Philosophy,* vol. 23, issue 1, 2015, pp. 102–112.

title of his major thesis: *Individuation in Light of Notions of Form and Information.* Yet it was not taken up sympathetically by either Deleuze or Stiegler, the two most prominent philosophers inspired by his work, and early commentators in Simondon's posthumous reception also largely passed it over, or displayed some fundamental misunderstandings. For example, Muriel Combes's influential study, so astutely perceptive on so many points, barely mentions the concept of information, and Thomas LaMare, in his preface to his English translation of this book, suggests that "Simondon's concept of information has nothing in common with Information Theory in the usual sense of transmitted data (or in the cybernetic sense, for that matter)."[2] Yet these approaches to Simondon are untenable, and omit the notion which Simondon himself presented as central to his work of conceptual reform, and which, although modified, was drawn from and continues to work alongside cybernetic Information Theory. More recently, many scholars have rightly begun to pay more attention to the notion of information in Simondon's work.[3] This current chapter aims to contribute to this deepening understanding of the nature and role of information in Simondon's thought by drawing out its implications for his unique conception of philosophy.

While Simondon reformed the notion of information, it is clear from his early studies of cybernetics that he was deeply inspired by this new science and the centrality of information to it.[4] Moreover, he also makes it clear that his own ontological notion of information is not supposed to challenge or be incompati-

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2   In Muriel Combes, *Gilbert Simondon and the Philosophy of the Transindividual*, transl. Thomas LaMarre, Cambridge, MA, MIT Press, 2012, p. xv.

3   See Jean-Hugues Barthélémy, *Penser l'individuation. Simondon et la philosophie de la nature*, Paris, L'Harmattan, 2005 (chapter 3); Jean-Yves Chateau, "Presentation: Communication et Information dans L'œuvre de Gilbert Simondon" in: *Communication et information*, Paris, Presses universitaires de France, 2015; Iliadis, "Informational Ontology", *op. cit.*; Kane X. Foucher, *Metastasis and Metastability: A Deleuzean Approach to Information*, Rotterdam, Sense, 2013; Andrea Bardin, *Epistemology and Political Philosophy in Gilbert Simondon: Individuation, Technics, Social System*, New York, Springer, 2014 (chapter 2); Yuk Hui, "Simondon et la question de l'information", in: Jean-Hugues Barthélémy (ed.), *Cahiers Simondon* 6, 2015, pp. 29–47; Simon Mills, *Gilbert Simondon: Information, Technology and Media*, London and New York, Rowman & Littlefield International, 2016; Juho Rantala, "The Notion of Information in Early Cybernetics and in Gilbert Simondon's Philosophy", Paper presented at Doctoral Congress in Philosophy 22, University of Tampere, Finland, 2018. (Available online: https:// www.researchgate.net/publication/337670231_The_Notion_of_information_in_early_cybe rnetics_and_in_Gilbert_Simondon%27s_philosophy). An early exception to the rule is Jacques Garelli, "Transduction et information" in: Gilles Châtelet (ed.), *Gilbert Simondon – Une Pensée de l'individuation et de la technique*, Paris, Albin Michel, 1994, pp. 55–68. Recent interest in this topic is also indicated by the symposium "Simondon and the Concept of Information," organised by Giovanni Menegalle, held at King's College London, 13 May 2019.

4   "Cybernétique et philosophie" and "Épistémologie de la cybernétique," both manuscripts dating from 1953, first published in 2016 in SLΦ.

ble with technical Information Theory, but to extend and modify it to provide a properly ontogenetic dimension, on the basis of which it – along with so many other things – might be better understood.[5] First, then, let us note what Simondon saw in information that he found so compelling. In his 1953 text "Épistémologie de la cybernétique," he writes:

> [T]he theory of information studies how a specified structure – for example, that of words constituting a message – is transformed by a specified operation into another structure equivalent to the first, or into a more basic level of information (that is, one incapable of fully retransforming itself back into the first structure) – for example, a temporal series of telegraphic signals. The theory of information thus does not directly have for its aim the study of information, but the particular *operations* which transform information into another type of information: coding, ciphering, deciphering, modulation, demodulation, the theory of background noise, or the conversion of a sinusoidal signal into a pulse signal. It invents a hypothesis on the nature of these operations, which really transform a type of information into another type of information.[6]

Already we see here, then, Simondon's move away from the communication of content – the message – between already-constituted positions (sender and receiver), in favour of the *operational* and *transformational* aspects of information, which make it suitable for the philosophy of individuation and ontogenesis that he will shortly develop. The theory of information, initially developed for engineering problems, was extended in cybernetics to model how systems of all kinds become ordered and structured through processes that are communication-like. Simondon takes this up, but emphasises the genetic aspect of these processes, rather than assuming already individuated forms that would communicate information. What Simondon centralises in information is in fact *transformation*, the communicative operation which gives form and changes form. While to my knowledge Simondon himself never expresses this in such a pithy formula, I would suggest that for him, *information is transformation*. It is notable that Simondon already saw this aspect *in* the technical and cybernetic theories of information, since it adds historical (or genetic) weight to the important corrective to the view that his notion of information is completely different to these theories.

For Simondon, then, Information Theory is a theory of *operations*, of *transformations* (and thus an *allagmatics*, in Simondon's terms). An important aspect of the value of the notion of information is that it is *general* enough to apply to any domain. In Information Theory, information content is independent of its support, meaning that the same message can be carried by different supports (or media). This independence of specific support would also seem to apply to

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5   See ILNFI, p. 31 note 10/p. 384 note 12.
6   SLΦ, pp. 181–182. Translations from French texts are mine.

the transformative capacity of information: the same kind of transformative operation can be seen in different domains, regardless of the "substances" that are being transformed. This gives information a paradigmatic and transductive power, meaning that the notion can be applied in any domain of reality, as well as between different domains. Moreover, information also seems to have both *quantitative* and *qualitative* dimensions, increasing its capacity to work in different domains, from the physical to the psychosocial. Raymond Ruyer highlights the way that Information Theory arose from precursor theories such as behaviourism and linguistic pragmatics, which focus on the *effects* communication has, rather than on semantic meaning.[7] In this way, information seems to connect the pragmatic, effective dimensions of *operation* and *transformation* with the more usual or common sense notion of information as meaningful semantic content, or *signification.*

Indeed, it is this connection between the non-meaningful and meaningful aspects of reality (to put it crudely) that Simondon further indicates as being important to the notion of information as a *reform* of the notion of *form.* Simondon presents information as the latest and best development in a genealogy of the notion of form, and states that "we actually uncover the same goal at work in the successive theories of hylomorphism, good form, and then information: the goal that seeks to discover the inherence of significations to *being.*"[8] This implies the connection, as I put it above, of the non-meaningful and meaningful aspects of reality, or of how meaning "emerges" from the non-meaningful – or as Simondon expresses this here, "the inherence of significations to *being.*" And, he adds, "it is precisely this inherence that we would like to discover in the operation of individuation."[9] Placed in this lineage, then, information appears for Simondon as a way of thinking form itself in its role as *ontogenesis,* which the notions of form in hylomorphism, and in the Gestaltists' notion of 'good form' did not manage to do (because the former understood form as a fixed pre-existent term, and the latter as a stable equilibrium).

This, then, is the promise that Simondon sees in the cybernetic theory of information. But he also believes that the notion needs to be reformed in order to take it out of the relatively narrow technical confines of its cybernetic application, in order that it may have truly encyclopaedic, paradigmatic power.

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[7]   Raymond Ruyer, *La Cybernétique et l'origine de l'information*, Paris, Flammarion, 1954, pp. 7–8.

[8]   ILNFI, p. 17/ILFI, p. 35.

[9]   ILNFI, p. 17/ILFI, p. 35.

2. Simondon information

The various technical theories of information are sometimes called after their inventors – for example, "Fisher information," "Shannon information," "Kolmogorov information," etc. In a similar fashion, we might talk of "Simondon information."[10] Simondon information is what he at one point calls "first" or "primary" information, in relation to technical information. This occurs in the important note in which he indicates the complementarity of technical theories and his own ontological theory of information. After affirming the importance of the latter, he notes:

> This affirmation does not lead to contesting the validity of the quantitative theories of information and the measures of complexity, but it does suppose a fundamental state (that of pre-individual being) anterior to any duality of emitter and receiver and therefore to any transmitted message. What remains of this fundamental state in the classical case of information transmitted as a message is not the source of information but the primordial condition without which there is no effect of information and therefore no information: this condition is the metastability of the receiver, whether it be a technical being or the living individual. This information can be called "first information."[11]

As we noted above, "information" is for Simondon the name of the transformative operation in general. In this sense, perhaps his best general description of information, as he understands it, is to be found in the essay "L'Amplification dans les processus d'information," which he presented at the conference he organised at Royaumont in 1962 on The Concept of Information in Contemporary Science. Here we read the following:

> *To be or not to be* information does not depend solely on the internal characteristics of a structure; information is not a thing, but the operation of a thing arriving in a system and producing a transformation in it. Information cannot define itself outside of this action of transformative effect [*incidence*] and the operation of reception.
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> … the *local* reality, the receiver, is *modified in its becoming* by the *incident* [*incidente*] reality, and it is this modification of the local reality by the incident reality that is the function of information.[12]

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10   A precedent in this is Foucher, *Metastasis and Metastability*, *op. cit.* (chapter 2).

11   ILNFI, p. 384, note 12/ILFI, p. 31, note 10. Taylor Adkins, whose recently published translation of *Individuation* I quote from here and throughout, and which should now be taken as the standard reference in English, renders "*information première*" as "first information." However, I prefer to follow previous translators who have rendered it as "primary information," since "first" seems to more strongly imply a temporal order, while "primary" can better suggest a temporally neutral *order of priority*, which I think better expresses the ontological nature of this idea, with its attendant temporal paradoxes (since temporality is itself generated by the primary information processes involved in individuation).

12   CI, p. 159.

Information as transformative operation is difficult to "locate" definitively in any specific stage of the transformative or form-taking process that Simondon describes, since he states that it is never a term but is always a relation of tension;[13] because time itself is generated by the process of individuation as one of its dimensions (such that information does not exist at one point in a time that would pre-exist and envelop it, but which it itself generates); and because, in practice, Simondon locates it in multiple times and places in the processes he describes: information is both the seed for individuation (the message) and the metastable system that individuates (the receiver), but more properly perhaps it is the tension that is set up and is resolved in the communication between them. Moreover, information is what is resolved by signification, and it is also this signification that resolves. As Simon Mills explains,

> information is descriptive of the process by which individuation occurs and as such is often used by Simondon as a description of different aspects of that process. […] As such, for Simondon, *information* is the term used to describe the individuation process from a number of different perspectives.[14]

In tracking the various ways in which Simondon uses the term "information" in his writings, we might seem to run into logical contradictions: how can it be both this, *and* that? This however should not be unexpected, since Simondon does in fact insist that concepts do not seem adequate for the thought of individuation, and asserts that the laws of classical logic, such as the principles of identity and excluded middle, are appropriate only to individuated beings, and not to the thought of being in its genesis. If "information is the formula of individuation,"[15] it should not be surprising then that Simondon's elaboration of information seems to run afoul of classical logic. In sum, "information" is the most basic and general term for what in a metastable system establishes a communication between disparate orders of potentials and produces an internal resonance, and the resolution of the problematic so generated such that a transductive operation of individuation results and a signification is produced. The *link* between "primary information" and the technical information described by cybernetics and Information Theory is given in the cultural relevance of information technologies, as described in *On the Mode of Existence of Technical Objects*, as we shall see in the section on the new *task* Simondon sets for philosophy, below.

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13   ILNFI, p. 11/ILFI, p. 31.

14   Mills, *Gilbert Simondon*, *op. cit.*, p. 44.

15   ILNFI, p. 12/ILFI, p. 31.

3. A new *image* of philosophy : thought as individuation

Taking inspiration from chapter three of Deleuze's *Difference and Repetition*, I want to suggest that Simondon gives us a new image of thought. The character of this thought is *individuation.* I will begin with a general description of this image, then show how Simondon's early studies of cybernetics reveal an informational inspiration and character of this image of thought. One of the fundamental roles of philosophy for Simondon is to provide a knowledge of individuation (an ontology, or ontogenesis), and he announces in the Introduction of *Individuation* that knowledge of individuation must take the form of individuation of knowledge :

> by being accomplished, only the individuation of thought can accompany the individuation of beings other than thought; we therefore cannot have an immediate knowledge or a mediated knowledge of individuation, but we can have a knowledge that is an operation parallel to the operation known […] this apprehension is […] an analogy between two operations, an analogy that is a certain mode of communication. The individuation of the real, exterior to the subject, is grasped by the subject due to the analogical individuation of knowledge within the subject; but it is *through the individuation of knowledge* and not through knowledge alone that the individuation of non-subject beings is grasped. Beings can be known through the knowledge of the subject, but the individuation of beings can only be grasped through the individuation of the subject's knowledge.[16]

While other modes of thought can have knowledge of individuated things, it is philosophy's task to think ontogenesis through the individuation of knowledge. This requires a new image of thought: thought itself must be understood as individuation, which becomes adequate to what it thinks through an analogical relation with it, in which both subject and object co-individuate.

Simondon elaborates this later on in *Individuation*, stating that "*[t]he epistemological postulate of this study is that the relation between two relations is itself a relation.*"[17] We need then to understand ontogenetic knowledge as involving three relations which all have an individuating character, which combine in the individuation of knowledge. First, there is the relation in the domain of the object which individuates the object of study. The nature of these relations in the different domains is what is studied throughout *Individuation*, starting with the basic paradigm of physical individuation, crystallisation, with the relation between the seed and the supersaturated solution. Second, there is individuation in the realm of the subject, that of thought. Simondon explains this as a historical genesis of thought: "every thought, precisely to the extent that it is real, is a *relation*, i.e. includes a historical aspect in its genesis."[18] Thoughts appear in relation

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16   ILNFI, p. 17/ILFI, p. 36.
17   ILNFI, p. 76/ILFI, p. 83.
18   ILNFI, p. 77/ILFI, p. 84.

to past thoughts. And thirdly, there is the analogical relation between the subjective and objective relations, which itself has an individuating power, and produces knowledge of individuation.

The *informational* aspect of this image of thought is more clearly revealed in a note only recently published in *Sur la philosophie.* This note is explicitly related to the abandoned second part of Simondon's major thesis, on "The History of the Notion of the Individual," and so cannot be taken at face value in terms of its consistency with the completed thesis. Nevertheless, we can see the basic structure of an analogy between the process to be studied and the process of thought that studies it, and a specification of the origin of this image of thought in Information Theory:

> We will employ […] a postulate conforming to the theory of information, which states that for reflective consciousness, the prereflexive ground from which this consciousness emerges must contain, in the form of internal tensions, a potential of information large enough for this consciousness to be capable of defining a reflective notion possessing the same quantity of information as the very prereflexive ground from which it emerged. The thought provides the reflection, but it does not create the information by taking it from nothing.[19]

Moreover, Simondon understands the two terms – objective reality and the thought which thinks it – in a co-constitutive relation. The metastable state of the object to be thought contains in itself an incompletion which is partially fulfilled by the knowing subject, and the subject itself desires to know the object because of its own incompletion. He explains:

> Reflection is a particular case of the relation between a problematic and the different operations by which it can be resolved thanks to the presence of a subject that is already constituted, but still incomplete in its equilibrium. A perfectly completed subject which would not have in itself any lack of unity would find itself incapable of thinking and reflecting.[20]

As such, we can see the idea of information as a *transforming operation* between two orders – which, we saw above, Simondon emphasises as the most important aspect of Information Theory – as operative in the image of thought as the individuation of knowledge. Knowledge is a communication of information between the subject and the object, each individuating the other. In the relation that is knowledge, thought and its object are both modified, their metastable states taking on greater stability.

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19   "'Point de méthode' (Note sur Individuation et Histoire de la pensée, autour de 1955)", in SLΦ, p. 27.

20   "'Introduction' (Note sur l'attitude refléxive, autour de 1955)", in SLΦ, pp. 23–24.

When Simondon describes a "simple" process of individuation, involving a single relation or relations in a single order, he emphasises that there is *no loss* of information, but rather a *conservation of information.*[21] When it is a matter of two different orders of individuation communicating and producing a new individuation, however, it is a matter of greater complexity, and Simondon describes this as the production of a *higher level or degree of information.* In the preparatory study "Point de méthode," he explains:

> the postulate of this method is that the access to the reflexivity of a form of individuation can perform like the condition of the appearance of a form possessing a higher level of information. […]

> One can call this necessity "ontological necessity" or "allagmatic necessity", because it combines the foundation of two other necessities [logical and physical]; one can formulate it thus: information does not create itself *ex nihilo*, but is produced by successive stages of conversions of operation into structure and of structure into operation. Each conversion integrates, in a quantum manner, a higher degree of information, which is produced by this act of conversion itself. The act of conversion includes some supplementary information in its result, which creates a difference of level between the initial state and the final state: this act achieves a decrease of the initial number of operations or structures, to the profit of the level of information of the resulting operations or structures; it is a creator of synthesis.[22]

What this means for knowledge is this: the order of thought is informed by the order of the object it studies, and there is a transfer of information between these orders which enables an individuation which produces knowledge as a "higher level" of information than that of either the object or subject alone before they come into communication.

In the 1953 draft "Cybernétique et philosophie," Simondon further indicates the cybernetic inspiration for the model of philosophical thought he is developing, highlighting in particular the way that thought contributes to the domain that it studies by enabling the resolution of a problematic state already contained in the domain itself, which it could not resolve on its own:

> In terms of this investigation, we see that the philosophical effort can think itself cybernetically: the philosophical effort, which manifests itself in a domain, is a becoming conscious of a certain problematic which up to that point existed in a spontaneous fashion and would not be able to resolve itself solely on the basis of the structural characteristics of the holistic system in which it manifests itself; the philosophical effort transforms the structure of the holistic system […] it brings reflexivity, in addition to spontaneous functions, which creates a new internal resonance.[23]

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21   ILNFI, p. 15/ILFI, p. 34.
22   "'Point de Méthode", SLΦ, p. 28.
23   "Cybernétique et philosophie", SLΦ, pp. 61–62.

Simondon further compares the relation of thought to its object to the physical paradigm of individuation, thus underlining the image of thought *as* individuation:

> This situation of a being which can be transformed by the intervention of reflection is comparable to that of a system in a state of over-tension [*surtension*], like, for example, a supersaturated solution such as it is studied by physics. But it is also necessary that the subject capable of operating the transformation of the over-tense state is such because it tries to find a higher completion itself. It is in this way that the seed of the crystal is able to operate the resolution of a state bearing a certain number of internal tensions. It is in the same way that the subject capable of reflecting a specified given must be animated by a certain number of internal tensions capable of provoking the structuration of a field, of an operational field, itself incomplete and in a state of tension.[24]

In sum then, we can see from these early studies that the image of philosophical thought as individuation is inspired by cybernetics and Information Theory: Simondon proposes to think knowledge as a kind of cybernetic system, in which metastable states communicate and resolve problems through processes which are informational in the sense that they involve operations of transformation. The resolution of the tension between two states of incompletion, the subject and the object, produces knowledge which can be understood as a level of information higher than that which either of the two states alone contained. This would seem to correspond to the general intuition that knowledge is a gain in information.

4. A new *task* for philosophy: the integration of technics and culture

In *On the Mode of Existence of Technical Objects*, Simondon gives philosophy a specific task: to overcome alienation by accomplishing the integration of technics and culture. The general features of this task have become well known in the secondary literature, but an overlooked aspect of it I wish to emphasise here is the role of information. In fact, and crucially for our interests here, Simondon writes that "the notion of information is the most suitable for accomplishing the integration of culture with a representative and axiological content adequate to technical reality envisaged in its essence […]."[25] Let us briefly rehearse Simondon's account of the problem of alienation and the challenge of overcom-

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24   "'Introduction", SLΦ, pp. 21–22.

25   METO, p. xiii. This comment is found in the "Summary of *On the Mode of Existence of Technical Objects*" included at the end of Nathalie Simondon's Note in the English translation, and does not appear in the French edition.

ing it through integrating technics and culture, before highlighting the role of information in this new philosophical task.

Simondon proposes that, at a deeper level than the alienation proposed by Marx (which he interprets as functioning on an economic level), in contemporary culture there is an alienation between the human and technical objects. This alienation is based on a split between culture, which deals with human representations, and technics, which are considered to be different in essence from the human, and are treated as objects with an exclusive function of utility. According to Simondon's innovative thesis, however, this is an illegitimate exclusion of technics from culture, based on an artificial divide. In fact, technics contain an aspect of humanity just as "cultural" products do, because they are creations of human beings and express a possible relation between the human and the world. Our experience of technical objects produces a feeling of alienation, because the objects themselves are alienated from human culture. There is a general dimension to this alienation which, in a speculative genealogy presented in the third section of *Mode*, Simondon traces to a phase shift from the "primitive magical unity" to the two modes of human relation to the world that are religion and technics. However, there is also a more specific dimension of technical alienation which devolves from the fact that the representations of technologies that do circulate in culture lag behind the reality of current technological developments: we maintain ideas of artisanal or industrial technologies, while our current technologies are post-industrial (that is, informational).[26]

To overcome our alienated relation to technical objects, Simondon proposes that such objects need to be understood by studying them in their *genesis*; by understanding how notions of *progress* shape the human relation to technics; and by understanding the *essence* of technicity, which is a broader reality than individual technical objects, and indicates a mode of the relation between human being and the world. Each of these tasks corresponds to each of the three main sections of *Mode.* As elaborated in the final chapter of the book, philosophy has a privileged role as the only type of thought able to accomplish the integration of culture and technics.

The key role of information in the first two of the three parts of *Mode* is clearly explained in the Prospectus of the book. The place of information in the evolution of technical objects is indicated as follows:

> There is something like a redundancy of information in the technical object having become concrete. […] This notion of information allows the general evolution of technical objects to be interpreted via the succession of elements, of individuals and of ensembles,

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[26]   "Post-industrial" is a term not used in METO, but Simondon uses it in some later writings, for example, "Technical Mentality" (trans. Arne de Boever in: Arne de Boever, Alex Murray, Jon Roffe, and Ashley Woodward (eds.), *Gilbert Simondon: Being and Technology*, Edinburgh, Edinburgh University Press, 2012, pp. 1–15).

according to the law of conservation of technicity. […] there is a preservation through-
out the successive cycles of evolution of technicity as information.[27]

I will not pursue this issue of the evolution of technical objects further here, oth-
er than to note that Simondon indicates that ensembles – to which we will re-
turn below – are more evolved, and have a higher degree of technicity, because
they have a greater openness to information.

Corresponding to the second section of *Mode*, the role of information in
the notion of *progress* which regulates the rapport between man and technical
objects is explained as follows:

> [W]hat remains to be elaborated is a new notion of progress corresponding to the dis-
> covery of technics at the level of the ensembles of our epoch, by virtue of a deepening of
> the theory of information and communication: […] man […] is the agent and translator
> of information from machine to machine, intervening within the margin of indetermina-
> cy harbored by the open machine's way of functioning, which is capable of receiving
> information. Man constructs the signification of the exchanges of information between
> machines.[28]

The *value* of information as a paradigm of progress is that it is related to *regula-
tion*, in contrast to the paradigm drawn from thermodynamic machines, which,
Simondon says, are symbols of power, and give rise to the danger of a control-
ling technocratism. The key difference between the technologies of the thermo-
dynamic age and the information age, Simondon tells us, is that the former in-
volve the same channels for energy supply and for regulation, while the latter
separate these channels.[29] This separation allows the idea of regulation to emerge
as an independent technical schema, and a series of values to develop on the
basis of the study of information channels. Simondon explains:

> [I]n machines, the advent of the use of information-channels that are distinct from ener-
> gy channels caused a very profound change in the philosophy of technics. […] Beyond
> the dimensions defined by thermodynamics, a new category of physical dimensions
> emerges that makes it possible to classify information channels and compare them. This
> elaboration of new concepts has a particular sense for philosophical thought because it
> provides the example of new values which, until this day, made no sense in technics,
> though they made sense in human thought and behaviour.[30]

The related ideas of information channels and regulation thus present a
close link between technics and human culture. Regulation is a highly "suitable"
technical schema for incorporation into culture, because culture itself, for

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27   METO, p. xv/MEOT, p. 362.
28   METO, p. xvi/MEOT, pp. 362–363.
29   METO, p. 143/MEOT, pp. 179–180.
30   METO, pp. 143–144/MEOT, pp. 180–181.

Simondon, has the role of regulating human behaviour, including relations be-tween human beings and the world, and thus also the relation between the hu-man and the machine. Information machines thus seem to supply a technical schema which has the special characteristic (regulation) of being more suitable to overcoming technical alienation than the schemas of the technics of previous paradigms.

Moreover, information technologies have a specific relevance to the third type of technical objects in their evolution, *ensembles*. Simondon writes:

> the birth of a technical philosophy at the level of ensembles is possible only through an in-depth study of regulations, which is to say of information. True technical ensembles are not the ones that use technical individuals, but those that form a fabric of technical individuals through a relation of interconnection. Any philosophy of technics that starts from the reality of ensembles using technical individuals without putting them into a relation of information remains a philosophy of human power through technics, not a philosophy of technics.[31]

Simondon presents us, then, with a convergence of several qualities and tenden-cies attendant to information technologies which make them – and the technical schema of information – especially suitable for an overcoming of alienation.

However, in section 2 of *Mode*, Simondon moves from establishing the paradigmatic superiority of Information Theory over thermodynamics to then marking some definite *limits* to the *technical* theory of information, and sketching a non-technical or extra-technical theory of information as a necessary supple-ment. This move coincides with a critique of cybernetics, as well as the idea of the automaton, and an argument for a necessary relation of humans *with* machines. This intriguing section[32] is extremely important in understanding Simondon's philosophy of information, since it allows insight into the relationship between the *technical* notion of information, as developed in Information Theory and cyber-netics, and Simondon's original, ontological notion of "primary information."

The *limit* of the technological notion of information is that it does not allow us to understand the necessity of the human as mediator between machines. The physical analogy between humans and machines which predominated in cyber-netics did not acknowledge a qualitative difference between the ways human be-ings and machines process information, but Simondon believes this difference is essential.[33] He introduces this limit and this difference by pointing out the

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31   METO, p. 141/MEOT, p. 176.

32   METO, pp. 147–159/MEOT, pp. 185–203.

33   Raymond Ruyer had mounted a similar argument in his 1954 book *La cybernétique et l'origine de l'information*. Jean-Hugues Barthélémy reports that Simondon read this book, and calls it an "indispensable" [incontournable] source for his own work on cybernetics and Infor-mation Theory (Barthélémy, *Penser l'individuation*, *op. cit.*, p. 21). However, it is a largely hid-den source, as Simondon's references to Ruyer in his writings are extremely rare, the only

nonunivocal nature of information, its paradoxical quality as lying between "stereotypy"[34] and "contingency." In Information Theory, information is understood as a measure of surprise – if the receiver receives something it already knows, it is not information. Information thus needs to involve a dimension of contingency, of the chance event. However, the receiver must also be so constituted that it can make some sense of the message, so must bear a degree of similarity or "stereotypy" in relation to the message, or as Simondon puts it, it must contain some common forms. He states that

> [t]his opposition represents a technical antinomy that poses a problem for philosophical thought: information is *like* the chance event, but it nevertheless distinguishes itself from it. An absolute stereotypy, excluding all novelty, also excludes all information.[35]

This "technical antinomy" in information then points to the necessity of *a margin of indeterminacy* in information machines. This is the open space of possibility of a machine to be in different states or to serve different functions. Mechanically, a reduction of indeterminacy – a choice between possibilities – is effectuated by a transducer. Yet the technical transducer is only a very inferior version of the transducer which is a living being. Simondon suggests that ultimately, the decisions and choices which *inform* machines must be supplied by living beings, which contain a capacity of information *within* them, as machines do not. We can understand this to mean that human beings are needed to make the choices which inform the operations of machines, which programme them and which feed them new information. In *Mode*, Simondon distinguishes be-

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substantial engagement being his essay "Les Limites du progrès humain" (SLT, pp. 412–427), a response to Ruyer's identically titled essay ("Les Limites du progrès humain", in: *Revue de métaphysique et de morale*, vol. 63, issue 4, October–December 1958, pp. 412–427). On this exchange, see Philippe Gagnon, "Ruyer and Simondon on Technological Inventiveness and Form Outlasting Its Medium", in: *Deleuze Studies*, vol. 11, issue 4, 2017, pp. 538–554. The relations between Ruyer and Simondon on the issues of information and cybernetics need to be reconstructed. See Barthélémy's efforts in this direction, *op. cit.*, pp. 125–130. I would note that several arguments Ruyer develops bear a strong similarity to those Simondon mounts. For example Ruyer's argument concerning the "perpetual motion" of information machines as an absurdity to which the cybernetic theory seems to lead, with the example of telephones in circuit talking amongst themselves. His argument that machines are only capable of relations of causality in the dimension of actuality, whereas the creation of information requires a virtuality that can only be supplied by a human mind, are also close to the terms of Simondon's arguments in section 2 of METO. Barthélémy rightly notes, however, that the metaphysics which frames Ruyer's approach is too "vitalist" and "spiritualist" for Simondon's taste (*op. cit.*, 128).

34   I here follow Malaspina and Rogove's translation of *stéréotypie*, but I would suggest that "standardisation" or "conventionality" would perhaps more clearly translate the antonym of contingency indicated in this context.

35   METO, p. 149/MEOT, p. 189.

tween *forms*, which are what machines can work with, and what in this context he calls simply *information*. The descriptions Simondon gives here of the information that humans need to provide are closely reminiscent of the descriptions of "primary information" in *Individuation*, indicating a resolution of problems and an actualisation of potentials. In *Mode*, Simondon identifies this type of information with *signification*,[36] the meaning or sense which humans are capable of creating and understanding, and machines are not. This then is why the *technical* understanding of information is limited, and why machines need human beings: they need the level of signification to translate between the operations of different machines, uniting them through meaning and purpose. We could translate Simondon's claims into the language of contemporary philosophy of information by saying that what machines operate with is *the syntax of data transmission*, while human beings are exclusively capable of supplying the *semantics* of information.[37]

Simondon thus proposes Information Theory as the current, and the best – provided it undergoes the modifications he specifies – paradigm for the incorporation of technical schemas into culture. In this regard, he supports Norbert Wiener's basic proposal of the link between information and values, writing:

> [I]nformation is opposed to background noise in the same way that negative entropy is opposed to entropy as defined by thermodynamics. […] this opposition contains within itself an entire method for the discovery and for the definition of a set of values that are implied in technical ways of functioning and in the concepts by means of which one can think them.[38]

Social regulation can thus be understood in terms of the positive value of information and communication, and the negative value of noise. Simondon explains:

> [T]hermodynamic energeticism is replaced by information theory, whose content is normative and eminently regulative and stabilizing: the development of technics appears to be a guarantee of stability. The machine, as an element of the technical ensemble, becomes that which increases the quantity of information, increases negentropy, and opposes the degradation of energy: the machine, being a work of organization and information, is, like life itself and together with life, that which is opposed to disorder, to the leveling of all things tending to deprive the universe of the power of change.[39]

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36   While in *Individuation* signification is more clearly identified as one type of information, or information from a certain perspective. See the section "From Information to Signification," ILNFI, pp. 244–250/ILFI, pp. 219–223.

37   See for example Floridi, *The Philosophy of Information*, op. cit., chapter 6.

38   METO, p. 161 /MEOT, pp. 205–206.

39   METO, p. 21/MEOT, pp. 17–18.

Again, however, while being deeply influenced by cybernetics, Simondon critiques and departs from it by suggesting that Wiener's applications of these values to culture need to be modified in the following ways. First, while Wiener puts the emphasis on individual leaders as best being able to instantiate such values for social regulation (Platonic philosopher-kings, as Simondon has it), Simondon puts the emphasis on *culture*. Second – and crucially, in my view – Simondon suggests, in opposition to Wiener, that *homeostasis* should not be an absolute social value, and points also to the social and political values of "advent," or change, as also important and consistent with the model of social regulation drawn from cybernetic and informatic principles. Finally, Simondon suggests that technicity cannot solve *all* problems, as cybernetics seems to imply – instead, technicity needs to be placed in rapport with other modes of relation between the human and the world, such as religion and aesthetics. It is precisely *philosophy* which has the role of doing this.

The third part of *Mode*, on the essence of technicity, which explains this role of philosophy, falls strangely silent with regard to information. Here, beyond the letter of Simondon's text, I want to suggest that we can develop this aspect by drawing a link back to the *informational* nature of philosophy, as developed in *Individuation* and early notes, and outlined above.

5. Conclusion : philosophical thought as information process

In the last section of *Mode*, Simondon presents a speculative genealogy of the relation between human being and the world, proposing that an original magical unity phase shifts into religion and technics, which each then phase shift into theoretical and practical aspects. Alienation is due to the division of these various phases, especially the divorce of the technical from the others. What gives philosophy the special power to overcome alienation is precisely its "neutrality" with respect to any particular phase or mode of relation to the world; its ability to understand any domain of reality by following the processes of individuation as they unfold, and to integrate them by charting the transductive relations between them. Philosophy thus has a unifying function, effectuating the relations between different domains, individuals, and problems, and realising a transductive unity in being, reminiscent of the primitive magical unity.

This function of philosophical thought recalls the new image of thought as individuation, and the inspirations from Information Theory in composing this new image, as we saw above. Simondon writes here that "philosophical thought reintegrates itself into genetic coming-into-being in order to fulfil it,"[40] a descrip-

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[40] METO, p. 244/MEOT, p. 323.

tion reminiscent of his early studies concerning the way that two types of information transform and complete each other in the relation that is knowledge. Broadly speaking, then, while Simondon is silent on this particular issue in *Mode*, we might propose that thought is capable of overcoming alienation because of its informational character.

More specifically, I want to suggest that the image of philosophical thought as information process plays an essential role in the accomplishment of the task of integrating culture and technics. Elaborating the general problem of overcoming alienation, Simondon writes: "The philosophical effort thus finds itself faced with a unique task to be accomplished: the search for unity among the technical and non-technical modes of thought."[41] The foundation of this task, and an essential step in its accomplishment, is the integration of the technical and the non-technical in the image of philosophy itself. This is crucial, because philosophical thought (along with poetry, art, and other exemplars of human culture) has often been held up as itself a paragon of non-technical thought. The integration of these different modes, I would argue, thus needs to begin with a changed image of philosophy, one which better conforms to the ideal "neutrality" with respect to different phases and domains of being Simondon points to, and this is in fact what he provides us with through the notion of information.

In short, Simondon's complex notion of information allows an integration – through a nonreductive, transductive relation – of the technical and of what has been thought to be exclusive to human culture – that is, reflective thought or philosophy. The notion of information performs this integrating function because it proposes a single idea – information – with two extreme poles, technical information and primary information, with a transductive relation between them.

This particular, Simondonian image of thought as information process lies between two popular extreme images of thought which both fail to overcome alienation. On the one hand, there is the reduction of thought to technical information processing, as cybernetics seemed to imply, and as many more recent views, such as functionalism, computationalism, and cognitive science have continued to suggest in various ways. On the other hand, there is the belief in an absolute difference between technical information on the one hand, and philosophical thought and human culture on the other, a view dominant in most continental philosophical traditions of the twentieth century, and most canonically expressed by Heidegger, whose critiques of cybernetics and Information Theory, while brief and schematic, were well known and widely influential.

Simondon's informational image of philosophy thus sails between the Scylla and Charybdis of these equally alienating positions, presenting an idea of thought which is inspired by technical information, which exceeds it to encompass the hu-

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41   METO, p. 225/MEOT, p. 296.

man, cultural dimension, and which envelops and maintains a connection with technical information, presenting a transductive unity of technical and primary information. The reform of philosophy's image is then itself a part of philosophy's task of integrating culture and technics: it is a philosophy of information which embodies "humanistic needs," and connects them with information technologies: philosophy becomes informational; information becomes philosophical.