

Digitality, (Un)knowledge, and the Ontological Character of Non-Knowledge

Alexandre Monnin

The dialectic between knowledge and non-knowledge may obscure the very fact that digitization has also “remedied” knowledge, lending it the character of a commodity instead of a norm (which it was previously considered, despite the disagreement on its proper characterization entertained by philosophers and epistemologists). Hence, one is required to situate not only non-knowledge vis-à-vis knowledge but also knowledge vis-à-vis digitization and a third term I would call “unknowledge.” Non-knowledge is taken to be a necessary condition of many phenomena that are not reducible to knowledge, which, at the same time, is threatened by the generalization of digitally fueled unknowledge.

Although we have no word for it, establishing an appropriate degree of “middle connectivity” to the world is such a basic feature of the human condition that doing it successfully has been lifted into the rarefied reaches of sainthood and enlightenment; failing to accomplish it, identified as a cause of paralytic anxiety
– Brian Cantwell Smith

The relationship between knowledge, non-knowledge, and digitality is a complex one, still waiting to be fully explored. As evidenced in this volume, efforts to shed some light on “non-knowledge” open up new directions of research that are especially relevant, as we’ll see, in a world becoming more digitized every day. On the other hand, as such, the opposition between knowledge and non-knowledge tends to obscure the very fact that digitization has also “remedied” knowledge, lending it the character of a commodity instead of a norm (which it was previously considered, despite the disagreement entertained by philosophers and epistemologists among themselves). Hence, one is required not only to situate non-knowledge vis-à-vis knowledge but also knowledge vis-à-vis digitization.

Knowledge, Digitality, and Unknowledge

Knowledge and Digitality: Epistemic Issues

Knowledge both admits of a vast number of characterizations and comes in different flavors. While it is possible to hold shared views on the purview of knowledge while at the same time disagreeing on its exact definition, disagreement may still loom over the horizon. Whether tacit or practical knowledge refers to a phenomenon that can be subsumed under one heading along with scientific knowledge, or knowledge as traditionally conceived

by epistemologists, is a question that remains largely open to debate.

For that reason, it would at first glance seem illusory to contrast (and not necessarily to oppose) a unified concept of knowledge with non-knowledge. Yet, without such a unified concept, the need for a correlative unified concept of non-knowledge becomes, at best, moot. The best-known philosophical answer to the question, "What exactly is knowledge?" has long been "justified true belief." Despite the paradoxes this definition lends itself to (in particular the Gettier problem), let us take it as a departure point and add that knowledge is knowledge of a *referent*, whether in the form of an accurate description of it or true predictions regarding its behavior, etc.

What about digitization, then? Digitization and knowledge have a complex and quite paradoxical relationship. Going back to the concept of "knowledge economy,"¹ made possible by the advances of digitization, one immediately sees this relation for what it is: a relation of commodification. "Knowledge" in the knowledge economy no longer denotes any norm or domain (which it merely connotes) but rather betokens a broad assimilation to a commodity, essentially cultivated in order to sustain growth. Both the normative and pluralistic aspects of knowledge have as a consequence seemingly vanished or at least been largely obscured.

While paradoxical, this evolution shouldn't come as a surprise for it may very well characterize digitization as such. As a result, one of the claims in this paper will be that digitality has both overplayed *and* downplayed salient aspects of knowledge, to the point that we might, on initial approximation, think of this evolution as bringing knowledge nearer to its negation, what might be called "non-knowledge." As we shall see, however, as we progressively move away from epistemic questions, the case for introducing an

1 See Christoph Wulf's contribution to this volume.

108 additional category and situating non-knowledge on a different plane will become more and more compelling.

Overplayed, I would argue, because conceptual knowledge already grasps its referent in a simplified way, if only to articulate true propositions where, for instance, proper nouns denote individuals, and common nouns denote properties (a conceit still used within logical artificial intelligence (AI)). Mathematical models, despite potentially being very complex, must nonetheless simplify reality in order to allow for more accurate predictions. In this regard, they may be revised to accommodate some of the minute details of a world they never exhaust. Science, then, produces knowledge about the world but not necessarily one conclusive picture.

Now, with digitality, models and abstractions have become not only a sign of the portability of conceptual knowledge but also a means to perform assemblages that *induce* new realities instead of deferring, one way or another, to some preexisting world—again in the name of simplification and formalization. Make no mistake: deferring to the world involves taking into account the intricate ways in which the world is being transformed by our own activity—especially in the Anthropocene! That said, digitization tends to consider its models within its own reality without always properly deferring to the world. Google’s PageRank algorithm is a good example. It construes incoming hyperlinks as votes or endorsements (never as signs of defiance!) in its willingness to redefine the web by using measures of authority, while *pretending* to remain neutral—even though its own existence modifies the very topology of the thing it was supposed to measure independently.

And then *downplayed* since the commodification of knowledge, made possible by the lack of regard for traditional norms of knowledge (in a sense “anything goes” in the knowledge economy so long as its goals are achieved), resulted in more and more data, metadata, documents, and so on and so forth—what I

would term “knowledge traces”—being produced, gathered and made available with unforeseen consequences that are well worth examining.

Innovation is better served, or so it seems, by people who have little regard for the minutiae of everyday life, assured as they are of the well-foundedness of their mission to transform it. Of course, one may ask a) How and why on earth should that which is not well enough grasped be transformed? And b) Is it even possible to ensure that the replacement (or modification) is something genuinely *new*? One could argue regarding the second objection that only induction through enumeration would provide a proper answer, and it is well known to be insufficient. Let’s put it aside then because, basically, we have to live with similar “uncertainties.”

The answer to the first objection is much less straightforward. Digital technologies produce *new assemblages* while at the same time claiming to operationalize *preexisting realities* (intelligence, authority, vote, trust, etc.). Changing the meaning of those concepts/values/realities is seldom, if ever, an explicit goal. Rather, these realities are generally taken for granted and whether the ensuing operationalization turns out to be something wholly different, even in logical contradiction to what they previously stood for, is no one’s business.

Assemblages and performance have always marched hand in hand since assemblages perform, by definition, a specific effect. (Centre de Sociologie de l’Innovation 2013). And from that arises the legitimate fear that focusing on assemblages alone might obfuscate any reference (and deference) to the world. Yet, the lack of regard displayed by innovators concerns not just the world but also the assemblages produced therein (the subsequent operationalization is always made with reference to preexisting realities, resulting in a common neglecting of both sides of the equation: that which is being operationalized and the end result of such operationalizations).

110 Thus, we go from knowledge to what we'd call "unknowledge"—introducing this concept in order to characterize a specific contrast to knowledge akin to a lack of willingness to defer/refer to the world that is still unabashedly regarded as fully fledged knowledge.

Unknowledge is very well illustrated by this quote from Phil Agre about AI:

As a practical matter, the purpose of AI is to build computer systems whose operation can be narrated using intentional vocabulary. Innovations frequently involve techniques that bring new vocabulary into the field: reasoning, planning, learning, choosing, strategizing, and so on. Whether the resulting systems are really exhibiting these qualities is hard to say, and AI people generally treat the question as an *annoying irrelevance* [my emphasis]. What matters practically is not the vague issue of what the words "really mean" but the seemingly precise issue of how they can be defined in formal terms that permit suitably narratable systems to be designed. If you disapprove of the way that we formalize the concept of reasoning or planning or learning, they are likely to say, then you are welcome to invent another way to formalize it. (Agre 1997)²

Unknowledge prolongs knowledge insofar as it seemingly shares the aim of formalizing phenomena, thus leaving aside part of their richness. Yet, unlike knowledge, always revisable and never able to exhaust what there is, unknowledge, by materializing and making directly operational its representations, is in danger of losing sight of its referent and becoming self-referential (digital formalizations are also a lot more expensive than pen and paper ones!). This is what Agre means with the quote above: in the end,

2 I have suggested (Monnin 2015) that the roots of formalization thus conceived lie in Rudolf Carnap's concept of "explication," to which scholars have turned their attention in recent years; see especially Carus 2007 and Richardson 2013.

what the “words ‘really mean’” or what the world really is matters less than the design of new workable formal systems. We can thus conceive of unknowledge as a contemporary pathology of knowledge, albeit one that is rooted in some core aspects of knowledge itself, namely abstraction and/or discretization (without distinguishing them yet)—two essential forms of simplification that are nevertheless always in need of a careful reining in. 111

Non-Knowledge and Unknowledge: An Ontological Characterization

With unknowledge in sight, what can be said about non-knowledge? Brian Cantwell Smith contends that *content*, a technical term used in analytic philosophy to designate the basis of knowledge and action, can be either *conceptual* or *non-conceptual*. *Conceptual content* involves positing a world consisting of objects, properties and relations, which amounts to carving reality into discretized individuals (seen as the bearers of properties and in relation to one another). *Non-conceptual content*, while still representational, registers the world not in the same way but rather in terms of un-individuated “features” that precede the advent of objects or individuals—something which, for Smith, is essentially an ethical matter (a matter of “mattering” as he puts it). The picture offered by non-conceptual content is essentially a “subobjective”³ one. Whereas non-conceptual content depicts the world in overwhelming detail, fit for situated and local encounters, conceptual content and objectivity in general strip it of those same details so as to make it possible to make reference over long distances (to distant things, things long gone

3 See Lowe 1992, whose subtitle is composed of three texts by Adrian Cussin, Brian Cantwell Smith and Bruno Latour (currently being translated by the author).

112 and buried in the past, not yet born in a distant future, or too shrouded in vagueness to do otherwise).⁴

With objects and ontology predicated on ethics (in Smith's sense), what remains metaphysically indispensable is to give room to reference-making. That is, to articulate causally effective local encounters with the world with non-causal long-distance reference. In other words, what is valued here is less one overarching metaphysical category (the One, the transcendental a priori, Ideas, the Body and so on) than the room needed to conceive of both proximal connections and distal reference:

[I]t is essential ... and also an anchor of common sense, that the multi-various parts of the world do not march in lockstep together. The world is fundamentally characterized by an underlying flex or slop—a kind of slack or “play” that allows some bits to move about or adjust without much influencing, and without being much influenced by, other bits. ... As a contrast, therefore, imagine a world quite unlike ours, consisting, ... of nothing but an endless series of interlocked gears. Suppose ... that every gear is constructed so as to mesh with one or more immediate neighbors, and that the entire gear universe is interconnected, but in such a way that it is still possible for them all to be turned ... so that it does not lock up. Suppose, too, that the gears are perfect: no friction, no play between the teeth The gear world would lack slop. Effects would not dissipate. If one gear were to move by even a tiny amount, every other gear

4 “Perhaps the best way to summarize this is by an analogy. I sometimes think of objects, properties, and relations (i.e., conceptual, material ontology) as the long-distance trucks and interstate highway systems of intentional, normative life. They are undeniably essential to the overall integration of life's practices—critical, given finite resources, for us to integrate the vast and open-ended terrain of experience into a single, cohesive, objective world. But the cost of packaging up objects for portability and long-distance travel is that they are thereby insulated from the extraordinarily fine-grained richness of particular, indigenous life—insulated from the ineffable richness of the very lives they sustain.” (Cantwell Smith, draft, 37).

in the universe, no matter how far flung, would instantly and proportionally be affected. ... If the flex were too little ... the world would lock up like the gear world, and everything would be correlated with everything else. Such a world would be too rigid, too straight, too stuffy; intentionality would be neither possible nor necessary. If the flex were too great, on the other hand, it would have the opposite problem: things would be too loose, everything would be random, and effect-transcending coordination would be impossible. Imagine ... an infinite space randomly occupied by an indefinitely large number of particles, all of which drift aimlessly around, none of which ever interact. (Cantwell Smith 1998, 199–207)⁵

Following Smith, we understand non-knowledge as the very possibility of a separation from a referent (a possibility that itself allows room to be made for “some thing,” for the ontological realm of discretized objects). The paradox is then the following:⁶ while non-knowledge makes it possible to refer without any

- 5 Compare with William James, who put great emphasis on the fact that “[n]ot all the parts of the world are united mechanically, for some can move without the others moving.” (*Some problems of philosophy* in James 1996, 1046). Latour’s project in *An Inquiry into the Modes of Existence* (Latour 2012) has been summarized the following way: “What is at stake: to take seriously the first proposition, to civilize the moderns until they do not successfully ‘make room’ [for] others. The inquiry indicates that the function of its metaphysics is simply to make a place,” commentary signed by the GECO (*Groupe d’Etudes Constructivistes*) on the online version of Latour 2012. Available at: [http://modesofexistence.org/inquiry/#a=-SET+DOC+LEADER&c\[leading\]=DOC&c\[slave\]=TEXT&i\[id\]=#doc-257&-i\[column\]=DOC&s=o&q=make+room](http://modesofexistence.org/inquiry/#a=-SET+DOC+LEADER&c[leading]=DOC&c[slave]=TEXT&i[id]=#doc-257&-i[column]=DOC&s=o&q=make+room), accessed February 26, 2017. Giving room to modes of existence (whether modern or non-modern) is the new diplomatic goal of “metaphysics.” Of peculiar interest here is the fact that modes of existence themselves are all described by certain kinds of continuity and discontinuity (“hiatuses”). This is very much in tune with Smith. So much so, in fact, that it generalizes it in a pluralistic fashion. While a systematic comparative study of Smith’s and Latour’s positions hasn’t been undertaken, it would definitely be a task well worth embarking on.
- 6 I would like to express thanks to Pierre Livet who read an earlier version of this paper and pointed out this paradox.

114 causal links, unknowledge replaces reference and the referent with causal links between actionable traces—despite the fact that the relation between such traces and any referent has become an “annoying irrelevance.”

At first glance, unknowledge appears to threaten long-distance reference since according to the definition we have adopted it no longer defers to the world, preoccupied as it is with its own self-centered efficiency. But such a criticism would be mistaken if left at that. While unknowledge denotes a peculiar lack of awareness of its limits, it is also defined by what it produces, namely, “knowledge traces.” In other words, it adds gears where there were none, where space used to provide enough room for the “world’s flex and slop,” filling in preexisting gaps, favoring the multiplication of interlocked gears and short-distance communication to simulate continuity over long-distance reference. The strategy adopted is instead one of generalized padding, where gears can be endlessly introduced and correlated with one another. Therefore, unknowledge also raises ontological questions—rather than purely epistemic ones—by threatening the middle ground between absence and presence, distance and proximity, with its overflowing stuffiness.

The threat posed by abstraction was discussed at the beginning of this paper. At this point, the picture becomes more complex. Indeed, one must make an additional distinction to properly account for the risks induced by unknowledge. Conceptual formalization is one form of abstraction. On the other hand, digital formalization partakes in abstraction while at the same time being very much concrete: actual and not just virtual in the strict philosophical sense of these words. So much so that in the end unknowledge materializes formal abstractions (which, accordingly, are no longer abstractions, strictly speaking). The ensuing risk is twofold: a) by adding a layer of connected formal traces either “on top” of distal referents or which “stand for” those, we may no longer be concerned with what we are not locally and causally connected to (which, incidentally, represents

most of the world!) and that we can only apprehend through separation and distal reference—we need to be able to partially disconnect ourselves from our local surroundings to get a broader grasp of the world; and b) by neglecting the fact that what is digitized or materialized is nothing but the representation of an abstraction (a referent) that it may never completely exhaust, we tend to forget that such formal representations may very well misrepresent their referents—as they inevitably do.⁷

Love and Felicity and Subsistence

I will address the way these ontological issues manifest themselves concretely by looking at the example of love, as studied by Eva Illouz in her inquiry on how new digital life shapes our most intimate relationships.⁸ Illouz identifies that romantic encounters become increasingly saturated by knowledge practices. Thanks to the generalization of online profiles and the metadata they contain, knowledge's role has gone awry, obliterating, as she puts it, other types of relations and reshuffling the boundaries between proximity and distance (an ontological feat of no little consequence, as we have seen).

Nowhere else is the subtle dialectic between absence and presence, distance and proximity, more at play than in the phenomenon called "love." It is not surprising then that unbalancing this relation with knowledge (under the guise of unknowledge) should put it at risk. Before intimacy grew to become a norm, we had never known that much about our love interests. Additionally, before the advent of digital cultures, social

7 P. Livet understands what Smith treats as abstractions as a virtual element of a specific ontological kind. I am with him there but cannot discuss this point much further.

8 Her presentation at the Centre for Digital Cultures (CDC) during the winter semester, dedicated to non-knowledge and entitled "Knowing way too much... Love, Therapy, Technology," is available online: <https://vimeo.com/153692828>, accessed February 28, 2017.

116 networks, online profiles and the like, we never knew that much about our *potential* love interests ahead of encountering them.

It could be assumed that the boundaries of personhood in a relationship have by and large been displaced. While profiles do seem to provide accurate (if coarse) knowledge, making visible “who” we are by maintaining the boundaries of our identity, what in fact happens is that they delegate (outsource, really) what was previously left to chance encounters to algorithms that calculate our best match.

Of course, pretending that love owes nothing to chance is not entirely new either. Sociology, for one, is a discipline that literally saw its mission (as opposed to novel writing for instance) as the shedding of light onto the social dynamics underneath the most intimate and private phenomena, including lovers’ attraction. It held dear and strived to uncover the unseen determinants at play behind the curtain. And it was correct in its own right, of course. There’s no denying that love might not escape (at least some measure of) determinism.

We should nonetheless pay heed to a paramount difference between these two cases: while sociologists did provide statistical conclusions in favor of their claims, no one ever (mis)took them as spiritual advisers. In a sense, so much has happened with the advent of social networks and dating websites. Filling in innumerable fields on a daily basis means people become both providers *and* consumers of the (un)knowledge thus produced about themselves. Whereas sociologists’ scientific take on love used to be discussed mainly among peers or an educated readership with an interest in the *discipline*, it may be said to have now infused many, if not most, of our daily transactions, and what is more, in a degraded state.

Then again, such a move might be readily welcomed. Aren’t relationships, now that we can mimic the behaviors and functional possibilities of connected objects (especially the localization bit and the availability of “leaky” knowledge traces), the

better for it? After all, no philosophical talk will likely dispel the belief that cheating is cheating and that cell phones (undoubtedly the Internet of Thing's first citizen) do provide an efficient way to learn the truth in this matter. Must we eventually backtrack on the criticism of unknowledge if deferring to the world means deferring to such simple truths?

The point is rather that deferring to the world might precisely mean something else, at least as far as love is concerned. Bruno Latour (2012) suggests that we adopt a pluralistic view on metaphysics so as to give space to phenomena that are amenable to specific felicitous or infelicitous conditions. Going back to Agre's remark, we may begin to understand why digitality is by no means harmless. Digital tools do promise transparency. It is all too easy then to treat love as demanding it. Paying heed to the felicitous conditions of love should, however, advise otherwise. Indeed, the latter may lie less in the search for truth (or knowledge) than in love's own subsistence; a matter of delicate, fine-spun dialectic between proximity and distance, presence and absence, knowledge and non-knowledge, put at risk when (un)knowledge takes over in its "profusing transparency" (talk of "transparency" bears witness to an interesting choice of words, as the immediate danger is either to be *blinded* by the abundance of digital traces of all kinds or to treat them indeed as transparent intermediaries). However, in order to properly understand the key role played by non-knowledge with regards to love one has to overcome unknowledge first.

Not unlike love, art also has its own conditions of felicity. Subsistence, then, may adequately translate into being able to listen to the call of the work of art (to speak Etienne Souriau's language).⁹ And that might imply an obfuscation of part of the creative process if needs be. Immediately, the question arises, "does it amount to lying?" Whenever truth is equated with transparency, with little or no regard for the phenomenon at stake, the answer

9 See Souriau 2009 and 1955.

118 is yes. By contrast, when subsistence, understood as the continuation of the phenomenon at stake, takes priority, the answer shall be a clear “no,” knowledge at that point being subservient to care. This is reminiscent of “ethnographic refusal,” a decision not to write about a subject matter to avoid putting it at risk, being exploitative or unhelpful (among the many traps that await researchers in that field).¹⁰

Latour himself expresses the need for a “crooked language” in politics as well:

[N]othing is more important for this inquiry than to find the difference between truth and falsity in politics. If there is one area where our inheritance has to be revisited, it is surely that of the hopes placed in politics and its capacity for extension. What will we have to do to situate appropriately crooked speaking once again at the center of our civility as the only means to collect the collective, and above all to universalize it? Does the Circle give us a thread like Ariadne’s that will let us speak here again of the rational and the irrational but in a well-curved way, that is, in its own language, provided that we don’t seek to judge it with the help of a different touchstone? We need this thread, for how could we stand up straight on the agora, with no hope of help from any Science and yet without giving up on reason, about controversial issues that have taken on the dimensions of the planet and in the heat of a crowd that now numbers in the billions? (Latour 2012)¹¹

10 A note on ethnographic refusal with a bibliography was recently published online: <https://discardstudies.com/2016/08/08/ethnographic-refusal-a-how-to-guide/>, accessed February 28, 2017.

11 Online notes available at: [http://modesofexistence.org/inquiry/?lang=en#b\[chapter\]=#29&b\[subheading\]=#541&a=-SET+TEXT+LEADER&c\[leading\]=TEXT&c\[slave\]=VOC&s=o&q=nothing+is+more+important+for+this+inquiry+than+to+find+the+difference](http://modesofexistence.org/inquiry/?lang=en#b[chapter]=#29&b[subheading]=#541&a=-SET+TEXT+LEADER&c[leading]=TEXT&c[slave]=VOC&s=o&q=nothing+is+more+important+for+this+inquiry+than+to+find+the+difference), accessed February 28, 2017.

Contrary to Latour, I would not restrict such a crooked language to politics. Or rather, to put it more succinctly, this kind of language can be seen as the political answer provided to a broader issue. With respect to non-knowledge, we have come to give precedence to subsistence over those truths obtained by producing oversimplifications.¹² Subsistence requires care¹³ and a hospitable middle ground, whether in politics, love, or the arts. Unknowledge, by contrast, unable as it is to defer to the world even as it conveys trite truths, striving to unbalance the middle ground, sorely lacks this aspect. As Agre puts it, “a reformed technical practice [should] employ the tools of critical inquiry to engage in a richer and more animated conversation with the world” (1995). For this conversation with the world to be genuinely fruitful, non-knowledge should be neither overlooked nor undermined.

Conclusion

Crooked language is no enemy of reason, yet neither is it to be understood in terms of truth or falsity as science understands it. As we have seen, non-knowledge, unlike knowledge (and to a lesser extent unknowledge, which is not just a degraded epistemic norm but also has an ontological dimension), is less an epistemic value than a *metaphysical middle ground* allowing for

- 12 “Add some transparency, some truth (still in the sense of Double Click), and you still get only dissolution, stampede, the dispersal of that very agora in which the fate of all categories is judged.” [http://modesof-existence.org/inquiry/?lang=en#b\[chapter\]=#13&b\[subheading\]=#211&a=SET+TEXT+LEADER&c\[leading\]=TEXT&c\[slave\]=VOC&s=0&q=agora](http://modesof-existence.org/inquiry/?lang=en#b[chapter]=#13&b[subheading]=#211&a=SET+TEXT+LEADER&c[leading]=TEXT&c[slave]=VOC&s=0&q=agora), accessed February 26, 2017.
- 13 This was tacitly acknowledged in a recent tweet published on the AIME (An Inquiry into Modes of Existence) account: “It’s one hypothesis of AIME that beings of [POL] are so fragile that their mode of existence may disappear entirely through lack of care.” Available at: <https://twitter.com/AIMEproject/status/756786152548409344>, accessed February 26, 2017. That the generalization is not made outside [POL] is a testament of Latour’s rather complex relationship to care.

120 the subsistence of a multiplicity of generic phenomena according to their own requirements (akin to Latour's modes of existence). William James himself noted that "the same thing ... can belong to many systems, as when a man is connected with other objects by heat, by gravitation, by love, *and by knowledge* [my emphasis]" (1996, 1048). Tellingly, knowledge in his enumeration was but one among many such systems.

James also noticed our relentless propensity to add what he called new "systems of concatenation": "We ourselves are constantly adding to the connection of things, organizing labor unions, establishing postal consular, mercantile, railroad, telegraphs, colonial, and other systems that bind us and things together in ever wider reticulations" (ibid.). It is somewhat ironic that we only have a negative expression like "non-knowledge" at our disposal to refer to the multiplicity of these systems of concatenations minus one... Such is the overwhelming weight of unknowledge today: no longer a norm but rather a system of concatenations that not only overshadows and twists others but eventually jeopardizes their conditions of subsistence.

I would like to thank the CDC for the kind invitation to be involved in the semester dedicated to non-knowledge as a fellow in November 2015, and to express particular gratitude to Martina Leeker.

References

- Agre, Philip E. 1995. "The Soul Gained and Lost." *Stanford Humanities Review* 4 (2): 1–19.
- Agre, Philip E. 1997. "Toward a Critical Technical Practice: Lessons Learned in Trying to Reform AI." In *Bridging the Great Divide: Social Science, Technical Systems, and Cooperative Work*, edited by Geoffrey C. Bowker, Les Gasser, Susan Leigh Star, and William Turner. New York: Erlbaum Press.
- Cantwell Smith, Brian. 1998. *On the Origin of Objects*. Cambridge, MA: MIT Press.
- Cantwell Smith, Brian. "The Nonconceptual World." (unpublished draft paper)
- Carus, A. W. 2007. *Carnap and Twentieth-Century Thought Explication as Enlightenment*. Cambridge: Cambridge University Press.
- Centre de Sociologie de l'Innovation. 2013. *Sociologie des agencements marchands: textes choisis*. Paris: Mines ParisTech.

- James, William. 1996. *Writings: 1902–1910*. Published as *The Library of America* 38, edited by Bruce Kuklick. New York: Literary Classics of the United States.
- Latour, Bruno. 2012. *Enquête sur les modes d'existence: Une anthropologie des Modernes*. Paris: Éditions La Découverte.
- Lowe, Adam. 1992. *Registration Marks: Metaphors for Subobjectivity*. London, UK: Pomeroy Purdy Gallery.
- Monnin, Alexandre. 2015. "L'ingénierie philosophique de Rudolf Carnap: De l'IA au Web sémantique." *Cahiers philosophiques* 141 (2): 27. Accessed February 26, 2017. doi:10.3917/caph.141.0027.
- Richardson, Alan. 2013. "Taking the Measure of Carnap's Philosophical Engineering: Metalogic as Metrology." In *The Historical Turn in Analytic Philosophy*, edited by Erich Reck, 60–77. Basingstoke: Palgrave Macmillan.
- Souriau, Étienne. 1955. *L'Ombre de Dieu*. Paris: Presses Universitaires de France.
- Souriau, Étienne. 2009. *Les différents modes d'existence, suivi de De l'œuvre à faire*. Paris: Presses Universitaires de France.