VI

BLINDED BY SCIENCE? SPECULATIVE REALISM AND SPECULATIVE CONSTRUCTIVISM

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Introduction: Speculative Realism and Scientism

Within contemporary philosophy, there is renewed interest in speculative philosophy insofar as it provides an opportunity to deal with the anthropocentric perspective that has held Western philosophy in check since Kant. According to philosophers working under the banner of 'speculative realism', the inseparability of thinking and being, or so-called 'correlationism', prevents thought from considering reality independent of a knowing subject that provides the conditions of possibility and meaning of knowledge.[1] Supposedly, speculative philosophy can only live up to its ideal to explore 'the great outdoors' once the correlate of being and thought is rejected. Even though speculative realists are not a homogenous group, they do collectively argue for the importance of ontological issues and attribute an important role to realism and scientific theories such as materialism.[2]

In what follows, we will formulate some of the reservations we have about this renaissance of ontology as a philosophical practice. While we agree that anthropocentrism has become increasingly problematic both in science and in philosophy (not to mention, in art), the speculative-scientistic faith in rationality does not seem to be an adequate response. In particular, we think that the rationalist fascination with theoretical models puts us at risk of blinding ourselves to their practical sense, even to the point of eliminating the very question of politics. As Gilles Deleuze and Félix Guattari once put it, politics precedes being; as a consequence, even the most theoretical ontological truth ought to be evaluated not from the point of view of truth – let alone that of human subjectivity – but from the point

1 Q. Meillassoux, *After Finitude* (London: Continuum, 2006).

2 L. Byant, N. Srnicek, Graham Harman (eds.), *The Speculative Turn. Continental Materialism and Realism* (Melbourne: re.press, 2011).

of view of that for which it has real and not just theoretical consequences. Just as what science discovers about the world cannot be separated from the question of how it impinges upon the world, including all other practices that simultaneously exist, speculation should be taken from the calm world of the science of being to the agitated ontology of the world, where its constructions must effectively prove their value.

We will develop this argument by comparing the work of two authors, Manuel DeLanda and Isabelle Stengers, who both find their philosophical mentors in Deleuze and Guattari, yet whose work couldn't be further apart in terms of the extent to which they stake a claim to knowledge of a (presupposed) world 'out there'. DeLanda mobilizes a Deleuzian ontology, to carve out a realism in which the force of computational models is used to produce stable functions, describing morphological relations from which the world emerges. Stengers takes the processes from which knowledge is produced as her starting point, and values scientific knowledge as events in which consensual knowledge about particular phenomena may be established momentarily, only to be unsettled later on. In other words, whereas DeLanda used computational models to establish robust functions and thus seeks to align philosophy with scientific practice, Stengers sees scientific knowledge as established through negotiation and open for contestation. She thus reserves for philosophy a language that serves to (re-)dramatize scientific achievements.

Bootstrapping Ontologies

In *Philosophy and Simulation*, DeLanda refines the conceptual framework developed in his earlier books and proposes a new agenda for science and philosophy. DeLanda wishes to provide scientific explanations of 'emergence': processes where 'novel properties and capacities emerge from a causal interaction'.[3] Whereas science was previously preoccupied with 'simple laws acting as self-evident truths (axioms) from which all causal effects could be deduced as theorems […] [t]oday a scientific explanation is identified not with some logical operation, but with the more creative endeavor of *elucidating the mechanisms that produce a given effect*.'[4]

DeLanda deploys a conceptual apparatus that describes mecha-

3 M. DeLanda, *Philosophy and simulation: the emergence of synthetic reason* (London: Continuum, 2011), p. 1.

4 *Ibid*., p. 2. Emphasis added.

nisms of emergence: emergent properties, capacities and tendencies. The sharpness of a knife is an example of an *emergent property*. The shape of the cross-section of the knife makes up its sharpness, which requires the knife's metallic atoms to be arranged in such a manner that they form a triangular shape. Sharpness features emergence, since individual metallic atoms cannot produce the required triangular shape. What is more, sharpness provides the knife with the *capacity* to cut things. However, this capacity remains potential without a relational event; in this case, an encounter with something that has the capacity to be cut by the knife. Also, the metallic atoms of the knife must have the capacity to be arranged in such a manner that sharpness emerges. Finally, the knife's blade may have the *tendency* to liquefy if certain conditions change: for instance, in case its environment exceeds a particular temperature. Like capacities, tendencies are closely related to relational events (e.g. rising temperatures) but also to emergent properties, since the metallic atoms of the knife need to interact in such a manner that the blade melts – something individual atoms cannot do.

Whereas tendencies can be enumerated (e.g. the states in which a particular material find itself, such as solid, liquid, or gaseous), capacities are not necessarily finite due to their dependence on being affected and/or affecting innumerable other entities. In such events, DeLanda argues in Deleuzian fashion, capacities and tendencies become 'actual', but 'neither tendencies nor capacities must be actual in order to be real.'[5] Here DeLanda draws upon Deleuze's actual-virtual distinction, where the virtual is not so much a 'possible' lacking reality, but rather something fully real, waiting to be actualized. In Deleuze's ontology, the actual is not the point of departure of change and difference, but that which has been effected by potentiality, or, the virtual.[6]

DeLanda defines the virtual aspects of entities by their emergent properties, capacities and tendencies, which constitute a 'structure of the space of possibilities'[7] that can be explored by means of computer simulations. These exploration proceed in a manner he calls 'bootstrapping': 'a realist ontology may be lifted by its own bootstraps by assuming a minimum of objective knowledge to get the process going and then accounting for the rest.'[8] The structures of spaces of possibilities have an 'objective ex-

5 *Ibid*., p. 5.
6 G. Deleuze, *Difference and Repetition* (London: Continuum, 2004).
7 M. DeLanda, *Philosophy and simulation: the emergence of synthetic reason*, *op. cit*., p. 5.
8 M. DeLanda, 'Ecology and Realist Ontology'. In B. Herzogenrath (Ed.), *Deleuze/ Guattari & Ecology*, (London: Palgrave Macmillan, 2009), pp. 27-28.

istence'[9] that can be investigated mathematically, by the imposition of an arrangement through formalization or 'parametrizing'.[10] Computer simulations enable exploration by allowing experimenters to stage interactions between different entities and investigate the emergent wholes that are the result of these interactions, thereby gaining an understanding of mechanisms of emergence. Philosophy can fulfill the role of synthesizing simulation-enabled insights 'into an emergent materialist world view that finally does justice to the creative powers of matter and energy.'[11]

For DeLanda, science need not neutralize the 'intensive' or differentiating properties of the virtual, much like Deleuze and Guattari argued. In this sense, he has much to offer constructivist debates since his work 'attempts to provide both an ontological and epistemological alternative to philosophies of science based on axiomatic systems, deductive logic, and essentialist typologies, one that is grounded in *creative experiment* rather than theory, in the *multiplication* of models rather than the formulation of universal laws.'[12] However, unlike his mentors, DeLanda grants a particularly authoritative role to science in enabling a rigorous ontology of the virtual.

Eliminativism

In the process of bootstrapping, DeLanda wishes to avoid 'the postulation of general entities (ideal types, eternal laws)', since 'for a realist whose goal is to create a mind-independent ontology, the starting point must be those areas of the world that may be thought of as having existed prior to the emergence of humanity on this planet.'[13] Here DeLanda aligns himself with contemporary critiques of correlationism. By focusing on 'mechanisms of emergence' that produce the subjects studied by various scientific disciplines (such as meteorological phenomena, insect intelligence, and Stone Age economics), science now has the ability to describe '[w]holes the identity of which is determined historically by the processes that initiated and sustain the interactions between their parts.'[14] Concepts

9 M. DeLanda, *Philosophy and simulation: the emergence of synthetic reason*, p. 5.
10 *Ibid*., p. 187.
11 *Ibid*., p. 6.
12 W. Bogard, Book Review: How The Actual Emerges From The Virtual. *International Journal of Baudrillard Studies,* 2(1). Emphasis added.
13 M. DeLanda, 'Ecology and Realist Ontology', *op. cit*., p. 28.
14 M. DeLanda, *Philosophy and simulation: the emergence of synthetic reason*, *op. cit*., p. 3.

which do not elucidate sequences of events that produce emergent effects are considered irrelevant for scientific analyses. Philosophy emerges renewed, banished of reified generalities like 'Life', 'Mind', and 'Deity'.[15] Thus, DeLanda's book on simulations furnishes what we propose to call a 'robust realism': it features both a vigorous commitment to exploration, *and* a boisterous dismissal of knowledge that fails to contribute to what DeLanda hails as an ideal of scientific rationality.

A sense of ontological completion takes root in DeLanda's work over the course of his various publications: from a more speculative alternative history produced by a 'robot historian',[16] via the erudite exploration of the ability of science to engage intensities,[17] to his latest work on simulations that exerts a confidence that readers with more constructivist commitments may find troubling. DeLanda's commitment to intensities and the virtual notwithstanding, he also explicitly claims that knowledge created by means of simulations must abandon 'mystifying entities'.[18] Philosophers are suspected of a 'fear of redundancy', which 'may explain the attachment of philosophers to vague entities as a way of carving out a niche for themselves.'[19] DeLanda's claims come across as a roll call: 'the future of multiagent simulations as models of social reality will depend on how social scientists can affect this technology by deploying it creatively and on how they can be affected by it through the possession of the right social ontology.'[20] Due to the fact that computational power and data storage are becoming cheaper and more abundant, DeLanda argues in a celebratory manner, simulations will become more and more accessible over time.[21] This shows that DeLanda's work is devoid of illustrating the socio-material assemblages in which simulation is carried out, and for whom knowledge produced by means of simulations is relevant.[22]

15 *Ibid*.
16 M. DeLanda, *War in the Age of Intelligent Machines* (New York: Zone Books, 1991).
17 M. DeLanda, *Intensive Science and Virtual Philosophy* (London: Continuum, 2002).
18 M. DeLanda, *Philosophy and simulation: the emergence of synthetic reason*, *op. cit*., p. 2.
19 *Ibid*., p. 3.
20 *Ibid*., p. 183.
21 *Ibid*., p. 148.
22 E.g. A. MacKenzie *Mechanizing proof : computing, risk, and trust* (Cambridge, Mass.: MIT Press., 2001); G. Gramelsberger, *Computerexperimente: Zum Wandel der Wissenschaft im Zeitalter des Computers* (Bielefeld: Transcript Verlag, 2010); E. Winsberg, *Science in the Age of Computer Simulation* (Chicago: Chicago University Press, 2010).

Cosmopolitics

Proclaiming a privileged role for any scientific enterprise is highly problematic for Stengers, for whom the objectivity attributed to science needs to be seen in the context of historical events, in which science was endowed with the ability to speak on behalf of its subject matter. For example, the Scientific Revolution that began with Galileo Galilei and that conjoined empirical observation with mathematical descriptions, thus furnishing the ideal image of what is still seen as 'true science' today: the ability to explain and predict phenomena, in the objective world 'out there', by means of quantitative methods. In *The Invention of Modern Science*, Stengers characterizes the event of the experimental invention which produced Galilei as its spokesperson as 'the invention of the power to confer upon things the power of conferring on the experimenter the power to speak in their name'.[23] Precisely insofar as these three powers constitute an event in the history of science, it marks not a naturalization of the falling body. On the contrary, it is an unnatural construction because it is based on an abstraction of all friction. It is not a convergence between man and nature, but a divergence, a construction, relating a very specific type of human (the scientist), endorsing very strong obligations, to a very specific kind of phenomena (uniform acceleration), verifying very selective 'disciplinary' requirements. The accomplishments of dynamics are indeed triumphs of scientific imagination and invention, but they are also expressible as physical 'laws' that are bound to the very particular sort of questions addressed: the nature of forces in finite interactions that could be treated mathematically with linear equations. They are hardly applicable to modern economies or the brain.

Thus, the advent of the modern sciences is an event replete with underlying tensions that should not be veiled. This implies a refusal 'to reduce a situation to what the passing of time gives us power to say about it today.'[24] In scientific experiments, objects are witnesses framed in such a way that

23 See I. Stengers, *The Invention of Modern Science* (Minneapolis: University of Minnesota Press, 2000), p. 88; and I. Stengers, *Power and Invention: Situating Science* (Minneapolis: University of Minnesota Press, 1997), p. 165.

24 I. Stengers, *Thinking with Whitehead: a free and wild creation of concepts* (Cambridge, Mass.: Harvard University Press, 2011). Quoted in Adrian Mackenzie, Is the Actual World all That Must be Explained? The Sciences and Cultural Theory: Review Essay of Manuel Delanda, *Intensive Science, Virtual Philosophy* (2002) and Isabelle Stengers, *The Invention of Modern Science* (2000). *Journal for Cultural Research,* 9(1), 2005, p. 104.

their behavior confirms the relevance of the aspects of the world mobilized to explain it. But the innate weakness of science is that it tends to turn the entire world into the witness of its own reason and thus immunizes itself against the events of the world. This happens, for example, when Quentin Meillassoux celebrates 'Galileism'[25] or the mathematization of nature as an emancipatory stance (knowledge equals power), whereas he simultaneously realizes it lacks all relevance since nothing real follows from it (the matter of fact that 'anything is possible' is without all concern). By contrast, Galileo's invention is the coming into existence of a new and very particular kind of thinking, not just a matter of a thinker entertaining a new thought. It is a cosmological singularity, not just an epistemological event belonging to the history of science.

Another thinker who has engaged with the power of science to speak on behalf of the world is Bruno Latour, a French anthropologist-sociologist of science, whose work has recently come to be seen in a more ontological light.[26] Like speculative realists and his fellow-traveller Stengers, Latour criticizes anthropocentric worldviews and proposes to replace them by networks composed of human and non-human actors (also called 'actants'). According to Latour, scientific knowledge cannot be based on an objective and accurate representation of a (postulated) outside world, but should rather be seen as a product of scientific research. Research on the structure and status of scientific knowledge can explain how and why scientists take objectivity, accuracy, reliability and truth of scientific knowledge for granted. The work and maintenance that make up scientific knowledge can be explained by an analysis of 'actants' and the ways in which they are brought together and change through a process that Latour describes as 'translation'. The work of the physicist and chemist Boyle can serve as an example. By bringing together air, scientific instruments such as air pumps, and a group of 'independent' spectators, Boyle was able establish his famous law that describes how the pressure of a gas decreases once the volume of a gas increases. Subsequently, the network of actants underlying Boyle's law is hidden from view in a process of 'purification'. As a result, Boyle's law acquires the stature of a representation of fundamental principles of nature. Scientific theories are thus detached from their history and obtain the status of pure representations of nature.[27] Contrary to the modern

25 Q. Meillassoux, *After Finitude*, op. cit., p. 113.

26 G. Harman, *Prince of Networks: Bruno Latour and Metaphysics* (Melbourne: re.press, 2009).

27 See B. Latour, *Science in Action : How to follow scientists and engineers through society* (Cambridge, Mass.: Harvard University Press, 1987) and B. Latour, *We*

ideal of purity, Stengers' use of the concept of power already indicates that the event of the invention of modern science was not neutral, but possessed its own constitutive kind of power. 'The sciences do not depend on the possibility of representing; they invent the possibilities of representing, of constituting a fiction as a legitimate representation of a phenomenon.'[28] The intrinsic connection between power and representation enables Stengers to frame modern science not only as cosmological event, but also as a cosmopolitical invention, without reducing science to power play ('physics is a social practice like any other') or pretending there is a stronghold from which politics can be denounced or judged objectively (*eppure si muove*). The eliminativist tendencies of modern science, including those present in the work of DeLanda and certain other speculative realists, may therefore be contrasted with Stengers' 'diplomatic' criterion as proposed in *L'Invention des sciences modernes* (1993) for 'hard science' no less than 'radical politics', a criterion which she labels 'the Leibnizian constraint'.[29]

As the work of a great mathematician, philosopher, theologian and diplomat, Leibniz's *Monadology* (1714) offers a synoptic perspective before the time of specialization, in which metaphysics constitutes the foundations for such peace. He defined philosophy as a *scientia generalis*, an encyclopedia in which all 'sectarian' forms of knowledge could be included and 'taken further than before'.[30] The only pragmatic constraint was his famous declaration that the various ways of thinking should respect 'established sentiments'. According to Stengers, this was not meant, as is usually thought, in the 'shameful' (Deleuze) sense of the will not to clash with anyone, that is, to establish consensus in the service of Power. Rather, it is a principle of responsibility for the consequences of what one says and does, 'much as a mathematician 'respects' the constraints that give meaning and interest to his problem.' Just as in mathematics, an invention means not the destruction of a past definition and questions, but its conservation as a particular aspect of a transformed definition leading to new questions, '[t]he problem designated by the Leibnizian constraint ties together truth and becoming, and assigns to the statement of what one believes to be true the responsibility not to hinder becoming: not to collide with established sentiments, so as to try to open them to what their established identity led them

Have Never Been Modern (Cambridge, Mass.: Harvard University Press, 1993).

28 B. Latour, 'Foreword. Stengers's Shibboleth', in I. Stengers, *Power and Invention: Situating Science* (Minnesota: University of Minnesota Press, 1997).

29 I. Stengers, *The Invention of Modern Science*, op. cit., pp. 15-18.

30 G. W. Leibniz, *New Essays on the Human Understanding* (Cambridge: Cambridge University Press, 1982), p. 71.

to refuse, combat, misunderstand.'[31] Put differently, the Leibnizian constraint forces us to distrust words that tempt us either to reduce one practice to another (science is only a social construction) or to reduce differences to an irreducible opposition (science is opposed to politics or religion or to what Meillassoux calls 'fideism'). Yet this doesn't imply some kind of relativism of truth. Rather, it puts its bets on 'truth of the relative'. In terms of Galilei's experiment, Leibniz aims at a 'maximization of friction' and thus at a recovery of what has been obscured by specialized abstraction. This is what makes Leibniz a 'minor key' philosopher for Stengers: a philosopher of recalcitrance[32] who relates the aggressive passion for truth to a 'possible peace, a humor of truth'[33] and who demands us to speculate not about a final conception of the world, but about the collective becoming of practices, in a world full of different and unforeseen events.

At the core of Stengers' work lies the project of an 'ecology of practices', which can be aligned with what Latour has called the 'principle of irreducibility'. This principle indicates that 'nothing is, by itself, either reducible or irreducible to anything else.'[34] As Harman explains: 'In one sense we can never explain religion as the result of social factors, World War I as the result of rail timetables, or the complex motion of bodies as pure examples of Newtonian physics. Yet in another sense we can always attempt such explanations, and sometimes they are fairly convincing. It is always possible to explain anything in terms of anything else—as long as we do the work of showing how one can be transformed into the other, through a chain of equivalences that always has a price and always risks failure.'[35] In this sense, science is 'condemned' to persistent experimentation in the form of producing explanations, by following the 'chains of equivalences'. However, even though science is a matter of experimentation, it is constantly tempted to judge. Judging always happens in the name of something given *a priori* and in relation to which the *a posteriori* can be abstracted. 'The judge is the one who knows, *a priori*, according to what categories it is appropriate to interrogate and understand that with

31 I. Stengers, *The Invention of Modern Science*, op. cit., p. 15.

32 I. Stengers, 'The Cosmopolitical Proposal'. In B. Latour & P. Weibel (Eds.), *Making Things Public: Atmosphere of Democracy* (Cambridge, Mass.: MIT Press, 2005), p. 188.

33 I. Stengers, *Cosmopolitics I*. (Minneapolis: University of Minnesota Press, 2010), p. 4.

34 B. Latour, *The Pasteurization of France* (Cambridge, Mass.: Harvard University Press, 1988), p. 158.

35 G. Harman, *Prince of Networks: Bruno Latour and Metaphysics*, op. cit., pp. 14-15.

which he is dealing.'[36] But judging as such is opposed to construction; the application of principles is opposed to the original event, and the practical discovery of the possibility to submit a phenomenon to experimentation.[37]

According to Latour, the deployment of a completed ontology should be lamented since it implies new ontologies cannot be developed. Instead, Latour favors a pragmatist perspective that emphasizes the need to accurately describe the world and to connect with the practices in which networks of 'actants' are produced and maintained. By characterizing his metaphysics as 'experimental', Latour dissociates himself explicitly from philosophers who want to deliver exhaustive ontologies: ' It's experimental because if we have to begin to agree on the basic furniture of the world […] then politics is certainly finished, because there is actually no way we will settle these questions'.[38] The experimental nature of metaphysics ensures its alignment with the practices and political aspects of knowledge production. Cosmology is of secondary importance.

As an alternative to the expansion of scientific rationality, cosmopolitics involves a process of 'collective experimentation'.[39] The challenge of cosmopolitics is how to bring about a form of empowerment: to appeal to practitioners (including, but not confined, to scientists) in such a manner that they learn to understand their responsibility for and commitment to understanding the world from their own strength, or from what is relevant to them. In a recent essay, Stengers observes that 'happily equating our understanding with an active elimination of everything about 'us' that cannot be aligned with a so-called 'scientific' conception of matter, is now widely endorsed in the name of scientific rationality.'[40] This so-called 'eliminativism' relegates obstacles to its goals to an epistemological waste bin. Thus, struggle may be omitted from situations that involve conflicts, e.g. by refusing to acknowledge the response of Indian peasants to GMOs. Exceptionalism precludes scientific practitioners taking into account possible becomings of oth-

36 I. Stengers, *Power and Invention: Situating Science*, op. cit., p. 163.
37 *Ibid*., p. 164.
38 B. Latour, G. Harman, and P. Erdélyi, *The Prince and the Wolf: Latour and Harman at the LSE* (London: Zer0 Books, 2011), p. 46.
39 I. Stengers, 'Thinking with Deleuze and Whitehead: A Double Test'. In K. Robinson (Ed.), *Deleuze, Whitehead, Bergson: Rhizomatic Connections* (New York: Palgrave Macmillan, 2009).
40 I. Stengers, 'The Symbiosis Between Experiments and Techniques'. In J. Brouwer, A. Mulder, and L. Spuybroek (Eds.), *The Politics of the Impure* (Rotterdam: NAI Publishers, 2010), p. 368.

ers and forces the production of knowledge to 'mostly follow the landscape of settled interests'.[41]

By staking a claim to rationality, scientific practices and other practices (Stengers provocatively gives the example of tarot-card reading) are seen as a valid and viable claim to knowledge, leaving room for the elimination of those kinds of knowledge that do not contribute to the production of objective knowledge. Stengers argues assessments of the value of different practices should 'refrain from using general judgmental criteria to legitimate their elimination, and to refrain from dreaming about a clean world with no cause to wonder and alarm … I do not claim we should mimic those practices, but maybe we should accept to seeing them and *wonder*.'[42] It is exactly a sense of wonder or imagination that is important in simulation practice, as indicated in the studies of simulation practice from a STS perspective[43]. Much of DeLanda's work on simulations suggests a similar notion of imagination through exploration in the form of exploration, but is ultimately devoted to formalization in the name of 'purified' science that resolutely distinguishes the objective and the nonsensical. We therefore invite readers of DeLanda's book to ask to what extent it leaves room for imagination. In the light of Stengers' concerns about eliminativism, contemporary notions of scientific relevance, and the perceived appeal of quantitative methods enabled by computational techniques, DeLanda's sweeping claims appear eerily devoid of questions of relevance and socio-political aspects of scientific practice.

Speculative Constructivism

Stengers draws a strict distinction between science as a creative enterprise, a practice of invention and discovery, and science's modernist claim to invalidate all other discourses. She does not have a problem with science's actual, particular positive claims, but rather with its pretensions to universality and the way it is mobilized to deny the validity of all claims and practices other than its own. If there is one criterion according to which

41 I. Stengers, 'Wondering about materialism'. In L. Bryant, G. Harman, N. Srnicek (Eds.), *The Speculative Turn: Continental Materialism and Realism*, op. cit. p. 377.

42 *Ibid*., p. 379. Emphasis added.

43 O., Naomi, K. Schrader-Frechette, and K. Belitz. "Verification, Validation, and Confirmation of Numerical Models in the Earth Sciences." Science 263, no. 5147 (1994): 641-46.

we can evaluate scientific practices, it is what Latour has called 'risky construction'.[44] We don't gain access to anything without a construction. As a scientist, Galilei did not pre-exist the invention of the powers through which he came into existence. Even if experimenters may well know in advance what they want to achieve, as was the case with Galilei, a long process of 'tuning' (Andrew Pickering) will nevertheless be needed, within which nothing will be trusted, neither the human hypothesis nor the observations made. What counts is therefore not whether gravity exist as a matter of fact, but the efficacy of this existence. This is the pragmatist constraint: what counts is the ethopoetic transformation an invention is meant to induce. It's the practitioners who take the risk; the speculative philosopher merely learns about their dreams, ambitions and fears.

At the same time, we may wonder what speculation has to add to the world by itself. What does philosophy construct? Besides the 'tender-minded' irenism of Leibniz, Stengers is heir to the empiricist and pragmatist tradition of William James and most of all Alfred North Whitehead, in which she finds the diplomatic project of a 'speculative peace' among contradictory or mutually exclusive visions, ambitions, and methods. Speculative philosophy or cosmology, according to philosopher and mathematician Whitehead, 'is the endeavor to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted'. Other than a general theory, however, it aims not at the ordered unity of everything that exists, but at the 'engineering' and constant revision of conceptual tools that allow us to move from one particular form of experience to another.[45] Whitehead's main matter of concern was the 'bifurcation of nature' between a causal, objective nature and a free, subjectively perceived nature. Its incoherence is due to a 'fallacy of misplaced concreteness' as an ever renewable source of problems. The question of the naturalization of consciousness, for example, is a false problem, because experience confirms that nature belongs to the mind no less than to the body. The task of speculation is precisely to interpret them together, without opposition, hierarchy or disconnection (which belong to the logic of war) and thus make them more concrete than the abstract representations ('body', 'mind') specialized disciplines create of them. This doesn't mean to play the sad role of rendering thinkable what the bifurcation of

44 B. Latour in Isabelle Stengers, *Power and Invention: Situating Science*, op. cit. pp. XIII-XIV.

45 A. North Whitehead, *Process and Reality* (New York: The Free Press, 1979), p. 3-17.

nature has rendered unintelligible – a nature without sound or odor that a mind would hastily clothe with sound and odor – but to create new abstractions that avoid the 'reciprocal capture'[46] between mutually incompatible abstractions. For Whitehead, too, it is therefore not common sense that must be revised, but the power of theoretical abstractions that fixate it into a destructive routine thought.[47]

Stengers gives the example of 'the rather horrifying experience when trying to speak with so-called neo-liberal economists, the stone-blind eye they turn against any argument implying that the market may well be capable of repairing the destructions it causes.'[48] But one can also think of the arrogance with which some neurobiologists or evolutionary psychiatrists speak about psychoanalysis, for example, that it couldn't contrast more with the effective history of sciences: that is, the systematic connection between the production of knowledge and the creation of new practical possibilities, leading to new questions and new ways of belonging. Both cases reveal an obstinate lack of resistance among professionals to their own poisonous abstractions that takes the form of a kind of nasty, even entrepreneurial stupidity (she uses Deleuze's concept of *bêtise*) feeding on the devastating character of its own consequences: 'This stupidity currently organizes a situation in which *homo economicus* warrants an essential coincidence between the law of free competition and what is mathematically defined as progress, in which *homo geneticus* is lending a helping hand, as it adds that we are chained to a past that would make it utopian to escape

46 I. Stengers, *Cosmopolitics I*., op. cit., pp. 90-91.

47 'This attitude towards common sense or instincts designates Whitehead as a post-Darwinian thinker. What we call common sense is not an anthropological static feature to be opposed to high level speculation, it is maddening, always escaping identifying frames, as it tells of our ability to meaningfully interpret and orientate ourselves in a fluid, ever-changing plurality of situations. For Whitehead, it was the touchstone for any realist doctrine, as it enfolds the bewildering variety of what it means to be both in touch with and touched by 'reality', as it unfolds the dynamics of having things matter and having the way they matter matters. If there must be a speculative creation of concepts, it is thus not to revise common sense but to disarm the power of theoretical abstracts that fix the maddening achievement we call common sense into common sense doctrines, and to contribute continuing the adventure of common sense by unfolding what it demands and having it matter.' (Isabelle Stengers, 'Thinking with Deleuze and Whitehead: A Double Test'. In K. Robinson (Ed.), *Deleuze, Whitehead, Bergson: Rhizomatic Connections*, op. cit., 14).

48 I. Stengers 'Thinking with Deleuze and Whitehead: A Double Test', op. cit., p. 12.

our habits of non-sustainable competition.'[49] In the face of this, Stengers fully subscribes to Whitehead's assignment of the task of philosophy to take care of our 'modes of thought' and 'civilize' our abstractions by enlarging our imagination.[50] What is necessary is a diplomatic practice with its own technical know-how, irreducible to and yet not parasitical on the practices it makes communicate.

Like Leibniz and Whitehead, moreover, Stengers holds that any experience may be transformed, but that it can never be interpreted away in terms of conditions that annihilate what mattered in the first place. This is why the speculative question for her is how to 'think for' (Stengers follows Deleuze here) a possible peace – that is, to bet on it under the test of its virtual presence – and not against it.[51] The ideal of peace cannot be based on a rejection of the ambitions and passions of science, as if speculation was just another attempt to judge over experience according to the modern question of 'what can we know?'. 'The question of what is an object and thus what is an abstraction must belong, if nature is not allowed to bifurcate, to nature and not to knowledge alone'.[52] Hence speculative philosophy is not critical or deconstructivist, as if it would suffice to state that objective knowledge capable of reducing consciousness to a 'state of the central nervous system' requires consciousness as its condition of possibility. Instead, Stengers stresses with Deleuze that it is 'constructivist' and has no foundation but only creative advance as its ultimate. Philosophy constructs conceptual tools capable of 'giving to the situation the power to make us think'.[53] Every matter of fact has a virtual power of thought, but it takes inventiveness to actualize this power and turn it into a matter of concern, i.e. to turn it back into an event. For Whitehead, abstract propositions can act as a 'lure for feeling 'something that matters'', for eliciting interest and setting up a matter of concern.[54] In her own practice, similarly, she seeks to create new

49 See I. Stengers, 'Achieving Coherence. The Importance of Whitehead's 6th Category of Existence.' Presented at The Importance of Process – System and Adventure, the sixth Biosemiotic conference. Salzburg. 2006.

50 Whitehead, *Process and Reality,* p. 17.

51 I. Stengers, 'The Cosmopolitical Proposal'. In B. Latour & P. Weibel (Eds.), *Making Things Public: Atmosphere of Democracy* (Cambridge, Mass.: MIT Press, 2005), p. 186.

52 I. Stengers, *Thinking with Whitehead. A Free and Wild Creation of Concepts*, op. cit. p. 95.

53 I. Stengers, 'The Cosmopolitical Proposal', op. cit., p. 185.

54 Abstraction not as unilateral generalization that ignores empirical specificity (e.g. in logic), but singularization, an operation that exploits the singularirty of what it deals with in constructing new forms of definitions. (see Isabelle Stengers,

'practical identities', new ways for practices to be present, to connect, to become, to belong to something communicated between diverging practices and practitioners, usually at the cost of established contraries.

Thus if scientific reason and politics must be re-associated in a non-hierarchical and non-reductionist way, this is because the vulnerability of each in its separation is proven each time when, in the name of scientific objectivity, problems are defined and redefined that implicate human history. In democratically organized societies, 'politicians' are supposed to be occupied with decisions about how things should be ('prejudiced opinions') whereas 'experts' provide the conditions in terms of how things actually are ('neutral reality'). In practice, Stengers argues, this division of labour between human domain of power and the natural domain of science does not exist, but merely forecloses the possibility of thinking in democratic categories.

In this regard, tensions between speculative realism and speculative constructivism can also be illustrated by a recent debate between Latour and Graham Harman, one of the philosophers often associated with speculative realism (and rather willing to do so himself). Whereas Latour is committed to describing the different relationships of the human and/or non-human elements that make up assemblages, Harman is committed to devising an exhaustive ontological description of the world that precedes such research. Latour finds the deployment of such a completed ontology objectionable, since it problematizes the inclusion of new elements that might come into view over time. Instead, Latour emphasizes the value of a 'pragmatic-anthropological perspective', which delivers elaborate descriptions of knowledge production. According to Latour, this yields an experimental metaphysics through which he wishes to dissociate himself from philosophers who want to exhaustively describe the world prior to engaging with socio-material assemblages. The experimental nature of Latour's metaphysics ensures its alignment with the practices and political aspects that Latour seeks to understand. Ontological descriptions, or cosmologies, are of secondary importance. What really matters according to Latour is cosmopolitics.

Cosmopolitics I., op. cit., p. 196) Abstractions vectorize concrete experience, in the same way as a mathematical circle is not so much abstracted from concrete circular forms as it lures mathematical thought into a new adventure and produces a very concrete mathematical mode of existence. See Isabelle Stengers, 'A Constructivist Reading of *Process and Reality*'. *Theory, Culture & Society* 25 (4), 2008.

Conclusion: Speculative Constructivism And Speculative Realism

The speculative constructivism proposed by Stengers and Latour takes concrete practices and the manner in which they are constructed and maintained as its starting point. This provides a different beginning and nature to philosophical inquiry: instead of thinking about what things are, speculative constructivists are concerned with the question of what politics is possible and necessary, in other words, of what things may become. Today, Stengers is still most famous as a fellow-traveller of, and commentator on, chemistry Nobel prize winner Ilya Prigogine, whose work on far-from-equilibrium systems is also essential to DeLanda's undertaking: *La nouvelle alliance* (1986 [1979]) and *Entre le temps et l'éternité* (1992 [1988]). Yet she constantly emphasizes that her work with Prigogine had nothing to do with her philosophy. Drawing from Deleuze and Guattari's arguments about the respective sufficiency of scientific functions and philosophical concepts, she argues that whereas Prigogine's lifetime work led to 'the creation of a well-defined relation between an irreducibly probabilistic time-asymmetrical mathematical representation and the class of those dynamic systems for which this representation is necessary', philosophy's specific means were of no relevance. [55] In her own work, Prigogine's somewhat romantic idea of a science of time reconciled with the rest of culture in a 'new alliance' therefore features only by allusion. As Bruno Latour writes: 'No matter how time-dependent a science of phenomena far from equilibrium can be, it remains a science, that is, an attempt at stabilizing the world'[56] – such that, ultimately, we could speak of the world as it is 'in itself'. By contrast, isn't speculative philosophy precisely the attempt to destabilize the world, to let in a bit of chaos, and to return existence to the consistency of the event?

55 'My own participation in this work was a matter of putting it into historical perspective, of following how the paradoxes and blind generalizations implied in the so-called fundamental laws of nature, acquired their strange, quasi-metaphysical authority. But it was a complete surprise and even a shame to discover the many references in philosophical and cultural studies that were made to Prigogine and Stengers' theory of irreversible time. The very association of our two names was displaying a complete misunderstanding of the demanding character of physical mathematics' own specific means.' (Isabelle Stengers, 'Deleuze and Guattari's Last Enigmatic Message', in: *Angelaki. Journal of Theoretical Humanities*, vol. 10, nr. 2, pp. 151-67).

56 B. Latour, 'Foreword. Stengers's Shibboleth', p. x.