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# Bruno Latour's *Science Is Politics By Other Means*: Between Politics and Ontology

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*“Science Is Politics By Other Means” (SIPBOM) was coined in The Pasteurization of France, Latour’s 1984 empirical study of the birth of microbiology. Yet, it encapsulates an outstanding political theory of science that Latour has never formalized and that has remained unnoticed to this day. The theory is comprised of two dimensions. The first one is the ontological labor performed by science, that is, the laboratory production of new nonhumans. The second one is the ability of science to devise and implement novel policies targeted at the new beings it produces. These “other means” are incorporated in political projects and contribute to the shaping of society. Fifteen years later, Latour published Politics of Nature (1999/2004), a full-blown political treatise equally devoted to the political character of science. It would be mistaken, however, to assume that it falls in the same SIPBOM paradigm as the Pasteur study. The compositionist theory it offers redefines politics as the institution of the nonhumans that make up external reality, a task that has traditionally been monopolized by Science. In this sense, “science is politics by other means” has become “politics is science by other means,” these “other means” now referring to “cosmopolitics,” that is, the due process advocated by compositionism. The first claim of the present paper is that the respective weight ascribed to politics and ontology is different in The Pasteurization of France and in Politics of Nature. The second claim is that compositionism is not as successful as Latour’s early theory to account for the politicity of science.*

### 1. Introduction

In 1984, Bruno Latour published in French a two-part book translated as *The Pasteurization of France/Irreductions* that has received over 7000 citations according to Google Scholar (Latour [1984] 1988). Devoted to the empirical study of Louis Pasteur and the birth of microbiology, the first part of the book has since then been associated to the (in)famous sentence “science is politics by other means” (from now on SIPBOM).<sup>1</sup> No doubt, this tagline has been a key factor in propelling Latour to fame even though the study has not received the recognition it deserves. In scientific and rationalist circles, it has been turned into an absurd and defamatory thesis according to which science is no different from politics and, as a result, does not generate facts.<sup>2</sup> In Science and Technology Studies (STS), it tends to be interpreted as the mere application of actor-network theory (ANT). To counter these reductionist views, we contend a fresh look should be taken at it. The word “science” indicates the object of study whilst “politics” commands the disciplinary gaze that should be adopted, namely, political theory. Accordingly, we will see that in the Pasteur study SIPBOM is the name of a political theory of science.

Fifteen years later, Latour ([1999] 2004) published in French *Politics of Nature*, a book that sets out to “democratize science,” as the subtitle suggests.<sup>3</sup> Unlike *Pasteurization*, it does not offer an empirical study but presents as a full-blown political treatise. Despite the difference in format, at first sight it shares with the 1984 work a common feature. In effect, Latour indicates that it is about “the political philosophy of science” (Latour [1999] 2004, p. 3). Hence, we might assume that *Politics of Nature* falls within the same SIPBOM paradigm as *Pasteurization*. This conclusion is all the more credible because Latour has never disavowed his Pasteur study or repudiated the related catchphrase. Even during his strange conversion to pragmatism, he was still claiming: “... science and technology are political, yes, but by *other* means” (Latour 2007, p. 813). Nevertheless, we will see that the assumption of a strong communality between the two works proves erroneous since their theorization of science is very different. In the first case science is an original form of political action whereas in the second it is basically an ontological endeavour.

The first part of the present paper is devoted to the in-depth analysis of the Pasteur study. Scrutiny of recent interpretations of this foundational work by

1. For a fine-grained analysis of the wording of this phrase and some of its consequences, see Nelson 2023, pp. 57–83.

2. In the second half of the 1990s, these attacks gave rise to the science wars led by physicist Alan Sokal.

3. This subtitle is misleading since Latour fundamentally promotes the state of law, not democracy (Lord and Seguin, in preparation).

key commentators shows that its contribution to the political understanding of science has been largely overlooked to this day. Since Latour has never made the effort to formalize the theory it contains, we attempt to spell it out. We show that it brings to light the unique political function of science in the modern polity, which is to add the control of nonhumans to that of humans in the shaping of society. In other words, we offer an *explicit* account of the political theory of science encapsulated in the phrase SIPBOM. The second part of the paper tackles *Politics of Nature*. We show that it contains three theoretical layers, of which the deepest constitutes the original contribution of the book: the formulation of compositionist theory. Compositionism redefines politics as the production and arrangement of the nonhumans that make up external reality, an activity that has been illegitimately monopolized by Science since antiquity and must therefore be reformed.

The first claim of the paper is that the respective weight ascribed to politics and ontology is different in *The Pasteurization of France* and in *Politics of Nature*.<sup>4</sup> If *Pasteurization* combines ontology and politics, *Politics of Nature* depicts ontology as politics. Hence, from the first book to the second we have witnessed the reversal of the meaning of the famous tagline: “science is politics by other means” has become “politics is science by other means.” The second claim of the paper is that compositionism is not as successful as Latour’s early theory to account for the politicité<sup>5</sup> of science.

## 2. The Pasteurization of France

The Pasteur study is one of the most popular works published by Latour and has deservedly generated a number of book reviews. Even if such a task were feasible, our aim here is not to provide a synthesis of those reviews. Rather, we want to contextualize our own reading by looking into the analyses of two distinguished, contemporary, and presumably authorized commentators: Gerard de Vries and Graham Harman. Despite important differences in the way they approach Latour’s work, we argue that neither of them succeeds in pinning down what exactly is political in science according to the Pasteur study. We then turn to a third scholar, Karin Knorr-Cetina. Although she was writing almost forty years ago, her reading of *Pasteurization* is much more accurate and useful to understand its revolutionary character. In the third step, we draw upon Knorr’s astute observations to sketch what we believe to be the outstanding theoretical contribution of the Pasteur study.

4. As illustrated by Harman (2014), periodization is a necessary method to apprehend Latour’s oeuvre, which spans nearly five decades.

5. The much-needed neologism “politicité” was coined by French political scientist Nicolas Tenzer (1991, p. 108). Modeled on “scientificity,” it designates the intrinsically political nature of some phenomenon.

### 2.1. Ontological Bias and Apolitical Science

The structure of Gerard de Vries' (2016) introductory book on Latour is puzzling (Seguin 2019). The third chapter is devoted to *The Pasteurization of France/Irreductions* but de Vries begins to cover the topic of Pasteur in the second chapter.<sup>6</sup> The unifying theme of the two chapters is Latour's interest in ontology. Starting his discussion on epistemological grounds, de Vries puts forward that Latour's work on Pasteur broke away from the sociology of scientific knowledge (SSK), then the dominant approach in STS, and explains the fire of criticism he received from SSK proponents in the following way: "... Latour had called this reaction upon himself. In the first place, by presenting his ideas as an extension of the programme of social studies of science, rather than as an explicit transition to another programme, which in fact it is" (de Vries 2016, p. 70). Strangely enough, de Vries does not see that Latour's was a strategic move commanded by the principles of ANT: make others believe that what you say is exactly what they would say themselves. In ANT parlance, this is called interest translation. Had Latour not pretended to be walking in SSK's footsteps, his work might have been ignored outright. Now as public relations practitioners and scientists know quite well, negative publicity is much better than deafening silence.

De Vries goes on arguing that after the social turn impinged by SSK in the 1970s, Latour has introduced an ontological turn in the study of science: "To limit our attention only to social, interpretative processes means neglecting all the 'ontological work' that is required" (de Vries 2016, p. 51). De Vries' analysis is nothing new under the sun. This claim was made twenty-two years ago in a commentary on the debate that opposed Latour to David Bloor, the main theorist of SSK: "Latour's approach marks a shift from the social determinants of scientific knowledge to the ontological labour performed by scientific activity" (Seguin 2000a, p. 503). Had de Vries acknowledged this commentary, he might have avoided the mistake of reducing the Pasteur study to a sole ontological concern. Ontology may later have become increasingly important in Latour's work on science, it is nevertheless incorrect to argue without qualification that it was his primary concern in the early 1980s. In addition to pointing out the ontological labor performed by science, the above commentary further argues that Latour does not share the object of study of SSK because he is fundamentally interested in the politics of science (Seguin 2000a). As we will see below, besides ontology the Pasteur study is predicated on another key dimension: politics. Indeed, the outstanding feature of this study is the very articulation of ontology and politics.

The count of the words "politics" and "political" shows de Vries does not neglect politics entirely. However, the terms he associates to it are quite

6. Latour has devoted several books and articles to Pasteur.

revealing. What is political in *Pasteurization* according to him? Here is the exhaustive list: doctors and hygienists' decisions; the games in which doctors and hygienists are involved; a reading of a term; a domain; forces when combined with interests; doctors and hygienists' motives and interests. One striking aspect of this inventory is the underlying individualistic framing of politics, which arguably prevents de Vries to grasp the political character of microbiology. As a matter of fact, nowhere does he qualify science or microbiology as "political." And yet he mentions several aspects, such as "the role of science in society," that clearly touch upon the political function of science. He even speaks twice of a "revolution": "... the Pasteurians revolutionized public health, veterinary practice and eventually society ..." (de Vries 2016, p. 61). Strangely enough though, he never brings his reasoning to its logical conclusion, that is, to acknowledge that science is political. Now if revolutionizing society is not doing politics, what is? Further evidence of de Vries' failure to notice the intrinsic connection between politics and science is the omission of the phrase SIPBOM, which is never mentioned.

De Vries' book is essentially a general introduction addressed to students and people unfamiliar with Latour. In contrast, Graham Harman devotes his 2014 book to the more specialized task of extracting a political philosophy from Latour's oeuvre. One would therefore expect him to put much emphasis on the political aspect of science, but this expectation is hardly met. In his analysis of *Pasteurization/Irreductions*, SIPBOM is not cited in relation to the Pasteur study but in the section devoted to *Irreductions*. The section on *Pasteurization* is mostly descriptive and remains far too close to Latour's text. Claiming that Pasteur's research is read in "political" terms by Latour, Harman recalls that the Pasteurian strategy evolved in two steps: first pre-empting the hygiene movement, then offering reluctant doctors a compromise. According to him, this shows the lack of distinction between politics and science in early Latour, an affirmation he explains in the following way: "Pasteur's actions are all alike; all involve the assembly of animate and inanimate allies in a chain that does the work Pasteur needs" (Harman 2014, p. 49). What Pasteur ultimately needs is "to consolidate his discoveries" (Harman 2014, p. 46). This is the kind of reading that explains why Latour's opponents have always charged him with downgrading science to politics in his so-called anti-science agenda.

It should be noted that just as de Vries, Harman frames politics in individualist terms since he equates it with the strategic action of one individual, Louis Pasteur. This conceptualization is problematic since it deprives politics of any distinctive character. In effect, even if we endorse the mainstream conception and define politics as a "sphere" or "field," strategy is by no means specific to it, and this has long been documented in social science and philosophy. Jürgen Habermas (1970), for instance, argues that

strategic behavior is one of the two types of purposive-rational action that characterize the domain he calls “labor” as opposed to the one called “interaction.” In a similar fashion, Michel Crozier has developed a theory of the strategic actor according to which despite their formal rules and role definitions, organizations such as firms allow actors to act strategically in a significant measure. If Harman shares de Vries’ individualist conception of politics, unlike him, though, he fails to mention aspects such as social change that might come close to acknowledging the political function of microbiology. Taking at face value Latour’s claim that *Pasteurization* is an application of the ontological proposals developed in *Irreductions*, the bulk of his analysis is devoted to the question “did microbes exist before Pasteur?” In prioritizing this ontological problem, Harman shies away from uncovering the original, non-anthropocentric, political content of the Pasteur study.

In short, both de Vries and Harman ultimately read *Pasteurization/ Irreductions* as an exercise in ontology and miss out on the strictly political dimension of science, albeit for different reasons. De Vries’ analysis mostly consists in pointing out the differences between Latour and SSK, which leads him to emphasize Latour’s extension of the symmetry principle to the ontological human/nonhuman distinction.<sup>7</sup> Harman is on the lookout to find the influence of political philosophy on Latour, but this leads him to focus on the ontological competition between entities described in *Irreductions*, at the expense of the Pasteur study. Admittedly, the two commentators’ ontological bias can in part be explained by the very features of *Pasteurization/ Irreductions*. This is a rich and dense book that performs several tasks at the risk of leaving in the background the politics/science interface. Alongside the empirical study of the emergence of microbiology, it offers a critique of rationalism, arguably the one concern that spreads over the whole of Latour’s career. It also takes issue with sociology defined as the sociology of the social and lays the premises of actor-network theory. The latter is the aspect that Latourian supporters and most STS scholars have retained from the book. Lastly, *Pasteurization* disputes the validity of SSK and, as we have seen above, replaces its object of study by a different one. As a result of these parallel scholarly endeavours, the political function of microbiology can go unnoticed.

## 2.2. The Power of the Scientific Laboratory

We may hypothesize that an additional factor accounts for de Vries’ and Harman’s ontological reading of the Pasteur study: their common neglect of the paper that Latour published under the title “Give me a Laboratory and I Will Raise the World” in anticipation of *Pasteurization*. This paper

7. Strangely enough, de Vries does not explicitly mention David Bloor’s famous symmetry principle.

appeared in a 1983 book co-edited by Karin Knorr-Cetina and Michael Mulkey. Two years later, Knorr-Cetina published a review of *Les microbes: Guerre et paix*, the original French version of *Pasteurization*. We may assume that her familiarity with Latour's 1983 paper greatly influenced her reading of the book and explains her effective grasp of the political nature of microbiology underlying the Pasteur study. True, her review contains less satisfactory threads similar to those pursued by Harman and de Vries, especially the assimilation of politics to strategic behavior on the part of Pasteur and the hygienists. She speaks, for instance, of "political mastermind strategists" (Knorr-Cetina 1985, p. 584). However, she does criticize this line of thought for being reductionist. Thus, in parallel she offers a non-anthropocentric reading, and emphasizes very significant aspects that could have put our understanding of the Pasteur study on the right tracks but were ignored by later commentators.

The first thing she notes in Latour's study is the centrality of the laboratory. She cleverly points out that besides alliances and interests "... there is another ingredient in Pasteur's success. Latour considers this to be Pasteur's use of the scientific laboratory as his base of support" (Knorr-Cetina 1985, p. 579). This observation is crucial as it contributes to withdraw politics from its individualistic framing and to push it towards science. The second aspect mentioned by Knorr is the microbe: "The microbes appear (...) as newly recognized inhabitants of the social world" (Knorr-Cetina 1985, p. 584). As we will see below, the politics of science centers on nonhumans and this quote shows that Knorr is well aware of it. The third vital dimension she emphasizes is power. She astutely remarks that Pasteur uses the lab "... to reverse the power relations between himself and the phenomena under investigation" (Knorr-Cetina 1985, p. 580). Knorr-Cetina's review thus makes it clear that among the many features that define politics, sovereign power is arguably the most important. This is consistent with Latour and Callon's later claim that the laboratory has supplanted Parliament as the locus of power in contemporary society. The final aspect highlighted by Knorr-Cetina, also noticed by de Vries though in a less satisfactory way, is *society*. She stresses that the effect of microbiology was "... the transformation of French society and medicine ..." (Knorr-Cetina 1985, p. 583). Far from treating it as one feature among others, she regards social change as the very object of the Pasteur study: "The basic question Latour sets out to answer in his historical investigation is how we can explain the transformation of living conditions and the 'revolution' of the medical sciences in Europe at the turn of the twentieth century" (Knorr-Cetina 1985, p. 578). Brought together, the four features highlighted by Knorr-Cetina effectively circumvent the ontological bias and could have paved the way for the recognition

of the political theory of science embedded in the Pasteur study. Unfortunately, her analysis was ignored by later commentators.

### 2.3. The Politicity of Science

The discursive genre of *Pasteurization*, a case study in the history of science, is deceptive. Yet, Knorr-Cetina has succeeded in seeing the forest instead of the trees and this is most likely due to her familiarity with Latour's 1983 paper which she co-edited. The paper's title foregrounds the lab whilst the allusion to Archimedes links it to power. Crucially, early on a sentence in the text provides the main analytical clue: "... sciences are used *to transform society* and redefine what it is made of and what are its aims" (Latour 1983, p. 144; our emphasis). The italicized segment in the quote carries a definition of politics, namely, the transformation of society, which is one of the most widespread conceptions found in political theory and political science. The first dimension of this transformation is the change in what society is made of. The second one is the ascribing of new aims to society. As we will see below, these two aspects are intermingled: achieving redefined aims is conditional upon a new social makeup and, conversely, changing the composition of society serves political action. Nevertheless, it is necessary to analytically distinguish these two components if we are to evade the ontological bias and properly delineate the fundamental content of the study. In what follows they are analyzed in turn.

The first dimension is the ontological labour performed by science, that is, the laboratory production of new nonhumans.<sup>8</sup> Science enacts that at any point in time society is made up of more actors than is assumed. Researchers connect events, features, and evolutions of society to new, unsuspected, or uncharacterized, beings. These new beings are not so much "socially constructed" than produced, made visible at will, controlled, thanks to the displacements and changes of scale performed by the laboratory, a process that ends up in "a reversal of the actors' strengths" (Latour 1983, p. 147). As noted in Knorr-Cetina's review, the laboratory is a material setting that exerts power, and Latour bluntly speaks of "training microbes and domesticating them" (Latour 1983, p. 148). Microbiology makes microbes visible in a Petri dish, can force them to grow faster or die, and can even modify their virulence. The controlled fabrication of new entities is undoubtedly the prerequisite for science to inimitably intervene in the shaping of society.

This leads us to the second dimension of SIPBOM without which the politic- ity of science cannot be captured. In effect, the ontological labour of science

8. The word "laboratory" must not be understood as a place enclosed by walls but as a set of material practices. Observatories, large equipments, mathematical models or computer simulations fall in this category. To capture the generic meaning of the term, Latour later replaced it by "centers of calculation."



generates the power to pursue new, redefined, aims. In the absence of such aims, far from being a political endeavour science is nothing but a freak show: “Cultivating the microbes was a curiosity ...” (Latour 1983, p. 148). Now science does not operate in a vacuum and its aims are part of conventional political goals advanced by polities. In the nineteenth century, European states were engaged in urban reform, the rehabilitation of destitute people, public health, colonial expansion, the maximization of profit, and so on. Microbiology helped these states achieve their goals in an unexpected way. As Latour points out: “... politics is made not with politics but with *something else*” (Latour 1988, p. 56). The new aims set by science thus act as the middle term that connects the goals of polities and the newly created microbes: “... all the interested commercial, colonial, and medical interests had to pass through their [Pasteurians’] laboratories ...” (Latour 1983, p. 159).

One can see here why science exerts a unique political function. It increases the capacity to carry out political projects by means of novel policies targeted at the new beings it produces. In the case of microbiology, the original policy that helped reconcile health with wealth is graphically described by Latour: “Everywhere Pasteurian laboratories were established as *the only agency able to kill the dangerous actors* that were until then perverting efforts to make beer, vinegar, to perform surgery, to give birth, to milk a cow, to keep a regiment healthy and so on” (Latour 1983, p. 158; our emphasis). Whilst government implements policies aimed at making humans act in certain ways, science and science alone devises and implements policies that are adapted to nonhumans because they are made of a range of laboratory practices. For killing microbes, science offers a range of tools centered on vaccination: “... disinfection, cleanliness, conservation, inoculation gesture, timing and recording ...” (Latour 1983, p. 152).

The above discussion shows that the transformation of society by science does not merely consist in adding to it new nonhumans. Changing the makeup of society is only the precondition for acting with and on the new added beings. These beings are integrated to political projects and forced to obey in a number of social settings thanks to the use of scientific devices. Thus, the Pasteur study brings to light that in modernity the shaping of society is inseparable from what happens within the lab. Scientific action leads to a massive increase in the power to achieve set goals and transform society. Latour puts it in the most vivid way: “Political politics fails, but politics by other means succeeds superlatively” (Latour 1988, p. 142). From this analysis it can be concluded that SIPBOM is a phrase that encapsulates *an outstanding political theory of science*, comparable in scope to that developed in the 1950s by famous political theorist Hannah Arendt (Seguin 2021).<sup>9</sup>

9. For an analysis of similarities between Arendt and Latour, see Seguin 2018.

We will see in Part 2 that if *Politics of Nature* also offers a powerful, and this time formal, political theorization, it significantly departs from *Pasteurization* and ascribes to SIPBOM a rather different meaning.

### 3. Politics of Nature: How to Bring the Sciences into Democracy

Whereas *Pasteurization* is a case study in the history of science that does not follow the disciplinary codes of political theory, *Politics of Nature* is a full-blown theoretical treatise in the tradition of Locke or Rousseau. The title suggests it is devoted to the politics of the environmental movement but, as we are arguing below, it is comprised of three layers, with political ecology being only the first, surface, layer. Figure 1 provides a graphic representation of the book and the theory it conveys:

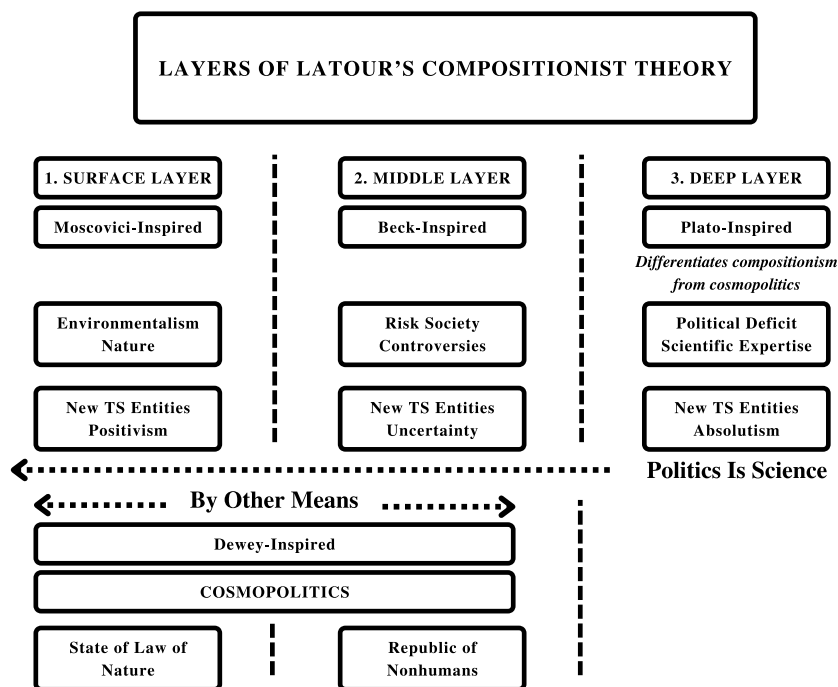


Figure 1.

As indicated by the subtitle, the common denominator of the three layers is science, and the book largely draws upon the knowledge accumulated by STS in the last four decades.<sup>10</sup>

### 3.1. Environmentalism

Himself a committed environmentalist, Latour praises the practice of the environmental movement but takes issue with deep ecology theory, which he regards as a betrayal of the movement it claims to represent. For him, the discrepancy between the practice and the theory of the green movement is comparable to the fascination that communism exerts on socialism. Deep ecology theory is but an intellectual resignation since its radical veneer conceals a combination of two outdated cultural premises, which will be tackled in turn in the following paragraphs. The first one is the metaphysics of *Nature*, the second one is the rationalist conception of *Science*.

In the age-old metaphysics associated to it, Nature is primarily depicted as fixed and given. Latour points out that Serge Moscovici was among the first authors to go against the grain and theorize nature as being endlessly recreated by human action. As a result, a diversity of natures can be observed across different societies and the history of nature must be entirely rethought: "... l'homme créateur et sujet de la nature nous impose de reconnaître l'existence d'une *histoire humaine de la nature* ..." (Moscovici 1968, p. 28).<sup>11</sup> With Moscovici's lessons in mind, Latour sarcastically puts forward that Nature is nothing but a "... blend of Greek politics, French Cartesianism, and American parks" (Latour 2004, p. 5). This leads him to criticize the two main claims of deep ecology derived from the metaphysics of Nature. Firstly, the green movement does not bring Nature into politics for the first time in history. In fact, says Latour, nature and politics have always been interwoven. Since antiquity politics has been circumscribed by the properties and functions of nature, and this has always resulted in nature getting the upper hand and shrinking public discourse. The invocation of Nature has always served to give political lessons and to reform

10. By Latour's own admission STS is not a popular discipline. On the one hand, it is actively opposed by science warriors as notoriously exemplified by Alan Sokal's hoax. On the other hand, it is unknown to most people, including academics. To circumvent this problem, Latour puts into practice the lessons of ANT. He binds his STS-inspired theory to the environmental movement, just as Pasteur pre-empted the hygiene movement to further his microbiology agenda.

11. Man as creator and subject of nature forces us to acknowledge the existence of a human history of nature.

public life. The subject of law and the object of science have been pitted against one another insofar as human freedom has always been defined and restricted by the laws of natural necessity. Latour thus laments that "... ecological thinkers have not devoted all their strength to discussing the political nature of nature" (Latour 2004, p. 255n15).

The second problematic claim of green theory is that Nature needs protection. To counter this by now commonsensical idea, Latour uses a rather telling empirical case. Whereas the 1986 nuclear catastrophe threatened to make a desert of the Chernobyl area, it turns out that expeditions are now being organized to watch its burgeoning wildlife. Latour thus challenges the notion that politics should seek to preserve "the higher equilibria of nature" (Latour 2004, p. 26). These simply do not exist since beings are not organized into ecosystems that fit one in the other like Russian dolls. The entities the green movement takes in charge do not form systems ruled by the laws of cybernetics. They are organized into heterarchical assemblages characterized by surprising scales and temporalities. For Latour, political ecology brings to light uncertain and unexpected connections between entities; it reveals their unforeseen consequences. Crucially, the impact of beings does not depend on their ordering from the largest to the smallest, from the cosmos to microbes. Large and important entities can turn out to be easily controllable or especially fragile: the Gulf Stream might one day disappear. Conversely, what is small or without importance can become decisive: a snail can block a dam. The surprising and varying traits of entities makes it impossible to continue using the notion of Nature and it is about time that green theorists realize it. Hence, for Latour the environmental movement does not aim at protecting a fixed and threatened Nature but rather at including growing numbers of beings that no longer present themselves as matters of fact but rather as matters of concern.

The second untenable premise of deep ecology thinking is its conception of Science. As mentioned above, not only does deep ecology thinking endorse an idea of Nature contradicted by the daily practice of the environmental movement, it also subscribes to its twin and even synonymic notion, that of Science. On this front too, radical green theorists renounce accomplishing proper conceptual work. Ignorant of scientific practice, they fail to problematize Science: "A philosophy of ecology that did not absorb the controversies among scientists would neglect all its intellectual duties" (Latour 2004, p. 255n15). Instead, they are quite happy to regard Science as a mirror of the world. Happily embracing positivism, they believe that Nature is known through a Science that allegedly produces matters of fact, the central feature of which is their indisputability. If, as the saying goes, "facts speak for themselves," it is hard to see how they could generate uncertainty and

disputes among scientists. Hence, political ecology claims to be extending classical political concerns to new beings without realizing that what is at stake is the characterization of such beings. For Latour, the one thing that environmental crises bring to light is precisely the high degree of uncertainty surrounding entities and their attachments. Through a multiplicity of scientific protocols, entities appear chaotic and unbalanced, sometimes presenting as local, sometimes as global, at times slow or rapid. As a result, the notion of Nature crumbles and Latour argues it should be relinquished once and for all. Crucially, says Latour, with the end of Nature necessarily comes the end of scientific certainty about it. Ultimately, he faults deep ecology thinking for ignoring the most visible aspect of green politics: "... every ecological crisis opens up a controversy among experts ..." (Latour 2004, p. 63). This leads us to the second layer of *Politics of Nature*.

### 3.2. Risk Society

The second layer takes us beyond the official concern for the green movement and Latour's attempt at providing it with an adequate theory. It addresses a larger topic, that is, the contemporary evolution of modern societies, characterized by the breakout of controversies related to environmental, industrial, and public health risks<sup>12</sup>: "We have installed controversies at the heart of collective activity ..." (Latour 2004, p. 117). *Politics of Nature* is a typical product of its time. It was published in French in 1999, at the peak of the widespread interest for the study of "new risks" (Godard et al. 2002) stimulated by Ulrich Beck's theory of risk society (Beck 1992). To take one indicator, the *Journal of Risk Research* was first published in 1998. Similarly, in the second half of the 1990s, the French CNRS set up the programme "Risques collectifs et situations de crise"<sup>13</sup>, which hosted an interdisciplinary seminar that ran for several years and to which several French and international scholars contributed. In keeping with this interest of social scientists in risks, the second aim of *Politics of Nature* is to delineate a political theory adapted to risk society.<sup>14</sup>

Beck claims that around 1970 industrial societies entered the second stage of modernization, which he calls reflexive modernity. They turned into "risk societies" because the risks they face are no longer external to

12. Significantly, almost all examples given by Latour relate to public health, not the environment.

13. Collective risks and crisis situations.

14. Anglophone readers may be interested to know that Latour had *Risk Society* translated into French and wrote the preface of the book.

them (e.g., earthquake), they are socially fabricated inside them (e.g., chemical pollution). Center-stage in risk society, science undergoes four major and contradictory transformations. One<sup>15</sup> is the shift from primary to reflexive scientization in the relation between science and the public sphere: “Science is one of the causes, the medium of definition and the source of solutions to risks ...” (Beck 1992, p. 155). In other words, science creates the risks of harm we are facing (e.g., nuclear technology); we need it to perceive those new invisible risks (e.g., radioactivity); and it is the only means at our disposal to prevent the realization of future risks and remedy harm when it occurs. The advent of reflexive scientization is duly noted by Latour: “... the sciences are part of the solution only because they are part of the problem as well ...” (Latour 2004, p. 39).

Pursuing the thread launched by Beck, Latour puts forward that we are not confronted by an environmental crisis as claimed by the green movement. Rather, we are witnessing a crisis of objectivity, that is, a crisis of all objects, “natural” or not. To put this thesis in perspective, he describes the rather implausible characteristics that objects possess in the modernist regime. These objects are external and deprived of any connection to human society, to which they remain utterly indifferent and owe absolutely nothing. If they happen to have unforeseen, often catastrophic, consequences on society, these consequences do not engage their moral responsibility and do not retroact on them. In contradistinction to the freedom said to characterize humans, they obey strict causality and efficacy. The same causes always lead to the same effects, the same mechanisms always produce the same outcomes. As essences, they possess invariant and constitutive qualities that do not give rise to any uncertainty. They are universal and impose themselves to all cultures with the same indisputable force. Dumb, mute, boring, predictable, amoral, and free-floating, such are the risk-free objects of modernity that no longer exist in risk society. As Latour explains: “Beck certainly does not mean that we are more at risk today than we were yesterday, but that consequences are attached to objects in a way that is forbidden by modernism. A risky attachment is a “smooth” object to which its associated risks, its producers, its consumers, its cortege of “affairs” and juridical challenges, are finally added ...” (Latour 2004, p. 255n19). Though *Politics of Nature* is notorious for its high degree of abstraction, Latour illustrates this point with the example of asbestos. At first, it was regarded as the perfect material and a miracle product. Decades later, its discoverers and manufacturers realized it was not at all what they thought. Asbestos ended up being involved in a major

15. The three others are the demonopolization of knowledge claims, the emergence of the taboo of inchangeability, and the extension of scientific rationality.

public health crisis, linked to cancers, the treatment of buildings, and legal proceedings. In short, it became the central character of a typical public technoscientific controversy.

The empirical study of such controversies was initiated in the 1970s by Dorothy Nelkin (1971, 1975, 1979) and Alan Mazur (1973, 1977, 1982). It has been shown that in a public dispute every scientific statement made by a researcher will be challenged by another. Latour points out that scientists have always debated and disagreed with one another but that it used to happen in laboratories, behind closed doors. When scientific experts were called into the political process, the debates inherent in the production of knowledge were concealed and experts spoke in one voice. With the emergence of risk society, though, this facade is cracking as disputes between scientists break out in the public domain. For Latour, the public irruption of scientific disputes is the central trait of risk society. The magnitude of this phenomenon is such that scientific uncertainty becomes a structural feature of the science/politics interface: "... two attitudes are possible: we can wait for the sciences to come up with additional proofs that will put an end to the uncertainties, or we can consider uncertainty as the inevitable ingredient of crises in the environment and in public health" (Latour 2004, p. 63).

The blurring of the boundary between the inside and the outside of science is concomitant to another crucial development: public scientific disputes involve more people than the sole researchers. Beck speaks of "... conflictual equalization tendencies in the gradient of rationality between experts and lay people ..." (Beck 1992, p. 165). The legitimate involvement of non-scientists in scientific matters is greeted by Latour and provides the ultimate foundation of the third, deepest, layer of *Politics of Nature*.

### 3.3. Political Deficit

This third layer is the most important one as it aims to meet challenges less conjunctural than those associated with political ecology or risk society. It shares a lot with the sociology of scientific expertise pioneered by scholars such as Philippe Roqueplo (1997). However, and this makes all the difference in the world, it is brilliantly transposed onto the terrain of political theory. As we will see in the remainder of this paper, it offers an ontological theory of politics that delineates cosmopolitics and that should be called "compositionism" (Latour 2010; Seguin 2018).<sup>16</sup>

16. The theory is often called "cosmopolitics" but this is misleading. For one thing, it suggests too great a similarity between Latour's and Stengers' (Latour 2010; Stengers 2010, 2011) work. The term cosmopolitics should be restricted to the designation of the alternative form of politics described and advocated by compositionism.

This theory is comprised of a radical critique of public life in Western culture, and a conceptual blueprint for reforming it.<sup>17</sup> Prompted by the science wars led by physicist Alan Sokal, it is rooted in Latour's life-long criticism of rationalism and uses as its starting point the portrayal of Science drawn by epistemology since antiquity. Revisiting Plato's myth of the Cave, Latour argues that epistemology depicts Science as a knowledge entirely cut off from anything social or even human, and artificially creates an opposition between the external world and human society, each being associated to a string of contrary attributes. On the one side, Science out there is associated to truths, the objective world of primary qualities, laws that are inhuman, things as they really are, certainties, transcendence, in short Nature. On the other side, society in the Cave is the world of mere representations, beliefs, disputes, ignorance, in a word an inescapable prison with no access to the entities that make up reality. The philosophers-later-turned-scientists are ascribed the miraculous ability to detach themselves from the social world, enter the natural world to discover its eternal truths, and then return to the Cave to accomplish the venerable task of enlightening the prisoners.

For Latour, only political reasons can explain why such an unconvincing myth has managed to survive for twenty-five centuries: it silences the mob<sup>18</sup> and gives an enormous amount of power to scientific experts. Hence his qualification of epistemology as "(political) epistemology," that is, an epistemology that covertly pursues political goals and even accomplishes a policing function: "The trap set by the epistemology police consisted in denying to anyone who challenged the radical externality of Science the right to continue to talk about any external reality at all ..." (Latour 2004, p. 38–9). This statement is clearly a response to Sokal and other science warriors and is buttressed by the large corpus of empirical studies carried out in STS in the past forty years. The phrase that best captures the spirit of these studies is "seamless web," which means there is no such thing as a demarcation line between science and its exterior: scientific knowledge is at once objective and man-made. But it took centuries for this statement to become speakable.

Latour puts forward that at the dawn of modernity, the myth of the Cave gave rise to a "constitution" that organizes public life in two "houses"<sup>19</sup>, politics and its subjects on the one hand, Science and its objects on the other. Politics deals with human passions, interests, will, speech, values,

17. See footnote 21.

18. This is explained at length in *Pandora's Hope* (Latour 1999), which Latour presents as the twin book of *Politics of Nature*.

19. As noted by Brennan (2006), one striking aspect of Latour's rhetorical strategy is the use of political metaphors.



beliefs, and power relations, of which reality is never a stake. It is characterized by multiple beliefs, endless talk, and disputes. Conversely, Science has to do with nonhumans and their essences, facts, predictable causal relations, undiscussable findings, and a single reality. Against this vision and in line with STS, Latour argues that the sciences, in the plural, are worldly endeavors that produce about external reality an “ordinary knowledge” (Latour 2004, p. 13) that is relevant for human affairs. If, by themselves, the sciences are unable to put an end to uncertainty or provide definitive answers, (political) epistemology turns them into Science, a grandiose and unparalleled monopoly to speak about a rigid, totalized, reality cast as Nature. This is the first politicizing move of (political) epistemology: “... I am going to define Science as the politicization of the sciences through epistemology ...” (Latour 2004, p. 10). In a second move, (political) epistemology opposes the pair Science-Nature to the purely human and rather pathetic domain of politics, left with very little to deal with, namely, human passions, interests, and power: “... to politicize also refers to *the very invention of this absolute difference*, to this division of roles ...” (Latour 2004, p. 253n9). In the modern constitution, politics is thus amputated of the bulk of what matters to the profit of “... the other assembly, which has been meeting in secret for centuries and whose political work has always been hidden up to now ...” (Latour 2004, p. 58).

Latour frames the activity of Science as “political work” on the grounds that politics is the power to assemble: “... assembling, composing, unifying, the entirely traditional form that has always been called politics ...” (Latour 2004, p. 29). Despite being officially the polar opposite of politics, Science performs the exact same task although, one could point out, on a much wider scale since humans are a drop in the bucket compared to, for instance, galaxies, the four fundamental forces, or the seabed. Under the banner of Nature, Science assembles nonhumans: “... as long as the practice of the sciences and the practice of politics are not treated with equal interest, nature appears precisely *not* as a power of assembling equal or superior to that of politics.” (Latour 2004, p. 30). It is easy to guess the effects of the political machinery put in place by (political) epistemology. Through the pronouncements of scientific experts who get out of their laboratories to enter the public domain, Science tirelessly bombards politicians and other laypeople with new entities and facts whilst depriving the former of a say in the production and arrangement of this external reality. By imposing matters of facts already assembled in the so-called natural order, it silences and paralyzes politics: “The indisputable nature known by Science defined the order of respective importance of entities, an order that was supposed to close off all discussion among humans ...” (Latour 2004, p. 93).

And yet, this order is badly put together. The modern constitution allows for the speedy and surreptitious addition to the world of new beings instantly characterized as essences since their properties are supposedly given from the outset. As a result, the ever-expanding reality is poorly integrated and permanently lives under the threat of disruption. For instance, says Latour, experts have thrown the entity “climate change” in the external world only to make it clash with the entity “economy.” Instead of forming a harmonious whole in which each thing occupies its rightful place, a cosmos in the Greek sense of the word, reality becomes a cacocosmos. Characterized by secret, absence of agreed rules, restriction of public speech, concentration of power, and threat of civil war, the modern constitution turns out to sustain an absolutist regime that must be reformed in much the same way as the power of absolute monarchy was curbed in the seventeenth and eighteenth centuries.

It should be noted here that such considerations belong to the tradition of liberal thought that goes back to Thomas Hobbes. They are far more significant in *Politics of Nature* than the shortcomings of the environmental movement (first layer) or the transformations brought about by risk society (second layer). They provide a clear indication of the combat Latour is really carrying out: Science has always been an illegitimate power. The production of reality must therefore be given its state of law.<sup>20</sup> The “historical experience” (Latour 2004, p. 201) we are witnessing is thus the instatement of “a republic of things” (Latour 2004, p. 55), that is, “a Republic finally extended to nonhumans” (Latour 2004, p. 219). By analogy to the slogan “no taxation without representation” that American colonists opposed to the English crown, Latour sums up the spirit of the new republic with the motto “no reality without representation” (Latour 2004, p. 222).

The republic of things that Latour at once prescribes and describes<sup>21</sup> is built on three major innovations. Firstly, it breaks away from the splitting of public life in two houses, politics and science. Latour reminds us that nonhumans are always made of associations with humans: microbes do not exist without microbiologists. Since nonhumans are intimately woven in the fabric of our lives, in no way do they occupy an alien and inaccessible domain called Nature. They form a single order with humans, although this order cannot bear the name “society” since the adjective “social”

20. This is so true that van Dijk (2023, pp. 163–164) has been able to extract a new Bill of Rights from compositionism.

21. Latour explains that “...intellectual workers can never do much better than to help other intellectuals, their readers, rejoin what the demos already brought into the state of things some time ago” (Latour 2004, p. 224).

“... designates the hopeless effort of the prisoners of the Cave to articulate reality while lacking the means to do so” (Latour 2004, p. 249). Latour calls the assemblage of associations of humans and nonhumans a “collective” to emphasize its political work of collecting increasing numbers of new nonhuman entities.

This leads us to the second innovation that warrants the renewal of public life. The former pole of Science officially absorbs the former pole of politics, so to speak, and this gives rise to an alternative form of politics focused on the makeup of external reality, “the furnishings of the world” as Latour puts it. This unconventional politics, called “cosmopolitics,” combines what things are and what people want, facts and values. It extends to nonhumans the right to be duly represented, it institutionalizes them by means of explicit procedures. Cosmopolitics is thus the political process of producing and assembling reality and Latour defines it as “the progressive composition of the common world”: “The expression [common world] designates the provisional result of the progressive *unification* of external realities ...” (Latour 2004, p. 239). The political work of collecting and ordering entities is “progressive” because it is set in procedures akin to those of the state of law, known for slowing down political activity and decision-making. Hence, the main achievement of cosmopolitics is to “... distinguish the composition of the common world that is built ‘according to due process’ from that of a world elaborated without rules” (Latour 2004, p. 8). Accordingly, Latour sets out to provide a detailed blueprint of the new republic, whose functioning is placed under the aegis of John Dewey and described as an experimental metaphysics: “Up to now, under the modernist regime, experiments were undertaken, but among scientists alone; all the others, often in spite of themselves, became participants in an enterprise that they lacked the means to judge. We shall say, then, that the collective as a whole is defined from now on as collective experimentation. Experimentation on what? On the attachments and detachments that are going to allow it, at a given moment, to identify the candidates for common existence ...” (Latour 2004, p. 196).

This quote points to the third innovation of the republic of things. Whilst it has been illegitimately monopolized by Science since antiquity, the political task of deciding the composition of the world now draws upon the skills not only of scientists but also of politicians, economists, moralists, bureaucrats, and “diplomats.”<sup>22</sup> These people possess different abilities that are all relevant in their own specific way and must buttress one another to make the procedures, including checks and balances, work

22. “Diplomats” refers not to professional diplomats but to anthropologists. Latour presents himself as one of them. For an illustration of diplomatic work, see Blaser 2016.

properly and achieve a well-ordered world. For Latour, the model of this collaboration between various skills is the 1997 Kyoto conference on climate change: "... politicians and scientists, industrialists and militants found themselves on the benches of the *same assembly* without being able to count any longer on the ancient advantages of salvation from the outside by Science ...” (Latour 2004, p. 56). The sharing of the work between several skills enacts or formalizes a key observation in the sociology of scientific expertise: along with scientific factors, political decision making must take on board various unscientific elements and dimensions.

Most of *Politics of Nature* is devoted to the description of the new constitution that is replacing the modernist constitution. It pays a great deal of attention to the three powers of representation of nonhumans established by this new constitution and held jointly by the aforementioned professions.

The first power is the power to take into account, which belongs to the “upper house” and seeks to answer the question “how many are we?.” Acutely attentive to the multiplicity of beings that are seeking to become members of the collective’s common world, it is based on perplexity, that is, the ability to be surprised and concerned even by the weakest signs that an entity is trying to get into existence. One might assume that such task can only be performed by scientists thanks to their instruments, laboratories, and ability to question existing paradigms.<sup>23</sup> Yet, Latour aptly describes what the other professions can bring to this task. Politicians are particularly sensitive to the danger of being unfaithful to constituents, economists are gifted to imagine recombinations of unknown goods and people, and moralists are prone to express anxiety over neglected research that could testify to the existence of a being. Consultation is the other task performed by the upper house. It is the commitment to find and make speak all those who will be affected by a candidate entity, that is, the jury of all relevant spokespersons, including stakeholders and laypeople. For instance, Latour reckons that drug addicts should sit next to medical doctors and neurobiologists on the panel that analyzes the properties and effects of drugs. As it turns out, the aim of the upper house is to take into account the greatest possible number of beings: “The question becomes whether or not we have caught the totality of these beings in our nets ...” (Latour 2004, p. 198).

The second power is the power to put in order. It is held by the “lower house” and aims at evading the swift, unruly, and disrupting inclusion of new beings in the world. That is, it provides a counterbalance to the upper

23. It should be noted that science may not be the sufficient condition for composing the world but it is the necessary condition. Whereas no other skill could produce reality on its own, Science did so for twenty-five centuries.

house although it is exerted by the same professions. The question it seeks to answer is “can we live together?” If the composition of the common world necessarily intermingles facts and values, the latter are especially discernible in the first task of the lower house, which is to find the best hierarchy to accommodate incommensurable beings and allow candidate entities to live peacefully with existing ones by giving them their legitimate place. As Latour puts it: “The entire collective has to ask itself whether it can cohabit with so-and-so, and at what price ...” (Latour 2004, p. 196). Hierarchisation is required because the inclusion of new entities in the common world necessarily brings about changes in the collective.<sup>24</sup> Hence, the first task of the lower house is to review various scenarios of inclusion of candidate entities. Its second task is the institution of reality. After much debate, the right ordering of entities is found, and candidate entities become essences. In an astonishing exercise mixing facts and values, their qualities, their relations, including causal ones, and their liability, are decided irreversibly. This brings closure to the debates: entities have been institutionalized. Crucially though, the process is iterative and endless: rejected entities can appeal whilst new entities keep popping up.

One resource that facilitates the work of the lower house is the possibility to modulate the properties of the entities awaiting integration. That is, initially entities are said to have habits, not essential characteristics: “... this is the only way one can carry out the tasks involved in elaborating the common world without immediately running up against indisputable nature ...” (Latour 2004, p. 242). For example, Latour points out that traditionally it was assumed that batrachians could only lay their eggs by the pond where they had been born. This characteristic was forcing operators to build expensive ducts underneath highways to let the animals safely reach their place of birth. And yet, it was later discovered that installing artificial ponds on the side of highways could do the trick: “nature” was successfully circumvented. The relative flexibility we enjoy in characterizing candidate entities, however, does not mean that all of them can be integrated in the common world. If no scenario is found allowing an entity to peacefully coexist with existing ones, it must be temporarily excluded and left in the status of belief, artefact, superstition, irrationality, and so on. However, as mentioned above an excluded entity is given the opportunity to appeal the collective’s decision: “... we place the collective in a state of alert, to register as quickly as possible the appeal of the excluded entities that no morality ever again authorizes us to exclude definitively.” (Latour 2004, p. 198).

24. The nature of these changes reveals the distance that separates compositionism from SIPBOM. See section 3.4 below.

The third power, the power to follow up, stems from the iterative and experimental nature of the composition of the common world. As explained in footnote 21, Latour claims he is merely providing the “conceptual institutions” that account for historical developments that are already taking place. However, things are different with the third power: “If the historical experience we are trying to decipher (...) has also proposed countless institutions and procedures that await only a new gaze to become immediately obvious (...) the same does not hold true for the power to follow up, which is still inextricably confused with the question of the State.” (Latour 2004, p. 201). Claiming the State of political science should be replaced by the State of science policy<sup>25</sup>, Latour argues the State should no longer be equated with mastery but redefined as the art of governing. The purely administrative power to follow up involves the same four professions as the two other powers but primarily draws upon the additional skill of bureaucrats: “This new competency amounts to being able to establish, owing to fragile bonds of writings and dossiers, what is called a paper trail.” (Latour 2004, p. 204). Since all four tasks involved in the composition of the common world are concerned by it, the power to follow up must: 1. Accumulate scientific data over a very long period of time (perplexity); 2. Persistently check the credentials of the parties involved (consultation); 3. Record the choices already made along with the parties’ commitments (hierarchy); 4. Multiply the procedures such as “... votes, signatures, consensus-building meetings ...” (Latour 2004, p. 205) that allow the stabilization of entities (institution). In a word, the third power’s remit is simply to guarantee that the power to take into account and the power to put in order are properly exercised. If checks and balances work properly, external reality is produced and agreed upon until the next round.

#### 3.4. Compositionism and the BSE Crisis

As mentioned above, *Politics of Nature* is notoriously known and at times harshly criticized for its high degree of abstraction. It uses very little empirical evidence indeed. The lengthiest example given by Latour is that of the prion and its link to the political crisis associated to Bovine Spongiform Encephalopathy (BSE), better known as mad cow disease. In many respects, this saga obeyed the risk society dynamics captured by the middle layer of the book (Jones 2001). For instance, decisions on the risks posed by BSE were made in a context of acute uncertainty, and the final

25. This aspect of Latour’s argument lacks clarity and has led some commentators to depict the republic of things as a science policy. In our view, it is a renewed conception of politics.

resolution of this public health crisis was not brought about by Science but by a public inquiry composed of a judge, a civil servant, and a scientist. In the remainder of this section, we will try and show that Latour's analysis of the crisis proceeds from, and exemplifies, the ontological nature of compositionist theory.

The BSE crisis started in 1986 with the "discovery" of a new neurodegenerative cattle disease, dubbed BSE, similar to sheep scrapie and human CJD (Creutzfeldt-Jakob Disease). The discovery was reported in a 1987 scientific publication from the UK Ministry of Agriculture (Wells et al. 1987). Since the emergence of scrapie two hundred years ago, it has been known that this class of diseases is infectious, as their name indicates: Transmissible Spongiform Encephalopathies (TSEs). In 1988, scientists from the UK Ministry of Agriculture published epidemiological data that indicated the disease was transmitted by feeding cattle meat and bone meal made from carcasses of infected animals (Wilesmith et al. 1988). Hence, the 1988 "feed ban" was one of the earliest measures adopted by the UK government to protect animal and human health. It forbade feeding meat and bone meal (ruminant protein) to ruminants and thus forced industry to change the way feed was produced.<sup>26</sup> The same year, a combined team of researchers from the UK Neuropathogenesis Unit and Ministry of Agriculture reported that BSE could be transmitted to mice by intracerebral injection (Fraser et al. 1988). These experiments confirmed the new disease was a TSE and raised the possibility that it might transmit to humans even though scrapie had failed to do so. Based on infectiology's knowledge that the concentration of infection is highest in neurological tissue, the UK government implemented the 1989 "SBO ban" that prevented high risk offal such as brain and spinal cord from entering the human food chain. The SBO ban forced slaughterhouses to change their practices by sorting out different types of materials and using different tools to handle them.

The crisis peaked in March 1996 when the UK government announced that a new variant of CJD, dubbed vCJD, had been identified and was probably caused by ingestion of contaminated beef. This announcement came as a shock to the British population. Based on the scrapie experience, UK officials had always categorically affirmed that the risk of catching BSE from consumption of meat was "remote." If the crisis had been raging for years in Britain, the 1996 announcement signaled its international extension. It caused massive disruptions in commercial relations and nearly led to the collapse of the European Union. In 1997, two papers by teams

26. When it became public knowledge, the industrial feeding of cattle protein to cows offended moral feelings and gave rise to the astonishing notion of "cow cannibalism." For an analysis of BSE as a moral crisis, see Seguin 2003.

located on opposing sides of the prion controversy similarly concluded that BSE and vCJD were caused by the same infectious agent (Bruce et al. 1997; Hill et al. 1997). On 22 December 1997, the UK government created the BSE Inquiry whose remit was “To establish and review the history of the emergence and identification of BSE and new variant (sic) CJD in the United Kingdom, and of the action taken in response to it up to 20 March 1996; To reach conclusions on the adequacy of that response, taking into account the state of knowledge at that time” (UK National Archives). In October 2000, the UK government announced the publication of the Inquiry’s report along with the setting up of a fund to compensate victims of vCJD and their families (Guardian 2000).

TSEs have long been shrouded in mystery since they present the astonishing characteristic of being at once genetic, spontaneous, and infectious. In addition, research has shown that the infectious agent possesses very unusual characteristics. For years most scientists just assumed it was an unconventional virus, but alternative explanations were also suggested. The prion hypothesis was introduced by the 1982 publication of results reporting that the scrapie agent contains a protein that is required for infectivity. Author Stanley Prusiner boldly concluded that this protein was the cause of the disease and coined the term “prion” to denote a small proteinaceous infectious particle (Prusiner 1982). It was also demonstrated that this particle present in the brains of diseased animals is the abnormal isoform (PrP<sup>Sc</sup>) of a normal protein, dubbed prion protein (PrP<sup>C</sup>), found in the brains of healthy mammals. According to the prion hypothesis, the infectious mechanism lies in the ability of PrP<sup>Sc</sup> to induce the misfolding of PrP<sup>C</sup> in a chain reaction. The prion hypothesis sparked a 15-year controversy in the scientific community because the notion of an infectious protein clashes with the paradigmatic belief that infection requires nucleic acid, which itself rests on the central dogma of molecular biology (Seguin 2004). In 1997, even though the postulated mechanism of infection had not been empirically substantiated, Prusiner won the Nobel Prize for medicine. This award put an end to the scientific controversy, most researchers now assuming that TSEs are caused by a protein, and consolidated prionology as a new scientific discipline devoted to the study of prions (Seguin 2004). Unsurprisingly, a minority of scientists continued to argue that the most remarkable feature of prions is their possible non-existence (Manuelidis 2000).

Latour regards the BSE crisis as the extension of the prion controversy to the public domain. According to him, the understanding of the crisis requires “... familiarity with the controversy over the existence of these candidates ...” (Latour 2004, p. 113). By way of illustration, he reports an exchange between a TSE expert and the French president of the time



on the responsibility of “the prion” in BSE.<sup>27</sup> But as it turns out, the possibility that the infectious agent might be a prion was not publicly debated on the main scene of the BSE drama: the UK. The public controversy largely bore on the ability of BSE to impair public health. The contentious scientific question was whether the BSE agent, no matter its molecular biology characteristics, would behave like the scrapie agent and prove harmless to public health, or would jump the species barrier between cows and humans. Crucially, UK authorities were determined not to let the prion controversy that divided the scientific community interfere with the political management of the crisis (Seguin 2000b, 2002).

Latour leaves these aspects aside and depicts the BSE crisis as centering on the prion. This framing has the advantage of shedding light on the ins and outs of compositionism. Arguing the prion is still caught in the status of a candidate entity awaiting both integration in the common world and the essence that comes with it, he discusses it mostly in relation to the work of the lower house. First paying attention to the third task, he reviews changes that it might be necessary to implement to give the prion its rightful place: “Must all European cattle farming be modified, the entire meat distribution system, all manufacturing of animal-based feed, in order to make room for prions and situate them within an order that will array them from largest to smallest?” (Latour 2004, p. 113).

One can note already that according to this analysis, measures such as a feed ban adopted by government do not so much protect animal and human health as they consensually increase the gradient of reality of an infectious protein.

Latour then explains that the hierarchization exercise will lead to the right scenario that will institutionalize the prion, thus signaling completion of the fourth task:

When the solution is eventually found (...) The prion and its attachments will henceforth have an essence with fixed boundaries. Their descriptions will be found in manuals. Victims will be indemnified (...) the collective having changed profoundly, now that it is composed of—in addition to all the entities that it accepted heretofore—prions responsible for diseases that are dangerous for humans and animals, and that could be avoided if the production of animal-based meal and the conditions of slaughter were modified. (Latour 2004, p. 114).<sup>28</sup>

27. Latour provides no reference and no detail on this alleged interaction between scientist Dominique Dormont and politician Jacques Chirac.

28. As we have seen above, the measures contemplated by Latour were implemented in the UK years before publication of *Politics of Nature*. That, however, does not change the substance of his analysis and the assessment of compositionism it allows us to make.

Noticeable here is that all the changes the prion candidate forces the collective to make are put on the same footing. Political measures that engage everybody in society, for instance the use of public money to compensate victims, are regarded as equivalent to the modification of biology textbooks, which concerns only a subset of the student population and their professors. And again, these changes merely aim at making the prion real. Thus, victim compensation seemingly derives from the stabilization of the causal relation between prion and disease, not from a possible mismanagement of the situation by political authorities.<sup>29</sup> Latour's analysis of the BSE crisis as working towards the addition of a new nonhuman to the common world confirms that in compositionist theory, politics is sucked in ontology.

His analysis also demonstrates the radical departure of compositionism from SIPBOM. As suggested by our discussion so far, the transformation of the collective envisioned by Latour, and that occurred thirty years ago, rests on conventional political means. The measures implemented by the UK government and reviewed above were informed by scientific knowledge but did not draw upon the power of the prionology laboratory. That is, they did not involve the political targeting of prions by laboratory practices. The withdrawal of meat and bone meal from cattle feed, or the sorting out of different materials in slaughterhouses, do not require the intervention of scientific procedures and products. In short, such measures do not amount to the politics of science. Unlike microbiology (Latour 1983, 1988), or exoplanetology (Seguin 2015), prionology hardly qualifies as politics by other means.

The existence of prions as proteins causing TSEs is established knowledge since the 1997 Nobel Prize. Nonetheless, by 2015 20,000 attempts had failed to make PrP infectious in a test-tube (Manuelidis online), an experiment that, if successful, would decisively prove the accuracy of the prion hypothesis. This suggests that prionology has not (yet) acquired the status of a "freak show". It probably also explains why it is (still) unable to recruit the newly fabricated entity PrP in the pursuit of political projects and the revolutionizing of society. Forty years after the "discovery" of PrP<sup>sc</sup>, there is no treatment for "prion diseases," that is, TSEs, which all remain fatal. Even a non-invasive diagnostic test in pre-symptomatic individuals is not available. A capacitating policy that would turn prions into weapons in biological warfare is being discussed as a theoretical

29. The UK government decided to compensate vCJD patients and their families because the BSE Inquiry has shown that the protective measures adopted were not properly enforced by UK authorities (Seguin 2000b, 2002; UK National Archives).

possibility but whether it will see the light of day is open to debate (Giordano 2019).

#### 4. Coda

In the first half of the 1980s, Bruno Latour's study of the birth of microbiology sketched, albeit informally, a remarkable political theory of science, known as SIPBOM, which accounts for a form of politics that is conditional upon the ontological transformation of external reality: the politics of science. However, and this cannot be overestimated, in this theory there is no equivalence between ontology and politics. Ontology cannot be said to subsume politics since the production of new nonhumans is only one aspect of the equation: it must be coupled with policies that draw upon the laboratory control of these new beings. Science thus performs a unique political function in providing sources of power over nonhumans which are mobilized in the pursuit of political goals and contribute to the shaping of society.

Arguably, this politics of science explains why modern societies have reached a status unparalleled in history, carried out unprecedented projects, and achieved world domination. Present-day polities that aspire to become hegemonic powers, foremost among them China, are perfectly aware that science is the royal road to achieve their ambition. Even states that openly fight the Western world do not dispense with the politics of science, as demonstrated by the nuclear programme of the Islamic Republic of Iran.

When the science wars broke out in the 1990s, Latour responded with the genius of compositionism. This theory advocates, and accounts for, the end of the monopoly of Science on the production of reality, a production that is posited as the (covert) political task par excellence since the Greeks. In this theory, science no longer derives its political character from the combination of ontological labour and policies targeting nonhumans. As demonstrated by Latour's analysis of the BSE crisis, the social change that science jointly performs with other professions no longer rests on its material power but on the identification of the entities that populate reality. Paradoxically, although science features centrally in compositionism, ultimately it is not the object that is being theorized. That is what the reversed version of SIPBOM proposed above, "*politics* is science by other means," aims to highlight.

If Latour never made an ontological turn as such (Sanz Merino 2023, pp. 119–138), his move from SIPBOM to compositionism marks a radicalization of his lifelong interest in ontology. Whereas science and then politics had been central concerns for him at the beginning of his career, reality later became his primary object of study. *Politics of Nature* was a milestone

in his evolution that culminated in *An Inquiry into Modes of Existence*, which develops a conceptual framework that reduces politics and science to types of veridiction among others (Latour 2013).

Sadly, this theoretical positioning is likely to postpone even longer the acknowledgement, discussion, and use of his outstanding early political theory of science by those who might be most interested and challenged by it: political theorists.

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