

Transversal: International Journal for the Historiography of Science, 2025 (18): 1-16

ISSN 2526-2270

Belo Horizonte – MG / Brazil

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Special Issue

Leviathan and the Air-Pump

After 40 Years: Reception, Criticisms and Impacts

Modernity Leaks:

Latour's Reading of *Leviathan and the Air-Pump*

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Abstract:

This paper examines Bruno Latour's reading of *Leviathan and the Air-Pump*, arguing that the Boyle–Hobbes controversy, as reconstructed by Shapin and Schaffer, becomes foundational for Latour's critique of modernity. It situates Latour's reception of the book within broader shifts in science studies during the 1980s, focusing on the principle of generalized symmetry and a critique of social constructivism—a critique that, in Latour's account, turns on the partition of representation introduced by the modern Constitution. This conceptual division assigns the representation of humans to politics and that of nonhumans to science—a structure that, according to Latour, emerged only with the settlement of the Boyle–Hobbes controversy. The paper shows how Latour appropriates the conceptual personae of Hobbes and Boyle as delineated by Shapin and Schaffer and transforms them into the founding figures of this bifurcation, while bringing to light the theologico-political dimension of the laboratory.

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Keywords: Representation; Laboratory; Authority; Science Studies; Modernity

Received: March 27, 2025. Reviewed: May 29, 2025. Accepted: June 01, 2025.

DOI: <http://dx.doi.org/10.24117/2526-2270.2025.i18.06>



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*Put simply, the air-pump leaked. It was no good trying to patch it up,
because it was always bound to leak.*
— Thomas Hobbes, *Dialogus physicus*

Introduction

The main aim of this paper is to examine how Bruno Latour reappropriates *Leviathan and the Air-Pump* by Steven Shapin and Simon Schaffer (1985), transforming their historical reconstruction of the Boyle–Hobbes controversy into a philosophical resource for rethinking modernity. Rather than offering a philological reconstruction of *Nous n'avons jamais été modernes* (1991), I approach Latour's reading of Shapin and Schaffer in light of both the conceptual preoccupations that preceded it and the theoretical developments it enabled. In

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this sense, the paper does not treat *We Have Never Been Modern* in isolation, but reconstructs the conceptual constellation in which it belongs, drawing especially on earlier writings in science studies and later developments in Latour's own work.

Central to this investigation is the concept of representation: its partition into political and epistemological domains, its historical sedimentation in the so-called modern Constitution, and its reinterpretation through Latour's actor-network approach. The hypothesis I pursue is that Latour's engagement with *Leviathan and the Air-Pump* allows him to reconfigure the link between scientific practice and political legitimacy by way of a rethinking of what it means to "speak for"—humans, nonhumans, or collectives. His account of the Boyle–Hobbes controversy becomes foundational for this move, not because of its historical content alone, but because it dramatizes the very invention of the modern divide between nature and society.

The paper, therefore, reconstructs how Latour appropriates the conceptual personae of Hobbes and Boyle as presented by Shapin and Schaffer, and recasts them as the founding figures of a bifurcation that still governs contemporary practices of representation. In tracing this move, I aim to show how Latour opens up the possibility of an alternative: a compositionist politics of representation in which science and politics are no longer purified but recomposed, and in which the laboratory emerges not as a site of epistemic authority alone, but as a space with deep theologico-political implications.

The Double Bind

Five years after its publication, Latour would write a joint review of *Leviathan and the Air-Pump*, alongside Michel Serres's *Statues* and Sharon Traweek's *Beamtimes and Lifetimes* (1990, hereafter referred to as the "review"). The selection is not incidental. While Traweek's book represents for Latour everything that's wrong with science studies, and Serres is the guiding star that marks the path for the future, Shapin and Schaffer remain somewhere in the middle. As Latour writes in his review, Shapin and Schaffer usher us almost to the extreme verge of the modern Constitution, "without they themselves escaping from it" (Latour 1990, 159). They brilliantly trace the emergence of the dual device that will ground modernity, but the magnetism of "the Social" prevents them from drawing all the consequences of their findings. Latour comments that they "have pushed Science out of the modern world, but they have left the State firmly inside it," which "is why they left the job undone." (Latour 1990, 164)

Latour draws heavily on the conceptual personae of Boyle and Hobbes, as described by Shapin and Schaffer, in shaping his broader philosophical project, amplifying the settlement of their controversy into the foundation of the parajuridical framework he calls "the modern Constitution." Given that the central ideas concerning the latter are already present in the essay review—which would go on to form the core of the second chapter of *We Have Never Been Modern*—it would not be exaggerated to say that this text is the main supply for his 1991 seminal work, which will attempt to complete the job left undone in *Leviathan and the Air-Pump*. This job implies amending what Latour considers a fatal mistake: "believing in force more than in reason," Shapin and Schaffer "don't see that they are one and the same, that this dichotomy comes from one major *common* decision." (Latour 1990, 159) "For an anthropologist of science," on the other hand, "there is no more Force than Reason, no more Society than Nature." (1990, 159) This is exactly what leads Latour to the conclusion that will give the title both to the review—introducing the concept of *amodern*—and to the groundbreaking work he will publish the following year: "Hence, there is no, nor has there ever been, any modern world..." (1990, 159) Modernity, indeed, consists in this bifurcation that—in practice—has always leaked.

Trying to put an end to the by then seemingly endless strife between contextualists and internalists, Latour emphasizes how the book's significance lies not in framing the

creation of the experimental life in the context of the English Restoration, nor in showing how the power struggles of the time influenced the minds of scientists, but rather in displaying “the co-production of science and its social context” (Latour 1990, 147). By digging out both Boyle’s politics and Hobbes’ science, Shapin and Schaffer manage to replace the dichotomy between Hobbesian politics and Boyle an science with quadrants: each of them has a scientific theory *and* a political program. If *Leviathan and the Air-Pump* is a highly detailed historical work that highlights a crucial moment in the creation of modernity, Latour will receive some key aspects of the book as the defining traits of what he calls “the modern Constitution.” For Latour, the issue is not the 1660s English Restoration dispute between Boyle and Hobbes, but what that says about the metaphysical structure of the epoch known as modernity. Being gifted with a much more modest philological commitment but a far more ambitious philosophical concern, Latour will be able to pose the book a question regarding modernity as a whole. Latour never argues with Shapin and Schaffer in scholarly terms; in fact, he takes everything they say for granted. He differs, however, on an important point: If it is true that Shapin and Schaffer side with Hobbes over Boyle—and in this matter, matters of fact are not scarce—there is a methodological asymmetry, since they are studying a controversy and taking sides with one of the contenders. And the point, for Latour, is that the *complementarity* between Hobbes and Boyle creates a way of thinking that still persists and that invites us precisely to side with power or reason, politics or science, knowledge or order, without realizing that, in so doing, we are falling prey to a double bind in which, as Bateson says, we can’t win (1972, 153).

Leviathan and the Air-Pump’s main thesis concerns the relationship between the problem of order (politics) and the problem of knowledge (science). According to its authors, both Boyle and Hobbes have a proposal for each of them. They argue that “the problem of generating and protecting knowledge is a problem in politics, and, conversely, that the problem of political order always involves solutions to the problem of knowledge” (Shapin and Schaffer 2011, 21). If we call Shapin and Schaffer’s stance in this regard the *implication thesis*—knowledge implies order and vice versa—, the thesis concerning the modern *complementarity* between the epistemological and the political seems to be a Latourian one. The same is true for the theses concerning the *distribution* of representation and their *separation* into two disjointed chambers—what Latour calls “Bicameralism”—as the defining features of modernity. Let us take a look at these idiosyncratic aspects of Latour’s reading in more detail.

The main lessons Latour draws from Shapin and Schaffer can be read in his review when he writes that Hobbes and Boyle “are two Founding Fathers, drafting one and the same constitution but writing in their draft that their Branches should have no relation whatsoever. They conspire to make one and the same innovation in political theory: to science the representation of non-humans and no possibility of influence by or appeal to politics; to politics the representation of citizens with no influence by or relation to the non-humans produced and mobilized by science and technology.” (Latour 1990, 159) We could summarize this in three theses. First, the *complementarity thesis*: Hobbes’s legacy and Boyle’s legacy—modern science and modern politics—only work together. Second, the *distribution thesis*: the representation of reality is divided between two ontological kinds—modern politics will represent humans, while modern science will represent nonhumans. Third, the *separation thesis*: according to Latour, the modern organization of representation in two chambers only works if they remain mutually isolated, *de jure*, though not *de facto*. It is precisely this difference between the *de jure* and *de facto* planes that ensures we have never, *in fact*, been modern, in spite of still having a parajudicial modern apparatus.

Henning Schmidgen has already pointed out two main characteristics of Latour’s reading of *Leviathan and the Air-Pump*. Firstly, whereas in Shapin and Schaffer’s book, modernity as such is not an object of philosophical analysis, Latour “shifts the entire discussion of the work of Hobbes and Boyle from the relatively specific terrain of social

history to the more general discussion of modernity that began with Comte and Péguy and achieved new relevance in the early 1990s with the sociological contributions of Ulrich Beck, Zygmunt Bauman, and Anthony Giddens.” (Schmidgen 2015, 100-101) Secondly, whereas for Shapin and Schaffer “the air pump is an instrument made and used by humans, a material component of scientific practice,” Latour interprets the air pump as a *nonhuman actor*—a particularly reliable kind of actor, since it is transcendent to the mob’s petty interests—“thus endowing it with a life of its own that it does not have at all for Shapin and Schaffer.” (Schmidgen 2015, 101)

This approach is, in fact, entirely foreign to *Leviathan and the Air-Pump*, and we may read Schaffer’s essay review of *The Pasteurization of France* as a sort of reply not only to the book under review—a prior work, translated into English three years earlier—but also to Latour’s review of *Leviathan...*, which had been published just the previous year and in the same journal. Drawing on a passage where Latour speaks of the microbes’ “wishes”, Schaffer writes that Latour “attributes life to the inanimate” (Schaffer 1991, 192). The passage in question holds that “the researchers of the Rue d’Ulm were to offer these still ill-defined agents an environment entirely adapted to *their wishes*” (Latour 1988, 82). The use of the word is however not literal, at least in the sense of implying a metaphysics of a soul endowed with consciousness and free will; rather, it is a symmetrical inversion of what the Pasteurians themselves think about the microbes: “This parasite that diverts and confuses our wishes, we see it and reveal it, we make it speak and tame it,” say the Pasteurians.” (1988, 41) What is at stake is hence “the reversal of authorship and authority: *Pasteur authorizes the yeast to authorize him to speak in its name*” (Latour 1999, 132) Schaffer’s contention regarding the suppression of the controversies surrounding Pasteur—as well as Latour’s own mask as a Pasteurian in the book—is perhaps correct, but his assertion that “the book’s narrative is marked by the heresy of hylozoism, an attribution of purpose, will and life to inanimate matter, and of human interests to the nonhuman” (Schaffer 1991, 182) is problematic, since it goes too fast: it attributes competences before performances or, to put it differently, assumes that there are certain ontological traits of every being that precede all of their actions. If Latour, however, talks of “actors” or even “actants,” it is in order to focus on their actual causality regarding a singular event instead of thinking of them as the particular cases of a previously set form of universal. This is why Latour can describe his own project as an “experimental metaphysics.” In any case, what precisely is the context of these contested readings? I will address this issue in the following section.

The Construction Formerly Known as Social

The year following the publication of *Leviathan and the Air-Pump*, a brief but precise—and very flattering—review was signed by Harry Collins’s collaborator Trevor Pinch. As we can see in the “Introduction to the 2011 Edition,” however, Shapin and Schaffer did not find the syntagm “social constructivism” (Pinch 1986, 653)—used by the reviewer to describe the book—particularly amusing (see Shapin and Schaffer 2011, xxv). The term was already losing its sharply critical aura and beginning to be used in a disapproving manner. That same year, in a text proposing a “network approach... distinguished from that of social constructivism” (Law 1986, 130-131), John Law penned an incisive critique of this approach: “In social constructivism, natural forces or technological objects always have the status of an *explanandum*. The natural world or the device in question is never treated as the *explanans*. They do not, so to speak, have a voice of their own in the explanation. The adoption of the principle of generalized symmetry means that this is no longer the case.” (Law 1986, 131). In order to understand this concern with social constructivism, we need to go back a couple of years. But let us first remain a little longer in the year after Shapin and Schaffer’s book first appeared.

The shift between the first and second editions of *Laboratory Life* (1979, 1986) was already telling in regard to the cautiousness towards the reification of the social and the distancing from the field of social studies of science found in Latour's reading of *Leviathan and the Air-Pump*. Both the elimination of the word "social" from the subtitle *The Social Construction of Scientific Facts* and the addition of the appendices suggested a growing tension with the methodological framework used by authors like Robert K. Merton (1973) and David Bloor (1976). The book is an ethnographic study of scientific work inside the Salk Institute in California, where Latour and Woolgar observed neuroscientists studying a molecule called Thyrotropin-Releasing Factor (TRF), and it shows the path that leads to this neuropeptide hormone being considered "an established matter of fact" (Latour and Woolgar 1986, 81) Whereas in January 1968, TRF was "a contingent social construction," by January 1970—as the controversies were settled and all "modalities" dropped—it was metamorphosed into "an object of nature" (Latour and Woolgar 1986, 182) Now, let us compare the social constructivism of the first edition—"we claim that TRF is a thoroughly social construction" (Latour and Woolgar 1986 [1979], 152)—with the following passage from the second edition:

So what does it mean to talk about "social" construction? There is no shame in admitting that the term no longer has any meaning. "Social" retained meaning when used by Mertonians to define a realm of study which excluded consideration of "scientific" content. It also had meaning in the Edinburgh school's attempts to explain the technical content of science (by contrast with internalist explanations of technical content). In all such uses, "social" was primarily a term of antagonism, one part of a binary opposition. But how useful is it once we accept that *all* interactions are social? What does the term "social" convey when it refers equally to a pen's inscription on graph paper, to the construction of a text and to the gradual elaboration of an amino-acid chain? Not a lot. By demonstrating its pervasive applicability, the social study of science has rendered "social" devoid of any meaning. (Latour and Woolgar 1986, 281)

As Gerard de Vries rightly sums it up, Latour and Woolgar's contention in the second edition was that, "by explaining the construction of scientific facts in terms of social causes or processes, social study of science—while proclaiming the need to demystify realist epistemology among natural scientists—had un-reflexively adopted a realist attitude for its own work and had naively misunderstood the nature of ethnography" (De Vries 2016, 15). This is why Latour will hold in his review that *Leviathan and the Air-Pump* "marks the real start of an anthropology of science" (Latour 1990, 147): ethnography, indeed, was the only example—at least when it was done overseas—of a symmetrical approach that placed humans and nonhumans at the same level of analysis. As Latour will write in *We Have Never Been Modern*, "the anthropologist has to position himself at the median point where he can follow the attribution of both nonhuman and human properties" (1990, 96). Unlike the sociologist, the anthropologist "is not allowed... to use power games to account for what shapes external reality." (1990, 96) This median point, precisely, seems to be for Latour what lies beyond the threshold that Shapin and Schaffer glimpsed but did not cross.

Two years before this new edition, two important publications appeared. First, Latour's original version of *Les Microbes: Guerre et Paix, suivi de Irréductions*. Second, a special issue of *The Sociological Review* edited by John Law, which posed a suggestive question in its subtitle: "A New Sociology of Knowledge?" Among the contributions, perhaps the most relevant to our topic is Callon's, since he directs a critique towards sociologists of science which is largely identical to the one posed by Latour towards Shapin and Schaffer: "They acknowledge the existence of a plurality of descriptions of Nature without establishing any priorities or hierarchies between these descriptions. However, and this is where the paradox is revealed, within their proposed analyses, these social scientists act as if this agnosticism

towards natural science and technology were not applicable to society as well. For them, Nature is uncertain, but Society is not.” (Callon 1984, 197) Hence, the following question must be raised: “What would happen if symmetry were maintained throughout the analysis between the negotiations which deal with the natural and the social worlds?” (Callon 1984, 200) In this manner, Callon radically modified Bloor's principle of symmetry into what he calls the *principle of generalized symmetry*, whose goal is “not only to explain conflicting viewpoints and arguments in a scientific or technological controversy in the same terms”, but also, since “the ingredients of controversies are a mixture of considerations concerning both Society and Nature”, to “require the observer to use a single repertoire when they are described.” (Callon 1984, 200)

This principle will be adopted by Latour in the fourth chapter of *We Have Never Been Modern* (1991, 94-96). There we read: “Bloor's principle seeks to explain truth and falsehood alike through the same categories, the same epistemes and the same interests. But what terms does it choose? Those that the sciences of society offer social scientists— that is, Hobbes and his many successors. Thus, it is asymmetrical not because it separates ideology and science, as epistemologists do, but because it brackets off Nature and makes the ‘Society’ pole carry the full weight of explanation. Constructivist, where Nature is concerned, it is realistic about Society...” (Latour 1991, 94) We can see how Latour identifies the Hobbesian legacy with the reification of a Society that is always the *explanans* for Nature as an *explanandum*, viz., a radical violation of Callon's principle of generalized symmetry. This may not justify conceiving of *Leviathan and the Air-Pump* as an asymmetrical inquiry, but it certainly does explain why Latour has a reason for being upset with the book's ending sentence “Hobbes was right.” (Shapin and Schaffer 2010, 344) “At the last minute,” he writes in his review, “they cling to Hobbes and prefer one Branch of government to the other, believing in force more than in reason. (Latour 1990, 159) “But Society, as we now know, is no less constructed than Nature, since it is the dual result of one single stabilization process” (Latour 1991, 94).

Something crucial thus happened in 1984 that paved the way for *Laboratory Life's* modified version. When—many years later—Latour looks back on the genesis of what would become actor-network theory, he mentions that “[t]he Rubicon was crossed, for me at least, when successive connections were accepted of three former non-social objects (microbes, scallops, and reefs) that insisted on occupying the strange position of being associated with the former social entities we were trying to describe.” (Latour 2005, 106) Those three entities previously considered outside the social are the topic of the three works referenced in a footnote: Latour's own *Les microbes...* (1984), Michel Callon's already mentioned article, and John Law's “On the Methods of Long-Distance Control Vessels Navigation and the Portuguese Route to India”, which was also included in the special issue of *The Sociological Review*. All three were published in 1984.

The issue ended with Latour's “The Powers of Association,” and began with an introduction written by Law, entitled “Power/Knowledge and the dissolution of the sociology of knowledge”. Law divides the history of sociology of knowledge into three phases. The first one is represented by Marx and Durkheim's divergent analyses concerning the determination between social structure and belief. The second phase is located in the context of the 1960s tension between structuralism and phenomenology, and gave rise to three traditions: analyses of the relationship between infrastructure and superstructure in a Marxist manner, anthropological ethnography focusing on the homologues between social structure and culture, and Kuhn-inspired methodological relativism showing how social interests determine knowledge. While Law acknowledges that some of the contributions remain committed to this second phase, he also asserts that the stage is entering a crisis: “A third phase is upon us in the form of work that has gone some way to eroding the basis of the sociology of knowledge as this has traditionally been conceived.” (Law 1984, 2) In his brief account of each text, it becomes clear that the contributions pushing in the direction of

this third phase are Callon's, Latour's, and his own. Now, if this third phase erodes "the basis of sociology of knowledge as this has traditionally been conceived," it is fair to ask: Is it "A New Sociology of Knowledge" or rather something completely different?

This is the context in which Latour read *Leviathan and the Air-Pump*. The book came out right after these attempts, of which he was a part, to stop using concepts borrowed from the study of society in order to explain the scientific world. The authors acknowledge this reception in the 2011 introduction as follows: "Latour thought the story was distastefully asymmetric: it was said to explain experiment's career and authority in political terms, while these political terms were never themselves subjected to the scrutiny given to natural terms." (Shapin and Schaffer 2011, xxxii) In this late account of the book's reception, however, they also point—not without irony—to what Latour—as well as Hacking—did take from *Leviathan*... "You could get to a proper metaphysical theory of the nature of science and of the polity through a proper interpretation of the controversies to which Shapin and Schaffer had drawn attention. Both reviewers thus offered magisterial accounts that placed the contests between Boyle and Hobbes at the roots of modern order, whether by way of Hacking's self-authenticating laboratory style or Latour's modern constitution." (2011, xxxiii) Despite the mockery tone, the authors' description is quite accurate: if the dispute between Boyle and Hobbes as depicted by the authors acted as the "fruit flies of the new social theory of science" (Latour 1990, 148), Latour perceived himself as the Thomas Hunt Morgan who uncovered the underlying mechanisms revolutionizing his field. In order to see why, we need to delve deeper into the conceptual personae of Hobbes and Boyle.

Before and After Science

One of the main accomplishments of *Leviathan and the Air-Pump* is surely to have brightly illuminated a key moment in the genesis of the concept of *matter of fact*. Though the phrase had existed in legal contexts since the late 1500s—it was the vernacular translation of *res facti*, as opposed to *res juris* or matter of law—Boyle and the Royal Society gave it a new philosophical meaning in the 1660s. As for Latour, his use of the word *fact*, as in the quote from *Laboratory Life*, will switch, since his reading of *Leviathan and the Air-Pump*, into *matter of fact*, which will become a key concept in his proposal. In *Pandora's Hope*, he will include an entry of the term in the glossary in the appendix, where we read: "The general drift of science studies is to make matters of not, as in common parlance, what is already present in the world, but a rather late outcome of a long process of negotiation and institutionalization. This does not limit their certainty but, on the contrary, provides all that is necessary for matters of fact to become indisputable and obvious. To be indisputable is the end point, not the beginning, as in the empiricist tradition." (Latour 1999, 307) This long process of negotiation and institutionalization is the process empirically studied by Latour in an ethnographic style, combined with his philosophical insights about the construction of what he calls "the modern Constitution" as drawn from the conceptual personae of Boyle and Hobbes. The significance of the pair and the identification of what is at stake in their controversy are the evident traces – through a singular kind of translation, which is the philosophical creation – of *Leviathan and the Air-Pump*.

Shapin and Schaffer portray the creation of matters of fact in the laboratory as a complex apparatus that included an experimental scene featuring trustworthy witnesses who attested to the fact, discursive rules, material constraints (such as replicability), and the use of virtual witnesses.² It was, in the Wittgensteinian conceptual framework explicitly

² The question regarding the democratic or elitist character of knowledge production in Boyle is a philosophical one. From a descriptive point of view, the answer is ambiguous. On the one hand, the

stated by the authors, a language game bound up with a form of life. They write: "Just as for Wittgenstein the term 'language-game' is meant to bring into prominence the fact that the speaking of language is part of an activity or of a form of life, so we shall treat controversies over scientific method as disputes over different patterns of doing things and of organizing men to practical ends." (Shapin and Schaffer 2011, 15) Pinch wraps the core of this argument up in two sentences: "Boyle was not just concerned to experiment on air, he wanted to establish the 'experimental form of life' as a means of achieving assent within the natural philosophical community. His success in this goal depended on a combination of what the authors refer to as his 'literary technology' (the means by which the phenomena produced by the pump were made known to others), his 'social technology' (the new conventions whereby knowledge claims should be evaluated) and the 'material technology' of the air-pump." (Pinch 1986, 653)

The importance of the concept lies in its intrinsic attempt to escape from everything having to do with people, politics, power, and society. It then becomes at least a possible court of appeal when all-too-human conflicts are in need of a neutral, objective reality that would serve as a touchstone to settle disputes. However, as Latour will still state in the following century, this opposition is but the optical effect of a certain illumination, pertaining to the *dispositif* created by Boyle: "We don't have, on the one hand, a harsh world made of indisputable matters of fact and, on the other, a rich mental world of human symbols, imaginations and values. The harsh world of matters of fact is an amazingly narrow, specialized, type of scenography using a highly coded type of narrative, gazing, lighting, distance, a very precise repertoire of attitude and attention, of which historians of science like Lorraine Daston, Horst Bredekamp, Steve Shapin, Simon Schaffer and Peter Galison, to name a few, have made a careful inventory." (Latour 2008, 38)

There is, hence, a political relevance of matters of fact, perhaps understated by the Wittgensteinian framework: they are alleged to produce *assent*. Assent was something that was lacking in England after the wars of religion and during the fragile Restoration settlement with its strong, menacing undercurrents. Laboratory experiments could produce assent—or at least that's what experimental philosophers claimed. However, "Hobbes denied this automatic harmony: peaceful assent could not be assumed, but must be *made*." (Shapin and Schaffer 2011, 328) One of the interests of studying Hobbes's differing opinion on this matter—and, needless to say, controversies in general—is that it helps us identify problematic knots. By drawing attention to Hobbes's often-overlooked *Dialogus physicus de natura aeris* (1661), Shapin and Schaffer highlight how, if one had a conception of philosophy as geometrical in its method, causal in its subject and apodictic in its nature—that is, an enterprise that "secured a total and irrevocable assent"—as Hobbes did—then "whatever Boyle's experimental programme was, it was not *philosophy*." (Shapin and Schaffer 2011, 19) The conventional nature of experimental facts—the consensual nature of knowledge in Boyle's conception—could therefore not produce the universal and necessary assent that civil harmony required. Otherwise, Hobbes himself could not have claimed that the air-pump leaked. In contrast, "[t]he laws of geometry compelled in the same sense as the laws of civil society. Both geometry and the commonwealth were artifactual." (Shapin and Schaffer 2011,

device he creates relies, as Latour rightly puts it, on a parajudicial metaphor: "credible, trustworthy, well-to-do witnesses gathered at the scene of the action can attest to the existence of a fact, the matter of fact, even if they do not know its true nature." (Latour 1993, 18; see also 1990, 148) The number of direct witnesses is limited and very small in practice. Their trustworthiness and credibility obviously rely on certain moral qualities and gentlemanly manners, but this moral figure relies in turn on gender, race, age and prosperity – viz., inherited wealth and property ownership. "Whom to trust?" is a question to which the answers vary according to time and geography (Shapin 1998, 8), and 17th century England does not seem to consider the possibility of women, servants or children being reliable witnesses—not to mention people from distant geographies.

329) Establishing a parallel between divine and human creation, Hobbes maintains that compelling power belongs solely to the maker.³ Latour can therefore speak of a Hobbesian “generalized constructivism” designed to end civil war: “no transcendence whatsoever, no recourse to God, or to active matter, or to Power by Divine Right, or even to mathematical Ideas.” (Latour, 1993: 19)

Something odd happens while reading *Leviathan and the Air-Pump*: the difference between science and politics seems completely blurred. It's only *after* Boyle and Hobbes—for all that we know, other controversies may have also been important in this matter—have “settled” their controversy that this difference appears more clearly. Only that they haven't really settled anything, they just gave rise to two different movements, traditions, and *forms of life*. Officially, one might say Boyle won, given his central role in establishing experimental science as the most reliable form of knowledge during the centuries to come. However, Hobbes's position also engendered both a way of doing politics and a way of reflecting on politics. We do not live in a world where science is the ultimate word. We live in a community or some sort of political body, and the logic that rules it is not a scientific one, not in the sense of natural sciences or even formal sciences. We also have the disciplines formerly known as philosophy, sociology, anthropology, and so on—divisions of labor that began to be eroded by the end of the 20th century and left us with something like “the humanities,” or even the more minimalistic “theory.”

So, they both won. Latour draws a heavy consequence from this: what we used to think of as Modernity is the result of an underlying Constitution that assigns the representation of humans to politics and the representation of nonhumans to science—what we previously called the *complementarity thesis*. Even though this idea will be further developed in *We Have Never Been Modern*, it was already present in the review: “Part of the 17th century English Constitution is to distinguish two domains of representation, that of humans and that of non-humans, much as the Executive branch is distinguished from the Legislative branch.” (1990, 156) Hobbes and Boyle, together yet apart. It's a couple that, like Abbott and Costello, work as one by misunderstanding each other. On a practical level, scientists and politicians speak different languages and sometimes seem to live in different worlds. On an epistemological level, natural scientists will always try to explain away social beings, and sociologists will try to transform scientific theories into the result of some power struggle. We could also try to stay in the middle, in an Aristotelian way—as Collins and Yearley suggest (1992). However, Latour's contention is that all these possibilities imply staying *inside* the controversy, as if we could not see it from the outside because we have inherited one or

³ This point is eloquently articulated by Shapin and Schaffer: “In our culture, saying that knowledge is artifactual and conventional is tantamount to saying that it is not authentic knowledge at all... In everyday life, we ourselves diminish knowledge-claims by showing their constructed nature or their conventional bases. Such practices make sense within a particular game. And that game, ... is one in which knowledge is, so to speak, ultimately vouched for not by human agency (individual or collective) but by reality itself. Man is not a maker but a mirror. Yet, within other language-games, the situation might be quite different. It might be that knowledge is taken as secure insofar as it is seen as constructed in a certain way and uses certain conventions. This, we argue, is the case with Hobbes: certainty was a function of convention. Here is where Hobbes as rationalist and Hobbes as conventionalist come together. This point is perhaps most evident in Hobbes's treatment of the certainty to be expected from both geometry and from *civic philosophy*. Having said that geometry is demonstrable because geometrical figures ‘are drawn and described by ourselves,’ Hobbes then claimed that ‘civic philosophy is demonstrable because we make the commonwealth ourselves.’ ... This goes against all the intuitions of the empiricist. Hobbes was saying that one can only completely explain or understand that which one makes; the empiricist regards the man-made component of knowledge as a distortion of the mind's mirroring of reality.” (Shapin and Schaffer 2011, 150)

the other tradition. It's *either/or*, and they are both forms of *reducing* its other. The story about the genesis of the *fetish* is instructive in regard to this European inclination:

It all started on the West Coast of Africa, somewhere in Guinea, with the Portuguese. Covered with amulets of the saints and the Virgin themselves, they accused the Gold Coast Blacks of worshipping fetishes. When the Portuguese demanded an answer to their first question, "Have you made these stone, clay, and wood idols you honor with your own hands?" the Guineans replied at once that indeed they had. Ordered to answer the second question, "Are these stone, clay, and wood idols true divinities?" the Blacks answered "Yes!" with utmost innocence: yes, of course, otherwise they would not have made them with their own hands! The Portuguese, shocked but scrupulous, not wanting to condemn without proof, gave the Africans one last chance: "You can't say both that you've made your own fetishes and that they are true divinities; you *have to choose*: it's either one or the other. (Latour 2010, 2-3)

A modern is someone who, while constantly creating things they regard as real in practice, cannot conceive that something made could be real. A distribution of roles hence becomes necessary: moderns will assign Nature the monopoly of reality, and Society the monopoly of construction—all transcendence to Nature and all immanence to Society. They use Hobbes's constructivism for the process, but Boyle's matters of facts for the results—this is why, as STS scholars have been pointing out for decades, nobody really wanted to study the actual scientific processes. Since Science, as (political) epistemology conceives of it, is what gives us Nature, and Nature is already out there. Hence, the process of discovery becomes merely anecdotal. Latour's contention is, however, that—as we can see in *Leviathan and the Air-Pump*—reality and construction are not opposed (quite the contrary). A GMO is perfectly real in spite of being man-made, and the same could be said about states, markets, or washing machines. But if this is so, then the pressing question is: Why do moderns cling to this division—or, in other words, why the anti-fetishism? Why do they feel the need to criticize *certain* facts, but certainly not all, as being man-made, as if this would take away their reality? Latour's answer is definitely *political*, and can be seen in his critique of the dichotomy between facts and values in the third chapter of *Politics of Nature*: "if people are so fond of this distinction, which is as awkward as it is absolute, it is because it seems at least to guarantee a certain transcendence over the redoubtable immanence of public life" (Latour 2004, 121).

There are two important points worth underscoring here. First, as we learn from Boyle, matters of fact can indeed be *made*, and that does not mean that they are *made-up*. Second, as we learn from Hobbes, they do have a political existence. This cannot simply mean that it's impossible to eradicate the possibility of people "making use of them" for political or personal ends, since this would imply a conception that reduces Society to mere interests and Nature to objective matter,⁴ whilst Latour's proposal implies stepping away from this dichotomy altogether and trying to grasp the whole as a *real collective construction* composed both of humans and non-humans. So where does this political dimension of science lie—or, to put it bluntly, what exactly is the problem with Boyle's inheritance? Why is Latour also a bit of a Hobbesian when he emphasizes the political aspect of modern science? And isn't this move an asymmetrical one?

⁴ Latour sometimes uses the adjective "Machiavellian" for this conception. The adequacy of the term is of course contentious.

Deus sive Natura, or the Political Theology of the Laboratory

We are now better positioned to grasp the significance of the controversy between Hobbes and Boyle in Latour's reading of *Leviathan and the Air-Pump*. Let us, then, turn to *We Have Never Been Modern* and examine a key passage in its entirety:

After Hobbes has reduced and reunified the Body Politic, along comes the Royal Society to divide everything up again: some gentlemen proclaim the right to have an independent opinion, in a closed space, the laboratory, over which the State has no control. And when these troublemakers find themselves in agreement, it is not on the basis of a mathematical demonstration that everyone would be compelled to accept, but on the basis of experiments observed by the deceptive senses, experiments that remain inexplicable and inconclusive. Worse still, this new coterie chooses to concentrate its work on an air pump that once again produces immaterial bodies, the vacuum – as if Hobbes had not had enough trouble getting rid of phantoms and spirits! And here we are again, Hobbes worries, right in the middle of a civil war! We are no longer to be subjected to the Levellers and the Diggers, who challenged the King's authority in the name of their personal interpretation of God and of the properties of matter (they have been properly exterminated), but we are going to have to put up with this new clique of scholars who are going to start challenging everyone's authority in the name of Nature by invoking wholly fabricated laboratory events! If you allow experiments to produce their own matters of fact, and if these allow the vacuum to be infiltrated into the air pump and, from there, into natural philosophy, then you will divide authority again: the immaterial spirits will incite everyone to revolt by offering a court of appeal for frustrations. Knowledge and Power will be separated once more. You will 'see double', as Hobbes put it. Such are the warnings he addresses to the King in denouncing the goings-on of the Royal Society. (Latour 1993, 20)

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Hobbes's unease with Boyle is thus double, and concerns both the form (the laboratory) and the content (vacuum). As for the latter, the philosopher's plenist monism is directed at excluding the possibility of immaterial beings that could work as sources of legitimacy. It is in accordance with natural law for a person to speak for themselves, but when someone pretends to speak in the name of some other entity, problems arise. If this other entity is a human one, then the necessary question concerns the legitimacy of their authority, and can only be solved with the machine of the Leviathan. If this other entity, however, is not a human one, then the door opens for its alleged representer to claim to be above all civil laws due to the transcendent nature of their represented. Moreover, if this allegedly represented entity that "makes someone speak" is invisible to others, then the trouble is even bigger, since the authority of the representative depends only on belief. This is the reason why Hobbes eradicated spirits from his system, so there could be no more prophets. And this is exactly what Boyle reintroduces with his talk of the "spring of the air" within a void.

As for the form, who authorized him to speak in the vacuum's name? The laboratory, as we've seen, includes only the experimenter, his assistants, and a few wealthy men who act as witnesses. That is to say, it is a closed space wherein subjects pretend to be independent from their lawful sovereign. It is a kingdom within a kingdom. It creates a double order that makes people "see double," and double order amounts to no order. Let us recall the Hobbesian origin of this quote, which also lends its name to *Leviathan and the Air-Pump's* third chapter:

a Church, such a one as is capable to Command, to Judge, Absolve, Condemn, or do any other act, is the same thing with a Civil Commonwealth, consisting of Christian men; and is called a *Civill State*, for that the subjects of it are *Men*; and a *Church*, for that the subjects thereof are *Christians*. *Temporall* and *Spirituell* Government, are but two words brought into the world, to make men see double, and mistake their *Lawfull Sovereign*. It is true, that the bodies of the faithfull, after the Resurrection, shall be not onely *Spirituell*, but *Eternall*: but in this life they are *grosse*, and corruptible. There is therefore no other Government in this life, neither of State, nor Religion, but *Temporall*; nor teaching of any doctrine, lawfull to any Subject, which the Governour both of the State, and of the Religion, forbiddeth to be taught: And that Governour must be one; or else there must needs follow Faction, and Civil war in the Commonwealth, between the *Church* and *State*; between *Spiritualists*, and *Temporalists*; between the *Sword of Iustice*, and the *Shield of Faith*; and (which is more) in every Christian mans own brest, between the *Christian*, and the *Man*. The Doctors of the Church, are called Pastors; so also are *Civill Sovereignes*: But if Pastors be not subordinate one to another, so as that there may bee one chief Pastor, men will be taught contrary Doctrines, whereof both may be, and one must be false. Who that one chief Pastor is, according to the law of Nature, hath been already shewn; namely, that it is the *Civill Sovereign*... (Hobbes 2012, 732- 734)

There is thus a strict parallelism between religion and science: according to Hobbes, “experimental philosophers” are, in this sense, just like Pastors. The laboratory is their Church and Nature, their God. Just as Gods, Nature can be used as a court of appeal to settle human affairs with the aid of an outside intervention. The transcendence of matters of fact as well as that of divine or holy apparitions contrasts with the sheer immanence of power struggles. As Shapin and Schaffer point out, Hobbes’s problem with the experimenters was that they “pretended that *nature* could set up some right reason, and that their private community of interpreters then spoke with the authority of that reason” (Shapin and Schaffer 2011, 323) And for Hobbes, “no interpretation should be allowed to appeal to a higher authority than the civil one” (Latour 1990, 150). God or Nature, it makes no difference: they are both devices designed for bypassing the legitimate authority of the State. Latour summarizes the problem as follows:

One of the great dangers for civil peace comes from the belief in immaterial bodies such as spirits, phantoms or souls, to which people appeal against the judgements of civil power. Antigone might be dangerous when she proclaims the superiority of piety over Creon’s ‘reasons of State’; the egalitarians, the Levellers and the Diggers are much more so when they invoke the active powers of matter and the free interpretation of the Bible in order to disobey their legitimate princes. Inert and mechanical matter is as essential to civil peace as a purely symbolic interpretation of the Bible. In both cases, it behoves us to avoid at all costs the possibility that the factions may invoke a higher Entity - Nature or God - which the Sovereign does not fully control. (Latour 1993, 19)

The problem is precisely this *invocation* or “appeal by factions to a superior Entity” (Latour 1990, 150), which *accelerates* instead of properly *representing*. Latour is explicit about the normative role played by the contrast between *acceleration* and *representation* in his own proposal: only the institution of a *due process* can slow down the ontological proliferation so as to “represent rather than short-circuit” (Latour 2004a, 126), which hence becomes the goal of political ecology—the movement that, according to Latour, can bridge the gap between humans and non-humans. In this regard, once again, both science and religion posit mysterious non-human beings through procedures that are kept separate from the civic protocols. This detachment from the body politic shields them from political engagement

and, more importantly, from political responsibility. Latour's indebtedness to Hobbes on this point is manifest through his persistent rejection of the concept of nature: "if we have to give up nature, it is neither because of its reality nor because of its unity. It is solely because of the short-circuits that it authorizes when it is used to bring about this unity once and for all, without due process, with no discussion, outside the political arenas, and when something then intervenes from the outside to interrupt—in the name of nature—the task of gradually composing the common world." (2004a, 91)

On this matter, Hobbes proved to be correct. However, this should not lead us to believe—as we've noted earlier—that Latour agrees with Hobbes on the whole. Hobbes is wrong, since "[i]n this new regime of Knowledge *qua* Power everything is reduced: the Sovereign, God, Matter, the Multitude." (Latour 1990, 150) Hobbes's controversial claim about the sovereign deciding over grammar is, despite all the nuances that Hobbesian scholars may add, telling in this regard. But why is it reduced in such a way? Paradoxically, because Hobbes does not seem to accept a defining trait of political strategy, viz., change of scale: "What irritates Hobbes so much is that Boyle modifies the *relative scale* of phenomena: macro-factors about matter and God's powers may be made amenable to an experimental solution and this solution will be a partial modest one." (Latour 1990, 153) Through the air-pump, Boyle creates what, in *The Pasteurization of France*, Latour calls an "obligatory point of passage" (1988): "Shapin and Schaffer manage to explain how and why discussions dealing with the Body Politic, God and His miracles, matter and its power, have to be translated through the air pump." (Latour 1993, 21) For both Boyle and Pasteur, the laboratory works a miracle: by making it so that every discussion must go through it, they reverse power relations and transform weakness into strength. Hobbes's denial of this "essential feature of modern power" (Latour 1990, 153), which is the displacement of conflicts through the laboratory, is what makes it impossible for us to say, with Shapin and Schaffer, that he was right.

But there is a second reason why Latour rejects embracing the Hobbesian legacy as a whole: both he and Boyle are responsible for contributing to the creation of "two illicit assemblies that render each other mutually powerless and prohibit the exercise of public life" (Latour 2004a, 77), that is, the institution of "a two-house collective, made up of free subjects and indisputable natures, that is completely *inarticulate*, totally speechless, since the goal of the subject-object opposition is actually to suppress speech, to suspend debate, to interrupt discussion, to hamper articulation and composition, to short-circuit public life, to replace the progressive composition of the common world with the striking transfer of the indisputable—facts or violence, right or might." (2004a, 86)

That said, a fundamental point when focusing on the Hobbesian aspect in Latour is that he also wants to build one collective, unlike other authors engaged in cosmopolitics, such as Blaser (2016). This is precisely what he says when he quotes Hobbes—"It is the *Unity* of the representer, not the *Unity* of the represented that maketh the person *One*" (Hobbes 2012, 248)—and claims that:

Hobbes is obsessed by this unity of the Person who is, as he puts it, the actor of which, we citizens, are the authors. It is because of its unity that there should be no transcendence. Civil wars are raging when there exist supernatural entities to which citizens feel entitled to appeal when they deem themselves to be persecuted by the authorities of this base world. The dual loyalty of the old medieval society - God and the King as two parallel crowns - is no longer possible if everyone may appeal *directly* to God. Hobbes wants to get rid entirely of this dualism. In effect he wants to reobtain Catholic unity but by blocking all accesses to God's transcendence. (Latour 1990, 150; see also Latour 1993, 19)

This passage from the review will be transcribed almost untouched in the second chapter of *We Have Never Been Modern*. The problem is, however, that not only is the access to transcendence never closed off—and that all attempts at closing it can be nothing but monotonously despotic—but that this access is necessary for the Leviathan to work. This is why Boyle's program is complementary to that of Hobbes: the experimental program will become instrumental to the State: "the two Branches of government that Boyle and Hobbes are drafting apart are to be implemented only if clearly separated: Hobbes's State is powerless without science and technology (without the air-pump and the sword of the dust cover), but Hobbes talks only of the representation of naked citizens (of the scepter in the hand of the sovereign); Boyle's science is powerless without carefully distinguishing spheres of religion, politics and science, and this is why he is so careful in eliminating Hobbes' monism." (Latour 1990, 159)

The dual loyalty of the old modern society—science and politics as two parallel crowns—is no longer possible if *hybrids* proliferate until they become ever-present. Needless to say, Latour wants to get rid entirely of this dualism. Only this time, the goal is not to reobtain Catholic unity, even though Latour's background might point in this direction, nor is blocking all access to divine transcendence the means of achieving it. Rather, the means seems to be to open all paths to transcendence and, above all, to make them *explicit* through what he calls "due process" though the mechanisms proposed by Latour, and even more so the examples he provides, often remain unconvincing and troublingly reminiscent of modern parliamentarism. Be that as it may, some kind of institutionalization that would reintroduce scientific practices in the collective is, Latour thinks, the only way to create the conditions of possibility for engaging in a common world, i.e. for doing politics. The trouble is that there is a certain concept forged by the misinterpretation of scientific practices that obstructs this procedure, viz, the concept of Nature. It is no longer God, at least to a certain extent, whose transcendence is appealed to, but rather Nature. And the point is not to block or deny all access to nature, but to admit their existence. This implies fundamentally two things: admitting its multiplicity and rendering its political character explicit. As a byproduct, this has the positive effect of blurring the all-or-nothing, leap-of-faith conception of transcendence, and outlining an ontology where "small transcendences" are constantly being produced and put into play. As the attentive reader will have already noticed, this point is much closer to Boyle than to the aforementioned Latourian Hobbesianism. We could therefore say that Latourian politics implies a binding movement (Hobbesian moment) but also a proliferating movement (Boylean moment). Without the latter, the Leviathan would be as fragile and devoid of living entities as a house of cards; without the former, there would be no commonality.

Conclusions

Latour's engagement with *Leviathan and the Air-Pump* is neither that of a historian of science nor that of a commentator on seventeenth-century controversies. It is, rather, a philosophical appropriation of a historical episode—a hinge through which he reframes the modern divide between nature and society, fact and value, science and politics. In reinterpreting the roles of Hobbes and Boyle, Latour does not simply take sides; he shows how their opposition becomes the mechanism by which modernity sustains its bifurcated structure. His conceptual gesture is to expose that mechanism, thereby opening it to transformation.

If Hobbes is right to demand collective unity, and Boyle is right to multiply sources of legitimacy, Latour can be seen as attempting to inherit both: to envision a collective that acknowledges the proliferation of nonhuman agencies while devising political forms capable of representing them. This requires dismantling the dualist architecture that has governed

modern representation, and replacing it with a compositional process—a “due process”—in which transcendence is not denied but redistributed, made visible, and politically mediated.

From this perspective, the laboratory no longer appears as a neutral space of discovery but as a site in which a legitimate mode of representation is actively composed, through the careful translation of nonhuman entities into stable, communicable forms. The political challenge is to articulate a framework in which these representational practices can be brought into resonance with the institutions that speak for humans, without short-circuiting either. Such convergence must be made democratically sustainable: the procedures by which entities—human or nonhuman—are made to speak must be open to scrutiny, negotiation, and shared responsibility. Representation, in this sense, ceases to divide and begins to compose—a forging of the common world through procedures that are both epistemically rigorous and politically accountable.

Acknowledgement

I am grateful to Facundo C. Rocca for the many conversations that helped shape the questions and ideas developed in this paper. This text would not have taken form without him.

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