Introduction to Part I: Learning to Feed off Controversies

Like all sciences, sociology begins in wonder. The commotion might be registered in many different ways but it’s always the paradoxical presence of something at once invisible yet tangible, taken for granted yet surprising, mundane but of baffling subtlety that triggers a passionate attempt to tame the wild beast of the social. ‘We live in groups that seem firmly entrenched, and yet how is it that they transform so rapidly?’ ‘We are made to do things by other agencies over which we have no control and that seem plain and mundane enough.’ ‘There is something invisible that weighs on all of us that is more solid than steel and yet so incredibly labile.’ ‘There exist forces that are strangely similar to those studied by natural scientists and yet distinctively different.’ ‘This puzzling mixture of obdurate resistance and perverse complexity seems wide opened to inquiry, and yet it defies all inquiries.’ It would be hard to find a social scientist not shaken by one or more of these bewildering statements. Are not these conundrums the source of our _libido scienti?_ What pushes us to devote so much energy into unraveling them?

There is, however, an increasing distance between what triggers those successive shocks and the solutions that have been devised to explain them. I am going to argue in Part I that although the insights of sociology are correct, the solutions suggested by a shrinking definition of the social has in many ways adulterated what was productive and scientific in them. This is why I want to reexamine each of those successive questions and dissect them so that we can renew our definition of what is an association.

Faithful to relativist principles, instead of dividing the social domain as most textbooks of sociology usually do into a list of actors, methods, and domains _already_ taken as members of the social realm, I have organized the first part of this work by types of controversies about _what_ this universe is made of. I think it is possible to build upon the
major intuitions of the social sciences by examining five major uncertainties: 16
- the nature of groups: there exist many contradictory ways for actors to be given an identity;
- the nature of actions: in each course of action a great variety of agents seem to barge in and displace the original goals;
- the nature of objects: the type of agencies participating in interaction seems to remain wide open;
- the nature of facts: the links of natural sciences with the rest of society seems to be the source of continuous disputes;
- and, finally, about the type of studies done under the label of a science of the social as it is never clear in which precise sense social sciences can be said to be empirical.

What has made ANT so implausible is that before going anywhere those five uncertainties have to be piled on top of one another, with each new one making the former even more puzzling until some common sense is regained—but only at the end. Most users of ANT have so far had little patience to wait and I can’t blame them. 17

The reader will discover here a set of complicated instructions to make displacement more costly and more painful. The reason for this is that I want to break the habit of linking the notions of ‘society’, ‘social factor’, and ‘social explanation’ with a sudden acceleration in the description. When sociologists of the social pronounce the words ‘society’, ‘power’, ‘structure’, and ‘context’, they often jump straight ahead to connect vast arrays of life and history, to mobilize gigantic forces, to detect dramatic patterns emerging out of confusing interactions, to see everywhere in the cases at hand yet more examples of well-known types, to reveal behind the scenes some dark powers pulling the strings. Not that they are wrong since its perfectly true that older social relations have been packaged in such a way as to seem to provide a ready explanation for many puzzling subjects. But the time has come to have a much closer look at the type of aggregates thus assembled and at the ways they are connected to one another.

When you wish to discover the new unexpected actors that have more recently popped up and which are not yet bona fide members of ‘society’, you have to travel somewhere else and with very different kinds of gear. As we are going to see, there is as much difference in the

16 I have chosen ‘uncertainties’—in a weak allusion to the ‘uncertainty principle’—because it remains impossible to decide whether it resides in the observer or in the phenomenon observed. As we will see, it’s never the case that the analyst knows what the actors ignore, nor is it the case that the actors know what the observer ignores. This is the reason why the social needs to be reassembled.

17 For readers most interested in science studies, it might make more sense to read Chapter 4 first—p. 87—and then swallow the other sources of uncertainty one by one. For those more familiar with ANT, it might be easier to start with the introduction, p. 141.
two uses of the word ‘social’ as there is between learning how to drive on an already existing freeway and exploring for the first time the bumpy territory in which a road has been planned against the wishes of many local communities.\textsuperscript{18} There’s no question that ANT prefers to travel slowly, on small roads, on foot, and by paying the full cost of any displacement out of its own pocket.

The reason for this change of tempo is that, instead of taking a reasonable position and imposing some order beforehand, ANT claims to be able to find order much better \textit{after} having let the actors deploy the full range of controversies in which they are immersed. It is as if we were saying to the actors: ‘We won’t try to discipline you, to make you fit into our categories; we will let you deploy your own worlds, and only later will we ask you to explain how you came about settling them.’ The task of defining and ordering the social should be left to the actors themselves, not taken up by the analyst. This is why, to regain some sense of order, the best solution is to trace connections \textit{between} the controversies themselves rather than try to decide how to settle any given controversy.\textsuperscript{19} The search for order, rigor, and pattern is by no means abandoned. It is simply relocated one step further into abstraction so that actors are allowed to unfold their own differing cosmos, no matter how counter-intuitive they appear.\textsuperscript{20}

It is this increased level of abstraction in social theory which makes ANT hard to grasp at first. And yet this shift is comparable to what a cartographer does in trying to record the shape of a foreign coast on

\textsuperscript{18} A reader, asking in what sense our theory of the social could be reconciled with ‘conventional’ sociology, offered as an objection the way AIDS patients mobilized as a group. Looking at traditional ‘social movements’, it was obvious to her that patients’ organizations corresponded to ‘conventional’ definitions of the social because she had entirely forgotten how deeply innovative it was for patients to make politics out of retroviruses. For us on the other hand, AIDS activism, and more generally patient-based organizations, is just the type of innovation that requires completely new definitions of the social. See Steven Epstein (1996), \textit{Impure Science. AIDS, Activism and the Politics of Knowledge}; Michel Callon and Volonola Rabeharison (1999), \textit{Le pouvoir des maladies}; and Nicolas Dodier (2003), \textit{Leçons politiques de l'épidémie de sida}. These prove how fast people forget the new associations and include them in their ‘conventional’ definition of what is a society.

\textsuperscript{19} A striking example of the richness of this approach has been provided in Boltanski and Thevenot, \textit{On Justification}. In this major work, the authors have shown that it was possible to find a much more solid order once it was accepted that ordinary French persons, when engaged in polemics where they had to justify their positions, could rely not on one but six complete principles of justification (les \textit{Cités} or Orders of Worth: Market, Industrial, Civic, Domestic, Inspired, Opinion) to which the authors later added a possible Green justification. See Claudette Lafaye and Laurent Thevenot (1993), ‘Une justification écologique? Conflicts dans l'aménagement de la nature’. Although those principles were incommensurable, the sociologists, by moving one step further into abstraction, could nonetheless render them comparable. It’s this magnificent example of the power of relativity that I am trying to emulate here.
a piece of paper. She might exert herself to fit the various reports sent by explorers into some existing geometrical format—bays have to be circles, capes triangles, continents squares. But after noticing the hopeless mess created by those records, none of which exactly fall into pre-determined shapes, she will eagerly accept any proposition to displace the quest for geometrical rigor with a totally abstract Cartesian grid. Then she will use this empty grid to patiently record the coastline itself, allowing it to be drawn in as tortuous a way as geological history made it to be. Although it may appear stupid to record every reported point simply by longitude and latitude, it would be even more stupid to insist that only data that fits a preordained geometrical shape be kept. Similarly, ANT claims that it is possible to trace more sturdy relations and discover more revealing patterns by finding a way to register the links between unstable and shifting frames of reference rather than by trying to keep one frame stable. Society is no more ‘roughly’ made of ‘individuals’, of ‘cultures’, of ‘nation states’ than Africa is ‘roughly’ a circle, France a hexagon or Cornwall a triangle. There is nothing surprising in this since every scientific discipline is a slow training in devising the right sort of relativism that can be adapted to the data at hand. Why would sociology alone be forbidden to invent its own path and be requested to stick to the obvious? Now that geologists have accepted the notion of cold and rigid continental plates floating freely over the hot, molten seabed that seeps out of deep oceanic rifts, are they not, so to speak, on ‘firmer ground’? Similarly, ANT claims that we will find a much more scientific way of building the social world if we abstain from interrupting the flood of controversies. We, too, should find our firm ground: on shifting sands. Contrary to what is so often said, relativism is a way to float on data, not drown in them.20

Metaphors borrowed from cartography or from physics break down very fast, however, once the range of uncertainties to be swallowed by sociologists of association begins to be deployed. In some extreme situations, actors seem to have an uncanny ability to disagree with everything sociologists supposedly take for granted in order to begin their work. Abandoning the fixed frame of reference offered by ether, as physicists did, appears in retrospect a rather simple affair when compared with what we will have to let go of if we want to leave the actors free to deploy the full incommensurability of their own world-making activities.21 Be prepared to cast off agency, structure, psyche,

20 It’s only in Part II that we will deal with the other question of stabilizing controversies. For reasons that will become clear only later, sociologists of the social have not been able to keep the two movements distinct.

21 ‘World-making’ would be a fine word, see Nelson Goodman (1988), Ways of World Making, were it not for the conception of ‘making’ that goes with it and the definition of

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time, and space along with every other philosophical and anthropological category, no matter how deeply rooted in common sense they may appear to be.

Using the example of our cartographer, it is as if she had to deal not only with multiple reports coming from many travelers but also with multiple projection grids, where each point is requesting its own ad hoc coordinates. Faced with this confusion, one may decide to restrain the range of controversies or to unleash all of them. The first pre-relativist solution works fine but risks limiting sociology to routine, cold, and quiet situations. The second relativist solution tackles active, warm, and extreme situations, but then one has to let controversies unfold all the way. Striking some compromise between the two positions would be most absurd since controversies are not simply a nuisance to be kept at bay, but what allows the social to be established and the various social sciences to contribute in its building. Many of the difficulties in developing those disciplines have come from a refusal to be theoretical enough and from a misplaced attempt at clinging to common sense mixed with an ill-timed craving for political relevance. Such is the extreme position I wish to try and sustain for as long as possible. The drawback is that throughout their travels readers have to support themselves on a strange diet: they have to feed off controversies about what the social is made out of.

Traveling with ANT, I am afraid to say, will turn out to be agonizingly slow. Movements will be constantly interrupted, interfered with, disrupted, and dislocated by the five types of uncertainties. In the world ANT is trying to travel through, no displacement seems possible without costly and painful translations. Sociologists of the social seem to glide like angels, transporting power and connections almost immaterially, while the ANT-scholar has to trudge like an ant, carrying the heavy gear in order to generate even the tiniest connection. At the end of this book, we will attempt to summarize what differentiates a good ANT account from a bad one—a crucial quality test—by asking three questions: have all the difficulties of traveling been recognized? Has the complete cost of the travel from one connection to the next been fully paid? Has the traveler not cheated by surreptitiously getting a ride from an already existing ‘social order’? In the meantime, my advice is to pack as little as possible, don’t forget to pay your ticket, and prepare for delays.

the ‘one world’. This expression is thus taken as a provisional placeholder until we can redefine constructivism—see p. 88—and then much later what it means to compose ‘one common world’—p. 247.
Third Source of Uncertainty: Objects too Have Agency

If sociology has been marked from the start by the discovery that action was overtaken by other agencies, it has been spurred even more forcefully by the ethical, political, and empirical discovery that there exist hierarchies, asymmetries, and inequalities; that the social world is just as differentiated a landscape as a rugged and mountainous terrain; that no amount of enthusiasm, free will, or ingenuity can make those asymmetries go away; that they all seem to weigh as heavily as the pyramids, which hampers individual action and explains why society should be considered as a specific sui generis entity; that any thinker who denies those inequalities and differences is either gullible or somewhat reactionary; and, finally, that ignoring social asymmetry is as ridiculous as claiming that Newtonian gravitation does not exist.

How could we be faithful to this intuition and still maintain, as I just did with the first two sources of uncertainty, that groups are ‘constantly’ being performed and that agencies are ‘ceaselessly’ debated? Has the choice of those two departure points not been inspired by a naïve attitude that has smoothed the highly unequal social domain into a level playing field where everyone, it seems, has the same chance to generate one’s own metaphysics? Is ANT not one of the symptoms of this market spirit that claims, against all evidence, that everyone has the same chance—and too bad for the losers?69 ‘What have you done’, people could ask in exasperation, ‘with power and domination?’ But it is just because we wish to explain those asymmetries that we don’t want to simply repeat them—and even less to transport them further unmodified. Once again, we don’t want to confuse the cause and the effect, the explanandum with the explanans. This is

69. In Luc Boltanski and Eve Chiapello (2005), The New Spirit of Capitalism, the authors have made quite explicit this critique of ANT as does the scathing attack in Philip Mirowski and Edward Nik-Khah (2004), ‘Markets Made Flesh: Callon, Performativity, and a Crisis in Science Studies, augmented With Consideration of the FCC auctions’. We will have to wait until the Conclusion to tackle again the question of political relevance and answer those critiques.
why it’s so important to maintain that power, like society, is the final result of a process and not a reservoir, a stock, or a capital that will automatically provide an explanation. Power and domination have to be produced, made up, composed. Asymmetries exist, yes, but where do they come from and what are they made out of?

To provide an explanation, sociologists of associations must make the same radical decision as when they wanted to feed off the second source of uncertainty. It is because they wanted to keep the original intuition of social sciences that they had to adamantly reject the impossible solution that was proposed, namely that society is unequal and hierarchical; that it weighs disproportionally on some parts; and that it has all the character of inertia. To state that domination breaks down bodies and souls is one thing whereas concluding that these hierarchies, dissymmetry, inertia, powers, and cruelties are made of social stuff is a different argument altogether. Not only the second point has no logical continuity with the first, but it is also, as we shall see, in complete contradiction with it. In the same way as the overtaking of action by other agencies does not mean that society is taking over, the flagrant asymmetry of resources does not mean that they are generated by social asymmetries. It just leads to the opposite conclusion: if inequalities have to be generated, this is proof that other types of actors than the social ones are coming into play. As Marx did with Hegel’s dialectics, it’s time we put social explanation back on its feet.

The type of actors at work should be increased

So far, I have insisted mostly on the difference between ‘social’ as in ‘social ties’ and ‘social’ as in ‘associations’—bearing in mind that the second meaning is closer to the original etymology. I have argued that most often in social sciences, ‘social’ designates a type of link: it’s taken as the name of a specific domain, a sort of material like straw, mud, string, wood, or steel. In principle, you could walk into some imaginary supermarket and point at a shelf full of ‘social ties’, whereas other aisles would be stocked with ‘material’, ‘biological’, ‘psychological’, and ‘economical’ connections. For ANT, as we now understand, the definition of the term is different: it doesn’t designate a domain of reality or some particular item, but rather is the name of a movement, a displacement, a transformation, a translation, an

enrollment. It is an association between entities which are in no way recognizable as being social in the ordinary manner, except during the brief moment when they are reshuffled together. To pursue the metaphor of the supermarket, we would call ‘social’ not any specific shelf or aisle, but the multiple modifications made throughout the whole place in the organization of all the goods—their packaging, their pricing, their labeling—because those minute shifts reveal to the observer which new combinations are explored and which paths will be taken (what later will be defined as a ‘network’).\(^{71}\) Thus, social, for ANT, is the name of a type of momentary association which is characterized by the way it gathers together into new shapes.\(^{72}\)

Once this second meaning of social as association is in place, we can understand what was so confusing about the sociologists of the social. They use the adjective to designate two entirely different types of phenomena: one of them is the local, face-to-face, naked, unequipped, and dynamic interactions; and the other is a sort of specific force that is supposed to explain why those same temporary face-to-face interactions could become far-reaching and durable. While it’s perfectly reasonable to designate by ‘social’ the ubiquitous phenomenon of face-to-face relations, it cannot provide any ground for defining a ‘social’ force that is nothing more than a tautology, a sleight of hand, a magical invocation, since it begs the question of how and through which means this increase in durability has been practically achieved. To jump from the recognition of interactions to the existence of a social force is, once again, an inference that does not follow from the premise.

This distinction is especially crucial since what could be called the basic social skills are actually difficult to isolate in human societies. As we will see in Part II when criticizing the notion of ‘local interactions’, it’s mostly in non-human societies (ants, monkeys, and apes) that it’s possible to generate a social world understood as an entanglement of interactions. In humans, the basic social skills, although still present, offer an ever-present but nonetheless restricted repertoire. Most of the far-reaching and long-lasting associations are made by something else that could not be detected as long as the notion of social force was not submitted to scrutiny. With ANT, one needs to place the first definition within a very limited sphere and do away with the second, apart from using it as a kind of shorthand to describe what has been already

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\(^{71}\) On this notion of adjustment, see Franck Cochoy (2002), *Une sociologie du packaging ou l’âne de Burdian face au marché.*

\(^{72}\) The term ‘fluid’ was introduced in Annemarie Mol and John Law (1994), ‘Regions, Networks, and Fluids: Anaemia and Social Topology’—but see also Zygmunt Bauman (2000), *Liquid Modernity.* The word ‘fluid’ allows analysts to insist better than if they used the word network on the circulation and on the nature of what is being transported.
assembled together. In summary, no tie can be said to be durable and made of social stuff.

The main advantage of dissolving the notion of social force and replacing it either by short-lived interactions or by new associations is that it is now possible to distinguish in the composite notion of society what pertains to its durability and what pertains to its substance. Yes, there may exist durable ties, but this does not count as proof that they are made of social material—quite the opposite. It's now possible to bring into the foreground the practical means to keep ties in place, the ingenuity constantly invested in enrolling other sources of ties, and the cost to be paid for the extension of any interaction.

If we consider the basic social skills, it's easy to understand that the connections they are able to weave are always too weak to sustain the sort of weight that social theorists would like to grant to their definition of social. Left to its own devices, a power relationship that mobilizes nothing but social skills would be limited to very short-lived, transient interactions. But where has this situation ever been observed? Even baboon troops, although they are closest to the ideal world invented by many social theorists, cannot provide such an extreme case. As Hobbes and Rousseau have remarked long ago, no giant is strong enough not to be easily overcome in his sleep by a dwarf; no coalition is solid enough not to be run over by an even larger coalition. When power is exerted for good, it is because it is not made of social ties; when it has to rely only on social ties, it is not exerted for long. So, when social scientists appeal to 'social ties' they should always mean something that has great trouble spreading in time and space, that has no inertia and is to be ceaselessly renegotiated. It's precisely because it's so difficult to maintain asymmetries, to durably entrench power relations, to enforce inequalities, that so much work is being constantly devoted to shifting the weak and fast-decaying ties to other types of links. If the social world was made of local interactions, it will retain a sort of provisional, unstable, and chaotic aspect and never this strongly differentiated landscape that the appeals to power and domination purport to explain.

As soon as the distinction between the basic social skills and the non-social means mobilized to expand them a bit longer is not carefully kept, analysts run the risk of believing that it's the invocation of

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73 For an early presentation of this argument, see Strum and Latour, 'The Meanings of Social'.
74 In the complex notion of nature, I have been able to distinguish its outside reality from its unity: the two did not go together in spite of so much philosophy (see Latour, Politics of Nature). The same is true of society: durability does not point to its materiality, only to its movement.

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social forces that will provide an explanation. Sociologists will claim that when they appeal to the durability of social ties they bring in something that really possesses the necessary durability, solidity, and inertia. It is ‘society’, or ‘social norm’, or ‘social laws’, or ‘structures’, or ‘social customs’, or ‘culture’, or ‘rules’, etc., they argue, which have enough steel in them to account for the way it exerts its grip over all of us and accounts for the unequal landscape in which we are toiling. It is, indeed, a convenient solution but does not explain where their ‘steely’ quality is coming from that reinforces the weak connections of social skills. And sociologists, in a careless move, might take a wrong turn and say that durability, solidity, and inertia are provided by the durability, solidity, and inertia of society itself. They might go even further and take this tautology not for the starkest of contradictions, but from what should be admired most in the miraculous force of a society that is, as they say, sui generis, by which they mean that it is generated out of itself.\(^75\)

Even if this way of talking is innocuous enough when taken as some shorthand to describe what is already bundled together, the consequences of such an argument are disastrous. The temptation is too strong to act as if there now existed some formidable force that could provide all the short-lived asymmetries with the durability and expansion that social skills could not manage to produce by their own impetus. At which point the causes and effects would be inverted and the practical means for making the social hold would vanish from view. What had begun as a mere confusion of adjectives has become a wholly different project: to this base world has been added a world which is just as intractable as the heaven of ancient Christian theology—except it does not offer any hope of redemption.

Are sociologists of the social so foolish that they are unable to detect such a tautology in their reasoning? Are they really stuck in the mythical belief of another world behind the real world? Do they really believe in this strange bootstrapping of a society born out of itself?\(^76\) Of course not, since they never really use it in practice and so are never confronted by the contradiction inherent in the notion of a ‘self-production’ of society. The reason why they never draw the logical conclusion that their argument is contradictory is that they use it somewhat more loosely. When they invoke the durability of some social aggregates they always, wittingly or unwittingly, lend to the

\(^75\) Cornelius Castorladis (1998), *The Imaginary Institution of Society* extends the fallacy even further, considering this tautology itself as the imaginary foundation of society. But once this foundation is accepted, there is no longer any way to detect the composition of the social.

\(^76\) Bootstrapping is taken as one characteristic of the social itself. See Barry Barnes (1983), ‘Social Life as Bootstrapped Production’.
weak social ties the heavy load coming from the masses of other non-social things. It is always things—and I now mean this last word literally—which, in practice, lend their 'steely' quality to the hapless 'society'. So, in effect, what sociologists mean by the 'power of society' is not society itself—that would be magical indeed—but some sort of summary for all the entities already mobilized to render asymmetries longer lasting. This use of a shorthand is not tautological, but it is dangerously misleading since there is no empirical way to decide how all that stuff has been mobilized any longer—and worst of all, there is no way to know if such a load is still active. The idea of a society has become in the hands of later-day 'social explainers' like a big container ship which no inspector is permitted to board and which allows social scientists to smuggle goods across national borders without having to submit to public inspection. Is the cargo empty or full, healthy or rotten, innocuous or deadly, newly made or long disused? It has become anyone's guess, much like the presence of weapons of mass destruction in Saddam Hussein's Iraq.

ANT's solution is not to engage in polemics against sociologists of the social, but simply to multiply the occasions to quickly detect the contradiction in which they might have fallen into. This is the only way to gently force sociologists again to trace the non-social means mobilized whenever they invoke the power of social explanations. What ANT does is that it keeps asking the following question: Since every sociologist loads things into social ties to give them enough weight to account for their durability and extension, why not do this explicitly instead of doing it on the sly? Its slogan, 'Follow the actors', becomes, 'Follow the actors in their weaving through things they have added to social skills so as to render more durable the constantly shifting interactions.'

It's at this point that the real contrast between sociology of associations and sociology of the social will be most clearly visible. So far, I might have exaggerated the differences between the two viewpoints. After all, many schools of social science might accept the two first uncertainties as their departure point (especially anthropology, which is another name for empirical metaphysics), and of course ethnomethodology. Even adding controversies does not radically alter the type of phenomena they might want to study, only the difficulties of

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77 In Part II, we will discover that this tautology is the hidden presence of the Body Politic: the paradoxical relation of the citizen with the Republic has fully contaminated the entirely different relation of actor and system—see p. 161.

78 Important in organization studies is the fact that whenever the big animal is implied tautologically, look for accounts, documents, and the circulation of forms. See Barbara Czarniawska (1997), A Narrative Approach To Organization Studies; Cooren, James R. Taylor (1993), Rethinking the Theory of Organizational Communication: How to Read an Organization.
listing them. But now the gap is going to be considerably enlarged, because we are not going to limit in advance to one small repertoire only that which is needed for actors to generate social asymmetries. Instead, we are going to accept as full-blown actors entities that were explicitly excluded from collective existence by more than one hundred years of social explanation. The reasons are twofold: first, because the basic social skills provide only one tiny subset of the associations making up societies; second, because the supplement of force which seems to reside in the invocation of a social tie is, at best, a convenient shorthand and, at worst, nothing more than a tautology.

Shirley Strum’s baboons
To understand the link between the basic social skills and the notion of society, a detour through the study of apes and monkeys is required. In recalling the first meeting on baboon studies that she organized in 1978 in a castle near New York City, Shirley Strum (1987: 157–58) wrote:

‘Still, I knew my work painted a picture of baboon societies that others would find difficult to accept. My shocking discovery was that males had no dominance hierarchy; that baboons possessed social strategies; that finesse triumphed over force; that social skill and social reciprocity took precedence over aggression. This was the beginning of sexual politics, where males and females exchanged favors in return for other favors. It appeared that baboons had to work hard to create their social world, but the way in which they created it made them seem “nicer” than people. They needed one another in order to survive at the most basic level—the protection and advantage that group living offered the individual—and also at the most sophisticated level, one marked by social strategies of competition and defense. They also seemed “nice” because, unlike humans, no member of Pumphouse [the name of the troop] possessed the ability to control essential resources: each baboon got its own food, water and place in the shade, and took care of its own basic survival needs. Aggression could be used for coercion, but aggression was a roped tiger. Grooming, being close, social goodwill and cooperation were the only assets available for barter or to use as leverage over another baboon. And these were all aspects of “niceness”, affiliation not aggression. Baboons were “nice” to one another because such behavior was as critical to their survival as air to breathe and food to eat. What I had discovered was a revolutionary new picture of baboon society. Revolutionary, in fact, for any animal society as yet described. The implications were breathtaking. I was arguing that aggression was not as pervasive or important an influence in evolution as had been thought, and that social strategies and social reciprocity were extremely important. If baboons possessed these, certainly, the precursors of our early human ancestors must have had them as well.’
If sociologists had the privilege to watch more carefully baboons repairing their constantly decaying 'social structure', they would have witnessed what incredible cost has been paid when the job is to maintain, for instance, social dominance with no thing at all, just social skills. They would have documented empirically the price to pay for the tautology of social ties made out of social ties. The power exerted through entities that don't sleep and associations that don't break down that allow power to last longer and expand further—and, to achieve such a feat, many more materials than social compacts have to be devised. This does not mean that the sociology of the social is useless, only that it might be excellent for studying baboons but not for studying humans.

Making objects participants in the course of action

The contrast between the two schools cannot be made more dramatic. As soon as you start to have doubts about the ability of social ties to durably expand, a plausible role for objects might be on offer. As soon as you believe social aggregates can hold their own being propped up by 'social forces', then objects vanish from view and the magical and tautological force of society is enough to hold every thing with, literally, no thing. It's hard to imagine a more striking foreground/background reversal, a more radical paradigm shift. This is of course the reason why ANT first attracted attention. Social action is not only taken over by aliens, it is also shifted or delegated to different types of actors which are able to transport the action further through other modes of action, other types of forces altogether. At first, bringing objects back into the normal course of

79 See Hans Kummer (1995), In Quest of the Sacred Baboon for the key notion of 'social tools' about Hamadryas baboons.

80 The word object will be used as a placeholder until the next chapter where it will be defined as a 'matter of concern'. There is no way to speed things up since ANT is defined in this book by laying out the five sources of uncertainty in succession.

81 It cannot be understood apart from the two other uncertainties about groups and about action. Without them, ANT is immediately reduced to a rather silly argument about the causal agency of technical objects, that is, a clear return to technical determinism.

82 For the word delegation to hold, the ANT theory of action, that is, how someone makes another do things, has to be kept in mind. If such a dislocation is missed, delegation becomes another causal relation and a resurrection of a Homo faber fully in command of what he—it's almost always a 'he'—does with tools.
action should appear innocuous enough. After all, there is hardly any
doubt that kettles ‘boil’ water, knives ‘cut’ meat, baskets ‘hold’ provi-
sions, hammers ‘hit’ nails on the head, rails ‘keep’ kids from falling,
locks ‘close’ rooms against uninvited visitors, soap ‘takes’ the dirt
away, schedules ‘list’ class sessions, prize tags ‘help’ people calculating,
and so on. Are those verbs not designating actions? How could the
introduction of those humble, mundane, and ubiquitous activities
bring any news to any social scientist?

And yet they do. The main reason why objects had no chance to play
any role before was not only due to the definition of the social used by
sociologists, but also to the very definition of actors and agencies most
often chosen. If action is limited a priori to what ‘intentional’, ‘mean-
ingful’ humans do, it is hard to see how a hammer, a basket, a door
closer, a cat, a rug, a mug, a list, or a tag could act. They might exist in
the domain of ‘material’ ‘causal’ relations, but not in the ‘reflexive’
‘symbolic’ domain of social relations. By contrast, if we stick to our
decision to start from the controversies about actors and agencies,
then any thing that does modify a state of affairs by making a difference
is an actor—or, if it has no figuration yet, an actant. Thus, the ques-
tions to ask about any agent are simply the following: Does it make a
difference in the course of some other agent’s action or not? Is there
some trial that allows someone to detect this difference?

The rather common sense answer should be a resounding ‘yes’. If
you can, with a straight face, maintain that hitting a nail with and
without a hammer, boiling water with and without a kettle, fetching
provisions with or without a basket, walking in the street with or
without clothes, zapping a TV with or without a remote, slowing
down a car with or without a speed-bump, keeping track of your
inventory with or without a list, running a company with or without
bookkeeping, are exactly the same activities, that the introduction of
these mundane implements change ‘nothing important’ to the real-
ization of the tasks, then you are ready to transmigrate to the Far Land
of the Social and disappear from this lowly one. For all the other
members of society, it does make a difference under trials and so
these implements, according to our definition, are actors, or more
precisely, participants in the course of action waiting to be given a
figuration.

This, of course, does not mean that these participants ‘determine’
the action, that baskets ‘cause’ the fetching of provisions or that
hammers ‘impose’ the hitting of the nail. Such a reversal in the direc-
tion of influence would be simply a way to transform objects into the
causes whose effects would be transported through human action now limited to a trail of mere intermediaries. Rather, it means that there might exist many metaphysical shades between full causality and sheer inexistence. In addition to ‘determining’ and serving as a ‘backdrop for human action’, things might authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, and so on. ANT is not the empty claim that objects do things ‘instead’ of human actors: it simply says that no science of the social can even begin if the question of who and what participates in the action is not first of all thoroughly explored, even though it might mean letting elements in which, for lack of a better term, we would call non-humans. This expression, like all the others chosen by ANT is meaningless in itself. It does not designate a domain of reality. It does not designate little goblins with red hats acting at atomic levels, only that the analyst should be prepared to look in order to account for the durability and extension of any interaction. The project of ANT is simply to extend the list and modify the shapes and figures of those assembled as participants and to design a way to make them act as a durable whole.

For sociologists of associations, what is new is not the multiplicity of objects any course of action mobilizes along its trail—no one ever denied they were there by the thousands; what is new is that objects are suddenly highlighted not only as being full-blown actors, but also as what explains the contrasted landscape we started with, the overarching powers of society, the huge asymmetries, the crushing exercise of power. This is the surprise from which sociologists of associations wish to start instead of considering, as do most of their colleagues, that the question is obviously closed and that objects do nothing, at least nothing comparable or even connectable to human social action, and that if they can sometimes ‘express’ power relations, ‘symbolize’ social hierarchies, ‘reinforce’ social inequalities, ‘transport’ social power, ‘objectify’ inequality, and ‘reify’ gender relations, they cannot be at the origin of social activity.

83 This is why the notion of affordance, introduced in James G. Gibson (1986), The Ecological Approach to Visual Perception, has been found so useful. The multiplicity of modes of action when dealing with technology—hard and soft—is marvellously followed by Suchman, Plans and Situated Actions, C. Goodwin and M. Goodwin (1996), ‘Formulating planes: Seeing as a situated activity’, and Bernard Conen, Nicolas Dodier and Laurent Thévenot (1993), Les objets dans l’action. De la maison au laboratoire.

84 There is a bit of anthropocentric bias in using the expression non-humans. I have explained in detail elsewhere how the couple human/non-human should be substituted for the insurmountable dichotomy between subject and object (see Latour, Politics of Nature). No extra meaning should be looked for in this notion: it does not specify any ontological domain, but simply replaces another conceptual difference. For a complete panorama of humans/non-humans relations, see Philippe Descola (2005), La nature des cultures.

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A good example of an asymmetric definition of actors is offered by Durkheim (1966: 113) when he states:

‘The first origins of all social processes of any importance should be sought in the internal constitution of the social group. [italics in text]

It is possible to be even more precise. The elements which make up this milieu are of two kinds: things and persons. Besides material objects incorporated into the society, there must also be included the products of previous social activity: law, established customs, literary and artistic works, etc. But it is clear that the impulsion which determines social transformations can come from neither the material nor the immaterial, for neither possesses a motivating power [puissance motrice]. There is, assuredly, occasion to take them into consideration in the explanations one attempts. They bear with a certain weight on social evolution, whose speed and even direction vary according to the nature of these elements; but they contain nothing of what is required to put it in motion. They are the matter upon which the social forces of society act, but by themselves they release no social energy [aucune force vive]. As an active factor, then, the human milieu itself remains.’

This, for me, has always been a great surprise: How is it that, in spite of this massive and ubiquitous phenomenon, sociology remains ‘without object’? It is even more startling when you realize that this discipline emerged a full century after the Industrial Revolution and has been evolving in parallel with the largest and most intensive technical developments since the Neolithic. Not only that, but how to explain that so many social scientists pride themselves in considering ‘social meaning' instead of ‘mere’ material relations, ‘symbolic dimension' instead of ‘brute causality’? Much like sex during the Victorian period, objects are nowhere to be said and everywhere to be felt. They exist, naturally, but they are never given a thought, a social thought. Like humble servants, they live on the margins of the social doing most of the work but never allowed to be represented as such. There seems to be no way, no conduit, no entry point for them to be knitted together with the same wool as the rest of the social ties. The more radical thinkers want to attract attention to humans in the margins and at the periphery, the less they speak of objects. As if a damning curse had been cast unto things, they remain asleep like the servants of some enchanted castle. Yet, as soon as they are freed from the spell, they start shuddering, stretching, and muttering. They begin to swarm in all directions, shaking the other human actors, waking them out of their dogmatic sleep. Would it be too childish to say that ANT played the role of the Charming Prince’s kiss tenderly touching Sleeping...
Objects help trace social connections only intermittently

It is true that, at first sight, the difficulty of registering the role of objects comes from the apparent incommensurability of their modes of action with traditionally conceived social ties. But sociologists of the social have misunderstood the nature of such incommensurability. They have concluded that because they are incommensurable they should be kept separate from proper social ties, without realizing that they should have concluded precisely the opposite: it’s because they are incommensurable that they have been fetched in the first place! If they were as weak as the social skills they have to reinforce, if they were made of the same material quality, where would the gain be? Baboons we were, baboons we would have remained.

It’s true that the force exerted by a brick unto another brick, the spin of a wheel onto an axis, the balance of a lever onto a mass, the gearing down of a force through a pulley, the effect of fire on phosphorus, all of those modes of action seem to pertain to categories so obviously different from the one exerted by a ‘stop’ sign on a cyclist or that of a crowd over an individual mind that it seems perfectly reasonable to put material and social entities on two different shelves. Reasonable but absurd, once you realize that any human course of action might weave together in a matter of minutes, for instance, a shouted order to lay a brick, the chemical connection of cement with water, the force of a pulley unto a rope with a movement of the hand, the strike of a match to light a cigarette offered by a co-worker, etc. Here, the apparently reasonable division between material and social becomes just what is obfuscating any enquiry on how a collective action is possible. Provided of course that by collective we don’t mean an action carried over by homogeneous social forces, but, on the contrary, an action that collects different types of forces woven together because they are

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85 This is the power of the now outdated but still beautiful synthesis offered in André Leroi-Gourhan (1993), *Gesture and Speech*. For a more recent review of the state of the art, see Pierre Lemonnier (1993), *Technological Choices. Transformation in Material Cultures since the Neolithic* and Bruno Latour and Pierre Lemonnier (1994), *De la préhistoire aux missiles balistiques - L’intelligence sociale des techniques*.  

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different. This is why, from now on, the word ‘collective’ will take the place of ‘society’. Society will be kept only for the assembly of already gathered entities that sociologists of the social believe have been made in social stuff. Collective, on the other hand, will designate the project of assembling new entities not yet gathered together and which, for this reason, clearly appear as being not made of social stuff.

Any course of action will thread a trajectory through completely foreign modes of existence that have been brought together by such heterogeneity. Social inertia and physical gravity might seem unconnected, but they need no longer be when a team of workers is building a wall of bricks: they part company again only after the wall is completed. But while the wall is being built, there is no doubt that they are connected. How? The enquiry will determine this. ANT claims that we should simply not believe the question of the connections among heterogeneous actors to be closed, that what is usually meant by ‘social’ has probably to do with the reassembling of new types of actors. ANT states that if we wish to be a bit more realistic about social ties than ‘reasonable’ sociologists, then we have to accept that the continuity of any course of action will rarely consist of human-to-human connections (for which the basic social skills would be enough anyway) or of object-object connections, but will probably zigzag from one to the other.

To get the right feel for ANT, it’s important to notice that this has nothing to do with a ‘reconciliation’ of the famous object/subject dichotomy. To distinguish a priori ‘material’ and ‘social’ ties before linking them together again makes about as much sense as to account for the dynamic of a battle by imagining a group of soldiers and officers stark naked with a huge heap of paraphernalia—tanks, rifles, paperworks, uniforms—and then claim that ‘of course there exist some (dialectical) relation between the two’. One should retort adamantly ‘No!’ There exists no relation whatsoever between ‘the material’ and ‘the social world’, because it is this very division which is a complete

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86 This is what was at stake in the dispute about the exact role of non-humans and known as the ‘Bath controversy’. See Harry Collins and Steven Yearley (1992), ‘Epistemological Chicken’ and Michel Callon and Bruno Latour (1992), ‘Don’t throw the Baby out with the Bath School! A reply to Collins and Yearley’—a tiny landmark for our little field.

87 See Diane Vaughan (1996), The Challenger Launch Decision: Risky Technology, Culture and Deviance at NASA. ‘But I believed that with sufficient immersion in the case materials and by consulting technical experts, I could sufficiently master the technical details necessary to get at the sociological questions. It was, after all, human behavior I wanted to explain, and I was trained to do that’ (p. 40). This position is reasonable but is it the best way to follow a course of action like this one: ‘At approximately 7:00 a.m., the ice team made its second launch pad inspection. On the basis of their report, the launch time was skipped to permit a third ice inspection’ (p. 328). Where is the split here between engineering and sociology?
artifact. To reject such a divide is not to ‘relate’ the heap of naked soldiers ‘with’ the heap of material stuff: it is to redistribute the whole assemblage from top to bottom and beginning to end. There is no empirical case where the existence of two coherent and homogeneous aggregates, for instance technology ‘and’ society, could make any sense. ANT is not, I repeat is not, the establishment of some absurd ‘symmetry between humans and non-humans’. To be symmetric, for us, simply means not to impose a priori some spurious asymmetry among human intentional action and a material world of causal relations. There are divisions one should never try to bypass, to go beyond, to try to overcome dialectically. They should rather be ignored and left to their own devices, like a once formidable castle now in ruins.

This interest for the object has nothing to do with a privilege given to ‘objective’ matter in opposition to ‘subjective’ language, symbols, values, or feelings. As we will see when absorbing the next source of uncertainty, the ‘matter’ of most self-proclaimed materialists does not have a great deal to do with the type of force, causality, efficacy, and obstinacy non-human actants possess in the world. ‘Matter’, we will soon realize, is a highly politicized interpretation of causality. In order to absorb the third source of uncertainty, we should be ready to inquire about the agency of all sorts of objects. But since objects have such poor and constricted roles in most of the social sciences, it’s very difficult to extend their original activity to other types of material like documents, writings, charts, files, paper clips, maps, organizational devices, in brief intellectual technologies. As soon as some

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88 Psychologists have shown that even a two-month-old baby can clearly differentiate intentional and non-intentional movements. Humans and objects are clearly distinct. See Olivier Houdé (1997), *Rationalité, développement et inhibition: Un nouveau cadre d’analyse* and Dan Sperber, David Premack and Ann James Premack (1996), *Causal Cognition: A Multidisciplinary Debate*. But a difference is not a divide. Toddlers are much more reasonable than humanists: although they recognize the many differences between billiard balls and people, this does not preclude them to follow how their actions are woven into the same stories.

89 This is the reason why I have abandoned most of the geometrical metaphor about the ‘principle of symmetry’ when I realized that readers concluded from it that nature and society had to be ‘maintained together’ so as to study ‘symmetrically’ ‘objects and subjects’, ‘non-humans and humans’. But what I had in mind was not and, but neither: a joint dissolution of both collectors. The last thing I wanted was to give nature and society a new lease on life through ‘symmetry’.

90 Distributed cognition, situated knowledge, history of intellectual technologies, science studies, administrative sciences, and social accounting have each in its own way multiplied the range of objects engaged in making interactions longer lasting and further reaching. This long trend to materialize non-material technologies goes back to Jack Goody (1977), *The Domestication of the Savage Mind*; see Geoffrey C. Bowker and Susan Leigh Star (1999), *Sorting Things Out: Classification and Its Consequences*; Paolo Quattrone (2004), ‘Accounting for God. Accounting and Accountability Practices in the Society of Jesus (Italy, 16th–17th centuries)’; and the now classical work of Michel Foucault (1973), *The Birth of the Clinic: An Archaeology of Medical Perception*.
freedom of movement is granted back to non-humans, the range of agents able to participate in the course of action extends prodigiously and is no longer restricted to the ‘middle size dry goods’ of analytical philosophers. What makes ANT difficult to grasp is that it fills in precisely the space that is emptied by critical sociologists with the damning words of ‘objectification’ and ‘reification’.

Yet sociologists of the social are not fools. They have good reason to hesitate before following the social fluid wherever it leads them. What is so difficult to comprehend at first is that an ANT study has to tackle both continuity and discontinuity among modes of action. We have to become able to follow the smooth continuity of heterogeneous entities and the complete discontinuity between participants that, in the end, will always remain incommensurable. The social fluid does not offer to the analyst a continuous and substantial existence, but rather puts up only a provisional appearance much like a shower of physical particles in the brief instant it’s forced into existence. You begin with assemblages that look vaguely familiar and you end up with completely foreign ones. It is true that this oscillation makes the tracing of social connections especially tricky once you begin to add non-humans to the list of bona fide social ties.

A shepherd and his dog remind you nicely of social relations, but when you see her flock behind a barbed wire fence, you wonder where is the shepherd and her dog—although sheep are kept in the field by the piercing effect of wire barbs more obstinately than by the barking of the dog. There is no doubt that you have become a couch potato in front of your TV set thanks largely to the remote control that allows you to surf from channel to channel—and yet there is no resemblance between the causes of your immobility and the portion of your action that has been carried out by an infrared signal, even though there is no question that your behavior has been permitted by the TV command.

Between a car driver that slows down near a school because she has seen the ‘30 MPH’ yellow sign and a car driver that slows down because he wants to protect the suspension of his car threatened by the bump of a ‘speed trap’, is the difference big or small? Big, since the obedience of the first has gone through morality, symbols, sign posts, yellow paint, while the other has passed through the same list to which has been added a carefully designed concrete slab. But it is small since they both have obeyed something: the first driver to a rarely manifested altruism—if she had not slowed down, her heart would have been broken by the moral law; the second driver to a largely distributed

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91 Try it for yourself: throw it away and see how long you will spend moving back and forth from the couch to the set.
selfishness—if he had not slowed down his suspension would have been broken by the concrete slab. Should we say that only the first connection is social, moral and symbolic, and that the second is objective and material? No. But, if we say that both are social, how are we going to justify the difference between moral conduct and suspension springs? They might not be social all the way through, but they certainly are \textit{collected} or \textit{associated} together by the very work of road designers. One cannot call oneself a social scientist and pursue only some links—the moral, legal, and symbolic ones—and stop as soon as there is some physical relation interspersed in between the others. That would render any enquiry impossible.\footnote{Since ANT is often accused of being indifferent to morality, it's worth recalling that there are good deontological reasons in having at least as much freedom of movement as the actors we study. This principle is as old as the notion of translation. See Michel Callon (1981) 'Struggles and Negotiations to Decide What is Problematic and What is Not: The Sociology of Translation'.}

How long can a social connection be followed without objects taking the relay? A minute? An hour? A microsecond? And for how long will this relay be visible? A minute? An hour? A microsecond? One thing is certain: if we interrupt our fieldwork at each relay by focusing only on the list of already gathered connections, the social world would become immediately opaque, shrouded into those strange autumn fogs that leave visible only tiny and unpredictable smears of the landscape. And yet, on the other hand, if sociologists have also to become engineers, artisans, craftsmen, designers, architects, managers, promoters etc., they will never end up following their actors through those many intermittent existences. So, we have to take non-humans into account only as long as they are rendered commensurable with social ties and also to accept, an instant later, their fundamental incommensurability.\footnote{This is clearly at odds with the explicitly asymmetric program offered in Weber 'To be devoid of meaning is not identical with being lifeless or non-human; every artifact, such as for example a machine, can be understood only in terms of the meaning which its production and use have had or will have for human action; a meaning which may derive from a relation to exceedingly various purposes. Without reference to this meaning such an object remains wholly unintelligible.' Max Weber (1947), the Theory of Social and Economic Organization (p. 93) Then follows a definition of means and ends completely at odds with the notion of mediators.} To travel around using an ANT definition of 'social' requires quite a lot of nerve. No wonder then that sociologists of the social balked at that difficulty! That they had good reasons to abstain from following those oscillations does not mean, however, that they were right. It only means that sociology requires an extended range of tools.
A list of situations where an object’s activity is made easily visible

In exploring the new associations making up the social, ANT scholars have to accept two contradictory demands: on the one hand, we don’t want the sociologist to limit oneself to social ties; on the other, we don’t ask the enquirer to become a specialized technologist. One solution is to stick to the new definition of social as a fluid visible only when new associations are being made. Such is the rightful ‘domain’ of ANT, even though it is not a specific stretch of land nor an enclosed turf but only a brief flash which may occur everywhere like a sudden change of phase.

Fortunately for the analysts, those situations are not as rare as one might think. To be accounted for, objects have to enter into accounts. If no trace is produced, they offer no information to the observer and will have no visible effect on other agents. They remain silent and are no longer actors: they remain, literally, unaccountable. Although the situation is the same for groups and agencies—no trial, no account, no information—it is clearly more difficult for objects, since carrying their effects while becoming silent is what they are so good at as Samuel Butler noted.94 Once built, the wall of bricks does not utter a word—even though the group of workmen goes on talking and graffiti may proliferate on its surface. Once they have been filled in, the printed questionnaires remain in the archives forever unconnected with human intentions until they are made alive again by some historian. Objects, by the very nature of their connections with humans, quickly shift from being mediators to being intermediaries, counting for one or nothing, no matter how internally complicated they might be. This is why specific tricks have to be invented to make them talk, that is, to offer descriptions of themselves, to produce scripts of what they are making others—humans or non-humans—do.95

Again, this situation is not different for groups and agencies we reviewed earlier since humans, too, have to be made to talk; and this is why very elaborate and, often, artificial situations have to be devised to reveal their actions and performances (more on this in the fifth uncertainty). But still, there is a difference: once humans become mediators again, it is hard to stop them. An indefinite stream of data springs forth, whereas objects, no matter how important, efficient,
central, or necessary they may be, tend to recede into the background very fast, interrupting the stream of data—and the greater their importance, the faster they disappear. It does not mean they stop acting, but that their mode of action is no longer *visibly connected* to the usual social ties since they rely on types of forces chosen precisely for their differences with the normal social ones. Speech acts always look comparable, compatible, contiguous, and continuous with other speech acts; writing with writing; interaction with interaction; but objects appear associable with one another and with social ties only *momentarily*. This is quite normal since it is through their very heterogeneous agencies that social ties have been provided with completely different shape and figures—normal but tricky.

Fortunately, it is possible to multiply the occasions where this momentary visibility is enhanced enough to generate good accounts. Much of ANT scholars’ fieldwork has been devoted to trigger these occasions so I can go quickly.

The first solution is to study *innovations* in the artisan’s workshop, the engineer’s design department, the scientist’s laboratory, the marketer’s trial panels, the user’s home, and the many socio-technical controversies. In these sites objects live a clearly multiple and complex life through meetings, plans, sketches, regulations, and trials. Here, they appear fully mixed with other more traditional social agencies. It is only once in place that they disappear from view. This is why the study of innovations and controversies has been one of the first privileged places where objects can be maintained longer as visible, distributed, accounted mediators before becoming invisible, asocial intermediaries.

Second, even the most routine, traditional, and silent implements stop being taken for granted when they are approached by users rendered ignorant and clumsy by *distance*—distance in time as in archaeology, distance in space as in ethnology, distance in skills as in learning. Although those associations might not trace an innovation per se, the same situation of novelty is produced, for the analyst at least, by the irruption into the normal course of action of strange, exotic, archaic, or mysterious implements. In those encounters, objects become mediators, at least for a while, before soon disappearing again through know-how, habituation, or disuse. Anyone who has tried to make sense of a user’s manual will know how time-consum-
ing—and how painful—it is to read what is ironically called an ‘assembly drawing’. 97

The third type of occasion is that offered by accidents, breakdowns, and strikes: all of a sudden, completely silent intermediaries become full-blown mediators; even objects, which a minute before appeared fully automatic, autonomous, and devoid of human agents, are now made of crowds of frantically moving humans with heavy equipment. Those who watched the Columbia shuttle instantly transformed from the most complicated human instrument ever assembled to a rain of debris falling over Texas will realize how quickly objects flip-flop their mode of existence. Fortunately for ANT, the recent proliferation of ‘risky’ objects has multiplied the occasions to hear, see, and feel what objects may be doing when they break other actors down. 98 Official enquiries are happening everywhere to map out for us the fabulous extension of what social ties have become in the hands of technical setups. Here again, it will never be the lack of material that will stop the studies. 99

Fourth, when objects have receded into the background for good, it is always possible—but more difficult—to bring them back to light by using archives, documents, memoirs, museum collections, etc., to artificially produce, through historians’ accounts, the state of crisis in which machines, devices, and implements were born. 100 Behind each bulb Edison can be made visible, and behind any microchip is the huge, anonymous Intel. By now, the history of technology should have forever subverted the ways in which social and cultural histories are narrated. 101 Even the humblest and most ancient stone tools from the Olduvai Gorge in Tanzania have been turned by paleontologists into the very mediators that triggered the evolution of ‘modern man’.


98 The multiplication of those ‘risky’ objects is at the heart of Ulrich Beck (1992), Risk Society. Towards a New Modernity. Although he uses an entirely different social theory, Beck’s attention to the new forms of objectivity (what he calls ‘reflexive modernisation’) has his innovative sociology in very close conversation with ANT, especially through its political, or rather, ‘cosmopolitical’ interests.


100 The encounter with Thomas P. Hughes (1983), Networks of Power. Electrification in Western Society, 1880–1930 was important because Hughes abstained from giving an explanation in terms of social shaping of technology and had coined the expression ‘seamless web’. See Thomas P. Hughes (1986), ‘The Seamless Web: Technology, Science, Etcetera, Etcetera.’

101 There is no difference, on that score, between history of technology and ANT, except when the social theory is made explicit—but often this sociological packaging has so little relation to the cases at hand that it makes no real difference.
Finally, when everything else has failed, the resource of fiction can bring—through the use of counterfactual history, thought experiments, and ‘scientifiction’—the solid objects of today into the fluid states where their connections with humans may make sense. Here again, sociologists have a lot to learn from artists.\(^{102}\)

Whatever solution is chosen, the fieldwork undertaken by ANT scholars has demonstrated that if objects are not studied it is not due to a lack of data, but rather a lack of will. Once the conceptual difficulty of the flip-flop between commensurability and incommensurability has been lifted, all of the remaining problems are matters of empirical research: they are not a matter of principle any more. The impassable boundary marked by some Herculean Columns to stop the social sciences reaching beyond the narrow confines of social ties has been left behind. It’s thus possible now for social scientists to catch up with what paleontologists call ‘anatomically modern humans’, who have already been settled for tens of thousands of years beyond the limits dictated to them by social science.

### Who has been forgetting power relations?

We can now at last put our finger on what upset ANT so much in the pretensions of the sociology of the social to explain asymmetries in order to be faithful to the central intuition of their science: they could not deliver. The word ‘social’ meant either local face-to-face interactions that were too transient to account for asymmetries or a magical appeal to tautological forces whose exact price in object-load they were never ready to fully pay.

Social explanations run the risk of hiding that which they should reveal since they remain too often ‘without object’.\(^{103}\) In their study, sociologists consider, for the most part, an object-less social world, even though in their daily routine they, like all of us, might be constantly puzzled by the constant companionship, the continuous intimacy, the inveterate contiguity, the passionate affairs, the convoluted attachments of primates with objects for the past one

\(^{102}\) It ranges from Francis Ponge’s (1972), *The Voice of Things* to the thought experiments allowed by science fiction or Richard Powers’s decisive work as a novelist of science studies in, for instance, Richard Powers (1995), *Galilee*, 2.2.

\(^{103}\) Even though objects proliferate in the works of Simmel, Elias, and Marx, the presence of objects is not enough to load the social. It’s their way of entry that makes the difference. Hence the necessity to add the fourth uncertainty (see next chapter) to the one on agency and later the redefinition of politics (see Conclusion). For a very useful collection of cases on the effect of technology studies on materialism, see Donald Mackenzie and Judy Wajeman (1999), *The Social Shaping of Technology*.  

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million years. When we define the quality control of ANT accounts, we
have to be very scrupulous in checking whether power and domin-
arion are explained by the multiplicity of objects given a central role
and transported by vehicles which should be empirically visible—and
we will not be content to have power and domination *themselves*
be the mysterious container that holds inside of it that which makes the
many participants in the action move.

To follow the social links even when they weave their way through
non-social objects might be difficult for a reason that has nothing to
do with theory. For the social scientists, there were some serious
motives behind the need to ceaselessly patrol the border separating
the ‘symbolic’ from the ‘natural’ domain, namely a good—that is, a
bad—polemical argument. To carve out a little niche for themselves,
they had abandoned, early in the 19th century, things and objects to
the scientists and engineers. The only way to plead for a little auton-
omy was to forsake the vast territories they had given up and stick
forcefully to the shrinking plot allotted to them: ‘meaning’, ‘symbol’,
‘intention’, ‘language’. When a bicycle hits a rock, it is not social. But
when a cyclist crosses a ‘stop’ sign, it becomes social. When a new
telephone switchboard is installed, this is not social. But when the
colors of telephone sets are discussed, this becomes social because
there is, as designers say, ‘a human dimension’ in the choice of such
a fixture. When a hammer hits a nail, it is not social. But when the
image of a hammer is crossed with that of a sickle, then it graduates to
the social realm because it enters the ‘symbolic order’. Every object was
thus divided in two, scientists and engineers taking the largest part—
efficacy, causality, material connections—and leaving the crumbs to
the specialists of ‘the social’ or ‘the human’ dimension. Thus, any
allusion by ANT scholars to the ‘power of objects’ over social relations
was a painful reminder, for sociologists of the social, of the clout of the
other ‘more scientific’ departments on their independence—not to
mention grant money—and on the territories they were no longer
allowed to walk through freely.

But polemics among disciplines does not produce good concepts,
only barricades made of any available debris. When any state of affairs
is split into one material component to which is added as an appendix
a social one, one thing is sure: this is an artificial division imposed by
the disciplinary disputes, not by any empirical requirement. It simply
means that most of the data has vanished, that the collective course of
action has not been followed through. To be ‘both material and social’
is not a way for objects to exist: it is simply a way for them to be
artificially cut off and to have their specific agency rendered utterly
mysterious.
It is fair to say that social scientists were not alone in sticking polemically to one metaphysic among the many at hand. Their ‘dear colleagues’ in the other hard science departments were also trying to claim that all material objects have only ‘one way’ to act and that was to ‘causally determine’ other material objects to move. As we shall see in the next chapter, they were granting the social no other role than that of an intermediary faithfully ‘transporting’ the causal weight of matter. When the social realm is given such an infamous role, great is the temptation to overreact and to turn matter into a mere intermediary faithfully ‘transporting’ or ‘reflecting’ society’s agency. As usual with those polemics among disciplines, stupidity breeds stupidity. To avoid the threat of ‘technical determinism’, it is tempting to defend adamantly ‘social determinism’, which in turn becomes so extreme (the steam engine becoming, for instance, the ‘mere reflection’ of ‘English capitalism’) that even the most open-minded engineer becomes a fierce technical determinist bumping the table with virile exclamations about the ‘weight of material constraints’. These gestures have no other effect but to trigger even a moderate sociologist to insist even more vehemently on the importance of some ‘discursive dimension’.  

What renders these disputes moot is that the choice between these positions is unrealistic. It would be incredible if the millions of participants in our courses of action would enter the social ties through three modes of existence and only three: as a ‘material infrastructure’ that would ‘determine’ social relations like in the Marxian types of materialism; as a ‘mirror’ simply ‘reflecting’ social distinctions like in the critical sociologies of Pierre Bourdieu; or as a backdrop for the stage on which human social actors play the main roles like in Erving Goffman’s interactionist accounts. None of those entries of objects in the collective are wrong, naturally, but they are only primitive ways of packaging the bundle of ties that make up the collective. None of them are sufficient to describe the many entanglements of humans and non-humans.

Talking of ‘material culture’ would not help very much since objects, in this case, would be simply connected to one another so as to form an homogeneous layer, a configuration which is even less likely than one which imagines humans linked to one another by nothing else than

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social ties. Objects are never assembled together to form some other realm anyhow, and even if it were the case they would be neither strong nor weak—simply 'reflecting' social values or being there as mere decorum. Their action is no doubt much more varied, their influence more ubiquitous, their effect much more ambiguous, their presence much more distributed than these narrow repertoires. The best proof of this multiplicity is provided by a close look at what objects really do in the texts of the writers alluded to above: they deploy many other ways for objects to act than the ones granted to them by their author's own philosophy of matter. Even as textual entities, objects overflow their makers, intermediaries become mediators. But in order to learn this lesson, the research field should be made wide open to begin with and it cannot be opened if the difference between human action and material causality is maintained as adamantly as Descartes's distinguished mind from matter (res extensa from the res cogitans) as a proof of scientific, moral and theological virtue—and even he kept open the tiny conduit of the pineal gland that sociologists of the social have cut off as well.

There exists, however, an even more important reason for rejecting adamantly the role given to objects in the sociology of the social: it voids the appeals to power relations and social inequalities of any real significance. By putting aside the practical means, that is the mediators, through which inertia, durability, asymmetry, extension, domination is produced and by conflating all these different means with the powerless power of social inertia, sociologists, when they are not careful in their use of social explanations, are the ones who hide the real causes of social inequalities. If there is one point where confusing cause and effect makes a huge difference, it is at this juncture when an explanation should be provided for the vertiginous effect of domination. Of course, appealing to 'social domination' might be useful as shorthand, but then it is much too tempting to use power instead of explaining it and that is exactly the problem with most 'social-explainers': in their search for powerful explanations, is it not their lust for power that shines through? If, as the saying goes, absolute power corrupts absolutely, then gratuitous use of the concept of power by so many critical theorists has corrupted them absolutely—or at least rendered their discipline redundant and their politics impotent. Like the 'dormitive virtue of opium' ridiculed by Molière, 'power' not only puts analysts to sleep, which does not matter so much, it also try to anesthetize the actors as well—and that is a political crime. This

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rationalist, modernist, positivist science nurtures in its bosom the most archaic and magical ghost: a self-generated, self-explanative society. To the studied and modifiable skein of means to achieve powers, sociology, and especially critical sociology, has too often substituted an invisible, unmoving, and homogeneous world of power for itself. 106 In sociology, powerful explanations should be counterchecked and counterbalanced.

Thus, the accusation of forgetting ‘power relations’ and ‘social inequalities’ should be placed squarely at the door of the sociologists of the social. If sociologists of associations wish to inherit this ancient, venerable, and fully justified intuition of the social science—power is unequally distributed—they also have to explain how domination has become so efficacious and through which unlikely means. Quite reasonably, it is for them the only way to make it modifiable. But to do so, a fourth uncertainty has to be accepted, a fourth can of worms opened—and this one is a Pandora’s box.

106 That this lesson is easy to forget is shown dramatically by the transatlantic destiny of Michel Foucault. No one was more precise in his analytical decomposition of the tiny ingredients from which power is made and no one was more critical of social explanations. And yet, as soon as Foucault was translated, he was immediately turned into the one who had ‘revealed’ power relations behind every innocuous activity: madness, natural history, sex, administration, etc. This proves again with what energy the notion of social explanation should be fought: even the genius of Foucault could not prevent such a total inversion.
Fourth Source of Uncertainty: Matters of Fact vs. Matters of Concern

Groups are made, agencies are explored, and objects play a role. Such are the three first sources of uncertainty we rely on if we want to follow the social fluid through its ever-changing and provisional shapes. So far, our core hypothesis may still remain acceptable to those who define social in the traditional sense of the word. To be sure, it requires more work: an extension of the list of actors and agencies; a deepening of the conflicts about practical metaphysics; an abandonment of the artificial divide between social and technical ‘dimensions’; a pursuit through areas scarcely visited until now; a new practice of finding controversies more rewarding and, in the end, more stable than absolute departure points; and, finally, an invitation to develop a puzzling new custom to generously share metalinguage, social theory, and reflexivity with the actors themselves who are no longer considered as mere ‘informants’. Still, the travels that are made possible by such a new departure point, although rougher and bumpier, have not requested any basic changes in the scientific outlook itself. After all, sociology may remain a science even though this means paying a higher price than expected, visiting sites that had not been anticipated, accepting more relativity, and deploying more contradictory philosophies than seemed necessary at first glance. On the whole, abandoning the ether of society to feed off of controversies doesn’t seem to be that much of a sacrifice. No matter how startling at first, new habits of thought might be quick to form.

Unfortunately, the difficulties we have to tackle do not stop at these three. A fourth source of uncertainty has to be accepted, and this one will lead us to the trickiest points of the sociology of associations as well as to its birthplace. Sociology of science, or what is known as ‘science studies’, is a convenient although banal translation into
English of the Greek word ‘epistemology’. After having doubted the ‘socio’ in the word socio-logy, we now have to doubt its ‘logy’. Once this double revision is completed, we might finally be able to use the word positively again and without too many qualsms. At this juncture problems become so numerous that all our travels would come to a stop if we were not careful enough to prepare the visitors to get through this tangle. Once again, in order to gain some freedom of movement we have to learn how to go even slower.

Constructivism vs. social constructivism

ANT is the story of an experiment so carelessly started that it took a quarter of century to rectify it and catch up with what its exact meaning was. It all started quite badly with the unfortunate use of the expression ‘social construction of scientific facts’. We now understand why the word ‘social’ could entail so much misunderstanding: it confused two entirely different meanings: a kind of stuff and a movement for assembling non-social entities. But why has the introduction of the word ‘construction’ triggered even more confusion? In accounting for this difficulty, I first hope to make clear why I give so much prominence to the tiny subfield of science studies. It has renewed the meaning of all the words making up this innocent little expression: what is a fact, what is a science, what is a construction, and what is social. Not so bad for an experiment so recklessly conducted!

In plain English, to say something is constructed means that it’s not a mystery that has popped out of nowhere, or that it has a more humble but also more visible and more interesting origin. Usually, the great advantage of visiting construction sites is that they offer an ideal vantage point to witness the connections between humans and non-humans. Once visitors have their feet deep in the mud, they are easily struck by the spectacle of all the participants working hard at the time of their most radical metamorphosis. This is not only true of science but of all the other construction sites, the most obvious being those that are at the source of the metaphor, namely houses and

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107 A striking proof of the impact of science studies on social theory is provided by the parallel effect it had on Haraway. See Donna J. Haraway (1991), *Simians, Cyborgs, and Women: The Reinvention of Nature*. Pickering’s critique of the earlier explanations provided by the Edinburgh school (Andy Pickering (1995), *The Mangle of Practice. Time, Agency and Science*) as well as Karin Knorr-Cetina’s definition of agencies in science (Karin Knorr-Cetina (1999), *Epistemic Cultures: How the Sciences Make Knowledge*). They all had to take a similar turn.

108 This is of course Marx's decisive insight and remains the crucial advantage of any historicization.
buildings fabricated by architects, masons, city planners, real estate agents, and homeowners. The same is true of artistic practice. The ‘making of’ any enterprise—films, skyscrapers, facts, political meetings, initiation rituals, haute couture, cooking—offers a view that is sufficiently different from the official one. Not only does it lead you backstage and introduce you to the skills and knacks of practitioners, it also provides a rare glimpse of what it is for a thing to emerge out of inexistence by adding to any existing entity its time dimension. Even more important, when you are guided to any construction site you are experiencing the troubling and exhilarating feeling that things could be different, or at least that they could still fail—a feeling never so deep when faced with the final product, no matter how beautiful or impressive it may be.

So, using the word ‘construction’ seemed at first ideal to describe a more realistic version of what it is for anything to stand. And indeed, in all domains, to say that something is constructed has always been associated with an appreciation of its robustness, quality, style, durability, worth, etc. So much so that no one would bother to say that a skyscraper, a nuclear plant, a sculpture, or an automobile is ‘constructed’. This is too obvious to be pointed out. The great questions are rather: How well designed is it? How solidly constructed is it? How durable or reliable is it? How costly is the material? Everywhere, in technology, engineering, architecture, and art, construction is so much a synonym for the real that the question shifts immediately to the next and really interesting one: Is it well or badly constructed?

At first, it seemed obvious to us—the early science students—that if there existed building sites where the usual notion of constructivism should be readily applied, it had to be the laboratories, the research institutes, and their huge array of costly scientific instruments. Even more so than in art, architecture, and engineering, science offered the most extreme cases of complete artificiality and complete objectivity moving in parallel. There could be no question that laboratories, particle accelerators, telescopes, national statistics, satellites arrays, giant computers, and specimen collections were artificial places the history of which could be documented in the same way as for buildings, computer chips, and locomotives. And yet there was not the slightest doubt that the products of those artificial and costly sites were the most ascertained, objective, and certified results ever

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109 See two totally different but equally remarkable examples in Tracy Kidder (1985), *House* (1985) and Rem Koolhaas and Bruce Mau (1995), *Small, Medium, Large, Extra-Large*. No one should use the word ‘construction’ without reading first the ‘constructors’.


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obtained by collective human ingenuity. This is why it was with great enthusiasm that we began using the expression ‘construction of facts’ to describe the striking phenomenon of artificiality and reality marching in step. Moreover, to say that science, too, was constructed gave the same thrill as with all the other ‘makings of’: we went back stage; we learned about the skills of practitioners; we saw innovations come into being; we felt how risky it was; and we witnessed the puzzling merger of human activities and non-human entities. By watching the fabulous film that our colleagues the historians of science were shooting for us, we could attend, frame after frame, to the most incredible spectacle: truth being slowly achieved in breathtaking episodes without being sure of the result. As far as suspense was concerned, history of science outdid any plot Hollywood could imagine. Science for us became better than simply objective, it became interesting, just as interesting as it was for its practitioners engaged in its risky production.  

Unfortunately, the excitement went quickly sour when we realized that for other colleagues in the social as well as natural sciences the word construction meant something entirely different from what common sense had thought until then. To say that something was ‘constructed’ in their minds meant that something was not true. They seemed to operate with the strange idea that you had to submit to this rather unlikely choice: either something was real and not constructed, or it was constructed and artificial, contrived and invented, made up and false. Not only could this idea not be reconciled with the sturdy meaning one had in mind when talking about a ‘well constructed’ house, a ‘well designed’ software, or a ‘well sculpted’ statue, but it flew in the face of everything we were witnessing in laboratories: to be contrived and to be objective went together. If you began breaking the seamless narratives of fact making into two branches, it made the emergence of any science simply incomprehensible. Facts were facts—meaning exact—because they were fabricated—meaning that they emerged out of artificial situations. Every scientist we studied was proud of this connection between the quality of its construction and the quality of its data. This strong connection was actually one’s main claim to fame. While the epistemologists might have forgotten this etymology, there was there to remind everybody. We were prepared to answer the more interesting question: Is a given fact of science well or  

111 Before the ‘anti-whiggish’ reactions in the history of science, it was impossible to share the libido scientill of practitioners: faced with the final product, the public had no other way to get interested in science but the pedagogical injunction: ‘It’s true, so you should know about it.’  

112 The French epistemologist Gaston Bachelard has often insisted on this double etymology. For an English presentation see Mary Tiles and Robert B. Pippin (1984), Bachelard: Science and Objectivity.
badly constructed? But certainly not to sway under this most absurd alternative: ‘Choose! Either a fact is real or it’s fabricated!’

And yet, it became painfully clear that if we wanted to go on using the word construction we would have to fight on two fronts: against the epistemologists who went on claiming that facts were ‘of course’ not constructed—which had about as much sense as saying that babies are not born out of their mother’s wombs—and against our ‘dear colleagues’ who seemed to imply that if facts were constructed then they were as weak as fetishes—or at least what they believed fetishists ‘believed’ in. At which point, it could have been safer to abandon the word ‘construction’ entirely—especially since the word ‘social’ had the same built-in defect of maddening our readers as surely as a toreador’s cape in front of a bull. On the other hand, it remained an excellent term for all the reasons just mentioned. Especially useful was the clear fashion in which ‘construction’ focused on the scene in which humans and non-humans were fused together. Since the whole idea of the new social theory we were inventing was to renew in both directions what was a social actor and what was a fact, it remained crucial not to lose sight of those most extraordinary building sites where this double metamorphosis was occurring. This is why I thought it more appropriate to do with constructivism what we had done for relativism: thrown at us like insults, both terms had a much too honorable tradition not to be reclaimed as a glorious banner. After all, those who criticized us for being relativists never noticed that the opposite would be absolutism. And those who criticized us for being constructivists would have probably not wished to see that the opposite position, if words have any meaning, was fundamentalism.

On the one hand, it seemed easy enough to reclaim a sturdy meaning for this much-maligned term construction: we simply had to use the new definition of social that was reviewed in the earlier chapters of this book. In the same way as a Socialist or an Islamic Republic is the opposite of a Republic, adding the adjective ‘social’ to ‘constructivism’ completely perverts its meaning. In other words, ‘constructivism’ should not be confused with ‘social constructivism’. When we say that a fact is constructed, we simply mean that we account for the solid objective reality by mobilizing various entities whose assemblage could fail; ‘social constructivism’ means, on the other hand, that we replace what this reality is made of with some other stuff, the social in which it is ‘really’ built. An account about the heterogeneous genesis of a building is substituted by another one dealing with the homogeneous

113 David Bloor (1991), Knowledge and Social Imagery.
114 Bruno Latour (2005a), ‘The Promises of Constructivism’. I am following here in this chapter the clarifying work of Ian Hacking (1999), The Social Construction of What?
social matter in which it is built. To bring constructivism back to its feet, it’s enough to see that once social means again association, the whole idea of a building made of social stuff vanishes. For any construction to take place, non-human entities have to play the major role and this is just what we wanted to say from the beginning with this rather innocuous word.

But obviously this rescue operation was not enough since the rest of the social sciences seemed to share a completely different notion of the same term. How could that be? Our mistake was that since we had never shared the idea that construction could mean a reduction to only one type of material, we produced antibodies against the accusation that we had reduced facts to ‘mere construction’ only very slowly. Since it was obvious to us that social construction meant a renewed attention to the number of heterogeneous realities entering into the fabrication of some state of affairs, it took years for us to react in a balanced way to the absurd theories with which we appeared to be associated.115 Even though constructivism was for us a synonym for an increase in realism, we were feted by our colleagues in social critique as having shown at last that ‘even science is bunk’! It took me a long time to realize the danger of an expression that, in the hands of our ‘best friends’, apparently meant some type of revenge against the solidity of scientific facts and an exposé of their claim to truth. They seemed to imply that we were doing for science what they were so proud of having done for religion, art, law, culture, and everything the rest of us believe in, namely reducing it to dust by showing it was made up. For someone who had never been trained in critical sociology, it was hard to imagine that people could use the causal explanation in their own discipline as proof that the phenomena they were accounting for didn’t really exist, not to mention that they were associating the artificiality of the construction with a deficit in reality. Unwittingly, constructivism had become a synonym of its opposite number: deconstruction.

No wonder that our excitement in showing the ‘social construction of scientific fact’ was met with such fury by the actors themselves! For physicists, it is far from the same thing to settle complex controversies about black holes or to be presented instead with ‘power struggles among physicists’. For a religious soul, it is far from the same thing to address God in prayer and to be said to pray only to ‘the personalization

115 Since, in the French tradition, constructivist and rationalist are synonymous, it was especially difficult for the French. The association of the word ‘construction’ with any suspicion about the reality of science crossed our ‘Duhemian’ (see Pierre Duhem 1904, La Théorie Physique. Son objet sa structure), ‘Bachelardian’, or ‘Canguilhemian’ mind only very slowly. See Georges Canguilhem (1968 [1988]), Ideology and Rationality in the History of the Life Sciences.
of Society'. For a lawyer, it is not the same thing to obey the Constitution or to yield to powerful lobbies hidden behind the law. For a haute couture seamstress, it is not the same to cut through thick and shiny velvet or to be said to make 'social distinction' visible. For a follower of a cult, it's not the same thing to be tied to the existence of a divinity and to be told that one adores a fetish made out of wood. The substitution of the social with other stuff seems to every actor a catastrophic loss to be adamantly resisted—and rightly so! If, however, the word social is not used to replace one kind of stuff by another, but is used instead to deploy the associations that have rendered some state of affairs solid and durable, then another social theory might become audible at last.

How could there be, we wondered, such a divide in the basic duties of social science? This is why it slowly dawned on us that there was something deeply flawed not only in the standard philosophy of science, but also in the standard social theories used to account for other domains than science. This is what made ANT scholars at first look either too critical—they were accused of attacking 'even' matters of facts and of not 'believing' in 'Nature' or in 'outside reality'—or much too naive—they believed in the agencies of 'real things' that were 'out there'.\(^\text{116}\) In effect, what ANT was trying to modify was simply the use of the whole critical repertoire by abandoning simultaneously the use of Nature and the use of Society, which had been invented to reveal 'behind' social phenomena what was 'really taking place'. This, however, meant a complete reinterpretation of the experiment that we had conducted, at first unwittingly, when trying to account sociologically for the production of science. After all, there is a lot to be said in favor of red flags in the hands of clever toreros as they might, in the end, allow one to tame the wild beast.

The fortunate wreck of sociology of science

Let me first dispose of a mistake frequently made about our original subfield by people who are not conversant with it—and that means, I am afraid, most of the world. The field of science studies is often presented as the extension of the same normal sociology of the social to a new object: scientific activities. After having studied religion, class struggles, politics, law, popular cultures, drug addiction, urbanism,

\(^{\text{116}}\) The first critique has been offered during the 'Science Wars' episode, the second can be seen in Collins and Yearley 'Epistemological Chicken'; Simon Schaffer (1991a), 'The Eighteenth Bruinaire of Bruno Latour'; and Steve Woolgar (1991), 'The Turn to Technology in Social Studies of Science'.


: Oxford University Press, UK., p 104

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