

We Have Never Been Modern

Bruno Latour

translated by Catherine Porter

Harvard University Press
Cambridge, Massachusetts

I
□
CRISIS

1.1 The Proliferation of Hybrids

On page four of my daily newspaper, I learn that the measurements taken above the Antarctic are not good this year: the hole in the ozone layer is growing ominously larger. Reading on, I turn from upper-atmosphere chemists to Chief Executive Officers of Atochem and Monsanto, companies that are modifying their assembly lines in order to replace the innocent chlorofluorocarbons, accused of crimes against the ecosphere. A few paragraphs later, I come across heads of state of major industrialized countries who are getting involved with chemistry, refrigerators, aerosols and inert gases. But at the end of the article, I discover that the meteorologists don't agree with the chemists; they're talking about cyclical fluctuations unrelated to human activity. So now the industrialists don't know what to do. The heads of state are also holding back. Should we wait? Is it already too late? Toward the bottom of the page, Third World countries and ecologists add their grain of salt and talk about international treaties, moratoriums, the rights of future generations, and the right to development.

The same article mixes together chemical reactions and political reactions. A single thread links the most esoteric sciences and the most sordid politics, the most distant sky and some factory in the Lyon suburbs, dangers on a global scale and the impending local elections or the next board meeting. The horizons, the stakes, the time frames, the actors – none of these is commensurable, yet there they are, caught up in the same story.

On page six, I learn that the Paris AIDS virus contaminated the culture medium in Professor Gallo's laboratory; that Mr Chirac and Mr Reagan had, however, solemnly sworn not to go back over the history of that

discovery; that the chemical industry is not moving fast enough to market medications which militant patient organizations are vocally demanding; that the epidemic is spreading in sub-Saharan Africa. Once again, heads of state, chemists, biologists, desperate patients and industrialists find themselves caught up in a single uncertain story mixing biology and society.

On page eight, there is a story about computers and chips controlled by the Japanese; on page nine, about the right to keep frozen embryos; on page ten, about a forest burning, its columns of smoke carrying off rare species that some naturalists would like to protect; on page eleven, there are whales wearing collars fitted with radio tracking devices; also on page eleven, there is a slag heap in northern France, a symbol of the exploitation of workers, that has just been classified as an ecological preserve because of the rare flora it has been fostering! On page twelve, the Pope, French bishops, Monsanto, the Fallopian tubes, and Texas fundamentalists gather in a strange cohort around a single contraceptive. On page fourteen, the number of lines on high-definition television bring together Mr Delors, Thomson, the EEC, commissions on standardization, the Japanese again, and television film producers. Change the screen standard by a few lines, and billions of francs, millions of television sets, thousands of hours of film, hundreds of engineers and dozens of CEOs go down the drain.

Fortunately, the paper includes a few restful pages that deal purely with politics (a meeting of the Radical Party), and there is also the literary supplement in which novelists delight in the adventures of a few narcissistic egos ('I love you . . . you don't'). We would be dizzy without these soothing features. For the others are multiplying, those hybrid articles that sketch out imbroglios of science, politics, economy, law, religion, technology, fiction. If reading the daily paper is modern man's form of prayer, then it is a very strange man indeed who is doing the praying today while reading about these mixed-up affairs. All of culture and all of nature get churned up again every day.

Yet no one seems to find this troubling. Headings like Economy, Politics, Science, Books, Culture, Religion and Local Events remain in place as if there were nothing odd going on. The smallest AIDS virus takes you from sex to the unconscious, then to Africa, tissue cultures, DNA and San Francisco, but the analysts, thinkers, journalists and decision-makers will slice the delicate network traced by the virus for you into tidy compartments where you will find only science, only economy, only social phenomena, only local news, only sentiment, only sex. Press the most innocent aerosol button and you'll be heading for the Antarctic, and from there to the University of California at Irvine, the mountain ranges of Lyon, the chemistry of inert gases, and then maybe to the

United Nations, but this fragile thread will be broken into as many segments as there are pure disciplines. By all means, they seem to say, let us not mix up knowledge, interest, justice and power. Let us not mix up heaven and earth, the global stage and the local scene, the human and the nonhuman. 'But these imbroglios do the mixing,' you'll say, 'they weave our world together!' 'Act as if they didn't exist,' the analysts reply. They have cut the Gordian knot with a well-honed sword. The shaft is broken: on the left, they have put knowledge of things; on the right, power and human politics.

1.2 Retying the Gordian Knot

For twenty years or so, my friends and I have been studying these strange situations that the intellectual culture in which we live does not know how to categorize. For lack of better terms, we call ourselves sociologists, historians, economists, political scientists, philosophers or anthropologists. But to these venerable disciplinary labels we always add a qualifier: 'of science and technology'. 'Science studies', as Anglo-Americans call it, or 'science, technology and society'. Whatever label we use, we are always attempting to retie the Gordian knot by crisscrossing, as often as we have to, the divide that separates exact knowledge and the exercise of power — let us say nature and culture. Hybrids ourselves, installed lopsidedly within scientific institutions, half engineers and half philosophers, *'tiers instruits'* (Serres, 1991) without having sought the role, we have chosen to follow the imbroglios wherever they take us. To shuttle back and forth, we rely on the notion of translation, or network. More supple than the notion of system, more historical than the notion of structure, more empirical than the notion of complexity, the idea of network is the Ariadne's thread of these interwoven stories.

Yet our work remains incomprehensible, because it is segmented into three components corresponding to our critics' habitual categories. They turn it into nature, politics or discourse.

When Donald MacKenzie describes the inertial guidance system of intercontinental missiles (MacKenzie, 1990); when Michel Callon describes fuel cell electrodes (Callon, 1989); when Thomas Hughes describes the filament of Edison's incandescent lamp (Hughes, 1983); when I describe the anthrax bacterium modified by Louis Pasteur (Latour, 1988b) or Roger Guillemin's brain peptides (Latour and Woolgar, [1979] 1986), the critics imagine that we are talking about science and technology. Since these are marginal topics, or at best manifestations of pure instrumental and calculating thought, people who are interested in politics or in souls feel justified in paying no attention.

Yet this research does not deal with nature or knowledge, with things-in-themselves, but with the way all these things are tied to our collectives and to subjects. We are talking not about instrumental thought but about the very substance of our societies. MacKenzie mobilizes the entire American Navy, and even Congress, to talk about his inertial guidance system; Callon mobilizes the French electric utility (EDF) and Renault as well as great chunks of French energy policy to grapple with changes in ions at the tip of an electrode in the depth of a laboratory; Hughes reconstructs all America around the incandescent filament of Edison's lamp; the whole of French society comes into view if one tugs on Pasteur's bacteria; and it becomes impossible to understand brain peptides without hooking them up with a scientific community, instruments, practices – all impedimenta that bear very little resemblance to rules of method, theories and neurons.

'But then surely you're talking about politics? You're simply reducing scientific truth to mere political interests, and technical efficiency to mere strategical manœuvres?' Here is the second misunderstanding. If the facts do not occupy the simultaneously marginal and sacred place our worship has reserved for them, then it seems that they are immediately reduced to pure local contingency and sterile machinations. Yet science studies are talking not about the social contexts and the interests of power, but about their involvement with collectives and objects. The Navy's organization is profoundly modified by the way its offices are allied with its bombs; EDF and Renault take on a completely different look depending on whether they invest in fuel cells or the internal combustion engine; America before electricity and America after are two different places; the social context of the nineteenth century is altered according to whether it is made up of wretched souls or poor people infected by microbes; as for the unconscious subjects stretched out on the analyst's couch, we picture them differently depending on whether their dry brain is discharging neurotransmitters or their moist brain is secreting hormones. None of our studies can reutilize what the sociologists, the psychologists or the economists tell us about the social context or about the subject in order to apply them to the hard sciences – and this is why I will use the word 'collective' to describe the association of humans and nonhumans and 'society' to designate one part only of our collectives, the divide invented by the social sciences. The context and the technical content turn out to be redefined every time. Just as epistemologists no longer recognize in the collectivized things we offer them the ideas, concepts or theories of their childhood, so the human sciences cannot be expected to recognize the power games of their militant adolescence in these collectives full of things we are lining up. The delicate networks traced by Ariadne's little hand remain more invisible than spiderwebs.

'But if you are not talking about things-in-themselves or about humans-among-themselves, then you must be talking just about discourse, representation, language, texts, rhetorics.' This is the third misunderstanding. It is true that those who bracket off the external referent – the nature of things – and the speaker – the pragmatic or social context – can talk only about meaning effects and language games. Yet when MacKenzie examines the evolution of inertial guidance systems, he is talking about arrangements that can kill us all; when Callon follows a trail set forth in scientific articles, he is talking about industrial strategy as well as rhetoric (Callon *et al.*, 1986); when Hughes analyzes Edison's notebooks, the internal world of Menlo Park is about to become the external world of all America (Hughes, 1983). When I describe Pasteur's domestication of microbes, I am mobilizing nineteenth-century society, not just the semiotics of a great man's texts; when I describe the invention-discovery of brain peptides, I am really talking about the peptides themselves, not simply their representation in Professor Guillemin's laboratory. Yet rhetoric, textual strategies, writing, staging, semiotics – all these are really at stake, but in a new form that has a simultaneous impact on the nature of things and on the social context, while it is not reducible to the one or the other.

Our intellectual life is out of kilter. Epistemology, the social sciences, the sciences of texts – all have their privileged vantage point, provided that they remain separate. If the creatures we are pursuing cross all three spaces, we are no longer understood. Offer the established disciplines some fine sociotechnological network, some lovely translations, and the first group will extract our concepts and pull out all the roots that might connect them to society or to rhetoric; the second group will erase the social and political dimensions, and purify our network of any object; the third group, finally, will retain our discourse and rhetoric but purge our work of any undue adherence to reality – *horresco referens* – or to power plays. In the eyes of our critics the ozone hole above our heads, the moral law in our hearts, the autonomous text, may each be of interest, but only separately. That a delicate shuttle should have woven together the heavens, industry, texts, souls and moral law – this remains uncanny, unthinkable, unseemly.

1.3 The Crisis of the Critical Stance

The critics have developed three distinct approaches to talking about our world: naturalization, socialization and deconstruction. Let us use E.O. Wilson, Pierre Bourdieu, and Jacques Derrida – a bit unfairly – as emblematic figures of these three tacks. When the first speaks of

naturalized phenomena, then societies, subjects, and all forms of discourse vanish. When the second speaks of fields of power, then science, technology, texts, and the contents of activities disappear. When the third speaks of truth effects, then to believe in the real existence of brain neurons or power plays would betray enormous naiveté. Each of these forms of criticism is powerful in itself but impossible to combine with the other two. Can anyone imagine a study that would treat the ozone hole as simultaneously naturalized, sociologized and deconstructed? A study in which the nature of the phenomena might be firmly established and the strategies of power predictable, but nothing would be at stake but meaning effects that project the pitiful illusions of a nature and a speaker? Such a patchwork would be grotesque. Our intellectual life remains recognizable as long as epistemologists, sociologists and deconstructionists remain at arm's length, the critique of each group feeding on the weaknesses of the other two. We may glorify the sciences, play power games or make fun of the belief in a reality, but we must not mix these three caustic acids.

Now we cannot have it both ways. Either the networks my colleagues in science studies and I have traced do not really exist, and the critics are quite right to marginalize them or segment them into three distinct sets: facts, power and discourse; or the networks are as we have described them, and they do cross the borders of the great fiefdoms of criticism: they are neither objective nor social, nor are they effects of discourse, even though they are real, and collective, and discursive. Either we have to disappear, we bearers of bad news, or criticism itself has to face a crisis because of these networks it cannot swallow. Yes, the scientific facts are indeed constructed, but they cannot be reduced to the social dimension because this dimension is populated by objects mobilized to construct it. Yes, those objects are real but they look so much like social actors that they cannot be reduced to the reality 'out there' invented by the philosophers of science. The agent of this double construction – science with society and society with science – emerges out of a set of practices that the notion of deconstruction grasps as badly as possible. The ozone hole is too social and too narrated to be truly natural; the strategy of industrial firms and heads of state is too full of chemical reactions to be reduced to power and interest; the discourse of the ecosphere is too real and too social to boil down to meaning effects. Is it our fault if the networks are *simultaneously real, like nature, narrated, like discourse, and collective, like society*? Are we to pursue them while abandoning all the resources of criticism, or are we to abandon them while endorsing the common sense of the critical tripartition? The tiny networks we have unfolded are torn apart like the Kurds by the Iranians, the Iraqis and the Turks; once night has fallen, they slip across borders to get married, and

they dream of a common homeland that would be carved out of the three countries which have divided them up.

This would be a hopeless dilemma had anthropology not accustomed us to dealing calmly and straightforwardly with the seamless fabric of what I shall call 'nature-culture', since it is a bit more and a bit less than a culture (see Section 4.5). Once she has been sent into the field, even the most rationalist ethnographer is perfectly capable of bringing together in a single monograph the myths, ethnosciences, genealogies, political forms, techniques, religions, epics and rites of the people she is studying. Send her off to study the Arapesh or the Achuar, the Koreans or the Chinese, and you will get a single narrative that weaves together the way people regard the heavens and their ancestors, the way they build houses and the way they grow yams or manioc or rice, the way they construct their government and their cosmology. In works produced by anthropologists abroad, you will not find a single trait that is not simultaneously real, social and narrated.

If the analyst is subtle, she will retrace networks that look exactly like the sociotechnical imbroglios that we outline when we pursue microbes, missiles or fuel cells in our own Western societies. We too are afraid that the sky is falling. We too associate the tiny gesture of releasing an aerosol spray with taboos pertaining to the heavens. We too have to take laws, power and morality into account in order to understand what our sciences are telling us about the chemistry of the upper atmosphere.

Yes, but we are not savages; no anthropologist studies us that way, and it is impossible to do with our own culture – or should I say nature-culture? – what can be done elsewhere, with others. Why? Because we are modern. Our fabric is no longer seamless. Analytic continuity has become impossible. For traditional anthropologists, there is not – there cannot be, there should not be – an anthropology of the modern world (Latour, 1988a). The ethnosciences can be connected in part to society and to discourse (Conklin, 1983); science cannot. It is even because they remain incapable of studying themselves in this way that ethnographers are so critical, and so distant, when they go off to the tropics to study others. The critical tripartition protects them because it authorizes them to reestablish continuity among the communities of the premoderns. It is only because they separate at home that ethnographers make so bold as to unify abroad.

The formulation of the dilemma is now modified. Either it is impossible to do an anthropological analysis of the modern world – and then there is every reason to ignore those voices claiming to have a homeland to offer the sociotechnological networks; or it is possible to do an anthropological analysis of the modern world – but then the very definition of the modern world has to be altered. We pass from a limited

problem – why do the networks remain elusive? Why are science studies ignored? – to a broader and more classical problem: what does it mean to be modern? When we dig beneath the surface of our elders' surprise at the networks that – as we see it – weave our world, we discover the anthropological roots of that lack of understanding. Fortunately, we are being assisted by some major events that are burying the old critical mole in its own burrows. If the modern world in its turn is becoming susceptible to anthropological treatment, this is because something has happened to it. Ever since Madame de Guermantes's salon, we have known that it took a cataclysm like the Great War for intellectual culture to change its habits slightly and open its doors to the upstarts who had been beyond the pale before.

1.4 1989: The Year of Miracles

All dates are conventional, but 1989 is a little less so than some. For everyone today, the fall of the Berlin Wall symbolizes the fall of socialism. 'The triumph of liberalism, of capitalism, of the Western democracies over the vain hopes of Marxism': such is the victory communiqué issued by those who escaped Leninism by the skin of their teeth. While seeking to abolish man's exploitation of man, socialism had magnified that exploitation immeasurably. It is a strange dialectic that brings the exploiter back to life and buries the gravedigger, having given the world lessons in large-scale civil war. The repressed returns, and with a vengeance: the exploited people, in whose name the avant-garde of the proletariat had reigned, becomes a people once again; the voracious elites that were to have been dispensed with return at full strength to take up their old work of exploitation in banks, businesses and factories. The liberal West can hardly contain itself for joy. It has won the Cold War.

But the triumph is short-lived. In Paris, London and Amsterdam, this same glorious year 1989 witnesses the first conferences on the global state of the planet: for some observers they symbolize the end of capitalism and its vain hopes of unlimited conquest and total dominion over nature. By seeking to reorient man's exploitation of man toward an exploitation of nature by man, capitalism magnified both beyond measure. The repressed returns, and with a vengeance: the multitudes that were supposed to be saved from death fall back into poverty by the hundreds of millions; nature, over which we were supposed to gain absolute mastery, dominates us in an equally global fashion, and threatens us all. It is a strange dialectic that turns the slave into man's owner and master, and that suddenly informs us that we have invented ecocides as well as large-scale famine.

The perfect symmetry between the dismantling of the wall of shame and the end of limitless Nature is invisible only to the rich Western democracies. The various manifestations of socialism destroyed both their peoples and their ecosystems, whereas the powers of the North and the West have been able to save their peoples and some of their countrysides by destroying the rest of the world and reducing its peoples to abject poverty. Hence a double tragedy: the former socialist societies think they can solve both their problems by imitating the West; the West thinks it has escaped both problems and believes it has lessons for others even as it leaves the Earth and its people to die. The West thinks it is the sole possessor of the clever trick that will allow it to keep on winning indefinitely, whereas it has perhaps already lost everything.

After seeing the best of intentions go doubly awry, we moderns from the Western world seem to have lost some of our self-confidence. Should we *not* have tried to put an end to man's exploitation of man? Should we *not* have tried to become nature's masters and owners? Our noblest virtues were enlisted in the service of these twin missions, one in the political arena and the other in the domain of science and technology. Yet we are prepared to look back on our enthusiastic and right-thinking youth as young Germans look to their greying parents and ask: 'What criminal orders did we follow?' 'Will we say that we didn't know?'

This doubt about the well-foundedness of the best of intentions pushes some of us to become reactionaries, in one of two ways. We must no longer try to put an end to man's domination of man, say some; we must no longer try to dominate nature, say others. Let us be resolutely antimodern, they all say.

From a different vantage point, the vague expression of postmodernism aptly sums up the incomplete scepticism of those who reject both reactions. Unable to believe the dual promises of socialism and 'naturalism', the postmoderns are also careful not to reject them totally. They remain suspended between belief and doubt, waiting for the end of the millennium.

Finally, those who reject ecological obscurantism or antisocialist obscurantism, and are unable to settle for the scepticism of the postmoderns, decide to carry on as if nothing had changed: they intend to remain resolutely modern. They continue to believe in the promises of the sciences, or in those of emancipation, or both. Yet their faith in modernization no longer rings quite true in art, or economics, or politics, or science, or technology. In art galleries and concert halls, along the façades of apartment buildings and inside international organizations, you can feel that the heart is gone. The will to be modern seems hesitant, sometimes even outmoded.

Whether we are antimodern, modern or postmodern, we are all called into question by the double debacle of the miraculous year 1989. But we take up the threads of thought if we consider the year precisely to be a double debacle, two lessons whose admirable symmetry allows us to look at our whole past in a new light.

And what if we had never been modern? Comparative anthropology would then be possible. The networks would have a place of their own.

1.5 What Does it Mean To Be a Modern?

Modernity comes in as many versions as there are thinkers or journalists, yet all its definitions point, in one way or another, to the passage of time. The adjective 'modern' designates a new regime, an acceleration, a rupture, a revolution in time. When the word 'modern', 'modernization', or 'modernity' appears, we are defining, by contrast, an archaic and stable past. Furthermore, the word is always being thrown into the middle of a fight, in a quarrel where there are winners and losers, Ancients and Moderns. 'Modern' is thus doubly asymmetrical: it designates a break in the regular passage of time, and it designates a combat in which there are victors and vanquished. If so many of our contemporaries are reluctant to use this adjective today, if we qualify it with prepositions, it is because we feel less confident in our ability to maintain that double asymmetry: we can no longer point to time's irreversible arrow, nor can we award a prize to the winners. In the countless quarrels between Ancients and Moderns, the former come out winners as often as the latter now, and nothing allows us to say whether revolutions finish off the old regimes or bring them to fruition. Hence the scepticism that is oddly called 'post'modern even though it does not know whether or not it is capable of taking over from the Moderns.

To go back a few steps: we have to rethink the definition of modernity, interpret the symptom of postmodernity, and understand why we are no longer committed heart and soul to the double task of domination and emancipation. To make a place for the networks of sciences and technologies, do we really have to move heaven and earth? Yes, exactly, the Heavens and the Earth.

The hypothesis of this essay is that the word 'modern' designates two sets of entirely different practices which must remain distinct if they are to remain effective, but have recently begun to be confused. The first set of practices, by 'translation', creates mixtures between entirely new types of beings, hybrids of nature and culture. The second, by 'purification', creates two entirely distinct ontological zones: that of human beings on

the one hand; that of nonhumans on the other. Without the first set, the practices of purification would be fruitless or pointless. Without the second, the work of translation would be slowed down, limited, or even ruled out. The first set corresponds to what I have called networks; the second to what I shall call the modern critical stance. The first, for example, would link in one continuous chain the chemistry of the upper atmosphere, scientific and industrial strategies, the preoccupations of heads of state, the anxieties of ecologists; the second would establish a partition between a natural world that has always been there, a society with predictable and stable interests and stakes, and a discourse that is independent of both reference and society.

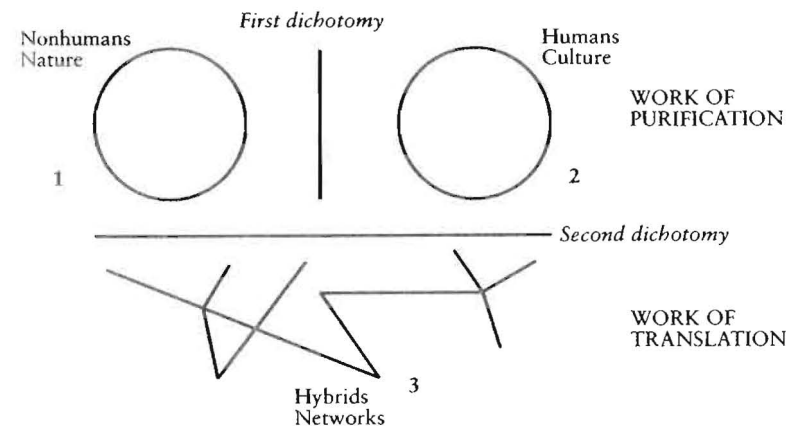


Figure 1.1 Purification and translation

So long as we consider these two practices of translation and purification separately, we are truly modern – that is, we willingly subscribe to the critical project, even though that project is developed only through the proliferation of hybrids down below. As soon as we direct our attention simultaneously to the work of purification and the work of hybridization, we immediately stop being wholly modern, and our future begins to change. At the same time we stop having been modern, because we become retrospectively aware that the two sets of practices have always already been at work in the historical period that is ending. Our past begins to change. Finally, if we have never been modern – at least in the way criticism tells the story – the tortuous relations that we have maintained with the other nature-cultures would also be transformed. Relativism, domination, imperialism, false consciousness, syncretism – all the problems that anthropologists summarize under the loose

expression of 'Great Divide' – would be explained differently, thereby modifying comparative anthropology.

What link is there between the work of translation or mediation and that of purification? This is the question on which I should like to shed light. My hypothesis – which remains too crude – is that the second has made the first possible: the more we forbid ourselves to conceive of hybrids, the more possible their interbreeding becomes – such is the paradox of the moderns, which the exceptional situation in which we find ourselves today allows us finally to grasp. The second question has to do with premoderns, with the other types of culture. My hypothesis – once again too simple – is that by devoting themselves to conceiving of hybrids, the other cultures have excluded their proliferation. It is this disparity that would explain the Great Divide between Them – all the other cultures – and Us – the westerners – and would make it possible finally to solve the insoluble problem of relativism. The third question has to do with the current crisis: if modernity were so effective in its dual task of separation and proliferation, why would it weaken itself today by preventing us from being truly modern? Hence the final question, which is also the most difficult one: if we have stopped being modern, if we can no longer separate the work of proliferation from the work of purification, what are we going to become? Can we aspire to Enlightenment without modernity? My hypothesis – which, like the previous ones, is too coarse – is that we are going to have to slow down, reorient and regulate the proliferation of monsters by representing their existence officially. Will a different democracy become necessary? A democracy extended to things? To answer these questions, I shall have to sort out the premoderns, the moderns, and even the postmoderns in order to distinguish between their durable characteristics and their lethal ones.

Too many questions, as I am well aware, for an essay that has no excuse but its brevity. Nietzsche said that the big problems were like cold baths: you have to get out as fast as you get in.

2



CONSTITUTION

2.1 The Modern Constitution

Modernity is often defined in terms of humanism, either as a way of saluting the birth of 'man' or as a way of announcing his death. But this habit itself is modern, because it remains asymmetrical. It overlooks the simultaneous birth of 'nonhumanity' – things, or objects, or beasts – and the equally strange beginning of a crossed-out God, relegated to the sidelines. Modernity arises first from the conjoined creation of those three entities, and then from the masking of the conjoined birth and the separate treatment of the three communities while, underneath, hybrids continue to multiply as an effect of this separate treatment. The double separation is what we have to reconstruct: the separation between humans and nonhumans on the one hand, and between what happens 'above' and what happens 'below' on the other.

These separations could be compared to the division that distinguishes the judiciary from the executive branch of a government. This division is powerless to account for the multiple links, the intersecting influences, the continual negotiations between judges and politicians. Yet it would be a mistake to deny the effectiveness of the separation. The modern divide between the natural world and the social world has the same constitutional character, with one difference: up to now, no one has taken on the task of studying scientists and politicians in tandem, since no central vantage point has seemed to exist. In one sense, the fundamental articles of faith pertaining to the double separation have been so well drawn up that this separation has been viewed as a double ontological distinction. As soon as one outlines the symmetrical space and thereby reestablishes the common understanding that organizes the separation of natural and political powers, one ceases to be modern.

The common text that defines this understanding and this separation is called a constitution, as when we talk about amendments to the American constitution. Who is drafting such a text? For political constitutions, the task falls to jurists and Founding Fathers, but so far they have done only a third of the work, since they have left out both scientific power and the work of hybrids. For the nature of things, it is the scientists' task, but they have done only another third of the work, since they have pretended to forget about political power, and they have denied that hybrids have any role to play even as they multiply them. For the work of translation, writing the constitution is the task of those who study those strange networks that I have outlined above, but science students have fulfilled only half of their contract, since they do not explain the work of purification that is carried out above them and accounts for the proliferation of hybrids.

Who is to write the full constitution? As far as foreign collectives are concerned, anthropology has been pretty good at tackling everything at once. In fact, as we have seen, every ethnologist is capable of including within a single monograph the definition of the forces in play; the distribution of powers among human beings, gods, and nonhumans; the procedures for reaching agreements; the connections between religion and power; ancestors; cosmology; property rights; plant and animal taxonomies. The ethnologist will certainly not write three separate books: one dealing with knowledge, another with power, yet another with practices. She will write a single book, like the magnificent one in which Philippe Descola attempts to sum up the constitution of the Achuar of the Amazon region (Descola, [1986] 1993):

Yet the Achuar have not completely subdued nature by the symbolic networks of domesticity. Granted, the cultural sphere is all-encompassing, since in it we find animals, plants and spirits which other Amerindian societies place in the realm of nature. The Achuar do not, therefore, share this antinomy between two closed and irremediably opposed worlds: the cultural world of human society and the natural world of animal society. And yet there is nevertheless a certain point at which the continuum of sociability breaks down, yielding to a wild world inexorably foreign to humans. Incomparably smaller than the realm of culture, this little piece of nature includes the set of things with which communication cannot be established. Opposite beings endowed with language [*aents*], of which humans are the most perfect incarnation, stand those things deprived of speech that inhabit parallel, inaccessible worlds. The inability to communicate is often ascribed to a lack of soul [*wakan*] that affects certain living species: most insects and fish, poultry, and numerous plants, which thus lead a mechanical, inconsequential existence. But the absence of communication is sometimes due to distance: the souls of stars and meteors,

infinitely far away and prodigiously mobile, remain deaf to human words. [p. 399]

If an anthropology of the modern world were to exist its task would consist in describing in the same way how all the branches of our government are organized, including that of nature and the hard sciences, and in explaining how and why these branches diverge as well as accounting for the multiple arrangements that bring them together. The ethnologist of our world must take up her position at the common locus where roles, actions and abilities are distributed – those that make it possible to define one entity as animal or material and another as a free agent; one as endowed with consciousness, another as mechanical, and still another as unconscious and incompetent. Our ethnologist must even compare the always different ways of defining – or not defining – matter, law, consciousness and animals' souls, without using modern metaphysics as a vantage point. Just as the constitution of jurists defines the rights and duties of citizens and the State, the working of justice and the transfer of power, so this Constitution – which I shall spell with a capital C to distinguish it from the political ones – defines humans and nonhumans, their properties and their relations, their abilities and their groupings.

How can this Constitution be described? I have chosen to concentrate on an exemplary situation that arose at the very beginning of its drafting, in the middle of the seventeenth century, when the natural philosopher Robert Boyle and the political philosopher Thomas Hobbes were arguing over the distribution of scientific and political power. Such a choice might appear arbitrary if a remarkable book had not just come to grips with this double creation of a social context and a nature that escapes that very context. I shall use Boyle and Hobbes, along with their descendants and disciples, as a way of summarizing a much longer story – one that I cannot retrace here but one that others, better equipped than I, may want to pursue.

2.2 Boyle and His Objects

A book by Steven Shapin and Simon Schaffer (Shapin and Schaffer, 1985) marks the real beginning of a comparative anthropology that takes science seriously. At first glance, this book does nothing more than exemplify what has been the slogan of the Edinburgh school of science studies (Barnes and Shapin, 1979; Bloor, [1976] 1991) and of a great body of work in the social history of science (Shapin, 1982) and in the sociology of knowledge (Moscovici, 1977): 'questions of epistemology are

also questions of social order'. It is impossible to do justice to either question if the two are separated, one assigned to departments of philosophy and the other to departments of sociology or political science. But Shapin and Schaffer push this general programme to the limit – first by displacing the historical beginning of this very divide between epistemology and sociology, and second, in part unwittingly, by ruining the privilege given to the social context in explaining the sciences.

We have not referred to politics as something that happens solely outside of science and which can, so to speak, press in upon it. The experimental community [set up by Boyle] vigorously developed and deployed such boundary-speech, and we have sought to situate this speech historically and to explain why these conventionalized ways of talking developed. What we cannot do if we want to be serious about the historical nature of our inquiry is to use such actors' speech unthinkingly as an explanatory resource. The language that transports politics outside of science is precisely what we need to understand and explain. We find ourselves standing against much current sentiment in the history of science that holds that we should have less talk of the 'insides' and 'outsides' of science, that we have transcended such outmoded categories. Far from it; we have not yet begun to understand the issues involved. We still need to understand how such boundary-conventions developed: how, as a matter of historical record, scientific actors allocated items with respect to their boundaries (not ours), and how, as a matter of record, they behaved with respect to the items thus allocated. Nor should we take any one system of boundaries as belonging self-evidently to the thing that is called 'science.' (Shapin and Schaffer, 1985, p. 342)

In this long passage the authors do not show how the social context of England might justify the development of Boyle's physics and the failure of Hobbes's mathematical theories. They come to grips with the very basis of political philosophy. Far from 'situating Boyle's scientific works in their social context' or showing how politics 'presses in upon' scientific doctrines, they examine how Boyle and Hobbes fought to invent a science, a context, and a demarcation between the two. They are not prepared to explain the content by the context, since neither existed in this new way before Boyle and Hobbes reached their respective goals and settled their differences.

The beauty of Shapin and Schaffer's book stems from their success in unearthing Hobbes's scientific works – which had been neglected by political scientists, because they were embarrassed by the wild mathematical imaginings of their hero – and in rescuing from oblivion Boyle's political theories – which had been neglected by historians of science because they preferred to conceal their hero's organizational efforts. Instead of setting up an asymmetry, instead of distributing science to Boyle and political theory

to Hobbes, Shapin and Schaffer outline a rather nice quadrant: Boyle has a science and a political theory; Hobbes has a political theory and a science. The quadrant would be uninteresting if the ideas of our two heroes were too far apart – if, for example, one were a philosopher after the fashion of Paracelsus and the other a Bodin-style lawmaker. But by good fortune, they agree on almost everything. They want a king, a Parliament, a docile and unified Church, and they are fervent subscribers to mechanistic philosophy. But even though both are thoroughgoing rationalists, their opinions diverge as to what can be expected from experimentation, from scientific reasoning, from political argument – and above all from the air pump, the real hero of the story. The disagreements between the two men, who agree on everything else, make them the ideal laboratory material, the perfect fruit flies for the new anthropology.

Boyle carefully refrained from talking about vacuum pumps. To put some order into the debates that followed the discovery of the Torricellian space at the top of a mercury tube inverted in a basin of the same substance, he claimed to be investigating only the weight of the air without taking sides in the dispute between plenists and vacuists. The apparatus he developed (modelled on Otto von Guericke's) that would permanently evacuate the air from a transparent glass container was, for the period – in terms of cost, complication and novelty – the equivalent of a major piece of equipment in contemporary physics. This was already Big Science. The great advantage of Boyle's installations was that they made it possible to see inside the glass walls and to introduce or even manipulate samples, owing to a series of ingeniously constructed lock chambers and covers. The pistons of the pump, the thick glass containers and the gaskets were not of adequate quality, so Boyle had to push technological research far enough, for instance, to be able to carry out the experiment he cared about most: that of the vacuum within a vacuum. He enclosed a Torricelli tube within the pump's glass enclosure and thus obtained an initial space at the top of the overturned tube. Then, by getting one of his technicians (who were invisible [Shapin, 1989]) to work the pump, he suppressed the weight of the air enough to bring down the level of the column, which descended nearly to the level of the mercury in the basin. Boyle undertook dozens of experiments within the confined chamber of his air pump, starting with attempts to detect the ether wind postulated by his adversaries, or to explain the cohesiveness of marble cylinders, or to suffocate small animals and put out candles – these experiments were later popularized by eighteenth-century parlour physics.

While a dozen civil wars were raging, Boyle chose a method of argument – that of opinion – that was held in contempt by the oldest

scholastic tradition. Boyle and his colleagues abandoned the certainties of apodeictic reasoning in favour of a doxa. This doxa was not the raving imagination of the credulous masses, but a new mechanism for winning the support of one's peers. Instead of seeking to ground his work in logic, mathematics or rhetoric, Boyle relied on a parajudicial metaphor: credible, trustworthy, well-to-do witnesses gathered at the scene of the action can attest to the existence of a fact, the matter of fact, even if they do not know its true nature. So he invented the empirical style that we still use today (Shapin, 1984).

Boyle did not seek these gentlemen's opinion, but rather their observation of a phenomenon produced artificially in the closed and protected space of a laboratory (Shapin, 1990). Ironically, the key question of the constructivists – are facts thoroughly constructed in the laboratory? (Woolgar, 1988) – is precisely the question that Boyle raised and resolved. Yes, the facts are indeed constructed in the new installation of the laboratory and through the artificial intermediary of the air pump. The level does descend in the Torricelli tube that has been inserted into the transparent enclosure of a pump operated by breathless technicians. '*Les faits sont faits*': 'Facts are fabricated,' as Gaston Bachelard would say. But are facts that have been constructed by man artifactual for that reason? No: for Boyle, just like Hobbes, extends God's 'constructivism' to man. God knows things because He creates them (Funkenstein, 1986). We know the nature of the facts because we have developed them in circumstances that are under our complete control. Our weakness becomes a strength, provided that we limit knowledge to the instrumentalized nature of the facts and leave aside the interpretation of causes. Once again, Boyle turns a flaw – we produce only matters of fact that are created in laboratories and have only local value – into a decisive advantage: these facts will never be modified, whatever may happen elsewhere in theory, metaphysics, religion, politics or logic.

2.3 Hobbes and His Subjects

Hobbes rejected Boyle's entire theatre of proof. Like Boyle, Hobbes too wanted to bring an end to the civil war; he too wanted to abandon free interpretation of the Bible on the part of clerics and the people alike. But he meant to reach his goal by a unification of the Body Politic. The Sovereign created by the contract, 'that *Mortall God*, to which we owe, under the *Immortal God*, our peace and defence' (Hobbes, [1651] 1947, p. 89), is only the representative of the multitude. 'For it is the *Unity* of the Representer, not the *Unity* of the Represented, that maketh the Person *One*' (p. 85). Hobbes was obsessed by the unity of the Person who

is, as he puts it, the Actor of which we citizens are the Authors. It is because of this unity that there can be no transcendence. Civil wars will rage as long as there exist supernatural entities that citizens feel they have a right to petition when they are persecuted by the authorities of this lower world. The loyalty of the old medieval society – to God and King – is no longer possible if all people can petition God directly, or designate their own King. Hobbes wanted to wipe the slate clean of all appeals to entities higher than civil authority. He wanted to rediscover Catholic unity while at the same time closing off any access to divine transcendence.

For Hobbes, Power is Knowledge, which amounts to saying that there can exist only one Knowledge and only one Power if civil wars are to be brought to an end. This is why the major portion of *Leviathan* is devoted to an exegesis of the Old and New Testaments. One of the great dangers for civil peace comes from the belief in immaterial bodies such as spirits, phantoms or souls, to which people appeal against the judgements of civil power. Antigone might be dangerous when she proclaims the superiority of piety over Creon's 'reasons of State'; the egalitarians, the Levellers and the Diggers are much more so when they invoke the active powers of matter and the free interpretation of the Bible in order to disobey their legitimate princes. Inert and mechanical matter is as essential to civil peace as a purely symbolic interpretation of the Bible. In both cases, it behoves us to avoid at all costs the possibility that the factions may invoke a higher Entity – Nature or God – which the Sovereign does not fully control.

This reductionism does not lead to a totalitarian State, since Hobbes applies it to the Republic itself: the Sovereign is never anything but an Actor designated by the social contract. There is no divine law or higher agency that the Sovereign might invoke in order to act as he wishes and dismantle the Leviathan. In this new regime in which Knowledge equals Power, everything is cut down to size: the Sovereign, God, matter, and the multitude. Hobbes even rules out turning his own science of the State into an invocation of transcendence. He arrives at all his scientific results not by opinion, observation or revelation but by a mathematical demonstration, the only method of argument capable of compelling everyone's assent; and he accomplishes this demonstration not by making transcendental calculations, like Plato's King, but by using a purely computational instrument, the Mechanical Brain, a computer before its time. Even the famous social contract is only the sum of a calculation reached abruptly and simultaneously by all the terrorized citizens who are seeking to liberate themselves from the state of nature. Such is Hobbes's generalized constructivism designed to end civil war: no transcendence whatsoever, no recourse to God, or to active matter, or to Power by Divine Right, or even to mathematical Ideas.

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

2.4 The Mediation of the Laboratory

This political interpretation of Hobbes's plenism does not suffice to make Shapin and Schaffer's book a solid foundation for comparative anthropology. Any good historian of ideas could have done the same job. But in three decisive chapters our authors leave the confines of intellectual history and pass from the world of opinions and argument to the world of practices and networks. For the first time in science studies, all ideas pertaining to God, the King, Matter, Miracles and Morality are translated, transcribed, and forced to pass through the practice of making an instrument work. Before Shapin and Schaffer, other historians of science had studied scientific practice; other historians had studied the religious, political and cultural context of science. No one, before Shapin and Schaffer, had been capable of doing both at once.

Just as Boyle succeeds in transforming his tinkering about with a jerry-built air pump into the partial assent of gentlemen with respect to facts

that have become indisputable, so Shapin and Schaffer manage to explain how and why discussions dealing with the Body Politic, God and His miracles, matter and its power, have to be translated through the air pump. This mystery has never been cleared up by those seeking a contextualist explanation for the sciences. Contextualists start from the principle that a social macro-context exists – England, the dynastic quarrel, Capitalism, Revolution, Merchants, the Church – and that this context in some way influences, forms, reflects, has repercussions for, and exercises pressure on 'ideas about' matter, the air's spring, vacuums, and Torricelli tubes. But they never explain the prior establishment of a link connecting God, the King, Parliament, and some bird suffocating in the transparent closed chamber of a pump whose air is being removed by means of a crank operated by a technician. How can the bird's experience translate, displace, transport, distort all the other controversies, in such a way that those who master the pump also master the King, God, and the entire context?

Hobbes indeed seeks to get round everything that has to do with experimental work, but Boyle forces the discussion to proceed by way of a set of sordid details involving the leaks, gaskets and cranks of his machine. In the same way, philosophers of science and historians of ideas would like to avoid the world of the laboratory, that repugnant kitchen in which concepts are smothered with trivia (Cunningham and Williams, 1992; Knorr, 1981; Latour and Woolgar, [1979] 1986; Pickering, 1992; Traweek, 1988). Shapin and Schaffer force their analyses to hinge on the object, on a certain leak, a particular gasket in the air pump. The practice of fabricating objects is restored to the dominant place it had lost with the modern critical stance. Their book is not empirical simply because of its abundant details; it is empirical because it undertakes the archaeology of that new object that is born in the seventeenth century in the laboratory. Shapin and Schaffer, like Ian Hacking (Hacking, 1983), do in a quasi-ethnographic way what philosophers of science now do scarcely at all: they show the realistic foundations of the sciences. But rather than speaking of the external reality 'out there', they anchor the indisputable reality of science 'down there', on the bench.

The experiments don't go very well. The pump leaks. It has to be patched up. Those who are incapable of explaining the irruption of objects into the human collective, along with all the manipulations and practices that objects require, are not anthropologists, for what has constituted the most fundamental aspect of our culture, since Boyle's day, eludes them: we live in communities whose social bond comes from objects fabricated in laboratories; ideas have been replaced by practices, apodeictic reasoning by a controlled doxa, and universal agreement by groups of colleagues. The lovely order that Hobbes was trying to recover

is annihilated by the multiplication of private spaces where the transcendental origin of facts is proclaimed – facts that have been fabricated by man yet are no one's handiwork, facts that have no causality yet can be explained.

How can a society be made to hold together peacefully, Hobbes asks indignantly, on the pathetic foundation of matters of fact? He is particularly annoyed by the relative change in the scale of phenomena. According to Boyle, the big questions concerning matter and divine power can be subjected to experimental resolution, and this resolution will be partial and modest. Now Hobbes rejects the possibility of the vacuum for ontological and political reasons of primary philosophy, and he continues to allege the existence of an invisible ether that must be present, even when Boyle's worker is too out of breath to operate his pump. In other words, he demands a macroscopic response to his 'macro-'arguments, a demonstration that would prove that his ontology is not necessary, that the vacuum is politically acceptable. Now what does Boyle do in response? He chooses, on the contrary, to make his experiment more sophisticated, to show the effect on a detector – a mere chicken feather! – of the ether wind postulated by Hobbes in the hope of invalidating his detractor's theory (Shapin and Schaffer, 1985, p. 182). Ridiculous! Hobbes raises a fundamental problem of political philosophy, and his theories are to be refuted by a feather in a glass chamber inside Boyle's mansion! Of course, the feather doesn't move at all, and Boyle draws the conclusion that Hobbes is wrong, that there is no ether wind. However, Hobbes cannot be wrong, because he refuses to admit that the phenomenon he is talking about can be produced on a scale other than that of the Republic as a whole. He denies what is to become the essential characteristic of modern power: the change in scale and the displacements that are presupposed by laboratory work (Latour, 1983). Boyle, a new Puss in Boots, now has only to pounce on the Ogre, who has just been reduced to the size of a mouse.

2.5 The Testimony of Nonhumans

Boyle's innovation is striking. Against Hobbes's judgement, he takes possession of the old repertoire of penal law and biblical exegesis, but he does so in order to apply them to the testimony of the things put to the test in the laboratory. As Shapin and Schaffer write:

Sprat and Boyle appealed to 'the practice of our courts of justice here in England' to sustain the moral certainty of their conclusions and to support the argument that the multiplication of witnesses allowed 'a concurrence of

such probabilities.' Boyle used the provision of Clarendon's 1661 Treason Act, in which, he said, two witnesses were necessary to convict. So the legal and priestly models of authority through witnessing were fundamental resources for the experimenters. Reliable witnesses were ipso facto the members of a trustworthy community: Papists, atheists, and sectaries found their stories challenged, the social status of a witness sustained his credibility, and the concurring voices of many witnesses put the extremists to flight. Hobbes challenged the basis of this practice: once again, he displayed the form of life that sustained witnessing as an ineffective and subversive enterprise. (Shapin and Schaffer, 1985, p. 327)

At first glance, Boyle's repertoire does not contribute much that is new. Scholars, monks, jurists and scribes had been developing all those resources for a millennium and more. What is new, however, is their point of application. Earlier, the witnesses had always been human or divine – never nonhuman. The texts had been written by men or inspired by God – never inspired or written by nonhumans. The law courts had seen countless human and divine trials come and go – never affairs that called into question the behaviour of nonhumans in a laboratory transformed into a court of justice. Yet for Boyle, laboratory experiments carry more authority than unconfirmed depositions by honourable witnesses:

'The pressure of the water in our recited experiment [on the diver's bell] having manifest effects upon inanimate bodies, which are not capable of prepossessions, or giving us partial informations, will have much more weight with unprejudiced persons, than the suspicious, and sometimes disagreeing accounts of ignorant divers, whom prejudicate opinions may much sway, and whose very sensations, as those of other vulgar men, may be influenced by predispositions, and so many other circumstances, that they may easily give occasion to mistakes.' [Shapin and Schaffer, 1985, p. 218]

Here in Boyle's text we witness the intervention of a new actor recognized by the new Constitution: inert bodies, incapable of will and bias but capable of showing, signing, writing, and scribbling on laboratory instruments before trustworthy witnesses. These nonhumans, lacking souls but endowed with meaning, are even more reliable than ordinary mortals, to whom will is attributed but who lack the capacity to indicate phenomena in a reliable way. According to the Constitution, in case of doubt, humans are better off appealing to nonhumans. Endowed with their new semiotic powers, the latter contribute to a new form of text, the experimental science article, a hybrid between the age-old style of biblical exegesis – which has previously been applied only to the

Scriptures and classical texts – and the new instrument that produces new inscriptions. From this point on, witnesses will pursue their discussions around the air pump in its enclosed space, discussions about the meaningful behaviour of nonhumans. The old hermeneutics will persist, but it will add to its parchments the shaky signature of scientific instruments (Latour and De Noblet, 1985; Law and Fyfe, 1988; Lynch and Woolgar, 1990). With a law court thus renewed, all the other powers will be overthrown, and this is what makes Hobbes so upset; however, the overturning is possible only if all connections with the political and religious branches of government become impossible.

Shapin and Schaffer pursue their discussion of objects, laboratories, capacities, and changes of scale to its extreme consequences. If science is based not on ideas but on a practice, if it is located not outside but inside the transparent chamber of the air pump, and if it takes place within the private space of the experimental community, then how does it reach 'everywhere'? How does it become as universal as 'Boyle's laws' or 'Newton's laws'? The answer is that it never become universal – not, at least, in the epistemologists' terms! Its network is extended and stabilized. This expansion is brilliantly demonstrated in a chapter which, like the work of Harry Collins (Collins, 1985) or Trevor Pinch (Pinch, 1986) offers a striking example of the fruitfulness of the new science studies. By following the reproduction of each prototype air pump throughout Europe, and the progressive transformation of a piece of costly, not very reliable and quite cumbersome equipment, into a cheap black box that gradually becomes standard equipment in every laboratory, the authors bring the universal application of a law of physics back within a network of standardized practices. Unquestionably, Boyle's interpretation of the air's spring is propagated – but its speed of propagation is exactly equivalent to the rate at which the community of experimenters and their equipment develop. No science can exit from the network of its practice. The weight of air is indeed always a universal, but a universal in a network. Owing to the extension of this network, competences and equipment can become sufficiently routine for production of the vacuum to become as invisible as the air we breathe; but universal in the old sense? Never.

2.6 The Double Artifact of the Laboratory and the Leviathan

How far does the symmetry hold between Hobbes's invention and Boyle's? Shapin and Schaffer are not clear on this point. At first sight, however, it seems that Hobbes and his disciples created the chief resources that are available to us for speaking about power ('representa-

tion', 'sovereign', 'contract', 'property', 'citizens'), while Boyle and his successors developed one of the major repertoires for speaking about nature ('experiment', 'fact', 'evidence', 'colleagues'). It should thus seem also clear that we are dealing not with two separate inventions but with only one, a division of power between the two protagonists, to Hobbes, the politics and to Boyle, the sciences. This, however, is not the conclusion drawn by Shapin and Schaffer. After having had the stroke of genius that led them to compare the experimental practice and political organization of two major figures from the very beginning of the modern era, they back off and hesitate to treat Hobbes and his politics in the same way as they had treated Boyle and his science. Strangely enough, they seem to adhere more steadfastly to the political repertoire than to the scientific one.

Yet Shapin and Schaffer unintentionally displace the traditional centre of reference of the modern critique downward. If science is based on forms of life, practices, laboratories and networks, then where is it to be situated? Certainly not on the side of things-in-themselves, since the facts are fabricated. But it cannot be situated, either, on the side of the subject – or whatever name one wants to give this side: society, brain, spirit, language game, epistemes or culture. The suffocating bird, the marble cylinders, the descending mercury are not our own creations, they are not made out of thin air, not of social relations, not of human categories. Must we then place the practice of science right in the middle of the line that connects the Object Pole to the Subject Pole? Is this practice a hybrid, or a mixture of the two? Part object and part subject? Or is it necessary to invent a new position for this strange generation of both a political context and a scientific content?

The authors do not give us a definitive answer to these questions as if they had failed to do justice to their own discovery. Just as Hobbes and Boyle agree on everything except how to carry out experiments, the authors, who agree on everything, disagree on how to deal with the 'social' context – that is, Hobbes's symmetrical invention of a human capable of being represented. The last chapters of the book waver between a Hobbesian explanation of the authors' own work and a Boyleian point of view. This tension only makes their work more interesting, and it supplies the anthropology of science with a new line of ideally suited fruit flies, since they differ by only a few traits. Shapin and Schaffer consider Hobbes's macro-social explanations relative to Boyle's science more convincing than Boyle's arguments refuting Hobbes! Trained in the framework of the social study of sciences, they seem to accept the limitations imposed by the Edinburgh school: if all questions of epistemology are questions of social order, this is because, when all is said and done, the social context contains as one of its subsets the

definition of what counts as good science. Such an asymmetry renders Shapin and Schaffer less well equipped to deconstruct the macro-social context than Nature 'out there'. They seem to believe that a society 'up there' actually exists, and that it accounts for the failure of Hobbes's programme. Or – more precisely – they do not manage to settle the question, cancelling out in their conclusion what they had demonstrated in Chapter 7, and cancelling out their own argument yet again in the very last sentence of the book:

Neither our scientific knowledge, nor the constitution of our society, nor traditional statements about the connections between our society and our knowledge are taken for granted any longer. As we come to recognize the conventional and artifactual status of our forms of knowing, we put ourselves in a position to realize that it is ourselves and not reality that is responsible for what we know. Knowledge, as much as the State, is the product of human actions. Hobbes was right. [p. 344]

No, Hobbes was wrong. How could he have been right, when he was the one who invented the monist society in which Knowledge and Power are one and the same thing? How can such a crude theory be used to explain Boyle's invention of an absolute dichotomy between the production of knowledge of facts and politics? Yes, 'knowledge, as much as the State, is the product of human actions', but that is precisely why Boyle's political invention is much more refined than Hobbes's sociology of science. If we are to understand the final obstacle separating us from an anthropology of science, we have to deconstruct Hobbes's constitutional invention according to which there is such a thing as a macro-society much sturdier and more robust than Nature.

Hobbes invents the naked calculating citizen, whose rights are limited to possessing and to being represented by the artificial construction of the Sovereign. He also creates the language according to which Power equals Knowledge, an equation that is at the root of the entire modern Realpolitik. Furthermore, he offers a set of terms for analyzing human interests which, along with Machiavelli's, remains the basic vocabulary for all of sociology today. In other words, even though Shapin and Schaffer take great care to use the expression 'scientific fact' not as a resource but rather as a historical and political invention, they take no such precautions where political language itself is concerned. They use the words 'power', 'interest' and 'politics' in all innocence (Chapter 7). Yet who invented these words, with their modern meaning? Hobbes! Our authors are thus 'seeing double' themselves, and walking sideways, criticizing science but swallowing politics as the only valid source of explanation. Now who offers us this asymmetric way of explaining

knowledge through power? Hobbes again, with his construction of a monist macro-structure in which knowledge has a place only in support of the social order. The authors offer a masterful deconstruction of the evolution, diffusion and popularization of the air pump. Why, then, do they not deconstruct the evolution, diffusion and popularization of 'power' or 'force'? Is 'force' less problematic than the air's spring? If nature and epistemology are not made up of transhistoric entities, then neither are history and sociology – unless one adopts some authors' asymmetrical posture and agrees to be simultaneously constructivist where nature is concerned and realist where society is concerned (Collins and Yearley, 1992)! But it is not very probable that the air's spring has a more political basis than English society itself . . .

2.7 Scientific Representation and Political Representation

If, unlike Shapin and Schaffer themselves, we pursue the logic of their book to the end, we understand the symmetry of the work achieved simultaneously by Hobbes and Boyle, and we might locate the practice of science that they have described. Boyle is not simply creating a scientific discourse while Hobbes is doing the same thing for politics; Boyle is creating a political discourse from which politics is to be excluded, while Hobbes is imagining a scientific politics from which experimental science has to be excluded. In other words, they are inventing our modern world, a world in which the representation of things through the intermediary of the laboratory is forever dissociated from the representation of citizens through the intermediary of the social contract. So it is not at all by oversight that political philosophers have ignored Hobbes's science, while historians of science have ignored Boyle's positions on the politics of science. All of them had to 'see double' from Hobbes's and Boyle's day on, and not establish direct relations between the representation of nonhumans and the representation of humans, between the artificiality of facts and the artificiality of the Body Politic. The word 'representation' is the same, but the controversy between Hobbes and Boyle renders any likeness between the two senses of the word unthinkable. Today, now that we are no longer entirely modern, these two senses are moving closer together again.

The link between epistemology and social order now takes a completely new meaning. The two branches of government that Boyle and Hobbes develop, each on his own side, possess authority only if they are clearly separated: Hobbes's State is impotent without science and technology, but Hobbes speaks only of the representation of naked citizens; Boyle's science is impotent without a precise delimitation of the

religious, political and scientific spheres, and that is why he makes such an effort to counteract Hobbes's monism. They are like a pair of Founding Fathers, acting in concert to promote one and the same innovation in political theory: the representation of nonhumans belongs to science, but science is not allowed to appeal to politics; the representation of citizens belongs to politics, but politics is not allowed to have any relation to the nonhumans produced and mobilized by science and technology. Hobbes and Boyle quarrel in order to define the two resources that we continue to use unthinkingly, and the intensity of their double battle is highly indicative of the novelty of what they are inventing.

Hobbes defines a naked and calculating citizen who constitutes the Leviathan, a mortal god, an artificial creature. On what does the Leviathan depend? On the calculation of human atoms that leads to the contract that decides on the irreversible composition of the strength of all in the hands of a single one. In what does this strength consist? In the authorization granted by all naked citizens to a single one to speak in their name. Who is acting when that one acts? We are, we who have definitively delegated our power to him. The Republic is a paradoxical artificial creature composed of citizens united only by the authorization given to one of them to represent them all. Does the Sovereign speak in his own name, or in the name of those who empower him? This is an insoluble question with which modern political philosophy will grapple endlessly. It is indeed the Sovereign who speaks, but it is the citizens who are speaking through him. He becomes their spokesperson, their persona, their personification. He translates them; therefore he may betray them. They empower him: therefore they may impeach him. The Leviathan is made up only of citizens, calculations, agreements or disputes. In short, it is made up of nothing but social relations. Or rather, thanks to Hobbes and his successors, we are beginning to understand what is meant by social relations, powers, forces, societies.

But Boyle defines an even stranger artifact. He invents the laboratory within which artificial machines create phenomena out of whole cloth. Even though they are artificial, costly and hard to reproduce, and despite the small number of trained and reliable witnesses, these facts indeed represent nature as it is. The facts are produced and represented in the laboratory, in scientific writings; they are recognized and vouched for by the nascent community of witnesses. Scientists are scrupulous representatives of the facts. Who is speaking when they speak? The facts themselves, beyond all question, but also their authorized spokespersons. Who is speaking, then, nature or human beings? This is another insoluble question with which the modern philosophy of science will wrestle over the course of three centuries. In themselves, facts are mute; natural forces

are brute mechanisms. Yet the scientists declare that they themselves are not speaking; rather, facts speak for themselves. These mute entities are thus capable of speaking, writing, signifying within the artificial chamber of the laboratory or inside the even more rarefied chamber of the vacuum pump. Little groups of gentlemen take testimony from natural forces, and they testify to each other that they are not betraying but translating the silent behaviour of objects. With Boyle and his successors, we begin to conceive of what a natural force is, an object that is mute but endowed or entrusted with meaning.

In their common debate, Hobbes's and Boyle's descendants offer us the resources we have used up to now: on the one hand, social force and power; on the other, natural force and mechanism. On the one hand, the subject of law; on the other, the object of science. The political spokespersons come to represent the quarrelsome and calculating multitude of citizens; the scientific spokespersons come to represent the mute and material multitude of objects. The former translate their principals, who cannot all speak at once; the latter translate their constituents, who are mute from birth. The former can betray; so can the latter. In the seventeenth century, the symmetry is still visible; the two camps are still arguing through spokespersons, each accusing the other of multiplying the sources of conflict. Only a little effort is now required for their common origin to become invisible, for there to be no more spokesperson except on the side of human beings, and for the scientists' mediation to become invisible. Soon the word 'representation' will take on two different meanings, according to whether elected agents or things are at stake. Epistemology and political science will go their opposite ways.

2.8 The Constitutional Guarantees of the Moderns

If the modern Constitution invents a separation between the scientific power charged with representing things and the political power charged with representing subjects, let us not draw the conclusion that from now on subjects are far removed from things. On the contrary. In his *Leviathan*, Hobbes simultaneously redraws physics, theology, psychology, law, biblical exegesis and political science. In his writing and his correspondence, Boyle simultaneously redesigns scientific rhetoric, theology, scientific politics, and the hermeneutics of facts. Together, they describe how God must rule, how the new King of England must legislate, how the spirits or the angels should act, what the properties of matter are, how nature is to be interrogated, what the boundaries of scientific or political discussion must be, how to keep the lower orders on

a tight rein, what the rights and duties of women are, what is to be expected of mathematics. In practice, then, they are situated within the old anthropological matrix; they divide up the capacities of things and people, and they do not yet establish any separation between a pure social force and a pure natural mechanism.

Here lies the entire modern paradox. If we consider hybrids, we are dealing only with mixtures of nature and culture; if we consider the work of purification, we confront a total separation between nature and culture. It is the relation between these two tasks that I am seeking to understand. While both Boyle and Hobbes are meddling in politics and religion and technology and morality and science and law, they are also dividing up the tasks to the extent that the one restricts himself to the science of things and the other to the politics of men. What is the intimate relation between their two movements? Is purification necessary to allow for proliferation? Must there be hundreds of hybrids in order for a simply human politics and simply natural things to exist? Is an absolute distinction required between the two movements in order for both to remain effective? How can the power of this arrangement be explained? What, then, is the secret of the modern world? In an attempt to grasp the answers, we have to generalize the results achieved by Shapin and Schaffer and define the complete Constitution, of which Hobbes and Boyle wrote only one of the early drafts. To do so I have none of the historical skills of my colleagues and I will have to rely on what is, of necessity, a speculative exercise imagining that such a Constitution has indeed been drafted by conscious agents trying to build from scratch a functional system of checks and balances.

As with any Constitution, this one has to be measured by the guarantees it offers. The natural power that Boyle and his many scientific descendants defined in opposition to Hobbes, the power that allows mute objects to speak through the intermediary of loyal and disciplined scientific spokespersons, offers a significant guarantee: it is not men who make Nature; Nature has always existed and has always already been there; we are only discovering its secrets. The political power that Hobbes and his many political descendants define in opposition to Boyle has citizens speak with one voice through the translation and betrayal of a sovereign, who says only what they say. This power offers an equally significant guarantee: human beings, and only human beings, are the ones who construct society and freely determine their own destiny.

If, after the fashion of modern political philosophy, we consider these two guarantees separately, they remain incomprehensible. If Nature is not made by or for human beings, then it remains foreign, forever remote and hostile. Nature's very transcendence overwhelms us, or renders it inaccessible. Symmetrically, if society is made only by and for humans, the Leviathan,

an artificial creature of which we are at once the form and the matter, cannot stand up. Its very immanence destroys it at once in the war of every man against every man. But these two constitutional guarantees must not be taken separately, as if the first assured the nonhumanity of Nature and the second the humanity of the social sphere. They were created together. They reinforce each other. The first and second guarantees serve as counterweight to one another, as checks and balances. They are nothing but the two branches of a single new government.

If we now consider them together, not separately, we note that the guarantees are reversed. Boyle and his descendants are not simply saying that the Laws of Nature escape our grasp; they are also fabricating these laws in the laboratory. Despite their artificial construction inside the vacuum pump (such is the phase of mediation or translation), the facts completely escape all human fabrication (such is the phase of purification). Hobbes and his descendants are not declaring simply that men make their own society by sheer force, but that the Leviathan is durable and solid, massive and powerful; that it mobilizes commerce, inventions, and the arts; and that the Sovereign holds the well-tempered steel sword and the golden sceptre in his hand. Despite its human construction, the Leviathan infinitely surpasses the humans who created it, for in its pores, its vessels, its tissues, it mobilizes the countless goods and objects that give it consistency and durability. Yet despite the solidity procured by the mobilization of things (as revealed by the work of mediation), we alone are the ones who constitute it freely by the sheer force of our reasoning — we poor, naked, unarmed citizens (as demonstrated by the work of purification).

But these two guarantees are contradictory, not only mutually but internally, since each plays simultaneously on transcendence and immanence. Boyle and his countless successors go on and on both constructing Nature artificially and stating that they are discovering it; Hobbes and the newly defined citizens go on and on constructing the Leviathan by dint of calculation and social force, but they recruit more and more objects in order to make it last. Are they lying? Deceiving themselves? Deceiving us? No, for they add a third constitutional guarantee: there shall exist a complete separation between the natural world (constructed, nevertheless, by man) and the social world (sustained, nevertheless, by things); secondly, there shall exist a total separation between the work of hybrids and the work of purification. The first two guarantees are contradictory only as long as the third does not keep them apart for ever, as long as it does not turn an overly patent symmetry into two contradictory asymmetries that practice resolves but can never express.

FIRST PARADOX

Nature is not our construction; it is transcendent and surpasses us infinitely.	Society is our free construction; it is immanent to our action.
---	--

SECOND PARADOX

Nature is our artificial construction in the laboratory; it is immanent.	Society is not our construction; it is transcendent and surpasses us infinitely.
--	--

CONSTITUTION

First guarantee: even though we construct Nature, Nature is as if we did not construct it.	Second guarantee: even though we do not construct Society, Society is as if we did construct it.
--	--

Third guarantee: Nature and Society
must remain absolutely distinct: the
work of purification must remain absolutely
distinct from the work of mediation.

Figure 2.1 The paradoxes of Nature and Society

It will take many more authors, many more institutions, many more rules, to complete the movement sketched out by the exemplary dispute between Hobbes and Boyle. But the overall structure is now easy to grasp: the three guarantees taken together will allow the moderns a change in scale. They are going to be able to make Nature intervene at every point in the fabrication of their societies while they go right on attributing to Nature its radical transcendence; they are going to be able to become the only actors in their own political destiny, while they go right on making their society hold together by mobilizing Nature. On the one hand, the transcendence of Nature will not prevent its social immanence; on the other, the immanence of the social will not prevent the Leviathan from remaining transcendent. We must admit that this is a rather neat construction that makes it possible to do everything without being limited by anything. It is not surprising that this Constitution should have made it possible, as people used to say, to 'liberate productive forces. . .'

2.9 The Fourth Guarantee: The Crossed-out God

It was necessary, however, to avoid seeing an overly perfect symmetry between the two guarantees of the Constitution, which would have prevented that duo from giving its all. A fourth guarantee had to settle the question of God by removing Him for ever from the dual social and

natural construction, while leaving Him presentable and usable nevertheless. Hobbes's and Boyle's followers succeeded in carrying out this task – the former by ridding Nature of any divine presence, the latter by ridding Society of any divine origin. Scientific power 'no longer needed this hypothesis'; as for statesmen, they could fabricate the 'mortal god' of the Leviathan without troubling themselves further about the immortal God whose Scripture was now interpreted only figuratively by the Sovereign. No one is truly modern who does not agree to keep God from interfering with Natural Law as well as with the laws of the Republic. God becomes the crossed-out God of metaphysics, as different from the premodern God of the Christians as the Nature constructed in the laboratory is from the ancient *phusis* or the Society invented by sociologists from the old anthropological collective and its crowds of nonhumans.

But an overly thorough distancing would have deprived the moderns of a critical resource they needed to complete their mechanism. The Nature-and-Society twins would have been left hanging in the void, and no one would have been able to decide, in case of conflict between the two branches of government, which one should win out over the other. Worse still, their symmetry would have been excessively obvious. If I am allowed to go on with the convenient fiction that this Constitution is drafted by some conscious agent endowed with will, foresight and cunning I could say that everything happens as if the moderns had applied the same doubling to the crossed-out God that they had used on Nature and Society. His transcendence distanced Him infinitely, so that He disturbed neither the free play of nature nor that of society, but the right was nevertheless reserved to appeal to that transcendence in case of conflict between the laws of Nature and those of Society. Modern men and women could thus be atheists even while remaining religious. They could invade the material world and freely re-create the social world, but without experiencing the feeling of an orphaned demiurge abandoned by all.

Reinterpretation of the ancient Christian theological themes made it possible to bring God's transcendence and His immanence into play simultaneously. But this lengthy task of the sixteenth-century Reformation would have produced very different results had it not got mixed up with the task of the seventeenth century, the conjoined invention of scientific facts and citizens (Eisenstein, 1979). Spirituality was re-invented: the all-powerful God could descend into men's heart of hearts without intervening in any way in their external affairs. A wholly individual and wholly spiritual religion made it possible to criticize both the ascendancy of science and that of society, without needing to bring God into either. The moderns could now be both secular and pious at the same time (Weber, [1920] 1958). This last constitutional guarantee was

given not by a supreme God but by an absent God – yet His absence did not prevent people from calling on Him at will in the privacy of their own hearts. His position became literally ideal, since He was bracketed twice over, once in metaphysics and again in spirituality. He would no longer interfere in any way with the development of the moderns, but He remained effective and helpful within the spirit of humans alone.

A threefold transcendence and a threefold immanence in a crisscrossed schema that locks in all the possibilities: this is where I locate the power of the moderns. They have not made Nature; they make Society; they make Nature; they have not made Society; they have not made either, God has made everything; God has made nothing, they have made everything. There is no way we can understand the moderns if we do not see that the four guarantees serve as checks and balances for one another. The first two make it possible to alternate the sources of power by moving directly from pure natural force to pure political force, and vice versa. The third guarantee rules out any contamination between what belongs to Nature and what belongs to politics, even though the first two guarantees allow a rapid alternation between the two. Might the contradiction between the third, which separates, and the first two, which alternate, be too obvious? No, because the fourth constitutional guarantee establishes as arbiter an infinitely remote God who is simultaneously totally impotent and the sovereign judge.

If I am right in this outline of the Constitution, modernity has nothing to do with the invention of humanism, with the emergence of the sciences, with the secularization of society, or with the mechanization of the world. Its originality and its strength come from the conjoined production of these three pairings of transcendence and immanence, across a long history of which I have presented only one stage via the figures of Hobbes and Boyle. The essential point of this modern Constitution is that it renders the work of mediation that assembles hybrids invisible, unthinkable, unrepresentable. Does this lack of representation limit the work of mediation in any way? No, for the modern world would immediately cease to function. Like all other collectives it lives on that blending. On the contrary (and here the beauty of the mechanism comes to light), *the modern Constitution allows the expanded proliferation of the hybrids whose existence, whose very possibility, it denies*. By playing three times in a row on the same alternation between transcendence and immanence, the moderns can mobilize Nature, objectify the social, and feel the spiritual presence of God, even while firmly maintaining that Nature escapes us, that Society is our own work, and that God no longer intervenes. Who could have resisted such a construction? Truly exceptional events must have weakened this powerful mechanism for me to be able to describe it today

with an ethnologist's detachment for a world that is in the process of disappearing.

2.10 The Power of the Modern Critique

At the very moment when the moderns' critical capacities are waning, it is useful to take the measure, one last time, of their prodigious efficacy.

Freed from religious bondage, the moderns could criticize the obscurantism of the old powers by revealing the material causality that those powers dissimulated – even as they invented those very phenomena in the artificial enclosure of the laboratory. The Laws of Nature allowed the first Enlightenment thinkers to demolish the ill-founded pretensions of human prejudice. Applying this new critical tool, they no longer saw anything in the hybrids of old but illegitimate mixtures that they had to purify by separating natural mechanisms from human passions, interests or ignorance. All the ideas of yesteryear, one after the other, became inept or approximate. Or rather, simply applying the modern Constitution was enough to create, by contrast, a 'yesteryear' absolutely different from today. The obscurity of the olden days, which illegitimately blended together social needs and natural reality, meanings and mechanisms, signs and things, gave way to a luminous dawn that cleanly separated material causality from human fantasy. The natural sciences at last defined what Nature was, and each new emerging scientific discipline was experienced as a total revolution by means of which it was finally liberated from its prescientific past, from its Old Regime. No one who has not felt the beauty of this dawn and thrilled to its promises is modern.

But the modern critique did not simply turn to Nature in order to destroy human prejudices. It soon began to move in the other direction, turning to the newly founded social sciences in order to destroy the excesses of naturalization. This was the second Enlightenment, that of the nineteenth century. This time, precise knowledge of society and its laws made it possible to criticize not only the biases of ordinary obscurantism but also the new biases created by the natural sciences. With solid support from the social sciences, it became possible to distinguish the truly scientific component of the other sciences from the component attributable to ideology. Sorting out the kernels of science from the chaff of ideology became the task for generations of well-meaning modernizers. In the hybrids of the first Enlightenment thinkers, the second group too often saw an unacceptable blend that needed to be purified by carefully separating the part that belonged to things themselves and the part that could be attributed to the functioning of the economy, the unconscious, language, or symbols. All the ideas of

yesteryear – including those of certain pseudo-sciences – became inept or approximate. Or rather, by contrast, a succession of radical revolutions created an obscure ‘yesteryear’ that was soon to be dissipated by the luminous dawn of the social sciences. The traps of naturalization and scientific ideology were finally dispelled. No one who has not waited for that dawn and thrilled to its promises is modern.

The invincible moderns even found themselves able to combine the two critical moves by using the natural sciences to debunk the false pretensions of power and using the certainties of the human sciences to uncover the false pretensions of the natural sciences, and of scientism. Total knowledge was finally within reach. If it seemed impossible, for so long, to get past Marxism, this was because Marxism interwove the two most powerful resources ever developed for the modern critique, and bound them together for all time (Althusser, 1992). Marxism made it possible to retain the portion of truth belonging to the natural and social sciences even while it carefully eliminated their condemned portion, their ideology. Marxism realized – and finished off, as was soon to become clear – all the hopes of the first Enlightenment, along with all those of the second. The first distinction between material causality and the illusions of obscurantism, like the second distinction between science and ideology, still remain the two principal sources of modern indignation today, even though our contemporaries can no longer close off discussion in Marxist fashion, and even though their critical capital has now been disseminated into the hands of millions of small shareholders. Anyone who has never felt this dual power vibrate within, anyone who has never been obsessed by the distinction between rationality and obscurantism, between false ideology and true science, has never been modern.

<i>Anchor point</i>	<i>Critical possibility</i>
Transcendence of nature	We can do nothing against Nature’s laws
Immanence of Nature	We have unlimited possibilities
Immanence of Society	We are totally free
Transcendence of Society	We can do nothing against Society’s laws

Figure 2.2 Anchor points and critical possibilities

Solidly grounded in the transcendental certainty of nature’s laws, the modern man or woman can criticize and unveil, denounce and express indignation at irrational beliefs and unjustified dominations. Solidly grounded in the certainty that humans make their own destiny, the modern man or woman can criticize and unveil, express indignation at and denounce irrational beliefs, the biases of ideologies, and the unjustified domination of the experts who claim to have staked out the limits of action and freedom. The exclusive transcendence of a Nature

that is not our doing, and the exclusive immanence of a Society that we create through and through, would nevertheless paralyze the moderns, who would appear too impotent in the face of things and too powerful within society. What an enormous advantage to be able to reverse the principles without even the appearance of contradiction! In spite of its transcendence, Nature remains mobilizable, humanizable, socializable. Every day, laboratories, collections, centres of calculation and of profit, research bureaus and scientific institutions blend it with the multiple destinies of social groups. Conversely, even though we construct Society through and through, it lasts, it surpasses us, it dominates us, it has its own laws, it is as transcendent as Nature. For every day, laboratories, collections, centres of calculation and of profit, research bureaus and scientific institutions stake out the limits to the freedom of social groups, and transform human relations into durable objects that no one has made. The critical power of the moderns lies in this double language: they can mobilize Nature at the heart of social relationships, even as they leave Nature infinitely remote from human beings; they are free to make and unmake their society, even as they render its laws ineluctable, necessary and absolute.

2.11 The Invincibility of the Moderns

Because it believes in the total separation of humans and nonhumans, and because it simultaneously cancels out this separation, the Constitution has made the moderns invincible. If you criticize them by saying that Nature is a world constructed by human hands, they will show you that it is transcendent, that science is a mere intermediary allowing access to Nature, and that they keep their hands off. If you tell them that we are free and that our destiny is in our own hands, they will tell you that Society is transcendent and its laws infinitely surpass us. If you object that they are being duplicitous, they will show you that they never confuse the Laws of Nature with imprescriptible human freedom. If you believe them and direct your attention elsewhere, they will take advantage of this to transfer thousands of objects from Nature into the social body while procuring for this body the solidity of natural things. If you turn round suddenly, as in the children’s game ‘Mother, may I?’, they will freeze, looking innocent, as if they hadn’t budged: here, on the left, are things themselves; there, on the right, is the free society of speaking, thinking subjects, values and of signs. Everything happens in the middle, everything passes between the two, everything happens by way of mediation, translation and networks, but this space does not exist, it has no place. It is the unthinkable, the unconscious of the moderns. What

better way to extend collectives than by bringing them into alliance both with Nature's transcendence and with all of human freedom, while at the same time incorporating Nature and imposing absolute limits on the boundaries of freedom? This makes it possible to do anything – and its opposite.

Native Americans were not mistaken when they accused the Whites of having forked tongues. By separating the relations of political power from the relations of scientific reasoning while continuing to shore up power with reason and reason with power, the moderns have always had two irons in the fire. They have become invincible.

You think that thunder is a divinity? The modern critique will show that it is generated by mere physical mechanisms that have no influence over the progress of human affairs. You are stuck in a traditional economy? The modern critique will show you that physical mechanisms can upset the progress of human affairs by mobilizing huge productive forces. You think that the spirits of the ancestors hold you forever hostage to their laws? The modern critique will show you that you are hostage to yourselves and that the spiritual world is your own human – too human – construction. You then think that you can do everything and develop your societies as you see fit? The modern critique will show you that the iron laws of society and economics are much more inflexible than those of your ancestors. You are indignant that the world is being mechanized? The modern critique will tell you about the creator God to whom everything belongs and who gave man everything. You are indignant that society is secular? The modern critique will show you that spirituality is thereby liberated, and that a wholly spiritual religion is far superior. You call yourself religious? The modern critique will have a hearty laugh at your expense!

How could the other cultures-natures have resisted? They became premodern by contrast. They could have stood up against transcendent Nature, or immanent Nature, or society made by human hands, or transcendent Society, or a remote God, or an intimate God, but how could they resist the combination of all six? Or rather, they might have resisted, if the six resources of the modern critique had been visible together in a single operation such as I am retracing today. But they seemed to be separate, in conflict with one another, blending incompatible branches of government, each one appealing to different foundations. What is more, all these critical resources of purification were contradicted at once by the practice of mediation, yet that contradiction had no influence whatsoever either on the diversity of the sources of power or on their hidden unity.

Such a superiority, such an originality, made the moderns think they were free from the ultimate restrictions that might limit their expansion.

Century after century, colonial empire after colonial empire, the poor premodern collectives were accused of making a horrible mishmash of things and humans, of objects and signs, while their accusers finally separated them totally – to remix them at once on a scale unknown until now. . . . As the moderns also extended this Great Divide in time after extending it in space, they felt themselves absolutely free to give up following the ridiculous constraints of their past which required them to take into account the delicate web of relations between things and people. But at the same time they were taking into account many more things and many more people. . .

You cannot even accuse them of being nonbelievers. If you tell them they are atheists, they will speak to you of an all-powerful God who is infinitely remote in the great beyond. If you say that this crossed-out God is something of a foreigner, they will tell you that He speaks in the privacy of the heart, and that despite their sciences and their politics they have never stopped being moral and devout. If you express astonishment at a religion that has no influence either on the way the world goes or on the direction of society, they will tell you that it sits in judgement on both. If you ask to read those judgements, they will object that religion infinitely surpasses science and politics and it does not influence them, or that religion is a social construct, or the effect of neurons!

What will you tell them, then? They hold all the sources of power, all the critical possibilities, but they displace them from case to case with such rapidity that they can never be caught redhanded. Yes, unquestionably, they are, they have been, they have almost been, they have believed they were, invincible.

2.12 What the Constitution Clarifies and What It Obscures

Yet the modern world has never happened, in the sense that it has never functioned according to the rules of its official Constitution alone: it has never separated the three regions of Being I have mentioned and appealed individually to the six resources of the modern critique. The practice of translation has always been different from the practices of purification. Or rather, this difference itself is inscribed in the Constitution, since the double play of each of the three agencies between immanence and transcendence makes it possible to do anything – and its opposite. Never has a Constitution allowed such a margin for manoeuvre in practice. But the price the moderns paid for this freedom was that they remained unable to conceptualize themselves in continuity with the premoderns. They had to think of themselves as absolutely different, they had to invent the Great Divide because the entire work of mediation

escapes the constitutional framework that simultaneously outlines it and denies its existence.

Expressed in this way, the modern predicament looks like a plot that I am about to unveil. False consciousness would force the moderns to imagine a Constitution that they can never apply. They would practise the very things that they are not allowed to say. The modern world would thus be populated by liars and cheaters. Worse still, by proposing to debunk their illusions, to uncover their real practice, to probe their unconscious belief, to reveal their double talk, I would play a very modern role indeed, taking my turn in a long queue of debunkers and critics. But the relation between the work of purification and that of mediation is not that of conscious and unconscious, formal and informal, language and practice, illusion and reality. I am not claiming that the moderns are unaware of what they do, I am simply saying that what they do – innovate on a large scale in the production of hybrids – is possible only because they steadfastly hold to the absolute dichotomy between the order of Nature and that of Society, a dichotomy which is itself possible only because they never consider the work of purification and that of mediation together. There is no false consciousness involved, since the moderns are explicit about the two tasks. They have to practise the top and the bottom halves of the modern Constitution. The only thing I add is the relation between those two different sets of practices.

So is modernity an illusion? No, it is much more than an illusion and much less than an essence. It is a force added to others that for a long time it had the power to represent, to accelerate, or to summarize – a power that it no longer entirely holds. The revision I am proposing is similar to the revision of the French Revolution that has been undertaken during the last twenty years or so in France – and the two revisions amount to one and the same, as we shall see further on. Since the 1970s, French historians have finally understood that the revolutionary reading of the French Revolution had been added to the events of that time, that it had organized historiography since 1789, but that it no longer defines the events themselves (Furet, [1978] 1981). As François Furet proposes, the Revolution as ‘modality of historical action’ is to be distinguished from the Revolution as ‘process’. The events of 1789 were no more revolutionary than the modern world has been modern. The actors and chroniclers of 1789 used the notion of revolution to understand what was happening to them, and to influence their own fate. Similarly, the modern Constitution exists and indeed acts in history, but it no longer defines what has happened to us. Modernity still awaits its Tocqueville, and the scientific revolutions still await their François Furet.

So, modernity is not the false consciousness of moderns, and we have to be very careful to grant the Constitution, like the idea of Revolution,

its own effectiveness. Far from eliminating the work of mediation, it has allowed this work to expand. Just as the idea of Revolution led the revolutionaries to take irreversible decisions that they would not have dared take without it, the Constitution provided the moderns with the daring to mobilize things and people on a scale that they would otherwise have disallowed. This modification of scale was achieved not – as they thought – by the separation of humans and nonhumans but, on the contrary, by the amplification of their contacts. This growth is in turn facilitated by the idea of transcendent Nature (provided that it remains mobilizable), by the idea of free Society (provided that it remains transcendent), and by the absence of all divinity (provided that God speaks to the heart). So long as their contraries remain simultaneously present and unthinkable, and so long as the work of mediation multiplies hybrids, these three ideas make it possible to capitalize on a large scale. The moderns think they have succeeded in such an expansion only because they have carefully separated Nature and Society (and bracketed God), whereas they have succeeded only because they have mixed together much greater masses of humans and nonhumans, without bracketing anything and without ruling out any combination! The link between the work of purification and the work of mediation has given birth to the moderns, but they credit only the former with their success. In saying this I am not unveiling a practice hidden beneath an official reading, I am simply adding the bottom half to the upper half. They are both necessary together, but as long as we were modern, they simply could not appear as one single and coherent configuration.

So are the moderns aware of what they are doing or not? The solution to the paradox may not be too hard to find if we look at what anthropologists tell us of the premoderns. To undertake hybridization, it is always necessary to believe that it has no serious consequences for the constitutional order. There are two ways of taking this precaution. The first consists in thoroughly thinking through the close connections between the social and the natural order so that no dangerous hybrid will be introduced carelessly. The second one consists in bracketing off entirely the work of hybridization on the one hand and the dual social and natural order on the other. While the moderns insure themselves by not thinking at all about the consequences of their innovations for the social order, the premoderns – if we are to believe the anthropologists – dwell endlessly and obsessively on those connections between nature and culture. To put it crudely: those who think the most about hybrids circumscribe them as much as possible, whereas those who choose to ignore them by insulating them from any dangerous consequences develop them to the utmost. The premoderns are all monists in the constitution of their nature-cultures. ‘The native is a logical hoarder’,

writes Claude Lévi-Strauss; 'he is forever tying the threads, unceasingly turning over all the aspects of reality, whether physical, social or mental' (Lévi-Strauss, [1962] 1966, p. 267). By saturating the mixes of divine, human and natural elements with concepts, the premoderns limit the practical expansion of these mixes. It is the impossibility of changing the social order without modifying the natural order – and vice versa – that has obliged the premoderns to exercise the greatest prudence. Every monster becomes visible and thinkable and explicitly poses serious problems for the social order, the cosmos, or divine laws (Horton, 1967, 1982). Descola writes about the Achuar:

The homeostasis of the 'cold societies' of Amazonia would be less the result of the implicit rejection of political alienation, with which Clastres credited 'savages' (Clastres, 1974) . . . than the effect of the inertia effect of a thought system *unable to represent the process of socializing nature in any way other than through the categories that dictate the way real society should function*. Running counter to the overhasty technical determinism with which evolutionist theories are often imbued, one might postulate that when a society transforms its material base, this is conditioned by a prior mutation of the forms of social organization that comprise the conceptual framework of the material mode of producing. (Descola, [1986] 1993; p. 405; emphasis added)

If, on the contrary, our Constitution authorizes anything, it is surely the accelerated socialization of nonhumans, because it never allows them to appear as elements of 'real society'. By rendering mixtures unthinkable, by emptying, sweeping, cleaning and purifying the arena that is opened in the central space defined by their three sources of power, the moderns allowed the practice of mediation to recombine all possible monsters without letting them have any effect on the social fabric, or even any contact with it. Bizarre as these monsters may be, they posed no problem because they did not exist publicly and because their monstrous consequences remained untraceable. What the premoderns have always ruled out the moderns can allow, since the social order never turns out to correspond, point for point, with the natural order.

Boyle's air pump, for example, might seem to be a rather frightening chimera, since it produces a laboratory vacuum artificially, a vacuum that simultaneously permits the definition of the Laws of Nature, the action of God, and the settlement of disputes in England at the time of the Glorious Revolution. According to Robin Horton, savage thought would have conjured away its dangers at once. From now on the English seventeenth century will go on to construct Royalty, Nature and theology with the scientific community and the laboratory. The air's spring will

join the actors that inhabit England. Yet this recruitment of a new ally poses no problem, since there is no chimera, since nothing monstrous has been produced, since nothing more has been done than to discover the Laws of Nature. *The scope of the mobilization is directly proportional to the impossibility of directly conceptualizing its relations with the social order*. The less the moderns think they are blended, the more they blend. The more science is absolutely pure, the more it is intimately bound up with the fabric of society. The modern Constitution accelerates or facilitates the deployment of collectives – which differ, as I indicated earlier, from societies made up only of social relations – but does not allow their conceptualization.

2.13 The End of Denunciation

To be sure, by affirming that the Constitution, if it is to be effective, has to be unaware of what it allows, I am practising an unveiling, but one that no longer bears upon the same objects as the modern critique and is no longer triggered by the same mainsprings. So long as we adhered willingly to the Constitution, it allowed us to settle all disputes and served as a basis for the critical spirit, providing individuals with justification for their attacks and their operations of unveiling. But if the Constitution as a whole now appears as only one half that no longer allows us to understand its own other half, then it is the very foundation of the modern critique that turns out to be ill-assured. I am thus trying the tricky move to unveil the modern Constitution without resorting to the modern type of debunking. To do so I am accounting for this vague and uneasy feeling that we have recently become as unable to denounce as to modernize. The upper ground for taking a critical stance seems to have escaped us.

Yet by appealing sometimes to Nature, sometimes to Society, sometimes to God, and by constantly opposing the transcendence of each one of these three terms to its immanence, the moderns had found the mainspring of their indignations well wound up. What kind of a modern could no longer fall back on the transcendence of nature to criticize the obscurantism of power? On the immanence of Nature to criticize human inertia? On the immanence of Society to criticize the submission of humans and the dangers of naturalism? On the transcendence of society to criticize the human illusion of individual liberty? On the transcendence of God to appeal to the judgement of humans and the obstinacy of things? On the immanence of God to criticize established Churches, naturalist beliefs and socialist dreams? It would be a pretty pathetic kind of modern, or else a postmodern: still inhabited by the violent desire to denounce, they would no longer have the strength to believe in the

legitimacy of any of these six courts of appeal. To strip moderns of their indignation is to deprive them, it seems, of all self-respect. To strip critical intellectuals of the six bases for their denunciations is apparently to rob them of all reason to live. In losing our wholehearted adherence to the Constitution, do we not have the impression that we are losing the best of ourselves? Was it not the origin of our energy, our moral strength, our ethics?

However, Luc Boltanski and Laurent Thévenot have done away with modern denunciation, in a book as important for my own essay as Shapin and Schaffer's. They have done for the work of critical indignation what François Furet did earlier for the French Revolution. 'The French Revolution is over,' he wrote; in the same vein the subtitle of *Économies de la grandeur* could have been 'The modern denunciation is over' (Boltanski and Thévenot, 1991). Up to that point, critical unmasking appeared to be self-evident. It was only a matter of choosing a cause for indignation and opposing false denunciations with as much passion as possible. To unmask: that was our sacred task, the task of us moderns. To reveal the true calculations underlying the false consciousnesses, or the true interests underlying the false calculations. Who is not still foaming slightly at the mouth with that particular rabies? Now Boltanski and Thévenot have invented the equivalent of an anti-rabies vaccine by calmly comparing all sources of denunciation – the Cities that supply the various principles of justice – and by interweaving the thousand and one ways we have, in France today, of bringing an affair to justice. They do not denounce others. They do not unmask anyone. They show how we all go about accusing one another. Instead of a resource, the critical spirit becomes a topic, one competence among others, the grammar of our indignations. Instead of practising a critical sociology the authors quietly begin a sociology of criticism.

Suddenly, thanks to this little gap opened up by systematic study, we can no longer fully adhere to the spirit of the modern critique. How can we still make wholehearted accusations when the scapegoating mechanism has become obvious? Even the human sciences are no longer the ultimate reservoir that would make it possible at last to discern the real motives beneath appearances. They too are made part of the analysis (Chateauraynaud, 1990); they too bring issues to justice, and become indignant and criticize. The tradition of the human sciences no longer has the privilege of rising above the actor by discerning, beneath his unconscious actions, the reality that is to be brought to light (Boltanski, 1990). It is impossible for the human sciences to be scandalized, without henceforth occupying one of the boxes in our colleagues' grid. The denouncer is the brother of the ordinary people that he claimed to be denouncing. Instead of really believing in it, we now experience the work of denunciation as a 'historical modality' which certainly influences our

affairs but does not explain them any more than the revolutionary modality explained the process of the events of 1789. Today, denunciation and revolution have both gone stale.

Boltanski and Thévenot's work completes the movement predicted and described by René Girard according to which moderns can no longer make sincere accusations; but Boltanski and Thévenot, unlike Girard, do not scorn objects. In order for the mechanism of victim-formation to function, the accused person who was sacrificed in public by the crowd had to be actually guilty (Girard, [1978] 1987). If the victim became a scapegoat, the mechanism of accusation became visible: some fall guy innocent of any crime was wrongly accused, with no reason except to reconcile the community at his expense. The shift from sacrifice to scapegoat thus voids accusation. This evacuation does not soften the moderns, however, since the reason for their series of crimes is precisely that they are never able to make a genuine accusation of a truly guilty party (Girard, 1983). But Girard does not see that he himself is thus making a more serious allegation, since he accuses objects of not really counting. So long as we imagine objective stakes for our disputes, he claims, we are caught up in the illusion of mimetic desire. It is this desire, and this desire alone, that adorns objects with a value that is not their own. In themselves, they do not count; they are nothing. By revealing the process of accusation, Girard, like Boltanski and Thévenot, forever exhausts our aptitude to accuse. But he prolongs the tendency of moderns to scorn objects even further – and Girard tenders that accusation wholeheartedly; he really believes it, and he sees in this hard-won scorn the highest proof of morality (Girard, 1989). Here is a denouncer and a half. The greatness of Boltanski and Thévenot's book comes from the fact that they exhaust denunciation even as they put the object engaged in tests of judgement at the heart of their analyses.

Are we devoid of any moral foundation once denunciation has been exhausted? But underneath moral judgement by denunciation, another moral judgement has always functioned by triage and selection. It is called arrangement, combination, *combinazione*, combine, but also negotiation or compromise. Charles Péguy used to say that a supple morality is infinitely more exigent than a rigid morality (Péguy, 1961b). The same holds true for the unofficial morality that constantly selects and distributes the practical solutions of the moderns. It is scorned because it does not allow indignation, but it is active and generous because it follows the countless meanderings of situations and networks. It is scorned because it takes into account the objects that are no more the arbitrary stakes of our desire alone than they are the simple receptacle for our mental categories. Just as the modern Constitution scorns the hybrids

that it shelters, official morality scorns practical arrangements and the objects that uphold it. Underneath the opposition between objects and subjects, there is the whirlwind of the mediators. Underneath moral grandeur there is the meticulous triage of circumstances and cases (Jonsen and Toulmin, 1988).

2.14 We Have Never Been Modern

I now have a choice: either I believe in the complete separation between the two halves of the modern Constitution, or I study both what this Constitution allows and what it forbids, what it clarifies and what it obfuscates. Either I defend the work of purification – and I myself serve as a purifier and a vigilant guardian of the Constitution – or else I study both the work of mediation and that of purification – but I then cease to be wholly modern.

By claiming that the modern Constitution does not permit itself to be understood, by proposing to reveal the practices that allow it to exist, by asserting that the critical mechanism has outlived its usefulness, am I behaving as though we were entering a new era that would follow the era of the moderns? Would I then be, literally, postmodern? Postmodernism is a symptom, not a fresh solution. It lives under the modern Constitution, but it no longer believes in the guarantees the Constitution offers. It senses that something has gone awry in the modern critique, but it is not able to do anything but prolong that critique, though without believing in its foundations (Lyotard, 1979). Instead of moving on to empirical studies of the networks that give meaning to the work of purification it denounces, postmodernism rejects all empirical work as illusory and deceptively scientific (Baudrillard, 1992). Disappointed rationalists, its adepts indeed sense that modernism is done for, but they continue to accept its way of dividing up time; thus they can divide up eras only in terms of successive revolutions. They feel that they come ‘after’ the moderns, but with the disagreeable sentiment that there is no more ‘after’. ‘No future’: this is the slogan added to the moderns’ motto ‘No past’. What remains? Disconnected instants and groundless denunciations, since the postmoderns no longer believe in the reasons that would allow them to denounce and to become indignant.

A different solution appears as soon as we follow both the official Constitution and what it forbids or allows, as soon as we study in detail the work of production of hybrids and the work of elimination of these same hybrids. We then discover that we have never been modern in the sense of the Constitution, and this is why I am not debunking the false consciousness of people who would practise the contrary of what they

claim. No one has ever been modern. Modernity has never begun. There has never been a modern world. The use of the past perfect tense is important here, for it is a matter of a retrospective sentiment, of a rereading of our history. I am not saying that we are entering a new era; on the contrary we no longer have to continue the headlong flight of the post-post-postmodernists; we are no longer obliged to cling to the avant-garde of the avant-garde; we no longer seek to be even cleverer, even more critical, even deeper into the ‘era of suspicion’. No, instead we discover that we have never begun to enter the modern era. Hence the hint of the ludicrous that always accompanies postmodern thinkers; they claim to come after a time that has not even started!

This retrospective attitude, which deploys instead of unveiling, adds instead of subtracting, fraternizes instead of denouncing, sorts out instead of debunking, I characterize as nonmodern (or amodern). A nonmodern is anyone who takes simultaneously into account the moderns’ Constitution and the populations of hybrids that that Constitution rejects and allows to proliferate.

The Constitution explained everything, but only by leaving out what was in the middle. ‘It’s nothing, nothing at all,’ it said of the networks, ‘merely residue.’ Now hybrids, monsters – what Donna Haraway calls ‘cyborgs’ and ‘tricksters’ (Haraway, 1991) whose explanation it abandons – are just about everything; they compose not only our own collectives but also the others, illegitimately called premodern. At the very moment when the twin Enlightenments of Marxism seemed to have explained everything, at the very moment when the failure of their total explanation leads the postmoderns to founder in the despair of self-criticism, we discover that the explanations had not yet begun, and that this has always been the case; that we have never been modern, or critical; that there has never been a yesteryear or an Old Regime (Mayer, 1982); that we have never really left the old anthropological matrix behind, and that it could not have been otherwise.

To notice that we have never been modern and that only minor divisions separate us from other collectives does not mean that I am a reactionary. The antimodern reaction struggles fiercely against the effects of the Constitution, but accepts it fully. Antimoderns want to defend localities, or spirit, or rationality, or the past, or universality, or liberty, or society, or God, as if these entities really existed and actually had the form that the official part of the modern Constitution granted them. Only the sign and the direction of their indignation vary. The antimoderns even accept the chief oddity of the moderns, the idea of a time that passes irreversibly and annuls the entire past in its wake. Whether one wishes to conserve such a past or abolish it, in either case the revolutionary idea *par excellence*, the idea that revolution is possible,

is maintained. Today, that very idea strikes us as exaggerated, since revolution is only one resource among many others in histories that have nothing revolutionary, nothing irreversible, about them. *'In potentia'* the modern world is a total and irreversible invention that breaks with the past, just as *'in potentia'* the French or Bolshevik Revolutions were midwives at the birth of a new world. Seen as networks, however, the modern world, like revolutions, permits scarcely anything more than small extensions of practices, slight accelerations in the circulation of knowledge, a tiny extension of societies, minuscule increases in the number of actors, small modifications of old beliefs. When we see them as networks, Western innovations remain recognizable and important, but they no longer suffice as the stuff of saga, a vast saga of radical rupture, fatal destiny, irreversible good or bad fortune.

The antimoderns, like the postmoderns, have accepted their adversaries' playing field. Another field – much broader, much less polemical – has opened up before us: the field of nonmodern worlds. It is the Middle Kingdom, as vast as China and as little known.

3



REVOLUTION

3.1 The Moderns, Victims of Their Own Success

If the critical apparatus of the moderns has made them invincible, why are they hesitating over their own destiny today? If the effectiveness of the Constitution depended precisely upon its obscure half, why can I now relate it to its luminous half? The bond between the two sets of practices must indeed have changed for me to be able to follow both the practices of purification and those of translation. If we can no longer adhere wholeheartedly to the tasks of modernization, unforeseen obstacles must have interfered with the mechanism. What has happened that makes the work of purification unthinkable, when a few years ago it was the deployment of networks that appeared absurd and scandalous?

Let us say that the moderns have been victims of their own success. It is a crude explanation, I admit, yet it would appear that the scope of the mobilization of collectives had ended up multiplying hybrids to such an extent that the constitutional framework which both denies and permits their existence could no longer keep them in place. The modern Constitution has collapsed under its own weight, submerged by the mixtures that it tolerated as material for experimentation because it simultaneously dissimulated their impact upon the fabric of society. The third estate ends up being too numerous to feel that it is faithfully represented either by the order of objects or by the order of subjects.

When the only thing at stake was the emergence of a few vacuum pumps, they could still be subsumed under two classes, that of natural laws and that of political representations; but when we find ourselves invaded by frozen embryos, expert systems, digital machines, sensor-equipped robots, hybrid corn, data banks, psychotropic drugs, whales outfitted with radar sounding devices, gene synthesizers, audience