



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 manoeuvres?' 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.

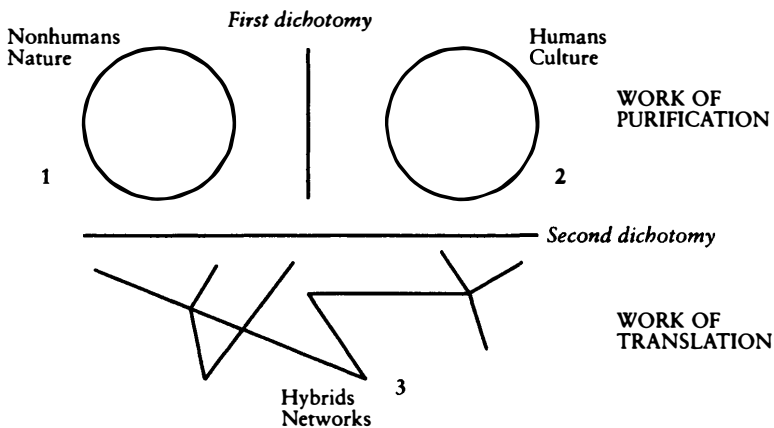


Figure 1.1 Purification and translation

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 got in.