# POSTHUMANISM, OR THE CULTURAL LOGIC OF GLOBAL NEO-CAPITALISM

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> Chaque époque doit découvrir son humanisme, en l'orientant vers le danger principal d'aliénation – Each epoch has to discover its humanism, by directing it towards the main danger of alienation (Simondon, 1969 : 102).

« We, civilisations, we know by now that we are mortal » (Valéry, 1924 : 11). Confronted with the barbarism of the trenches of Verdun, Paul Valéry concluded that Western civilisation could disappear like Elam, Ninive and Babylon had once disappeared in the past. The First World War triggered the second one, and Hiroshima and Nagasaki brought home to all of us that all civilisations could be made to disappear and all human life extinguished. Mutual destruction was assured and the madness of the whole arrangement acted as a paradoxical guarantee that the United States and the Soviet Union would ultimately step back from the brink. With the fall of the Berlin wall in 1989, the United States and their western allies could congratulate themselves on having won, thanks to their economic and technological superiority and without having fired a single shell, « the Third World War » (Zolo, 1997 : 21). With the serial collapse of really existing socialism in Eastern Europe, capitalism went ballistics and became the only game in town. Although the risk of a nuclear winter may now have receded (from the Western hemisphere at least)[1], the

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1. On the Indian subcontinent, the unthinkable remains thinkable. Moreover, 9/11 has brought home that wars are no longer the prerogative of nation-states. The « individualisation of war » (Beck, 2002 : 29) also means that individuals and networks of terror can now wage a war, and possibly a nuclear one, against states.

future of humanity is still not assured. Contemporary neo-liberal global capitalism knows no limits – apart from the ones that it is wont to transgress – and speculates on life itself[2]. The struggle of the anti-globalisation movement and non-governmental organisations (NGOs) against the commodification and patenting of the genome, cloning, genetically modified organisms (GMOs) (vegetal, animal and soon also human) shows that capitalism does not only colonise the life-world, but that it is intent on reifying and colonising life itself.

With Habermas (2001b : 51), we can distinguish three ways to destroy civilisation. The first way is cultural. Looking back at a tradition of its own making and desperately searching for some kind of stability, different forms of fundamentalism – from ecological to theological – are willing to pay the price of the cultural and structural de-differentiation of modern societies to obtain some illusory security. The second way to destroy civilisation is systemic. Modern societies cannot only destroy themselves through de-differentiation, but also through the exacerbation of the differentiation of its subsystems. Systematically uncoupled from the communicative structures of the life-world, the reifying logic of the economic, legal, scientific, technological subsystems can enter the life-world, with the result that the subjects start to behave as if they and the others in their environment were some kind of mini-systems themselves. According to Luhmann, this has already happened. The future lies behind us. Radicalising the reifying logic of the second way of destruction, the third way [*sic*] pertains to the risks of a technological modification and commodification of human nature itself. Driven forward by the thirst of profit, the technoscientific advances in the contemporary bio-, cyber- and nano-industries steadily undermine the moral limits of anthropic production and open up the posthuman perspective of the *Übermensch*, of the technological unmaking of the human through the genetic (com)modification of human nature.

To understand the perspective of the technological destruction of the human, we might follow the paradoxical reversals of G. B. Vico's principle of the *verum factum*, which, supposedly, founds the human sciences as hermeneutic sciences, into the engineering principle of universal « factibility » (Heidegger's *Machenschaft*). In an indirect polemic with Descartes' theory of innate ideas, Vico stated in his *Scienza*

2. The quasi-imperialist turn in American politics and the return to a realist approach in international relations makes one wonder, however, if the adjective neo-liberal is still adequate. When the hegemon uses military power to impose the free market – when McDonald needs McDonnell Douglas, the constructor of the F15, to prosper – the « invisible hand » of the free market becomes and iron punch. When politics regains the primacy over economics, the deregulation of the market becomes effectively « planned » once again. To emphasise that contemporary capitalism enrols the state as one of its agents of globalisation, I use the term neo- (or neo-mancunian) capitalism instead of the more usual one of neo-liberalism.

*nuova* that we could understand history, because we have made it[3]. However, we cannot understand nature : Only God, who has made it, can understand it. As soon as the principle was formulated in 1744, Feuerbach and Marx creatively reformulated it. We have made God, therefore, we can understand him. Theology thus turns into anthropology. And we have also made nature, not just the urban environment and the countryside, but as the French wave in the social studies of science has taught us, also nature as such. Anthropology turns into technology. And now that technology also makes the human, the circle is closed and technology reverts back to theology. At this point, everything is made, but there is hardly anything left to understand, apart perhaps from the non-culture of disenchantment that has brought us there.

In this article I want to present a critical analysis of posthumanism from a humanist perspective[4]. The contemporary developments in the field of bio-, cyber- and nanotechnologies that reinvent nature and reconstruct the human will not be welcomed here as the latest move in the « pomo-debate » that finishes off the human by deconstructing the phallogoanthropocentrism of Western thought, but rather as one more nail in the coffin of humanity. What I present is a « heuristics of fear » (Jonas, 1984 : 385) at the beginning of the Third Millennium. If I extrapolate and exaggerate the extent of the risk, it is only for strategic reasons, and not because I believe that after the end of God, philosophy, history, grand narratives, art, and nature, we have already reached the end of Man, though if we are not careful, the end might well be nigh[5]. Similarly, if I adopt a conservative posture in epistemo-ontological matters, it is only for the sake of political radicalism. That the epistemological radicalism of deconstruction ends up deconstructing itself is only conse-

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3. In a beautiful and famous passage of his *New Science*, Vico boldly stated his thesis of the *verum factum* : « In the night of thick darkness enveloping the earliest antiquities, so remote from ourselves, there shines the eternal and never failing light of a truth beyond all question : that the world of civil society has certainly been made by men, and that the its principles are, therefore, to be found within modifications of our human mind. Whoever reflects on this cannot but marvel that the philosophers should have bent all their energies to the study of the world of nature, which, since God made it, He alone knows : and that they should have neglected the study of the world of nations or civil world, which since men had made it, men could come to know » (quoted in Berlin, 1976 : 27).

4. Conceived as the sequel to my humanist critique of Actor Network Theory (Vandenberghe, 2002a), the article at hand could be subtitled « Reconstructing Humants 2 ».

5. Although I'm concerned about what will happen with humanity in the long term, I only deal here with the next fifty or hundred years. « What the human will be in one, ten or a hundred million years ? » (Hottois, 2001 : 35) falls beyond my purview, though I suspect that Keynes was right after all : In the long run, we are all dead. For a courageous exploration of the imminent risks of « knowledge enabled mass destruction » through destructive self-replication in genetics, nanotechnology and robotics, see the whistle blowing of Bill Joy (2000), co-founder and chief scientist of Sun Microsystems.

quent, but that in spite of all its intentions, declarations and gesticulations, it accompanies the « creative-destruction » of the world by the global entrepreneurs of today as its soundtrack, that is more worrying. What we need after postmodernism and deconstruction is critique and reconstruction (see also López and Potter, 2001).

Although the text has not been written as a genealogical excursion into the history of ideas, it can nevertheless be read to explore some of the theories (Leroi-Gourhan, Deleuze and Guattari, Serres and Simondon) that have significantly influenced the seminal formulation of actor-network-theory. In the « untimely considerations » that follow on the deconstruction of the categories of the human and the non-human by posthumanist theories and late-capitalist practices, the theoretical-critical and, at times, even polemical mode of presentation of ideas has been chosen. As a kind of ironic rejoinder to the postmodern politics of nature of Bruno Latour (1999), I will first adopt an anthropological perspective on culture, which is conspicuous by its absence in the latest wave of science studies, and reformulate the distinction between nature and culture as a reflexive distinction within culture that emerges with modernity (1). Combining the transcendental realism of Roy Bhaskar with the transcendental phenomenology of Edmund Husserl, I will next try to outline the contours of a realist phenomenology of human, animal and spiritual nature (2). This phenomenology of nature forms, however, only the background from which the critical analysis of the experimental scrambling of the regional ontologies that characterises post-humanism will depart. The main tenets of posthumanism will be introduced here via the detour of André Leroi-Gourhan's paleo-anthropological account of the role of technology in the evolution of mankind. That humans exteriorise their organs into technology and that the artificial organism modifies in turn the make-up of humans, which is the anthropo-technological intuition posthumanism will spell out in a neo-Nietzschean key (3). The most radical attempt to theorise the posthuman condition in non-anthropocentric terms has been brilliantly developed by Gilles Deleuze and Félix Guattari (4). Introducing symbiosis as a mechanism of « involution » that allows organisms to cross the ontological thresholds between the species, the vitalist analysis of the machinic heterogenesis of the human that these authors propose offers a radical departure from the genealogical reasoning of Darwinian models of filiation. In terms of systems theory, this break with Darwinism tunes in well with contemporary complexity theories, such as the network theory of Michel Serres or the vitalist theory of technology of Gilbert Simondon. In a critical intermezzo on living machines, I will analyse both of those theories from the perspective of the integrated attempt of the cyber- and biotechnologies of late capitalism to « rewrite » nature and « redesign » life (5). It will be argued that the global capitalist industry can be analysed as a giant complexity machine. From this perspective, the Deleuzian critique of capitalism can be interpreted as the theoretical-ideological oil that fuels the global machinic expansion of neo-imperial capitalism. (6) In the negativist spirit that characterises

the work of the first generation of the Frankfurt School, I will show, via an analysis of government of the self, the commodification of culture and the modification of nature how contemporary capitalism does not only colonise the life-world but life itself (7). Finally, I will conclude the article with an appeal to ethics : instead of changing nature, should we not rather change culture ? Can we reconstruct and reinvent nature as a convention that holds technology in check (8) ?

## 1. The Nature of Culture

The nice thing about culture is that everyone has it. The Bororo, the Mekeo, the Baktaman, the Katchin, the Nuer and the Taliban have it, but so do IBM, McDonalds and the International Sociological Association (ISA). Culture has become a global phenomenon. By this Marilyn Strathern (1995) means that the Euro-American perception of the ubiquitous role of culture in human affairs, which is typical of cultural anthropology, post-colonial and cultural studies, can be summoned in almost any context and at almost any level of human interaction. To the extent that anthropology puts things in contexts and conceives of culture both as a particularising context and as a generalising meta-context of contexts, it (anthropology) can be understood as an analytical machine for creating and comparing differences, for making incommensurables and providing at the same time a comparative framework for making them commensurable.

When they travel to exotic countries and come back to their homes and universities, anthropologists import culture and export cultures. Culture may now be everywhere – in the streets and universities but also on the shelves of your local supermarket – the fact remains that this double conception of culture as a singular *plurale tantum* is in itself most singular[6]. It is a European invention and one that is not very old. As a concept of philosophical significance, it emerged in Germany in the eighteenth century as a romantic reaction to the universalism of the Enlightenment. Like its conceptual counterpart nature, and like alienation, which

6. The interconnections between the singularity and the plurality of culture (culture as being both a *singulare tantum* and a *plurale tantum*) are of a « merographic » nature. Culture can be part of different systems that are internally related to each other via part-whole relations that can be described differently from different angles and thereby redescribed as something else (Strathern, 1991). Following the connections and shifting perspectives on the connections, so that what looks as a part can also be seen as a whole of which it is part, we can return to the example of culture and say with Marilyn Strathern, whose work has inspired my approach to culture : « Culture belongs to the domain of human activity, and in that sense is universally part of it ; but as an idea it may also be claimed as the specific construct of a specific era and thus (and to the contrary) also part of particular culture at one point in time » (Strathern, 1992a : 73).

dialectically thematises the ontological degradation of culture into (second) nature, culture is, as Raymond Williams (1976 : 76) has remarked, « one of the two or three most complicated words of the language. »

In European languages, the word culture is used in at least three different senses, a more philosophical one, an anthropological one, and a common one (Schnädelbach, 2000 : 10-19)[7]. As opposed to nature (*phusis* in Greek, referring to that which grows by itself and exists independently of humans), culture in the broadest sense refers, first of all, to everything that has been created by humans and is socially transmitted and reproduced. Culture, one could say, is everything human, everything which is produced by humans and which cannot be understood by itself. Without humans there is no culture, but without culture there are no humans either, as humans are by nature cultural beings. Culture in this encompassing sense refers to the totality of human products that produce humans.

Moving from culture in the singular to cultures in plural, we arrive at the second meaning : culture as a symbolic expression and emanation of the « soul » of a collectivity that differentiates it from other collectivities and determines each member's « whole way of life, from birth to the grave, from morning to night and even in sleep » (Eliot, 1948 : 31). Babylonian, Egyptian, Hindu, Arabic, Chinese, European and, why not, Mancunian, Kwakiutl and Omaha cultures represent so many cultures, so many different ways of defining the world, so many different ways of life. Speaking of English culture, the American essayist and poet T.S. Eliot lists Derby Day, Henley Regatta, the Twelfth of August, a cup final, the dog races, the dartboard, Wensleydale cheese, boiled cabbage cut into sections, beetroot in vinegar, nineteenth-century Gothic churches and the music of Elgar. Within each of the cultures – of which English culture represents only a particular or, so to say, a provincial example among others –, culture can, thirdly, refer to a social subsystem differentiated among others from the political, economic and juridical subsystems, that is internally differentiated into several fields and sub fields of cultural production, from museums, arts and literature to comics and haute couture, to only mention a few which Bourdieu has investigated.

Culture in the singular, as opposed and yet internally related to nature, exists only in the plural. It is typically modern to conceive of culture as a *plurale tantum*, as one amongst other cultures and as a subsystem of the social system. Herodotos, Protagoras and other sophists were obviously aware of the existence of other

7. This classification is obviously a simplification. Anthropologists will no doubt remember that Kroeber and Kluckhohn had already collected 164 definitions of culture in 1952, when the semi-autonomous discipline of cultural studies still had to be invented and the *Sociological Abstracts* did not have the oversized format of the telephone book.

cultures, but they nevertheless remained ethnocentric and conceived of the « non-Grecians » (Bush Jr.) as barbarians. Although modern cultures have also been prone to exclude the « Other », to phrase it mildly, they were also able and willing to consider themselves as barbarians and to question their own superiority[8]. « The extent to which Western society has historically constituted itself through the denial of the "other" and violent oppression of whole constituencies of the human species is indisputable and today increasingly well documented. So, too, is the process through which it began to question these exclusions, and to open itself to the possibility that these 'others » had been illegitimately excluded » (Soper, 1995 : 66). In modernity, the recognition of cultures other than one's own and the understanding of one's own culture as one culture among others are correlative processes that trigger the reflexivity of culture as such. If there is culture, it is first of all between those that do not share the same culture.

Taking the attitude of the exotic other, seeing one's own culture through the eyes of the culture of the other leads not only to a relativisation of one's own culture and a concomitant opening up to the other cultures in and through a progressive « fusion of horizons » (Gadamer), but also, and perhaps more interestingly, to a methodological self-objectification that estranges and thereby makes one aware of one's own culture. This methodological self-alienation paves the way to a critical hermeneutics that is able to uncover and make conscious the culturally and historically determined deep symbolic forms that pre-structure our vision of the world and ourselves, and thereby mediate and make possible our being-in-the-world (Kögler, 1992). In any case, awareness and acceptance of multiple cultures induce reflexive processes of cultural self-relativisation and self-objectification that make one become aware of culture as such, and correlatively, of nature as such. This reflexive emergence of the distinction between nature and culture is an epochal cultural event. It grounds the human sciences in general and anthropology in particular, or at least that branch of anthropology that defines itself by its subject matter and proceeds by way of a comparative analysis of culture[9].

Although pre-modern and modern cultures are both equally caught up in « the symbolical nets that they have spun themselves » (Cassirer-Geertz)**,** the difference between « us » and « them » is that we are able reflexively to know that « we » are

8. As Lévi-Strauss (1969 : 22) said : « The barbarian is first of all the man who believes in barbarism ».

9. Speaking for the American school of cultural anthropology, Robert Lowie proclaimed in 1917 that « culture is, indeed, the sole and exclusive subject-matter of ethnology, as consciousness is the subject-matter of psychology, life of biology, electricity as a branch of physics » (quoted in Kuper, 1999 : ix). In European anthropology, culture is not opposed to society, but considered as an aspect of society : the cultural is the social viewed from another perspective, not a distinct analytic entity.

spinning the threads of reality whereas « they » are not aware of what they do, or at least not on this meta-level. Modern cultures are by definition reflexive cultures. They do not simply live in cultural worlds like fish in water, but they know that they do so. They not only know that the world they live in is their own product, but they also know that it is a contingent and conventional world that could be different and is subject to change. In so far as this self-awareness of cultures proceeds from and presupposes a demarcation from nature (*phusis*), understood as that which naturally determines itself, we can presume that « the concepts of nature and culture are co-original » (Schnädelbach, 2000 : 16), and that they are thus constitutive of each other[10].

Indeed, the concept of nature results from the « disenchantment » of the natural world. It is no longer conceived of as a « magical garden », filled with demons, spirits and other anthropomorphisms, but objectified as an impersonal « mechanism that is submitted to the laws of causality » (Weber, 1922 : 564). This scientific objectification of nature is inseparable from the progressive denaturalisation of culture. As a matter of fact, the objectification of nature is itself an important stage in the grand Weberian narrative of the rationalisation of culture and society that characterises the world-historical advent of modernity. In modernity culture is no longer alienated as « second nature », created and instituted by the finger of God, but is thoroughly demystified and recognised as a human product. Conceived as *nomos*, culture appears to the modern mind as a conventional order of reality that is in principle transformable by humans. Unlike pre-modern cultures that occlude their creative potential by positing a meta-social or divine foundation of their own constitution, modern cultures are thoroughly reflexive and autonomous. They give themselves their own laws and to the extent that they know and accept that they do so, they are able to understand the cultural processes of « imaginary institutions » (Castoriadis, 1975) that constitute them as socio-cultural historical institutions, aware of their own « historicity » and « culturicity ». History and culture have always existed, but it is only in modern societies that they exist in reflexive form.

The difference between nature and culture is not completely unknown to pre-modern cultures, however. According to Lévi-Strauss (1967), this distinction is as

10. Unfortunately, the history of ideas does not confirm the original thesis of the co-originality of the concepts of nature and culture. The concept of nature as an unanimated causal mechanism is linked to the scientific revolution of the sixteenth and seventeenth century, which is itself linked to the emergence of entrepreneurial capitalism. The concept of culture comes later in the seventeenth and eighteenth century and is linked to the colonial expansion of the great powers. Here I am not so much concerned, however, with a Weberian genealogy of modernity as with a socio-epistemological analysis of the conditions of possibility of anthropology. For a similar attempt to account for the emergence of sociology, cf. Vandenberghe, 1997-98, I : 9-24.

universal as the incest taboo. All cultures make a demarcation between nature and culture, the wild and the domestic, or the raw and the cooked, even if their demarcation does not necessarily correspond to ours (Strathern, 1980). But to the extent that pre-modern cultures lack reflexivity and are not aware of the distinction itself, we can paraphrase Bruno Latour (1991) and conclude with some irony that « they have never been modern »[11].

## 2. Towards a Realist Phenomenology of Nature

What is at issue in the contemporary debates on nature that oppose the realism of the « nature-endorsing » approach of the ecologists to the constructivism of the « nature-sceptical » perspectives of the feminists of the third wave (Soper, 1995), is not the nature-culture distinction itself, but the way it is to be drawn, and whether it is to be conceptualised as one of kind or degree. Are we thinking of an absolute distinction between the « ontological regions » of the material world of things and the cultural world of humans, or should we rather conceive of them as « typological regions » ? Should we think of an opposition between absolute realms, or of a continuum in which no hard and fast distinctions can be drawn between nature and culture, between things and humans ? Or should we perhaps follow the radicalisation of postmodernism-turned-into-posthumanism and ignore the distinction altogether, happily mixing humans and non-humans in a heterogeneous network ?

### *A Realist Theory of Nature*

In an attempt to answer those (admittedly) difficult philosophical questions and to overcome the stalemate of the opposition between naturalists and culturalists, I will seek guidance and inspiration in the critical realism of Roy Bhaskar. With Bhaskar and the realist movement, I start from the distinction between the « transitive » (or epistemic) and the « intransitive » (or ontological) dimension of knowledge (Bhaskar, 1978 : 17). Applied to nature, the principle of the existential intransitivity of the objects of knowledge simply states that nature exists independently of our

11. Jack Goody contests the universality of the distinction between nature and culture, but by contesting it, he affirms its artificiality as « our » ethnocentric particularity : « The division between nature and culture is in some ways rather artificial. I would claim that there's no such pair in either of the two African languages known personally to me (LoDagaa and Gonja). Though there's a certain "opposition" of "bush" and "house", "cultivated" and "uncultivated", there's nothing that would correspond to the highly abstract and rather eighteenth century dichotomy that is current in western intellectual circles » (Goody, quoted in Horigan, 1988 : 40-41).

observations and descriptions of it. Assuming for a moment that humans were to disappear, nature would presumably still exist. The principle of the socio-historical transitivity of the knowledge of the objects recognises that nature can only be known under certain descriptions and that those are socially and historically variable. The whole point of this somewhat scholastic distinction is to foreclose the « epistemic fallacy » which, assuming that statements about being can be reduced to statements about knowledge, erroneously concludes from the fact that nature can only be known under certain descriptions that those descriptions constitute nature. Collapsed into « nature », nature becomes culture, while the intransitive or extra-discursive existence of nature is simply omitted. The signifier « nature » performatively constructs « nature », and at the end of the day the signified is deferred and the referent « exterminated » by discourse.

Against the radical claims of constructivism, one should remind their practitioners that even if objects could only be known « to us » under certain descriptions, one is nevertheless not allowed to conclude that the descriptions actually construct the objects themselves. What Régis Debray (1998 : 267) says about the map holds – *mutatis mutandis* – for all representations of reality : « It does not follow from the fact that the objective world is inseparable from the practical representations that a society has of it that the latter can construct all its objective references. That a map contributes to the formation of a territory does not mean that the territory is the invention of the cartographer » Indeed, even if mapping and map-making exemplify the ways in which spaces are made presentable and representable in maps, charts, pictures and other inscription devices so that they become available for further exploration, specification, sale, contract, management or any other form of « government » (Rose, 1999 : 30-37), one should not push the « defetishisation » of the map to the point where all natural boundaries are constructed, deconstructed and erased. To shore up their political arguments, carto-constructivists should rather recognise the existence of a mappeable substrate and analyse how the techniques of mapping construct a political space of government through the enclosure of entities (land, estates, populations, constituencies, etc.)[12].

Once the independent, extra-discursive existence of nature is recognised and accepted, we can grant the constructivist that there is, and can be, no reference to nature that is independent of discourse, except in discourse[13]. Provided that we do not interpret the discursive mediation and construction of nature as « nature » as an

12. For a documentation of several cartocontroversies (the Peters projection controversy, the Vinland map, etc.) that show how one can lie with maps and how maps continue politics on paper, see Monmonier, 1995.

13. After all, Derrida's famous statement that we never get out of discourses and texts (« Il n'y a pas de hors texte ») is not meant to deny that he is writing his text with a pen on a piece of paper, that the trains in the underground in Paris are riding or the over ground ones in

epistemological licence for the erasure of nature, we can even accept Judith Butler's most provocative thesis that the « construction of "sex" as the radically unconstructed » (Butler, 1990 : 7) is itself a discursive construction. Sex is indeed constructed as « prediscursive », as nature, prior to culture, but precisely through discourse. Discourses of bodies and bodies of discourse intersect in and through reiterative and citational practices that construct what appears as an unconstructed « outside ». Given that this outside is « not an "absolute" outside, an ontological thereness that exceeds or counters the boundaries of discourse », but a « constitutive "outside" which can only be thought – when it can – in relation to that discourse » (Butler, 1993 : 8), the body doesn't really matter, except of course as the unmarked body that makes the cultural distinction between nature and culture, sex and gender possible[14].

Moreover, to avoid further misunderstandings, it should also be stressed that the distinction between the transitive and the intransitive dimensions of knowledge does not aim to deny the social construction of nature, or its social destruction for that matter. The realist conception of nature only aims to posit the existence of a natural substrate in the physical world that is always presupposed by the natural sciences and that functions as a transcendental condition of the possible forms of human intervention in nature, from those of the engineer and the transsexual to the lyrical poet and the sociologist of science. With Kate Soper (1995 :155-160), we can indeed distinguish between the realist or « deep » concept of nature and the lay or « surface » concept of nature. The latter is used to refer to empirical nature, that is to the ordinary observable features and the directly tangible forms in the environment : the fauna and the flora, the countryside, the landscape, « the nature we have destroyed and polluted and are asked to conserve and preserve » (id. : 156). As an object of human destruction or of human appreciation, nature is always a human construction.

Provided that we distinguish between deep and surface nature, we can easily accept Beck and Giddens's thesis of the « end of nature ». Sociologists and anthropologists of science have convincingly demonstrated in the last decade that

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London have once again collided. Inversely, my critique of the cultural deconstruction of nature does not aim to deny that texts can change nature. The example of the Shakespeare Society in Connecticut which, having obtained an inventory of all the birds that occurred in the texts of the great bard, imported them from England to set them free, proves that culture can literally construct nature. More generally, but less literary, culture « leaks » into nature and effectively helps to construct it in the same way as the indications of the architect direct the performances of the house-builders.

14. Judith Butler is the theorist of transsexualism. But in so far as one will hardly find any references in her texts to silicone injections, aesthetic operations or other material practices that subvert the naturality of the distinctions between the sexes, one might as well say that her theory of transsexualism is really a theory of transtextualism. Always wrapped up in language, the body is as unfathomable as the Kantian Thing-in-itself.

the nature on which the scientists are working in their labs, the brains of the rats they are chopping into slices, the genes they are manipulating, are effectively and literally social constructions (Latour and Woolgar, 1978). And so is the landscape we admire. The nature and countryside we love and drive to in our cars on sunny Sunday afternoons is mostly a cultural landscape. In the countryside, nature is mostly agriculture, and quite often the « pure nature » we crave for is a nature that has been artificially reconstructed as nature by bulldozers (Keulartz, 1998). Finally and more subtly, we could also indicate that to see a stretch of nature as a landscape, we have to frame it, see it and constitute it categorically as a landscape (Trom, 2001).

*Regional Ontologies*

Can we conceive of nature as something that exists independently of culture and at the same time as something that is always subsumed under culture ? Can we combine the insight that the nature-culture distinction is universal with the fact that not all cultures draw it exactly in the same way ? To answer that question, let us move from the transcendental realism of Roy Bhaskar to the transcendental phenomenology of Edmund Husserl. Although the idealism of Husserl might, at first, seem incompatible with the materialism of Bhaskar, one should nevertheless remember that both of them are concerned with a transcendental inquiry into the conditions of possibility of knowledge. Taking the epistemic practices of the natural scientists as the starting point of their epistemological research, Husserl and Bhaskar each attempt in their own way, to answer the Kantian question – « How is nature possible ? » – by reflexively uncovering the a priori conditions of knowledge. If Bhaskar demonstrates that natural sciences always and necessarily presuppose the intransitive existence of nature as an incontrovertibly fact, Husserl insists that this nature can only be grasped if it is categorically constituted as nature (of a certain kind) in and through the epistemic practices of the scientists[15]. By proposing a theory, or perhaps better, a method to describe and analyse the « marvellous correlation between the object of knowledge and the phenomenon of knowledge » (Husserl, 1958 : 12), that is the object as it appears to consciousness, Husserl goes

15. With Kern (1962), we can distinguish three ways to explore the « infinite continent » of phenomenology that Husserl has opened up for analysis, namely the Cartesian way, the way via intentional psychology and the ontological way. The latter is the one that interests me : it does not annihilate the world as object but takes it as an index for the analysis of the constitution of the world as phenomenon. When phenomenology is entered via the ontological way, the dead end of the transcendental ego is avoided so that the realism of Bhaskar and the phenomenology of Husserl are no longer incompatible, but rather complementary. One might thus as well describe the ontological way to phenomenology as a phenomenological way to ontology.

further than Bhaskar[16]. Unlike Bhaskar, he not only shows that knowledge of nature necessarily presupposes *that* there is indeed something like nature « out there » (nature as transcendent object of knowledge), but he also analyses in detail *how* this nature can be grasped as nature (of a certain kind), that is how the epistemic activities of the subjects constitute nature as an intentional object of a certain kind (nature as phenomenon or immanent object of knowledge). By offering a method for describing in minute detail how the mind can grasp something that exists outside of the mind by constituting it inside the mind as an object of certain kind, he thereby solves an epistemological problem that Bhaskar does not really touch. Inversely, by insisting on the intransitive or transcendent properties of the objects of knowledge, Bhaskar can offer a transcendental index or guideline for the constitutive activities of the mind and act as a safeguard so that the mind cannot constitute the object of knowledge as it pleases, but has to take into account the essential properties of the objects of knowledge. What I want to suggest is that a « cross-reading » of Husserl and Bhaskar leads us to a realist phenomenology of nature that is able to describe and account for the correlation between the object and the phenomenon of knowledge.

In a former article, I drew on Husserl's complicated analysis of the structures of constitution of the material world (the thing-world), the animated world (the animal world) and the spiritual world (the human world) to dispute the ontological confusion of things and humans that has become the trademark of actor-network theory (Vandenberghe, 2002a, see also Husserl, 1952)[17]. Going « back to the things themselves » in order to analyse how different phenomena give themselves to consciousness and are intentionally constituted as givens of consciousness, I was claiming that all phenomena, human and non-human, have an essence (*eidos*) that predetermines what they necessarily must be when they are to be things of a certain kind. This essence can be *a priori* determined through the procedure of « eidetic variation ». By submitting a given phenomenon, say a book, to a process of imaginative variation, we can freely vary the perspectives on the book, introduce other books, which are different from the first one in terms of colour, size, shape, texture,

16. The method in question is the so-called « transcendental reduction » which « brackets » the real world in order to reflexively analyse the constitutive activities of the mind. By suspending temporarily the ontological question of the existence of the world « out there », the latter is no longer treated as a resource but as a topic in its own right. After analysis, the world is not only entirely regained, but also entirely understood in its objectivity as the intentional correlate of the epistemic acts of the inhabitants of the world.

17. I was only interested in establishing the ontological difference between the natural world and the social world, not the one between the animal and the human world. Humans are animals. We share 98 % of our genes with chimpanzees, 52 % with potatoes, and 48 % with bananas. For an excellent and more serious analysis of regional ontologies by one of Husserl's former assistants, see Landgrebe, 1963.

etc., and gain insight into the materially determinate essence of the book that remains invariant and of which any variation represents only a particular instance and possibility. Once grasped intuitively, an essence can be compared and contrasted with other essences at varying levels of generalisation and specification. At the highest level of generalisation, we can distinguish the three ontological regions of material, animate and spiritual nature that found respectively the physical sciences, the biological and psychophysical sciences, and the human sciences. Convincing ourselves that they are essentially different, we can arrive at a categorical determination of the essence of the thing, the soul and the spirit. Simplifying the long and important but complicated eidetic analyses of *Ideen II* on the constitution of the world that were so important for Merleau-Ponty (Husserl, 1952), we can say that a thing belongs to the material world by virtue of the fact that it is causally related to other things in a unified spatial-temporal context. The spirit belongs to a human world by virtue of the fact that it is endowed with meaning and intentionally constituted as a cultural world. The transition from the first region to the latter is made possible through the body, which is both an object of nature and an organ of the will, something that can touch, but also something that is touched. Although Husserl distinguishes between three ontological regions, he is, in fact, mainly concerned with the a priori establishment of a categorical distinction between the regions of nature and culture, and with the relation between the natural world and the spiritual, whereby the latter is granted priority over the former.

*Regional Typologies*

Assuming, for the sake of argument, that the distinction between the ontological regions of nature and culture could be established on secure transcendental-eidetic foundations, we can now reinterpret those regional ontologies as « regional typologies of the historical life-world » (Luckmann, 1970), and combine the transitivity of nature with the intransitivity of the nature-culture divide[18]. This move from a transcendental to an empirical phenomenology of the constitution of the regions of reality recodes the opposition between nature and culture, which corresponds to an objective order of the world, into an « artificial creation of culture » (Lévi-Strauss,

18. Luckmann opens his culturalist attack on Husserl's realism by exposing the tacit assumption that the transcendental ego is « somehow human ». Following the phenomenological sociology of Alfred Schütz, Luckmann argues that the human being is not constitutive, but socially constituted as human through the application of the typifications of the life-world. Instead of conceiving those views as exclusive of each other, I try to integrate them by conceiving the regional typologies as differential or transitive interpretations of one single reality, differentiated into different regional ontologies.

1967 : xvii). This cultural recoding of the universal divide allows us to make sense of the fact that even if all cultures draw a line between nature and culture, they nevertheless draw it differently[19]. Without falling into the evolutionist traps of the early anthropologists, I think, however, that we can generally differentiate the typologies of the pre-modern and the modern life worlds by saying that the former are gift economies that tend to interpret things within a anthropomorphic frame as if they were human, whereas the latter are commodity economies that tend to interpret humans in a fetichistic frame as if they were things[20]. By insisting on the *as if* character of those typifications, their conventionalist or imaginary status is recognised : things are things and humans are humans by nature, but that does not mean that humans cannot be conceived and treated as animals or things, or things as animals or humans. It is enough to swap the perspectives, seeing ourselves and the « others » through the estranging eye of the anthropologist, to obtain a perspective on the perspective that allows for a systematic relativisation or « symmetrisation » (Bloor) of both of the regional typifications. What seems strange to « us » is familiar and ordinary to « them », and *vice versa*, but there's no reason to assume that either of the miscategorisations is superior to the other. As Castoriadis (1975 : 221) rightly says, « Treating a human as a thing is not less but more imaginary than seeing a human as an owl. »

In the realm of the imaginary, we are no longer dealing with differences in kinds or realms, but with a continuum and fluid transitions between the extremities. In a world in which nature can become culture, and culture can become second nature, things, animals and humans can be more or less natural, more or less human, and shift from one end of the continuum to other, as can be gathered from the fact that the Greeks considered slaves as things, that the missionaries colonial masters considered Negroes as animals, and that there are still too many husbands who consider their spouses as pets. In the meantime, Blacks, women and pets have crossed the divide between humans and nonhumans, while at the same time everything, or almost everything, from body parts, babies and football players to

19. Just one example, which I borrow from Strathern (1999 : 249-250) – but anthropologists and historians could easily bring in other ones. According to the Araweté, who assume a basic continuity between all animate beings, people share with animals the same kind of soul and thus the same identities and indeed mental constructs. What differentiates them are their bodies. It is bodies which see and which determine what is seen. From out of their human body, human beings can only « see » animals as non-human ; but when the animals' point of view is imagined, these creatures do not see human beings as human beings, to them people appear as animals, and the animals appear to another as people.

20. This distinction between animated things and reified persons corresponds to the one between gifts (Mauss) and commodities (Marx). In the same way as the distinction between nature and culture can only be made within culture, the distinction between gifts and commodities only make sense from the point of view of the commodity economy.

audiences and human capacities, can be alienated and reified into a commodity (Radin, 1996). Notwithstanding the fetishism that is attached to commodities, they don't grow on trees but are eminently cultural. Like slaves, goods have a trajectory or a biography (Appadurai, 1986). In the same way as slaves are dehumanised when they are sold as things and forced to work (the slave as « thing in the field ») and re-humanised in a new setting (the slave as « person in bed » (Patterson, quoted by Kopytoff, 1982 : 220), goods are reified into commodities when they enter the market and de-commodified and re-personalised as they leave the sphere of circulation to enter the sphere of consumption.

By allowing for a cultural recoding of the ontological divide through regional typologies, the « interpretative flexibility » (Bijker) of the world is brought to the fore. The regional ontologies of the world do no more determine the interpretations of the world than the base determines the superstructure, though the latter are obviously conditioned by the former. Nevertheless, if we want to conceive of some kind of progress through « epistemic gain » (Taylor, 1989), we have to assume as a regulative ideal that in the very long run the regional typologies of the life-world will come to overlap and coincide with the regional ontologies[21]. When appearances and essences are identical, humans, animals and things will be considered as what they really *are*. This asymptotical overlap (or *Deckung*) of the ontological and the epistemological, of words and things, can be expected on the grounds of the self-corrective mechanism that is built in human cognition. Nothing forbids us to conceive of humans as baboons, baboons as cauliflowers, cauliflowers as stones and stones as persons, but the imaginary transfer of the project on the object is nevertheless restricted by the fact that the meanings that are intentionally transferred and projected from the subject onto the object will eventually be confirmed, modified or disconfirmed by the objects themselves. Thus, when I intentionally represent the stone as a person, the noematic meaning of the stone which I constitute in my present experience of the stone and automatically transfer to the next phase of the experience will be partially or totally confirmed or disconfirmed, depending on whether the stone walks, talks, etc., or not. When the projected meaning is totally confirmed and the object fills and fulfils each and every one of the expectations, then the object and the project perfectly overlap. « Then the real *adequatio rei et intellectus* is produced. The object is really "present" or "given", exactly as the object is intended and as the object that it is intended to be ; there is no longer a

21. The notion of epistemic gain is post-metaphysical. « It aims to establish, not that some position is correct absolutely, but rather that some position is superior to some other. It is concerned, covertly or openly, implicitly or explicitly, with comparative propositions. We show one of those comparative claims to be well founded when we can show that the move from A to B contains a gain epistemically » (Taylor, 1989 : 72).

partial intention that lacks fulfilment » (Husserl, 1980 : II/2 : 118). This is the noetic experience of *evidence*, and when it is continuously repeated and sediments into a relatively natural worldview, we can presume – for the time being and until further notice – that we have arrived at the truth and that the object really is as it is and as it gives itself to consciousness. « The objective correlate [of noetic experience of evidence] is called Being or also Truth » (id. : 122). Truth may be an artefact, but when the artifice is inter-subjectively validated and the relation between culture and nature is continuously confirmed in and through discursive practices, the ontology and the typology of the natural, the animal and the human world naturally overlap. When the congruence between them is given with evidence, we can counterfactually presume that the regional typology is grounded in reality as such. When it speaks the language of reality, reason presumably cannot be wrong, or can it ?

So far so good, were it not that since world war II the stable ontologies of the past have become subject to epochal technological inventions and reinventions of nature that are so revolutionary that they may well undermine any attempt to maintain a priori distinctions between humans, animals and things. As a result of the recent developments in bio-, nano- and cybertechnology, my archeo-modernist refusal to treat ontologies as simple ways of speaking that can be changed at will seems quaint and outmoded. That humans and nonhumans can be assembled and interconnected in heterogeneous networks is nothing new. If we may believe Latour (Strum and Latour, 1988) and the other members of his expanding actor-network-network (Latour, Callon, Akrich, Law, Mol, etc.), the fact that societies are stabilised through objects, that objects are so to say the « cement » that keeps human collectives together, is the *differentia specifica* that distinguishes humans from baboons. In this respect pre-modern cultures are not that different from modern cultures. « We » may have electronic cars, Portuguese vessels and « couch-potatoes », but the fact that we have more and longer socio-technical networks in which humans and non-humans are chained to each other only shows that we are not really modern and that, like « them », we don't really make a priori distinctions between nature and culture. In so far as actor network theory teaches us a postmodern way of telling semiotic stories about technology and about how it « redistributes » the actions of humans and non-humans over syntagmatic chains, it represents a most innovative, provocative and interesting take on the sociology of science and technology that projects and presents itself as an experimental ontology. The problem with this and similar socio-philosophical attempts to develop an experimental ontology that wilfully scrambles the demarcations between the material, the animal and the human world lies not with those attempts themselves, but with the fact that their joyous anti-humanism may well offer an ideological countenance to the socio-technical practices of the engineers of the contemporary bio- and cybertech industries of late capitalism that make tons of money by artificially producing a monstrous nature that

transforms the nature of the human itself[22]. As far as I'm concerned, postmodernists and their radical cousins, the posthumanists, can « cyborg anything – mix and juxtapose elements that are thereby made compatible in so far as their combination creates a workable circuit of ideas » (Strathern, 1995 : 165). But when I read in the newspaper that sheep are cloned and that it soon will be our turn, when I hear on the radio that pigs' genes are modified and patented so that their hearts can be transplanted into human bodies, when I'm told that the world champion of chess has been beaten by « Deep Blue » and that some people are dreaming of « downloading » the entire human brain into an artificial, immortal body, I start worrying about the future of « really existing humanity ». I start wondering about the innocence of the posthumanist celebrations of the new « meat and metal symbiosis » that allows us finally to overcome our philosophical anthropocentrism and to become the monstrous *Übermensch* that Nietzsche and the neo-Nietzschians want us to become : « The organic can rise to yet higher levels. Our eagerness to know nature is a means to perfect the body. […] In the long run, it is not a question of man at all : he is to be overcome » (Nietzsche, quoted by Deleuze, 1965 : 59)[23].

### 3. The Techno-genesis of Humankind

This is a story about complexity, mediation and alienation. Looking for a third position that polemically overcomes the ancient « conflict of the faculties », postmodern philosophers, historians and sociologists of science and technology set sail for the Canadian high North. Tacking through the icy waters and the immense

22. For a catalogue of the contemporary cabinet of technoscientific curiosities – from farming, cloning, xenotransplantation, bionics, biomimicry and biopiracy to nanotubes, humanimals, wearable computers, DNA chips, botox injections, neurochips and penis pumps, see (Best and Kellner, 2001 : 149-204).

23. I must confess that I don't share the fascination of the monstrous, the grotesque, the mutant or the downright freakish characteristic of the « postmodern Gothic ». I can, of course, see and appreciate how cyborgs scramble our mental categories and how, by opening up our mental framework, they aim to create space for the tolerance of otherness and the acceptance of the other as other. But that's on the level of the imaginary. On the level of the real, « cyber-teratologies », « metra- » and « meta(l)morphoses » look rather different, however, and what appears as a fashionable statement from one angle may very well appear as an irresponsible one from another. That is why I remain sceptical with the radical chic declarations of intention to innovate critical theory, like the following one for instance : « I will attempt to de-pathologise and to illuminate in a positive light some contemporary cultural and social phenomena, trying to emphasise their creative and affirmative potential … I would like to argue that we approach the anomalous and the monstrously different other not as a sign of pejoration, but as the unfolding of virtual possibilities that point to development and alternatives… Tracking the fluctuations of this new, post-human disorder is the task of critical theory », etc. (Braidotti, 2002 : 5, 213, 264).

arctic archipelagos, they search for the epistemic equivalent of « the Northwest Passage » that connects the Atlantic and Pacific Oceans. The passage that connects the natural and the human sciences is a complex unfolding topological network of mutual translations between theories and practices, forms and forces, words and things that performatively co-construct and co-produce the long winding road that connects nature and culture. At the end of the journey, the passage finally appears at the misty horizons : « [It is] the passage that one didn't hope to find anymore between two types of knowledge, each of which always deals with humans and the world, but separated by a bar, as if there were two worlds, the one of those who are awake and the other of those who are asleep, as if there were two humanities, the one that is busy transforming things, and the one that delights in its own relations » (Serres, 1980a : 60). At the intersection of the natural and the human sciences we find (among other things and other sciences) : technology.

Reconnecting the two humanities, technology acts as double mediation between nature and society that performatively co-constructs the objects and the subjects as it interconnects them into a seamless web. Humans make artefacts and the artefacts they make organise and fix them into human collectives. Socially constructed by humans, technology constructs society – that is how we could neatly summarise the constructivist position of contemporary science, technology and society (STS) (Akrich, 1994). Having supplemented the mantra of the action sociologists « no humans-no society » (« inter-subjectivity ») with its inversion « no objects-no society » (« inter-objectivity »), the postmodern analysers of science and technology go on, however, and tell us that without objects there would not only be no society, but there would be no humans either. By means of a posthumanist gloss, Mike Michael (2000 : 1) eloquently summarises the main tenets of Actor-Network-Theory : « There are no humans in the world. Or rather, humans are fabricated – in language, through discursive formations, in their various liaisons with technological and natural actors, across networks that are heterogeneously comprised of humans and non-humans who are themselves so comprised. »

*The Exteriorisation of the Organs*

To make hard the claim that we would not be human without non-humans, French anthropologists, sociologists and mediologists of a posthumanist bent draw on the seminal work of André Leroi-Gourhan, the paleoanthropologist and prehistorian who deciphered the « mythogrammes » of the grottoes of Lascaux and who can be considered as the antipode of Lévi-Strauss[24]. As a student of the prehistory of

24. Although Leroi-Gourhan remains relatively unknown inside and outside of France, one should not underestimate his importance. His work has significantly influenced Derrida's

humanity, Leroi-Gourhan has analysed the process of humanisation in terms of the progressive specialisation of two corporeal zones, namely the face and the hand, which, once liberated by the upward posture of humans, have made possible the exteriorisation of the brain and the body into the extra-organic realms of symbolical institutions and material technology, both of which have led to a better grip on reality[25]. Putting man thus « back on his feet », Leroi-Gourhan summarised his conclusion in *Le geste et la parole*, his masterwork in two volumes, by saying that « humanisation begins with the feet » (Leroi-Gourhan, 1964, I : 211). Indeed, the vertical locomotion of the « Zinjanthrope » has liberated the hand from the constraints of locomotion, which is a precondition for the development of tools, and the liberation of the hand has in turn liberated the mouth from the tasks that are related to food and made speech possible.

In this grand narrative of humanisation, which started 2,5 million years ago, the development of the brain appears only as a secondary process that follows the general one, though once developed it will take a decisive role in the evolution of mankind. Once the double capacity of the fabrication of tools and symbolic expression is functionally acquired, the process of humanisation and civilisation can begin and be understood as a process of progressive « exteriorisation of the operational programmes » that allow humans to adapt to their environment. At first, a piece of technology is a prosthetic extension of the hand that is exteriorised, but then it becomes independent of the hand and starts to follow its own laws (« technology »), and similarly for language. At first, memory is the extension and exteriorisation of speech, but then, with the invention of writing, memory can be stored in archives, knowledge can evolve according to its own laws and accessed at any time or consumed anywhere, thanks to the mass media. With the total exteriorisation of the organs in autonomous socio-cultural and socio-technical institutions and organisations, the evolution of humans has become « liberated » or « unballasted » (Gehlen, 1957) from its biological substrate :

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grammatological analysis between writing and speech, Deleuze and Guattari's double articulation between expression and content, Latour and Callon's co-construction of society and technology, or Debray's formulation of mediation studies. In the presentation of the work of Leroi-Gourhan, I draw in the following on passages of a former article of mine on Debray's mediology. Cf. Vandenberghe, 2001.

25. The outlines of Leroi-Gourhan's thesis of the « exudation » of organs can already be found in Leibniz and the philosophy of technologies of Ernst Kapp. Among the contemporaries of Leroi-Gourhan, one finds similar conceptions of technology in the work of Arnold Gehlen (1957), Helmut Plessner (1965, especially p. 309-321 where he exposes his « law of natural artificialism ») and Marshall McLuhan (1964), who conceives of the media as extensions of man, as is indicated in the subtitle of his book.

> *Liberated from his gestures, his muscles, the programmation of his actions, his memory, liberated from his imagination by the perfection of the means of tele-diffusion, liberated from the animal and the vegetal world, from the wind, the cold, the microbes, the unknown of the mountains and the seas, the homo sapiens of zoology is probably close to reaching the end of its career* (II : 266).

Having found its origin in the materiality of the human constitution, the « replacement of the organs » (*Organersatz*) by technology has led to « the replacement of the organic as such » (*Ersatz des Organischen überhaupt*) (Gehlen, 1957 : 10). From the hand to the brain and beyond, the process of extension, exudation and exteriorisation of the organs has found its provisional point of culmination in the substitution of the functions of the brain (information, computation, decision) by the computer.

Human evolution seems to be characterised by a tendency towards increasing spiritualization. Everything happens as if the evolution of the species is geared to converge and culminate in the Supreme Consciousness of the divine "point Omega" of his friend and co-religionist Teilhard de Chardin. Steered by a tendency towards enlightenment and dematerialisation, and a correlative affirmation of the Spirit that culminates in the emergence of a « collective intelligence » (Lévy) that is able to steer evolution, the human genesis is indeed conceived by Leroi-Gourhan as an orthogenesis, that is as a kind of Lamarckian evolution in which the variations onto-theo-teleologically lead to the end of supreme mastery (Groenen, 1996 : 61-90).

The specialisation and exteriorisation of the human organs in a socio-technical super-organ – society – that allows the humans to intervene more successfully than ever in their external environment and to adapt it to their own ends appears as the end product of biological evolution. The paleoanthropological story is not a happy one, however. The exteriorisation of the human faculties has not led to the perfection of the individual as such, but to a progressive integration of the individual as « a piece of the indefinitely perfectible mechanism of a totally socialised society » (II : 199). After millions of years of evolution we may ask ourselves if human societies are not at the point of regressing into societies of ants and bees in which the individual element is cybernetically programmed to be part and parcel of the social organism. Writing in the sixties, Leroi-Gourhan had already clearly understood the technocratic and consumerist trend of late capitalism in which « a restricted elite will not only work out programmes of life, politics, administration, techniques, but also emotional relations, epic evasions and the image of a life that is totally imagined » (II : 203). He had also anticipated the imminent advent of cyberworld in which « a humanity without teeth that would live and lie down using what remains of its anterior members to push buttons » (I : 183).

The apotheosis of humanity is thus at the same time its apocalypse. In one of those dramatic reversals, to which dialecticians are accustomed, the liberation of humans through technology turns out to coincide with their alienation by technology. Consequently, the exteriorisation of organs of the humans reverses into their reification by a super-organ that follows its own inhuman laws, while imposing them on its elements. Once again, as in the story of the Golem, the human becomes the creature of his own creation. Unless we keep our technology in check, « we may have only a couple of thousand years left, if not a couple of centuries » (Leroi-Gourhan, 1982 : 242).

*A Theory of Alienation without Alienation*

As a catholic and a humanist, Leroi-Gourhan would no doubt have refused the job offer to become the Secretary of the World Transhumanist Association, which defends « the philosophical thesis that we ought to employ technology in the near-term for the purpose of attempting to perfect ourselves » (cf. www.transhumanism.org)[26]. Insofar as his theory of socio-technological evolution offers the perfect platform for the development of a coherent post- or even anti-humanist position, it should nevertheless be taken seriously[27].

By conceiving of the anthropogenesis as a techno-genesis, Leroi-Gourhan has systematically extended the theory of the techniques of the body to technology as such. Inspired by Marcel Mauss (1950), his mentor, who has shown that even our seemingly most natural ways of behaving, such as walking or swimming, presuppose the learning of a technique, the French prehistorian has shown that

26. Transhumanists start from the assumption that the human is a « deficient animal » (Nietzsche) that is unable to cope with the complexity of the techno-scientific environment. On the webpage of Stellarc, a post-humanist net-artist, the latter affirms peremptorily that « it is time to question whether a bipedal, breathing body with binocular vision and a 1400cc brain is an adequate biological form. It cannot cope with the quantity, complexity and quality of information it has accumulated ; it is intimidated by the precision, speed, and power of technology and is biologically ill-equipped to cope with its new extraterrestrial environment » (cf. www.stelarc.va.com.au). To improve the human stock and overcome the biological limitations of the human condition, transhumanists and ectropians have singled out three « person engineering technologies » (PETs) : genetic engineering, artificial intelligence and nanotechnology.

27. In the same way as postmodernism can be said to extend modernism, some versions of post-humanism present themselves not as an inversion but as a radicalisation of humanist and rationalist positions. Like humanism, posthumanism values instrumental rationality, progress and humanity and does away with all supernatural forces that are supposed to control our destiny. It simply goes further by urging that we should push beyond the human stage of evolution and take our destiny in our hand.

technology forms the human being in its totality (*l'homme total*) in its biological (corporeal), psychological (emotional and intellectual) and social dimensions. In order to be able to use a piece of technology, say a car or a computer, humans have to learn a series of habits, gestures, reactions and other schemes of action that get progressively sedimented into a stable *habitus*. Through the formation of the habitus, the individual incorporates the technology at the same time as she is incorporated in it. Through this mutual incorporation of human and machine, an integrated operational technological apparatus is built up that not only mediates between the human and the environment, but that co-constructs both at the same time.

Contemporary posthumanism builds further on the theory of humanisation through the exteriorisation of organs into an integrated technological apparatus, but while it maintains it as an accurate description of the becoming other than human – technogenesis as heterogenesis – it divests it of its essentialist assumptions and normative overtones[28]. Although the notion of exteriorisation sounds similar to Hegel and Marx's notion of *Entaüsserung*, the posthumanist re-appropriation of it is highly selective. The « expressivist » idea that there might be something « inside » of humans that they exteriorise in and through their praxis and that this praxis is precisely what distinguishes them from animals is ditched. Given that humans have no essence, they cannot express their "species being" (*Gattungswesen*) in their work and, as a result, they cannot be alienated from it either. In so far as posthumanism accepts the theory of the "exteriorisation of organs" while refusing to interpret its dialectical reversal in terms of dehumanisation, it can be described as a theory of alienation without alienation – « *Entfremdung* to be understood by philosophers », as Marx (1972, III : 34) once said attacking the beautiful soul of the German literati[29].

Like postmodernism, posthumanism wholeheartedly says « yea » to life and wants to be affirmative. Refusing to consider the negativity of alienation in the dialectical light of its *Aufhebung*, it dismisses the old humanist notions of man, alienation and reification. Following Nietzsche's fourth Prologue to *Zarathustra*, posthumanists celebrate the negativity of dehumanisation as a step in the unfinished

28. The idea that the human is constructed by technology is a common trope of posthumanism. Peter Sloterdijk, for example, uses it in his controversial eugenic *Regeln für den Menschenpark* (*Rules for the Human Park*) when he presents man as the being that dwells not only language, but also in houses, and thus as the being that makes houses that make man and has to be domesticated politically, possibly genetically, by means of the political anthropotechnology of prenatal selection (Sloterdijk, 1999 : 35-47). In Germany, this proposal has sparked off a huge and rather nasty controversy between Habermas and Sloterdijk. See the weekly interventions by proxy in *Die Zeit*, from September 1999 onwards.

29. Deleuze and Guattari do not even aim to hide that they have no truck with the Hegelo-Marxian theory of alienation : « What we denounce is all the oppositions of man and machine, of man alienated by the machine, etc. » (Deleuze, 1990 : 32).

overcoming of the limits of the human, thanks to which the human becomes other than human, and creatively redefine alienation as « alteration »[30]. The human is no longer a being, but a becoming, a being that becomes other through the exteriorisation of its organs in a plethora of extra-organic mediations. Paraphrasing de Beauvoir, we could say that for the posthumanist man is not, but that he becomes what he is and what he is not, by overcoming himself, thanks to technology.

Having ditched every form of essentialism, the posthumanists adopt a performative vision of anthropology in which humans are literally made by what they have made, by culture, but also and above all by technology. By means of technology, nature is humanised. Seen from another angle, the humanisation of nature appears, however, as the naturalisation of humans. Between humans and nature, a technological mediation intervenes that establishes a performative or « transductive » relation between them. Co-constructed or performed by the relation, the human can no more exist outside of its relation with the non-human than the non-human can exist outside of its relation with the human. « Pro-jected » and « pro-duced » by humans, technologies, techniques, instruments and tools in turn act back on humans and modify them in that they modify human inner and external nature, material practices, bodies, language, habits, precepts, affects, etc.

This is nothing new. The flints, the pebbles and the bones made and transformed the man of Cro Magnon ; today, it is the spectacles, the pacemakers and the laptops that make Homo sapiens. We have never been human. Having estranged the human, nothing human is strange to the posthumanist. Once we understand that we are made by the technologies that we make and that we become human through our implants, transplants and prostheses, we can even appreciate the intelligence of a stupid statement like the following : « For a humanist, the best friend of man is man himself. For a non-humanist, it is his gun, his car or his mobile phone » (Tisseron, 1998 : 273). Indeed, the heterogeneous assemblages of humans and non-humans that transform, fix and stabilise the social, cultural and political networks also make, transform and modify human ways of acting, thinking, feeling, seeing and being. Inverting the classic tenets of humanism, the posthumanists not only affirm that it is the objects that make humans (like when we say that it is « the snit that makes the

30. « Slightly alienated, or better : alterated » (Latour, 2002 :16). Fascinated by the in-between of the *Aufhebung*, Nietzsche and the neo-Nietzscheans with him, love danger and welcome the *Untergang* of the human as a sign of its overcoming : « The greatness of Man is that he is a bridge and not an end ; what is lovely in man is that he is a transition and a decline. […] I love the one who only lives to know and who wants to know so that one day the *Übermensch* will live. And so he wants his own decline. I love the one who works and invents so that one day he will build the house of the *Übermensch* and prepare the soil, the animals and the plant for his return ; after all he wants his decline » (Nietzsche, 1988 : 16-17).

man »), they also insist that technologies follow their own laws and have a mind of their own, that they have unintended and unexpected consequences, both happy and perverse, that no one – no individual, no society, no politics – can control. Where humanists cry « wolf » and see only a sign of dehumanisation, alienation and reification, posthumanists see only a normal, « human, inhuman, all too human » process of humanisation through exteriorisation, reification and alienation.

Even more, as far as posthumanists are concerned, the « real cause of alienation » is to be found « not in the machine, but in the misunderstanding of the machine » (Simondon, 1969 : 9). Misunderstanding the machine happens when we oppose the human to the machine and do not understand that humans are among the machines and form with them an integrated artificial circuit. Rather than opposing the human and the non-human, treating the latter as a threat to the former, the posthumanist techno-utopians suggest that we should think of technology as a hybrid self-organising organism with a life of its own that mediates between humans and the world. The machine is not an alienated organ that imposes its constraints on the humans from without, but a kind of living organ that functions thanks and through them, and thanks to which we can successfully intervene in the world around us. Coupled to each other, humans and non-humans form an « associated milieu » that is fully individualised and conditions itself through a multiplicity of recursive processes and feedback loops. Humans may appear as servants of the machine, but in so far as their integration into the machine is in the last instance effectuated by humans who understand how machines function, posthumanists advise us to conceive of machines as « associates » of humans and humans as the « shepherds » of the machines. It is only if we accept to become mediators and partners (or interpreters) of machines rather than dominators (and legislators) that we can move beyond humanism and thus, presumably, also beyond alienation. The « mediocracy » (Debray), or the rule of the mediations, which appears to the posthumanist as the end of alienation, appears to the humanist as its radicalisation, an ominous intimation of the end of the human.

## 4. Machinic heterogenesis

From its origins, the human has been « fabricated » by technical evolution. Although technogenesis significantly relativises the place of humans in the greater scheme of things, it still has not broken completely with the anthropocentric mode of thinking. This only happens when we give up our ingrained resistance to fluxes of becoming and accept the experimental production of creative ontologies in which all the boundaries between the human, the animal and the material are wilfully transgressed, pragmatically blurred and finally overcome. Rejecting the distinction

between the trans-human and the inhuman as a mere survival of « old European thought » (Luhmann), contemporary neo-Nietzschean anti-humanism gives priority to the becoming of Life and seeks to conceptualise the death of Man free of anthropocentric conceits. « Man exists only to be overcome. What have you done to overcome him ? » (Nietzsche, 1988 : 14).

*Rhizomatic Becoming(s)*

The most radical and influential attempt to theorise the posthuman condition in non-anthropocentric terms has been « composed » as an esoteric, vitalist, orgiastic, vibrating « machinic opera » by Gilles Deleuze, a philosopher, and Félix Guattari, a practising psychoanalyst and lifelong political activist, in *A Thousand Plateaus* (Deleuze and Guattari, 1980)[31]. The thousand plateaus of the vitalists do not form a mountain, but open up a thousand ways that, unlike those of Heidegger, lead everywhere. Displacing the « question concerning technology » by the « question concerning the machine », Deleuze and Guattari present the genesis of the human not only as a techno-genesis, but – extending and radicalising it, dissolving *anthropos* into *bios* – equally as a « bio-techno-genesis » (Ansell Pearson, 1997 : 124), that is as a machinic production that plunges the human species back into the magma of the becoming of life.

The machinic conception of evolution conceives the human as a component of a heterogeneous assemblage that cuts across all lineages of different kinds and rearranges them in « monstrous couplings » and « anomalous becomings ». To the extent that the technological approach still suggests that the machine is a complex tool and thus an extension or exteriorisation of the human that fabricates the human, it still maintains the idea of human evolution. The machinic approach is, however, more radical. It replaces the idea of evolution with the idea of « involution » (Deleuze and Guattari, 1980 : 292), understood not as a form of regression, but as a « creative evolution » that brings heterogeneous populations into symbiosis, creating thereby « counter-natural alliances » between different species, such as the

31. The terminology of Deleuze and Guattari is esoteric and makes understanding difficult for the non-initiated. On the very first page of the book, the book itself is presented as a machinic assemblage or *agencement* : « In a book, as in all things, there are lines of articulation or segmentarity, strata and territories, but also lines of flight, movements of deterritorialisation and destratification. Comparative rates of flow on these lines produce rates of relative slowness and viscosity, or on the contrary, of acceleration and rupture. All this, lines and measurable speeds, constitutes an assemblage » (Deleuze and Guattari, 1980 : 9-10). This seems obscure but, funnily enough, it is by reading faster rather than slower that Deleuzian texts slowly start to make sense.

monkey and the human or the wasp and the orchid, to take Deleuze and Guattari's favourite example[32].

Moving away from the genealogical or syntagmatic conception of evolution, which is represented by the model of the tree or the root, it allows for a « rhizomatic » becoming whereby humans can creatively-destructively enter into the most monstrous of couplings with Gods, humans, animals, plants, things, tools, machines, etc. Although a rhizome can grow on roots, it is not a root itself, but a subterranean stem or underground sprout, such as a bulb or a tuber, with multiple branching roots and shoots that go off and proliferate in all directions, break off at a certain point and form a rhizome with other offshoots or something else – « with the wind, an animal, human beings » (Deleuze and Guattari, 1980 : 18)[33]. A rhizome is a network in which each and every point can in principle be connected, one way or another, with any another point[34]. By entering into « transversal communication » with different lines of descent, rhizomatic offshoots scramble the genealogical trees. Unlike the model of the tree, which reduces the multiplicity to the One, the rhizome eliminates every possible reference to a possible substance or substantive, synthesis or dialectics that leads back to the One in order to stimulate the proliferation of the Multiple and celebrate the virulence of Life. Multiplicity is more than a matter of logic, however. It is something one must make or do : « le multiple, *il faut le faire* » (Deleuze and Guattari, 1980 : 13)[35]. We must always make connections, ever more connections, between points, offshoots and lines of flight and, since they are not given, cross the boundaries and experimentally realise other possibilities than the ones that are given. As the rhizome grows and proliferates by making

32. Deleuze and Guattari (1972 : 47, 339, 385 ; 1980 : 20, 89, 360) have furtively borrowed the example of the unnatural coupling of the wasp and the orchid from Darwin. The wasp is an integral part of the orchid's reproductive system and morphology. The wasp uses the orchid for food whereas the orchid uses the wasp for fertilisation.

33. Although the image of the rhizome comes from the vegetal kingdom, colonies of ants offer perhaps a better example : « A rhizome may be broken, shattered at a given spot, but it will start up again on one of its old lines, or new lines. You can never get rid of ants because they form an animal rhizome that can rebound time and again after most of it has been destroyed » (Deleuze and Guattari, 1980 : 16).

34. A rhizome is a network : «In a network there always exists at least one way from one given point to another one, or from one given point to any other point ; quite often, to many points ; at the limit, to all the points» (Serres, 1974 : 27).

35. The connection between Latour and Deleuze is direct. Faint echoes and after-images of Deleuze and Guattari's pragmatism can be found in John Law's Franco-British translations of actor-network theory : « Perhaps there's nothing than stories performing themselves and seeking to make connections, practical and local connections, specific links. In which case ? In which case we are no longer in the business of epistemology. […] Instead we are the business of creating links, of making them, of bringing them more or less successfully into being. […] We are in the business of ontology » (Law, 1997 : 8-9).

always new connections, it becomes more complex, always more complex, and transgresses all the boundaries, until there is only one single, but always expanding and deterritorialising machinic flux or phylum of unformed materiality that fills the entire space with the most disparate things and, finally, covers the whole earth.

*The Plane of Immanence*

The machinic assemblage that is always in the making, always becoming, is a potentially infinite open system. It knows no limits and no boundaries. Without temporal or spatial limits, it transgresses the boundaries between the ontological regions and levels all that exists to a single ontological plane, the so-called « plane of immanence » or « plane of nature » (Deleuze, 1981 : 164-175) – though nature has nothing to do with it as it eschews all distinctions between natural and artificial kinds and includes bodies, souls and things. Opposed to the plane of transcendence, in which the multiplicity is always captured and organised by a hidden subject, form or force that cannot be seen, but that has to be inferred, deduced or transduced from the given, the common plane of immanence has no supplementary or « intransitive » dimension. There's no depth, only a surface ; there's nothing hidden, no God, no Master, no Man, no Plan that steers and organises from above the becoming of world[36]. On the one-dimensional plane of immanence, there is no dialectical synthesis of heterogeneous and disparate elements ; there's only, as Leibniz said, the becoming of « a continuous becoming like an ocean » (Serres, 1972 : 10), the division of which into Ethiopian, Caledonian or any other sea is arbitrary[37]. Everything is loosely connected with everything into a heterogeneous assemblage of sorts and immediately given, levelled, reduced to relations of speed :

> *In any case, there is pure plane of immanence upon which everything is given, upon which unformed elements and materials dance that are distinguished from one another only by their speed and that enter into that individuated arrangement depending on their connections, their relations of movement. A fixed plane of*

36. The radical empiricism of Deleuze and the critical realism of Bhaskar form the extremities of the epistemo-ontological continuum. Whereas Deleuze aims to systematically destroy any and every transcendence in the bud, even to the point of evacuating the possible emergence of a collective, Bhaskar (2000) has recently added a supplementary transcendental turn to his dialectical critical realism and introduced God as the real, total and enduring ultimatum of reality. Subsequently, he left England and disappeared to India.

37. Although Deleuze has found the model and the inspiration for his plane of immanence as heterogeneous space of becoming through continuous variation in Spinoza (Deleuze, 1981), one might as well follow Michel Serres (1968, 1974) and conceptualise it in the Leibnizian tradition as a « topological-energetic space ».

> *life upon which everything stirs, slows down or accelerates* (Deleuze and Guattari, 1980 : 312).

Speed and slowness do not refer to quantitative degrees of movement, however, but to qualitatively different types of movements of bodies through space, to two different ways of making space, namely the geometrical way and the topological-energetic one. Whereas the former analytically carves up space and organises it by means of walls, pillars and closings, the latter opens up space and performs it as it follows the flux of unformed materiality that moves along rhizomatically, shooting off in all directions, making connections, "occupying or filling a smooth space in the manner of a vortex, with the possibility of springing up at any point" (Deleuze and Guattari, 1980 : 473).

Whatever it is that moves on the plane of immanence, it is taken up in the vortex of becoming and consummated by it. Whatever enters in the energetic flux is dissolved into a « dance of unformed elements and materials ». The becoming of life that dissolves all forms of being into a pure magma of energetic, immaterial forces, this cosmic soup of free-floating sub-molecular, subatomic particles out of which organisms and beings emerge and in which they are sunk, this is the ultimate reality[38].

On the plane of immanence, there's life – just as we say that there is water or sand – and all beings, without distinction, partake of it. Life knows no distinctions or boundaries between genera, species, subjects, substances or organs. As it flows underneath, above, in and through everything and everywhere, it « disindividuates », disintegrates and annihilates all beings and all entities into an anonymous flux of becoming. Needless to say that, swamped by life, the human also disappears – « like a face in the sand at the edge of the sea » – in this orgiastic night of becoming[39].

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38. Deleuze and Guattari's phenomenology of life has clear affinities with the Buddhist view of the world : « Solitude, meditation, desiring contemplation pushed to its term and the loss of individuation to the profit of cosmic arrangements all lead to a paradoxical conjunction of individuated hypersubjectivation and radical abandonment of the subject to collective arrangements » (Guattari, 1977 : 327). For a phenomenological analysis of the dissolution of reality in Theravada Buddhism, see my « Uncartesian Meditations on the Phenomenology of the Nostril » (Vandenberghe, 2002c).

39. Having lost the boundaries that separate persons, animals and things, individuals are no longer conceived of as indivisible, bounded units, but as « dividuals » (Deleuze, 1990 : 244) that absorb or transmit heterogeneous material influences, reproducing thereby the anonymous flux from which they originated and to which they revert.

*Homo homini parasitus*

This vitalist « ontology of the annihilation of beings » (Foucault, 1966 : 291) forms the background of the bio-philosophy of « germinal » or « viroid » life that is put forward in the « Becoming-Animal » Plateau of the book[40]. Like Othello, Deleuze and Guattari would be only too happy to « change humanity with a Baboon ». Breaking with the evolutionist models of descent, they conceptualise the becoming-animal (vegetal, mineral, etc.) of the human as a becoming « anomal », that is anomalous and monstrous, through a machinic process whereby the human enters into symbiosis with heterogeneous populations. In biology symbiosis refers to the process whereby genetic material is transmitted between populations of different species, such as baboon and cat or wasp and orchid for example, through bacterial contamination and viral infection, *and not* through sex.

> *Propagation by epidemic, by contagion, has nothing to do with filiation by heredity. The vampire does not filiate, it infects. The difference is that contagion and epidemic involve terms that are entirely heterogeneous : for example, a human being, an animal, a bacterium, a virus, a molecule, a microorganism* (Deleuze and Guattari, 1980 : 295).

Symbiotic exchange through infection, contagion, mutation or genetic drift does not happen at the « molar level » of the organism or the species but underneath it, at the « molecular level » of the bacterial microorganisms (microbe, virus, bacillus, worm, phagocyte) that enter the organism and spread from within as they mingle with the microorganisms of the host. The lesson that Deleuze and Guattari have to teach us is ultimately a filthy one : « The human is an integrated colony of amoeboid beings, just as these amoeboid beings (prococtists) are integrated colonies of bacteria. Like it or not, our origins are in slime » (Ansell Pearson, 1997 : 124). Dust to dust, slime to slime, the *Homo sapiens* dissolvesinto a sticky substance and, degraded and debased, the species regresses to the sorry state of the *parasitus sapiens* (Serres, 1980b : 143).

Feeding onto each other, growing on and into each other, the symbiotic populations transgress the boundaries and form heterogeneous « blocks » of machinic becoming through a cascade of super-molecular differentiations. Those blocks are not simply hybrids. Whereas hybridisation brings together elements that are pure and uncontaminated before they are mixed, machinic symbiosis infects and fuses

40. For a comprehensive exploration of the biophilosophical aspects of Deleuze and Guattari's vitalism, see Ansell Pearson (1997, 1999). In his *User's Guide to Capitalism and Schizophrenia*, Massumi (1992 : 93-141) covers the same ground, but is more inspired by the recent developments in physics than in biology.

them in a new living synthesis that ignores the ontological boundaries to such extent that it becomes hard to say who is the host and who is the parasite. In symbiotic becoming, the distinction between the inside and the outside is fluid. This holds not only for the heterogenous organisms, but also for their relation with the environment. Both are linked through a porous intermediary environment, such as the membrane, that mediates between them. The opposition between the organism and the environment is dissolved into a hetero-genetic flow that relates the organism and the environment, co-constructing both at the same time. « An animal, a thing can thus never be separated from its relations with the environment : the interior is only a selected exterior, the exterior, a projected interior » (Deleuze, 1981 : 168). But if the organism « selects » its environment, rather then the other way round, if the organism does not adapt to the environment, but creates its environment by « deterritorialising [fluidifying] itself with respect to the exterior and reterritorialising [reorganising] itself with respect to its internal environment » (Deleuze and Guattari, 1980 : 71), then we are done with the principles of Darwinian evolution.

In terms of systems theory, one would say that machinic organisms are self-organising, self-regulating or autopoietic systems. Using the reflexive lingo of contemporary « radical constructivism », we can define autopoietic systems as systems that produce and maintain themselves by producing out of the elements of which they are composed the elements of which they are composed[41]. Autopoietic systems are by definition self-referentially or organisationally closed systems. They recursively constitute the elements of which they are made up by circular reference to their own self-reproduction as autonomous systems of communications. Paradoxically, this self-closure of the system is a precondition for its opening to the environment. Concretely, this means that as an autonomous and self-determining unity, the system can only react to the « provocations » of the environment in accordance with its own mode of operation. The environment cannot influence the system directly but only indirectly in so far as the self-referentially closed system opens itself up to the environment and allows it from within to selectively influence the system from without. In other words, the system can only communicate about the environment within itself. It cannot communicate with the environment without disintegrating.

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41. Like a train can hide another train, a constructivism can hide another one. Unlike the empiricist constructivism of the fourth wave of the sociology of science (after Mannheim, Merton and the Strong Programme) and the linguistic deconstructivism of third wave feminism, the radical constructivism of the second order cybernetics, neurologists, biologists, anthropologists and sociologists like von Foerster, Maturana, Varela, Bateson, Morin and Luhmann is a non-reductionist theory of cognition that analyses the construction of reality as a reflexive, self-organising and self-referential construction of the experience of reality. On radical constructivism, see (Schmidt, 1991). In the following I borrow a few passages from my obituary on Luhmann (Vandenberghe, 1999b).

On this crucial point, machinic heterogenesis differs from autopoiesis (Ansell Pearson, 1997 : 140-142 ; 1999 : 168-170). Less concerned with the maintenance of their own stability, machinic assemblages do not maintain the organisation of their structure invariant. As they cross techno-ontological thresholds between regions, they enter into a genuinely dynamic, open and transgressive relation with their environments, which are after all not that different from what they are, and allow for the punctual emergence of flexible, mutable, variable modes of organisation. At this point, where the « necessary disequilibrium and far-from equilibrium conditions » (Kauffman) required for a truly creative model of evolution are introduced into the system, machinic autopoiesis mutates into machinic heterogenesis, creating order out of chaos, islands out of a sea[42].

## 5. Intermezzo : Living Machines

Schematically speaking, we can conceive of technological development through the ages – « from prehistory to ballistic missiles » (Latour and Lemonnier, 1994) – in terms of a quatriphasic process of exteriorisation or objectivation of the human capacities, activities and organs in machinic organisms that « liberate », ameliorate and « unballast » the human capacities, activities and organs. In the first phase, the organ is removed from the body and exteriorised in the tool, while manual and intellectual work is still being done by the human. In the second phase, the physical force of the human is objectivated in the machine that now works for and in place of the human. In the third phase, it is not just the physical force that is exteriorised in the machine. With the automatisation of the machines, the psychic capacities and activities of the human are also unballasted as the functions of the brain (consciousness, computation, decision) are exteriorised and incorporated in the machine. In the fourth phase, the integration of machines into a living whole, life as such is finally exteriorised into a complex an-organic living organ.

Since the natural sciences, technology and the capitalist system of industrial production have become systematically coupled in the late eighteenth century, the pace and the reach of the correlative process of the humanisation of machines and the machinisation of humans has been accelerated and intensified, first with the industrial revolution and, now, with the post-industrial one, to such an extent that, today, life itself can be explained scientifically and produced technologically. From the hand to the mind to life as such, we see a progressive movement from the internal to the external – and back. As the internal workings of the organism are

42. « Order is an uncommon island. It is an archipelago. Disorder is the common ocean out of which those islands emerge » (Serres, 1977 : back flap).

analysed and properly understood by the sciences, they are exteriorised and constructed by technologies as an artificial organism that functions like a natural one. Arnold Gehlen (1957 : 21) summarises the process in the following terms : « As technology progresses, man brings into unanimated nature a principle of organisation that is already operative inside the organism at multiple locations ». What the sciences can theoretically conceive of is now on the verge of being artificially conceived and technologically produced as a living system, whether this system is a virtual organism (artificial life), a virtual mind (artificial intelligence), or a mixture of both (cyborg). Cyber- and biotechnologies converge asymptotically in the « rewriting » of the human code[43].

From this perspective, the postmodern infatuation with complexity theory does not so much represent a break with cybernetics as its ominous continuation as a thermo-dynamics of the umpteenth generation. Symbiosis may have appeared at first as a clear break with the determinism of the grand narrative of DNA but, today, the living organism is understood as a hyper-complex open system, regulated by a thermodynamics of open systems that can be described, at least in simple cases, as « a mathematical model, as a system of differential equations that represent the functioning of the cells whose limit-conditions would precisely describe the state of the boundaries, of the limits at the level under consideration » (Serres, 1972 : 265). In the meantime powerful computer programmes have been developed that are able to simulate the evolution of life (Hayles, 1999 : 222-246)[44]. Through recursive looping of the computing operations, small deviations become quickly magnified, leading to complex interactions that generate unpredictable evolutions. In such a synthesis of artificial life, the becoming of life over a couple of millions of generations is effectively replicated in the span of a few days by intelligent machines.

It is true that cybertechnologies abstract from the body and reduce the human to an intelligent machine that processes information, but when the biological sciences reduce in turn the human body, or better the DNA, to a complex string of information that can be cybernetically decoded, recoded and recombined[45], then it

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43. For a history of the developments of biotechnology that analyses the integration of informatics, biologics and economics, see Haraway, 1997 : 49-101 and 244-265.

44. It may be of interest to note that the programs that simulate the evolutionary process use symbiosis to introduce mutations : « Among the mutants were parasites that had lost their own copying instructions but developed the ability to invade a host and hijack its copying procedure. […] Later runs of the programme saw the development of hyperparasites […] Hyperparasites wait for parasites to invade them » (Hayles, 1999 : 227).

45. Joshua Lederberg, Nobel prize winner and participant of the famous Ciba-Symposion on the Future of Man, soberly redescribed the human in terms of a sequence of paired nucleotides : « Now we can define man. Genotypically at least, he is six feet of a particular molecular sequence of carbon, hydrogen, oxygen, nitrogen and phosphorous atoms – the

is not clear how complexity theory can help the human to escape unscathed from the digital pincer movement that reduces everything to the bits and bytes of the barcode. The universality of cybernetics realises the project of the *mathesis universalis* (Leibniz). When everything, life included, can potentially be levelled and reduced to information and the communication of modularised information – « gene = information » – the effective techno-industrial realisation of the one-dimensional plane of immanence may be just around the corner.

Inscribing every phenomenon and every event that cybernetics describes as a transitory moment of a global moment of « trans-lation », everything can be « trans-formed » into anything else, according to some algorithm. « In principle, there's no naturally occurring genome that cannot be experimentally redesigned » (Haraway, 1997 : 246). In theory, theory becomes virtually practical. Cybernetics is not just produced as a universal theory and epistemology, but also and already as a universal praxis, technè and technology. When scientific mastery is immediately coupled to the virtual mastery of its application, « theory does no longer disclose anything (épistémè), but makes virtually everything (technè) » (Freitag, 2002 : 291).

In spite of all the hype about genetic engineering and genetic therapies, one should, however, note that the biosciences do not really know how genes really function or how to explain their causal connection with illnesses. All they know is what the right and what the wrong sequences of nucleotides are, and how the genotypical variation is correlated with the phenotypical one. Wilfully confounding statistical correlation with causal explanation, they logically and pragmatically conclude that the wrong sequences have to be replaced by the right ones and, leaving aside all so-called epigenetic factors (that is everything besides the genes) as well as the complex interactions between genes, they simply explain the illness in terms of a wrong sequence of nucleotides. From the perspective of critical realism, which considers that an explanation is only given when the « constant conjunction » (Hume) between genotype and phenotype is explained by a generative mechanism that actually produces the conjunction in question, the market driven search for applications of molecular biology, in the form of genetic tests and therapies, can be interpreted as a practical strategy that aims to hide the deep theoretical and moral crisis of the new discipline of genomics.

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length of DNA tightly coiled in the nucleus of his provenient egg and in the nucleus of every adult cell, 5 thousand million paired nucleotide units long » (Lederberg, 1963 : 263-264). Given that all genetic information is located in the nucleus of the cell and that the technique of recombinant DNA aims to alter or, in the case of cloning, to fix the genetic material that is contained in the nucleus, Hans Jonas (1987 : 102, 171, 207) has proposed to rename molecular biology – in analogy with nuclear physics – as « nuclear biology ».

*The Order of Things*

In his theory of translation, which has obviously inspired Latour and Woolgar's brilliant ethno-philosophical analysis of the laboratory life at the Salk institute in California, Michel Serres (1974 : 15-72), the French philosopher who translates science into poetry and poetry into science, presents a Leibnizian analysis of genetics as a progressive translation of the idea of biological generation into a calculus of bio-chemical reproduction. On the one hand, there are qualitative, observable phenotypical differences between living beings ; on the other hand, there is an underlying, invisible genotypical code made up of letters, ciphers and characters. The passage or translation between the visible and the readable characters – *le visible et le lisible* – is effectuated when the phenomenal variety between the living beings is projected onto a single topological-energetic plane and deciphered as a continuous variation of the DNA code through differential combination of the biochemical letters of which it is made up. « The history of genetics consists of a slow passage from the reproduction of animals to the production of texts » (Serres, 1974 : 20). Combining identity with difference into a heterogeneous network of relations between words and things that is able to explain the generation of the phenomenal variety of organs and organisms, including the most anomalous ones, in terms of the infinite possibility of combinations of the code, contemporary biology finds the traces of its code everywhere, precisely because it decodes the totality of nature by projecting the variations of its code onto a stable referent. « When the reference is a plan, and the plan a collection of projected traces, every decomposition (découpage) of the real is like a book : Notification of the resolution of things into words, of the predominance of language » (Serres, 1977 : 28)[46].

If the world of yesterday was a text, the world of today and tomorrow is a hypertext. Thanks to hyperlinks, texts can be interconnected so as to form one single, giant hypertext that is continuously evolving and expanding without any foreseeable limits (Lévy, 1998 : 33-48). With the hypertext, there is no longer a text,

46. Extending the metaphor of the text, a popularising textbook on the genome describes the latter as a book : «Imagine that the genome is a book. There are twenty three chapters, called chromosomes. Each chapter contains several thousand stories, called genes. Each story is made up of paragraphs, called exons, which are interrupted by advertisements called introns. Each paragraph is made up of words, called codons. Each word is written in letters, called bases » (Ridley, 2000 :7). In passing, I note that the preceding quotation of Michel Serres does not come from a text on biology, but from a text on the episteme of the sciences of the nineteenth century. Given that the episteme of the classic epoch is written like a language and that all the sciences of the Encyclopaedia can be translated in the universal language of structuralism, the language of biology represents only an example of a more general case that characterises all the sciences, and, *pace* Foucault, not just the sciences of economics, linguistics and life.

but only text, just as we say that that there's water or sand. The page we see on the screen of our computer is not really a text, but a small window that gives us a view on (but never an overview of) a potentially endless reserve of text. The hypertext is a rhizome in which « any point can be and should be connected with any other point » (Deleuze and Guattari, 1980 : 13). Paraphrasing the topological language of complexity theory, we could say that the hypertext is a complex network of overlapping and interconnected ways and roads that meet in nodes, at the summit or at the crossroads where they bifurcate again and go off in multiple directions. Given that any point or summit is virtually connected with any other point or summit in the network, « there are as many ways as one wants to go from one summit to the other, or at least a very large number, as long as the number of summits is finite » (Serres, 1968 : 12). The network is thus a « crumpled space » that can be folded, unfolded and refolded like a handkerchief. The global network itself is, in turn, made up of local networks of overlapping and interconnected ways that coexist in the network and interfere in complex ways with one another[47]. Although the way to the summit cannot be predicted in a network of networks of overlapping and interconnected ways, the movement through space can very well be followed and traced mathematically, graphically and topographically on the plane of immanence. One way or many, the progression to the summits can easily be traced and recoded in the binary terms of informatics. Life itself is nothing but a network, nothing but a hypertext, nothing but a micro-bacterial flux that can be traced and captured by the informatics of life. Nature is a hypertext and so is life itself. Scientifically understood, it can now be technologically rewritten. Four hundred years after Galilei famously pronounced that nature is written in the language of mathematics, the sciences of biology and communication are integrated into a unified cybernetic science of information that translates the totality of the world, life included, into a digital code, the code of the « informatics of domination » (Haraway, 1991 : 161-167) that underlies the rewriting of nature by the cyber- and biotechnologies of late industrial capitalism[48].

47. To make things even more complex, reflexive and fluid : the description of the network is itself a network, with the result that it becomes undecidable if the hypertext of the network offers a complex description of the network, or a recursive projection of the network on a complex state of affairs. For a description of the history of mathematics in terms of networks, bifurcations, ways, etc. see (Serres, 1968 : 78-112).

48. All too often Harawayan feminists read the stories of chimponaut Ham, black woman Sojourner Truth and other Trickster figures of the cyborg in typical post-modern fashion as little stories about the proliferation of hyphenated or hybrid identities that help us to deconstruct the binary sexist and racist fixations of modernity. What they tend to oversee in their deconstructive readings of the micro-narratives is the grand socialist and sociological narrative about the informatics of power that undergirds those stories and gives them their radical and critical edge.

*Mechanology as Vitalist Technology*

Cybernetics teaches us that the organism is a living, self-organising system that reproduces itself (like a dictionary) through the self-referential production of the elements (words) out of which it is made up. But if the organism functions as a self-organising system, then the converse is also true : The self-organising system functions like an organism. It follows, not so much logically as *technologically*, that the scientific analysis of life can thus also become the template for the technological production of artificial systems as living systems, with the result that the age-old dividing line between mechanism and vitalism, technology and biology simply vanishes. When the Kantian formulation of the distinction between machine and organism is effectively overcome, the production of a vitalist technology or « mechanology » (Simondon) becomes possible – as a preamble and propaedeutics to a mechanological sociology and a machinic society ?

From a mechanological perspective, technology progresses and becomes progressively more « concrete » as its starts to function as an artificial organism that has successfully integrated the organs into a self-organising whole. The concrete technical object is in symbiosis with its environment. It has not only attained an internal coherence through the relative closure that allows for the recursivity of the internal operations as well as the circularity of causes and effects, but, by incorporating a part of the environment as an « associated environment », it has also transformed it into a condition of its own functioning, integrating it thus as part of a self-organising system of causes and effects. « Through technical concretisation, the object that was at first artificial becomes more and more like a natural object » (Simondon, 1969 : 46). Although the machinery functions like an organism that is in symbiosis with its environment – humans and the other machines with which it is interlinked – so as to form as single smoothly functioning machine, the symbiotic integration of the system and its environment can obviously not be accomplished by the machines themselves. On this point, cybernetics is plainly wrong. Reducing the system to an organism, it forgets that this reduction presupposes the intervention of the human to integrate the humans and the non-humans and harmonise them in a self-regulating machinery :

> *Self-regulating machines need the human as a technician, i.e. as an associate.* […] *This aspect of self-regulation through which the environment in its totality has to be taken into account cannot be accomplished by the machine on its own, however perfectly automated.* […] *There's something living in a technical whole and the function of the integration of life can only be secured by human beings* (Simondon, 1969 :125).

Thanks to the technical intervention of human beings, the ontological hiatus between life and mechanism, and thus also between human and machine, can be finally and successfully overcome in a living, self-regulating machine in which humans and machines are symbiotically integrated. That human beings can intervene in the functioning of the machine to functionally integrate themselves as one of its technical elements among others, raises, of course, the question of the identity of the human beings that intervene in the process as mediators. Who educates the educators ? Who mediates the mediators ? And how can we be sure that the mediators of the machine are not themselves mediated by a meta-system and integrated into a mega-system as one of its living parts ? After all, the essence of technology is nothing technological in itself. A machine is always social before it is technical, even if the social is invariably co-constructed by the technological. The windmill may well be linked to the feudal society but the windmill does no more produce the feudal society than the steam machine produces the industrial society or the computer the post-industrial one. Technological determinism is the ideology of technocracy, and technocracy is anti-democracy. What a machine is and what is does to humans, depends on the humans that make it. But what they make and why they make it depends in turn on the social machinery in which they are integrated. And today the social machine in which they are integrated is the capitalist mega-machine. To understand it and to understand what it does to humans, we now turn to an analysis of global neo-capitalism that produces the producers, the consumers, and life itself as a commodity.

## 6. Capitalism and the Machinic Production of Life

« One day, perhaps, the century will be Deleuzian » (Foucault, 1994a, II : 76). What was supposed to be an anti-platonic compliment by Foucault to his friend and philosophical companion can be interpreted with hindsight as a sociological statement about the state of the world. Continuing and radicalising the global trend of the late modern capitalism of the twentieth century, everything seems to indicate that the twenty-first century will not be spiritual and dialectical, but empiricist and materialist, pragmatic and performative, heterogeneous and machinic, chaosmotic and rhizomatic, hyper-complex and hyper-capitalist. The magic formula of the becoming without end : « pluralism = monism » (Deleuze and Guattari, 1980 : 31) that the anti-capitalist schizoids were searching for on a thousand plateaus has been found, and is almost realised, on a global scale and a single plane by contemporary neo-imperial capitalism. The machinic phylum that animates capitalism and flows through its unified body without organs is money. Money is always in flux and never rests. It is, as Simmel says in the analytic part of his unsurpassed vitalist *Philosophy of Money* (Simmel, 1989), the objectivation of economic circulation in a symbol

without substance that represents all possible goods and that, by substituting itself to them, speeds up the circulation of goods. Flowing through the subsystems of society, invading them from underneath, undermining them from within, money is the blood that flows through the veins of capitalism and unifies the subsystems into the single market of the integrated world-system of the world-economy (Braudel's *économie-monde*). Capital itself is a vampire : « Capital is dead labour which, like a vampire, only becomes alive by sucking out living labour, and the more it sucks, the more it is lively » (Marx, 1968 : 247). Marx had obviously understood the internal connection between labour and capital and predicted its enlarged reproduction on a global scale, but fixed as he was on the category of work, he could not foresee and work out that production would become post-industrial and that capital could exist and reproduce itself without labour (Vandenberghe, 2002b). But capitalism is inventive and productive ; to capitalise, it progressively leaves the factory and invades, like a parasite, all spheres of life and the life-world itself. At the end, it ends up producing and consuming life itself.

The basic principle of rhizomatic sociology is that society is always *en fuite*, always leaking and fleeing, and may be understood in terms of the manner in which it deals with its *lignes de fuite*, or lines of flight. There is always something that flees and escapes the system, something that is not controllable, or at least not yet controlled. With their machinic analysis of becoming, Deleuze and Guattari want to encourage leakages and « cause a run off – *faire fuire* – as when you drill a hole in the pipe or open up the abscess » (Guattari, 1977 : 120 ; Deleuze and Guattari, 1980 : 249 ; Deleuze, 1990 : 32). The intention is obviously anti-systemic : draining the system, digging holes, continuing the work of the old mole. Yet, today, the capitalistic system itself thrives on anti-systematicity and « artificial negativity » (Adorno). It explores and anticipates the deterritorialising lines of flight to capture them from without, enter into symbiosis with them, and redirects them from within, like a parasite, towards its own ends. Capitalism is inventive ; its creativity knows no limits, « it is of the viral type » (Deleuze and Guattari, 1980 : 580).

Deleuze and Guattari put their anticapitalist hopes in the guerrilla tactics of the schizoid minority that refuses to play the game (Marcuse's *nicht mitmachen*) of the self-content majority. Although they know that the squirmishes of the dispersed minority accompany the war machine of the entrepreneurial companies like their « supplement », although they realise that capitalism advances like a war machine that feeds on the lines of flight and have indicated that capitalism knows no internal limits, they nevertheless believed that capitalism would find its logical conclusion in the schizophrenic production of a free flow of desire : « Schizophrenia is the external limit of capitalism itself » (Deleuze et Guattari, 1972 : 292). What they apparently meant by that mad statement is that the final crisis of capitalism would eventually be generated not by the regulation or domestication of capitalism, but by

the complete commodification of the desiring machines that we are. Only by accelerating the decadence of the present system, only through some kind of self-commodification in a consumerist potlatch would the capitalist system be beaten by its own game :

> *Which is the revolutionary path, if there's one ? To withdraw from the world market* […] *in a curious renewal of the « economic solution » of the fascists ? Or might it go in the opposite direction ? To go still further in the movement of the market, of decoding and territorialisation ?* […] *Not withdraw from the process, but going further, « accelerating the process », as Nietzsche said. As a matter of fact, we ain't seen nothing yet* (Deleuze and Guattari, 1972 : 285)[49].

*Deleuze, or The New Spirit of Capitalism*

A quarter of a century later, the process of accumulation has accelerated to the point that capitalism itself has become Deleuzian in form, in style and in content. This junction is not accidental. As usual, an ironic and profoundly perverse relationship exists between the romantic ethic and the spirit of capitalism (Campbell, 1987 : 202-227). Needless to say that I am not claiming that Deleuze's libertarian critique of capitalism was anti-critical or phoney from the beginning, nor that Deleuze is somehow the Giddens of the seventies : a neo-liberal disguised as a libertarian, or Thatcher on LSD. What I am claiming is that capitalism has progressively integrated the critique of capitalism into its mode of functioning, with the result that capitalism appears stronger than ever, whereas the critique of capitalism seems rather disarmed.

In their analysis of the new spirit of capitalism, Boltanski and Chiapello (1999) have brilliantly demonstrated that capitalism has co-opted the postmodernising critique of the 1960's and 70's and used it as a way to reorganise itself and expand infinitely. The industrially organised capitalism of the « golden thirties » (1945-1973) was essentially Fordist. Bureaucratic, hierarchical, pyramidal and centrally controlled, planned and taylorised, oriented to the mass production of standardised goods, it was elephantine, rigid and alienating. Although the neo-corporatist arrangement between the state, the employers and the unions guaranteed an amount of

49. This is not an aberration, but a reiteration, as if we would get to the truth if only we would keep on lying through our teeth : « There has never been a struggle against the society of consumption, this idiotic notion. To the contrary, we say that there has never been enough consumption » (Deleuze, 1990 : 32).

job security of which only French civil servants can dream today, the relative job security hardly compensated for the employees' lack of autonomy. Attacking the dehumanising and disciplining, massifying and standardising nature of the « capitalist-bureaucratic-technical-totalitarian society of planned exploitation and directed consumption » (Lefebvre) in the name of spontaneity, creativity and authenticity, the libertarian left took over the « artistic critique » of capitalism of the bohemians and translated their grievances in a language that was inspired by surrealism and the masters of suspicion (Marx, Freud and Nietzsche).

At first, the capitalists reacted to the « artistic critique » of the *soixante huitards* in a traditional way. They negotiated with the unions about « quantitative demands » and granted a pay-rise, but realising that the critique did not abate in spite of the concessions, they opened discussions with the unions about the « qualitative demands » and started introducing changes in the workplace to solve the motivational crisis among the ranks of the disenchanted workers. « Measures that aim to alleviate the hierarchical control and to take the "potential" of the individuals into account are substituted to measures that aim to give more security to the workers. Through this change of politics, autonomy was somehow exchanged against security » (Boltanski and Chiapello, 1999 : 274).

In the wake of the crisis of accumulation of the 1970's, the capitalists proceeded to a neo-liberal reinterpretation of the libertarian critique of capitalism of the radical left. Transforming the cultural contradiction into a sociological compatibility, they progressively introduced more and more flexibility in the organisation via the application of market principles (Vandenberghe, 1999a). The old bureaucratic elephant of Fordism started to dance to the neo-liberal tune, but the *mahouts* had to hold on firmly if they didn't want to loose their jobs. As the fordist regime of accumulation was supplanted by the post-fordist regime of « flexible accumulation », the organisation became not only « leaner » (decentralisation of management, flattening of the pyramid, flexible specialisation and orientation to niche-markets, rotation of tasks, life-long learning, outsourcing and subcontracting, etc.), it also became « meaner ». The principles of the market were progressively introduced in the organisation, unions were sidelined, wages were individualised, contracts liberalised and labour time flexibilised, with the result that, thirty years later, the individualised, casualised and contractualised flexiworker is confronted with insecurity and delivered to a completely restructured, radically flexibilised labour market on which she has not only to sell her labour force, but also her personality, herself and ultimately perhaps also her soul.

Disorganising time as well as the career-track, flexible capitalism does not only apply the JIT (or just-in-time) approach to the punctual delivery of goods, but also

to the workers and management itself. Conceived as some kind of « standing reserve » that can be hired and fired at will, managers and workers alike have to become flexible, adaptable and multi-skilled, disposable, and at the disposition of a new employer, available and « at hand », ready for the spot market and ready to seize any job that might improve their situation. The emphasis that is put on adaptability and availability for the market transforms the worker into a performing « net-worker », that is into an agent that behaves strategically and constantly looks out for opportunities to enhance his social capital by making connections, always more connections, on which he can market his human capital, his connections and his personality. The good net-worker who treats his – or her – person as a marketable asset is a master in self-presentation and decorum. Promising to give herself entirely in any project, she remains in fact unattached to the job and to herself in order to remain at the disposition for any other project that might come up. Redefining herself as the opportunity may require, the net-worker treats her personality as a mask, reverting thereby to the original meaning of the term *persona* as the-one-who-speaks-through-the-mask.

Coincidence or not, the fact that the identity of the net-worker is variable and performed in and through the relations that she enters into chimes in all to well with the contemporary discourses on performativity, mobility, fluidity, complexity, topology, relations, networks, performances, displacements, multiple selves, etc. that follow the « postmodern flip » in the human sciences. In the mean time, those fashionable discourses have also been introduced in the « cultural circuit of capitalism » and discovered by the consultant gurus, the hero-managers and the business schools (Thrift, 1999)[50]. Displacing the politics of distribution by a politics of identity, those discourses have started to infiltrate and infect society at large, like a virus. With hindsight, we can now see that the hatred of the collective and transcendence, the pragmatism of connections and the disindividuation of the self that is the trademark of Deleuze & Co. is not accidental, but anticipates, expresses,

50. Under the auspices of the Institute of Santa Fe, complexity theory is simplified and offered as a strategy of innovation to business people. Here's an example of how the idea of the emergent order is sold to the controlling managers who are « living on the edge » : « The suggestions of complexity theory of business practice are a flattening of the management hierarchy, distribution of control through the system with fluid networks of interaction between the parts, and the necessity of periods of chaos for the emergence of appropriate new order. The move towards a more anarchic, spontaneous dynamic is clearly threatening to the controlling managers, but it appears to be the path to creativity and diversification. […] All the participants in this sector of social organisation can then experience a higher quality of life, since they have greater freedom, more opportunities for creative play, and richer interactions – good for them and good for the organisation » (Goodwin, quoted in Thrift, 1999 : 47).

accompanies and helps to perform the net-worker and the network society[51]. Were it not for its celebratory tone, we might even have welcomed Deleuze and Guattari's borderline description of schizophrenia as a more or less adequate expression of the disorganisation of time, the fracturing of life-narratives and the superficiality of relations that characterises the corrosion of character of the net-workers the new economy (Sennett, 1998). As it stands, I am more tempted to see the Deleuze-effect as a syndrome and symptom of a counter-cultural « bad trip », or « the sixties gone toxic », to borrow a phrase from Jameson's (1991 : 117) justly celebrated essay on the cultural logic of late capitalism.

## 7. The Colonisation of the Lifework and Life itself

From a systemic point of view, the flexible rationalisation of the organisation that transforms the worker into a net-worker can best be understood in terms of the generalised global introduction of market principles in the organisation, with the result that the boundaries between the organisation and its environment (markets and other organisations) are eroded and that the relations between the inside and the outside are radically transformed. Decentralisation and segmentation of the organisation itself, autonomisation of its unities and marketisation of their internal relations, increased self-organisation of the unities and of the sub-unities, all those structural transformations that accompany the introduction of the principles of exchange and competition in what was heretofore a hierarchical-bureaucratic organisation effectively convert the organisation into a profitable network of enterprises. When intra-organisational networks are interconnected in inter-organisational networks that cut across sectors and when those start to network and become interconnected on a global scale in a machinic network of sorts, we become the involuntary witnesses of the rhizomatic spreading of networks across sectors and frontiers that marks the passage from the net-work enterprise to the global network society of late capitalism.

Although the spread of networks might appear anarchic at first, it should be noted that the centrifugal process of decentralisation is balanced by a centripetal process of concentration and command. In the archipelago of networks, there is a mainland of power that commands the « decentralised concentration » of capital. In the conclusion of the first volume of his trilogy on the rise of the network society, Manuel Castells notes that the global network is geared to the extraction of profit and framed by a « metanetwork of financial flows » operated by electronic

51. For a general analysis of the many parallels between postmodernism and the more political-economic discourse of neoliberalism, see Ray and Sayer, 1999.

networks : « Networks converge toward a meta-network of capital that integrates capitalists interests at the global level and across sectors and realms of activity » (Castells, 1996 : 506). The virtual integration of regional, national, multinational and trans-national corporations into a global network of networks is not only driven by the introduction of market principles (marketisation as input) ; the thirst for profit is also what drives the expansion of the networks through the globe and triggers the colonising process of universal commodification (commodification as output) that characterises contemporary global capitalism[52].

*Colonisation, Commodification and Alienation*

Unlike the imperial capitalism of yesteryear, which had to expand through space and integrate its non-capitalist environment in a colonial system of exploitation to guarantee the continuous extraction and accumulation of surplus value, contemporary network capitalism no longer colonises the world. It colonises the life-world instead and introduces the calculating and objectifying logic with everyday-life, threatening thereby the communicative structure of society (Habermas, 1981, I : chapter 4). Having progressively integrated the markets of the periphery and the semi-periphery into a single world market, the logic of the market-society progressively invades and colonises the life-world by commodifying culture, the mind, the person and ultimately life itself[53].

Once capitalism has conquered the whole world and covered it with a financial network that eludes control by the states and captures the heterogeneous totality of monetary fluxes, capital starts indeed to operate, as Deleuze and Guattari (1980 : 567) say, as a « general axiomatic of decoded flows » that functions on a single plane. This axiomatic is general, because it trans-values all possible goods into

52. Radin (1996) reminds us that universal commodification is an idealtype that can be understood in a literal or in a metaphoric sense. Although metaphoric commodification sets the scene for literal commodification, I am not interested here in the market rhetoric of a Gary Becker or a Judge Posner who apply the reductionist model of neo-classic economy to the whole world. Conceiving of everything (babies, body parts, etc.) as fungible objects and of every social interaction (love, marriage, even rape) as a market transaction, they know the value of nothing and attribute a price to everything, even where no money changes hands and no real markets are involved – as yet.

53. Habermas's theory of the colonisation of the life-world by the subsystems of the economy and the state was meant as a reformulation of the Frankfurt School's theory of reification in the language of the communicative paradigm. The original formulation did hardly contain a word on colonisation in the strict sense or on colonisation in the broad sense. In fact, it is only as a result of the so-called Sloterdijk-debates on posthumanism that he has analysed the colonisation of life under the heading of « liberal eugenics » (Habermas, 2001a).

commodities and recodes all possible values into determinate prices[54], and it is global, because it deterritorialises the flows and operates in the smooth space of integrated (or better : integrating) world-capitalism. Saying that capital operates as a general and global axiomatic system that functions on the plane of immanence amounts to saying that it rules the whole world and forms an empire that no longer has an outside and that can thus no longer be criticised from without, but only from within, through a subversion of the axiomatics of capital[55]. When the lines of flight are sealed or, what amounts to the same, captured and co-opted by the axiomatics of capital, there is nothing that is not en-framed by capitalism, nothing that escapes the global flows of capital, though that does not mean that there is no alternative. Only that the alternative has to come from within capitalism.

To survive and further expand, capital had to shift from colonisation in the strict sense to colonisation in a more encompassing sense. To overcome its dependency on labour, it had to shift from an extensive to a more intensive form of production and integrate the other spheres of life (communication, cooperation, emotion, desire, etc.) and, ultimately, the production of life itself, into its axiomatics. Indeed, having reached the limits of the exploitation of labour, capital transgresses them and starts exploiting « immaterial labour » (Hardt and Negri, 2000 : 29-30, 290-294), that is intellectual, communicative, symbolic, or emotional labour that produces an immaterial good, such as a service, a brand-name, a soap, care or a smile that may be sold and capitalised on. Echoing the Marxist distinction between the formal and the real subordination of labour under capital – the former mode of extraction of surplus-value operates by means of an extension of the workday, the latter by means of the technological rationalisation of the production process – Deleuze and Guattari conceptualise the extension of the process of the colonisation of the life-world in terms of a distinction between « enslavement by the machine » and « social subjection », a distinction that will get more and more blurred when the machinic production of capital captures the subjects and controls them from within :

> *There is enslavement when human beings themselves are constituent pieces of a machine that they compose among themselves*

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54. *Non olet* – in a more scatological vein, Guattari (1977 : 17) compares the axiomatic reduction of all values to the lowest common denominator to shit : « When I talk about shit, it is hardly a metaphor : Capitalism reduces everything to shit, that is to say to the state of undifferentiated and decoded streams out of which everyone has to take its part in a private mode and with a sense of culpability ».

55. Integrating Marx's analysis of capital with Deleuze and Guattari's analysis of machinic production, Hardt and Negri (2000) have systematically developed a few pages from *A Thousand Plateaus* on the imperial war machine and the axiomatics of capital (cf. Deleuze and Guattari, 1980 : 525-527, 566-568, 584-568, 613-614) into a full blown theory of the global rise and the violent demise of the neo-capitalist Empire.

> *and with other things (animals, tools), under the control and direction of higher unity. But there is subjection when the higher unity constitutes the human being as a subject linked to a new exterior object, which can be an animal, a tool, or even a machine. The human being is no longer a component of the machine but a worker, a user… He is subjected* to *the machine and no longer enslaved* by *the machine* (Deleuze and Guattari, 1980 : 570-571).

Since the machinic production of capital has left the factory and spread to the whole of society, the capitalist machine reproduces itself by producing the subjects that produce and consume the products they have produced. Deleuze and Guattari suggest that the opposition between enslavement and subjection has been overcome. In the cybernetic « human-machine systems » of late capitalism, humans and machines have been coupled through a multiplicity of recursive processes and feedback loops and integrated in some kind of a monstrous, self-regulating global mega-machine that operates on a single plane. Having incorporated the humans as components of its own machinery, they have become the living medium and mediation of the system : « A small amount of subjectification took us away from machinic enslavement, but a large amount brings us back to it » (Deleuze and Guattari, 1980 : 572).

Using language that posthumanists self-consciously avoid, we could say with Adorno (1975, I : 391) that « reification reaches its limits with the reification of men ». When the constraints of the system are no longer imposed on humans from without, but alienation is mediated through them, alienation is intro-jected and reaches its very limits. Overdramatising a bit, we could say that the end of alienation thus coincides asymptotically with the end of Man. Indeed, when enslavement by the machine is no longer opposed to subjection, but both tend to coincide, subjection becomes the mode of alienation. Subjected to a capitalist mega-machine that produces willing subjects, the latter have been fully integrated into a living machine that functions not against their will, their thoughts, their desire, their body, etc., but *through* those.

The capitalist dialectics of subjectification remind us of the rationalist dialectic of enlightenment of Horkheimer and Adorno (1969). Although I have always opposed their bleak depiction of reification and the totally administered world on meta-theoretical and empirical grounds (Vandenberghe, 1997-1998), I must confess that I am slightly afraid that the contemporary conjunction and co-evolution of science, technology and capitalism might well offer a belated confirmation of some of the most radical theses on reification, alienation and commodification that have been propounded by the first generation of the Frankfurt School. To give substance

to my worries, I will show how the general axiomatics of the capitalist war machine are realised and reified through the processes of government of the subject, commodification of experience and the modification of life. Progressively invading the domains of the person, culture and nature in order to control and commodify them, capitalism colonises the life-world and life itself. It not only threatens the communicative infrastructure of the life-world, which is bad enough, but worse, the conjunction and integration of capital, science and technology potentially puts the human race itself at risk and thereby opens, though probably not in the way that the structuralists had expected it, the perspective of the end of the human sciences[56].

*Governing the Self*

Capitalism not only produces objects, but also subjects and subjectivities. To assure the conditions of its own reproduction, it has not only to produce goods and services, but also the producers and consumers of those products and services. Those processes of the production and reproduction do not remain constant however, but are historically variable as Foucault has amply shown in his genealogical studies of the mid-seventies, from *Discipline and Punish* to the *The History of Sexuality*[57]. Analysing the epochal changes in the epistemic, normative and institutional constellations through the ages, Foucault used his study of the changes in the penal regime of the eighteenth and nineteenth century to theorise the different forms of production of subjects and subjectivities, from the sovereign power of the Ancien Régime to the disciplinary power of modernity and from there perhaps also, as Deleuze (1986, 1990 : 229-247) suggests, to the emerging « society of control » of post-industrial modernity.

In the society of control, disciplinary power is more economic and liberal, more subtle and indirect, more decentralised and capillary, diffused and individualised, though no less pervasive and effective than the forms of power that preceded it. Unlike sovereign power, which is exercised through corporal punishments and decisions about life and death, disciplinary power is not repressive but democratic and productive : « It is a power that aims to produce forces, to make them grow and regulate them rather than block, submit or destroy them. […] It is a power that is

56. Claude Lévi-Strauss (1952 : 326) has most crisply and brutally formulated the end of the human sciences : « We believe that the ultimate end of the human sciences is not to constitute, but to dissolve the human ».

57. For a brilliant Hegelian reconstruction of Foucault that does not only dialectically reinterpret the texts of Foucault, but also the historical materials he was working on, see Suárez Müller, 2004.

positively exercised over life, that attempts to administer, raise, multiply and exercise precise controls and global regulations over it » (Foucault, 1976 : 179-180)[58].

Targeting the self or the soul of the subjects via the disciplination of the body, this power aims to produce docile bodies and responsible subjects. In the original project of the *History of Sexuality*, which was initially to count six volumes and not just three or four, Foucault wanted to enlarge his genealogy of ethico-political subjectification, from the Greeks to the middle ages and beyond, by illustrating how responsible, autonomous, free subjects are produced, not just in prisons, factories, schools and hospitals, but continuously and throughout society. Looking at his last investigations on the « care of the self » from the perspective of his middle, more sociological period, we realise that what he was really after was a genealogy of the present society of control that shows, through a careful analysis of the technologies of subjectification and other techniques of the self, how disciplinary power produces subjects not against their will, but by adopting and co-opting their will, thus precisely through and with their will.

Systematically extending the scattered remarks of the last Foucault on governmentality and the police (1994b, III : 635-657) and the « pastoral mode » of discipline (1994c, IV : 134-161) into a sociological theory of power in advanced liberal societies, Nikolas Rose (1998, 1999), the animator and instigator of the Anglo-Australian school of governmentality-studies, has forcefully introduced the notion of « government » over and against the notion of domination to analyse the heterogeneous practices of education, management, administration, reformation, counselling, therapy, etc. through which the conduct of individuals is subtly controlled[59]. Government is a form of power referring to the « conduct of conduct » : to govern is not to impose directly a certain action, but to control it indirectly through the structuring of the possible field of options and actions[60]. As such, government

58. To stress that power produces and regulates life by targetting the body, Foucault has introduced the notions of bio-power and bio-politics. Although he explicitly mentions that biology is inflected by politics – « le biologique se réfléchit dans le politique » (Foucault, 1976 : 187) –, bio-politics is about the production of life in general and not about the bio-technological production of life and the modification of the body. For an update of bio-power in the age of genomics, cf. infra.

59. Foucault has analysed « governmentality » in 1978 in his lectures at the Collège de France. For a summary, see Foucault (1994a, III : 719-723).

60. If individuals are controlled through the « conduct of conduct », organisations are for their part increasingly regulated through auditing or the « control of control » (Power, 1994) : transforming organisations in order to make them conform to ideals of auditability, audit attempt to act indirectly upon systems of control rather than directly upon first order activities. Embodying new receptivities to private sectors of management, the liberal technologies of government are political technologies that « enterprise up » individuals and organisations alike.

presupposes rather than annuls the capacity of individuals as agents. Rose insists, rightly and forcefully, that « governing means governing through the freedom and aspirations of subjects rather than in spite of them » (Rose, 1998 : 155). Flattering the aspirations of self-determination and self-realisation, the government of subjects passes through the personal strivings of each and every individual for self-fulfilment. Thus, power does not crush aspirations, but acknowledges and adjusts itself to them, while instrumentalising and utilising them for its own objectives.

Against this background, we can better understand how capitalism has been able to restructure itself and expand in the 70s and 80s through the cooptation of the aspirations to autonomy and authenticity that were voiced by the radical left in the 60s. The debureaucratisation of the enterprise and the flexibilisation of capitalism may have led to enforced self-realisation and constrained individualisation rather than to autonomy and authenticity, the fact remains that the system was in effect appealing to the aspirations of autonomy, initiative, creativity, spontaneity, originality and responsibility of the individual and tapped into the creative potential of the individual in order to increase flexibility and profitability. Re-enchanting work by promising self-realisation, the idea of the « good life » has thus been instrumentalised, while the subject is « enterprised up ». Governing by conducting the conduct of the individuals, they are summoned to govern themselves for their own good as entrepreneurs of their own life. « It is thus not only the gas industry but life in general that has been privatised », as Zygmunt Bauman (1995 : 270) forcefully remarks. This « privatisation of life » not only holds for the sphere of work ; it has now invaded all the spheres of life : consumption, education, leisure, and so on. Everywhere, at every moment, the system hails the individual and subjects him or her to its own imperatives. While instilling the illusion that we are only doing what we want to do and are governing ourselves, we are, in fact, governed, subjected and subtly controlled by the system.

*The Commodification of Culture*

It has become a commonplace to note that late capitalism has taken a « cultural turn ». This cultural turn in the economy should be understood in the context of the more general de-differentiation of the social subsystems that characterises postmodern societies (Crook, Pakulski, Waters, 1992). The collapse of the boundaries between culture and the economy works in two ways : the economy interpenetrates culture and transforms it into a commodity (economisation of culture), and culture is coupled to the economy, with the result that it loses its autonomy (culturalisation of the economy). The dissolution of the autonomy of the domain of culture does not mean that culture looses its importance. To the contrary, it gains in importance and effectiveness. Conceiving the dissolution of culture as an « explosion », an astute

observer of the postmodern scene has noticed « a prodigious expansion of culture throughout the social realm, to the point at which everything in our social life – from economic value and state power to practices and the very structure of the psyche itself – can be said to have become cultural » (Jameson, 1991 : 48).

As a result of this « shifting out » of culture through the social realm, culture assumes the role that was once imparted to material relations. In so far as the whole production process has shifted from the production of goods to the production of signs, this shifting out is in line with the shift from an industrial to a post-industrial and post-Fordist mode of capitalist production. What is increasingly being produced and consumed nowadays are not material objects but semiotic objects or signs. As the aesthetisation of commodities progresses (Haug, 1971), the design and branding of consumer products become more and more important. As a result, objects are increasingly aestheticised and emptied out of their material content. The aesthetic form trumps the material content. Use value becomes secondary and, at the end, everything happens as if it is now the exchange value that induces the use-value. Even more, according to Baudrillard (1972), the exchange value simply absorbs the latter, becomes self-referential and turns into a simulacrum that is into a copy without an original. Although Baudrillard's influential theory of « hyperreality » playfully and, at times, cynically exaggerates the extent of the dematerialization of reality, there can be no doubt about the fact that the « spectacularisation » (Debord) of commodities indeed characterises contemporary consumer culture.

Contemporary mass culture is more and more commodified, but that does not mean that it is standardised and homogenised. To the contrary, commodification leads to diversification and heterogenisation. Today's mass culture is pluralist, heterogeneous, fragmented and diversified, or postmodernist, a word which summarises it all. Diversity sells, and to guarantee a constant access to diversity, the margins of the sub- and countercultures of rebellious youth are constantly inspected for novelty. Counterculture aims to subvert the mainstream, while the mainstream attempts to co-opt the subculture. The idea that consumer culture is a form of conformism has become a commonplace of anti-consumerism. It obscures the fact that capitalism feeds on negativity and that rebellion is actually fuelling the carrousel of fashion and implicitly complicit in the making fashion victims. Consumer culture is hip. Advertising tells us that we are unique and different, non conformist and not part of the masses, and sells us what we need to become what we are : a nose ring, a tattoo, the latest double CD of Paul Oakenfold, or whatever is needed to distinguish oneself from one's fellow punters and to make an artwork of one's self. The idea of conspicuous consumption has been outmoded by hip consumerism : « It's no longer about keeping up with the Joneses, it's about being different from them » (Rutherford, quoted by Ray and Sayer, 1999 : 11).

In the new age of cultural capitalism, it is not only popular culture – « folklore and proletarian art, plus sports » (Kuper, 1999 : 229) – that is commodified. Since high culture is no longer exempted from the free market, but considered as an upmarket niche on high street, we can say that culture as such, understood as the totality of symbolic expressions that determines « the whole way of life, from birth to the grave, from morning to night and even in sleep » (Eliot), has become integrated as a profitable province of the economic system. Culture, which was once considered in opposition to the vulgar interests of economic sphere, has become a commodity, and « nothing else but a commodity » (Adorno, 1977 : 338).

The « webs of significance » that human beings spin around themselves to make sense of the world have been systematically raided by the culture industries. This was already the case when Adorno and Horkheimer coined the phrase to refer to the American mass culture of the forties and fifties, but following the digital revolution the commercialisation of culture has progressed to the point that experience itself is now on the verge of becoming a commodity, and nothing but a commodity. The integration of computers, telecommunications, cable television, consumer electronics, broadcasting, publishing and entertainment in an integrated communications network that is largely controlled by a few global corporations (Disney, Time Warner, Bertelsmann and Vivendi Universal) has given commercial enterprises unprecedented control over human experiences. According to Jeremy Rifkin, human experience has become the ultimate commodity of the new capitalist economy. Analysing the long-term shift from industrial to cultural production, he contends that hyper-capitalism is entering the new phase of the « age of access » in which markets are giving way to networks and ownership of goods is steadily replaced by paid access to interconnected supplier-user networks. Whether it is music, games or films, cuisine, travel or theme parks, sports or gambling, what we pay for and what is marketed is not so much the goods and the services as the cultural experiences we consume. By selling lived experiences, capitalism has commodified time and culture. Slowly, but surely it comes to resemble the « context of total blindness » (*totaler Verblendungszusammenhang*) that Adorno had anticipated by exaggerating and extrapolating the commodifying impact of the culture industries : « Capitalism is making its final transition into full-blown cultural capitalism, appropriating not only the signifiers of cultural life and the artistic forms of communication that interpret those signifiers but lived experience as well » (Rifkin, 2001 : 144). As the culture industry gives way to the experience industry, there is hardly a sphere of life that escapes the reach of capitalism. By paying for access to experiences and for the experiences themselves, we become, so to say, the consumers of our own lives.

*The Modification of Nature*

Having colonised the life-world, capitalism turns its attention to nature and invades life itself to modify and commodify it. Since the late seventies, the large multinational corporations, which had closely observed the developments in molecular biology and genetic engineering, began to invest substantially in biotechnology. Dependent on the universities for their expertise and on oil, chemical and pharmaceutical corporations for capital, the biotech industry rapidly enrolled the biosciences to redesign, patent and re-engineer life for commercial purposes. The first transgenic organisms appeared in the 1980's and, by 1988, Oncomouse™, a transgenic mouse, designed for research in cancer and marketed by Du Pont at 50 to 75 dollars per piece, became the first patented animal in the world (Haraway, 1997 : 49-118). Since then, the biosciences have made great progress and, using viruses as vectors for transmitting DNA between different species, they have fabricated and patented some of the most monstrous creatures for the sake of profit : tobacco plants with firefly genes ; fish and tomatoes with anti-freeze genes ; headless embryos of mice and frogs, dispensing with their superfluous heads so that that they can harvest their organs ; monkeys with jellyfish genes and human embryo cells merged with enucleated cows' eggs ; cloned calves and sheep carrying human genes, cows producing lactoferrin, a human protein useful for treating infections ; and not to forget, Dollies, sheep that are cloned, and Pollies, sheep that are both cloned and genetically engineered (Best and Kellner, 2001 : 171-175).

Involved in a highly competitive race for the human race, the private corporation Celera Genomics and the publicly funded Human Genome Project announced in 2000 that they had completed a rough draft of the entire human genome. While the atlas of the genome can be consulted against payment, the question about the ownership of the human genome remains unsolved : does the human genome belong to the individual person with a particular genome, to the scientist or the company who has identified particular genes or nucleiotide sequences, or is it the common heritage of mankind (De Witte and Ten Have, 1997) ? The question is momentous : if the human genome is the collective property of humanity, deliberative intervention should never occur without collective deliberation. If it is not, then the genome can be patented and privatised[61]. NGOs who observe the « gene rush » predict that

61. To procure a patent on genetic material, it must be shown that, through the process of research, development and production, the « natural product » has been transformed in an « invention ». Anything can be patented, as the Indians found out with horror, when they were informed in 2001 that an American company had reinvented, patented and thus appropriated their Basmati rice. In the same year the US patent and trademark office extended the boundaries of what can be patented to include single nucleotide polymorphisms (SNP's or « snips »), the smallest unit of genetic variability. Having already identified some 120,000

in less than twenty-five years, much of the « genetic commons » – the legacy of millions of years of biological evolution – will have been isolated, identified, and enclosed in the form of intellectual property, controlled, for the most part, by a handful of biotechnological corporations without frontiers and scruples like Monsanto, Novartis, Du Pont or Aventis.

Moving from the molecular to the molar body, we can now proceed with our analysis of the colonisation of life and further inspect the commodification of the body and its parts[62]. Enslavement, exploitation, prostitution, body trafficking and other practices that reduce human bodies to a pair of hands, a pair of breasts, or a vagina are only some examples of the commodification of the body that precede the systematic objectification, fragmentation, modification and commodification of the body by modern medicine. Driven by a highly technocratic ethos, the medical sciences drive out the common sense conceptions of the body as a unitary object, as something that we « are » rather than as something that we « have ». Cutting off the body from the human being that is embodied (dualism of body and mind), as well as from the other human beings (individualism) and the cosmos to which it was once intimately tied through a cascade of homologies (disenchantment of the world), they consider the body as some thing that exists in itself and functions like a machine or, to quote Descartes, like a « watch composed of wheels and counterweights » (Le Breton, 1990 : 61-82, see also Leder, 1992). Objectivating the body by means of sophisticated visual techniques (X-rays, sonography, endoscopy, magnetic resonance imaging) that render the body transparent and thus also permeable, the medical sciences increasingly conceive the body as an array of parts, organs and tissues that can be repaired or, if needed, replaced by other parts, organs and tissues. Like the global economy, the body is now an open, complex, flexible machine, with spares and parts available from the « body shop » (Kimbrell, 1993).

Analysing the fragmentation of the body and the breaching of its boundaries by transplants – organs, tissues, or fluids from other bodies, living or dead – and implants – artificial organs or body parts made of plastic, metal, nylon, or other synthetic materials – Cecil Helman notes that the body has been « reconceptualised as a "machine" (and "machines" reconceptualised as "people") » : « The body is

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SNP's by 1999, the CuraGen Company was reported to be « aggressive in making patent filings » (Lock, 2001 : 88).

62. For an exhaustive overview of the literature on the commodification of the body, see Sharp, 2000. Here I'm concerned with the commodification of the body as a real, material object and not with the body of texts that consider the body as a text. However, looking at the proliferation of books, dissertations, articles and even specialised journals that deal with the (politics of) representation of the (female) body (in films, novels, adds, etc.), I realise that I could also have made an argument about the commodification of the body in the academic industry.

now a collection of "parts" or "pieces", for which "spares" are available when they finally wear out » (Helman, 1988 : 15). Through transplants and implants, the individual is permanently linked to the world of the market, industry and science and transformed into a « potential prosthesis » (Le Breton, 1990 : 234 ; 1993 : 296). Whereas the implants and prostheses are mass-produced by the industry, the transplants and organs are available on the world market[63], or on the black market, as the bodies of innocents and poor people are now raided once again by organised body snatchers with links to the underworld[64]. Through the implantation of mass-produced heart valves, pace makers, artificial hip joints, prosthetic arms and legs, and synthetic lenses, the patient becomes effectively a cyborg ; through the transplantation of mass-marketed hearts, kidneys, lungs, lymph nodes, nerves, bone marrow and the infusion of blood and plasma, he becomes – like Frankenstein – a living patchwork of foreign bodies.

Through implants and transplants, the cybernetic organisms are linked as a living node in the medical network of commercial relations between producers, suppliers, doctors and nurses. « Overall, it is the older members of this society who, as they emerge from the workforce, will be reincorporated into the world of industry through the ageing of the bodies » (Helman, 1988 : 15). Ageing, they become consumers of implants and transplants ; sick, they become cyborgs, attached to a complex array of machines that keep them alive ; dying, they become potential donors of organs. In all cases, the bodies have been invaded by the medical industry and linked to a complex, evolving network of actors and actants.

Although capitalism tends to invade the totality of existence, one should not conclude all too fast that reification has become total, that everything is commodified, and that there is no way out. Even if our body has been objectified as a

63. Although the organs and human tissues that are « harvested » are mostly « given » and described as « gifts of life », recipients are nevertheless shown a price sheet, which reveals that the procuration of organs is paid for. The business of transplantation is, in fact, « a multi-million dollar medical industry where clients in need pay steep fees for the procurement, preparation, transportation, and surgical replacement of body parts » (Sharp, 2000 : 303-304 ; for a subtle critique of the gift, see Lock, 2001 : 65-73).

64. The contemporary traffic in organs reminds us eerily of the theft of bodies from hospitals, the buying of cadavers from the hangmen and the profanation of tombs for the sake of anatomical dissection that Le Breton (1993 : 113-168) has described in detail in his « nocturnal history » of Western medicine. Although there is now a global economy in body parts that flow from poor to rich countries and from the young to the elderly, a good deal of the macabre stories about cannibalism, vampirism and the theft of bodies and body-parts are often nothing but rumours. Reconnecting the occult economies of the post-colonial countries to the global market, the Comaroffs (1999) suggest that the urban legends should be read as so many symptoms of a fear of the creeping commodification of life itself that reflect on the level of the imaginary the violent abstractions of real capitalism.

material anatomo-physiological body (*Körper*) among bodies, the fact remains that for the time being, we still experience our body as a living body (*Leib*), that is, to use the phenomenological terms of Marcel, Plessner and Merleau-Ponty, as something that we *are* and not only a something that we *have*. Although we are always already caught in the tentacular grips of an integrated and integrating machinic capitalism, the omnipresence of commodification does not mean that in our everyday life we have become mere appendices of the capitalist megamachine and thus, so to say, executors of our own life. In spite of everything and for the time being, we remain human. We communicate, empathise, rationalise, moralise and criticise. To avoid the totalising closure of its critical analysis of the processes of reification, commodification and alienation, a critical theory of contemporary society has to take those anthropological constants into account. Having presented elsewhere a meta-critical analysis of critical theory (Vandenberghe, 1997-1998), I am only too aware that a critique of domination presupposes a theory of emancipation to be effective. Yet, if I have insisted in this lengthy paper on the colonising and totalising logic of capitalism, it is to flag the danger involved and in the hope to contribute to an active critique and passive resistance to the empirical tendencies of the system.

## 8. Gen-ethical Considerations on the Reinvention of Nature

Now that we have arrived at the point where, driven forward by the « werewolf hunger for profit » (Marx) and the unrelenting search for new niches and new markets, the expanding network of networks of capitalism has colonised the whole universe – or almost – and melted everything that is solid and natural into thin air, I would like to go back to the initial discussion about nature and culture. However, this time I will not reflect on the distinction between nature and culture from an epistemo-ontological angle. Instead, I will treat the question of the future of human nature from a more normative perspective and inquire if we could perhaps set some ethical limits to the colonisation of life by the techno-sciences in general and by the bio-sciences in particular. Taking up the suggestion of Simondon that each epoch has to reinvent its humanism by pondering the momentous dangers that humanity faces, I will look more closely at the slippery slopes of genomics that might put the future of humankind at risk and suggest that we should reinvent and reintroduce nature as a conventional and consensual marker that imposes normative limits to human engineering.

*The End of Nature*

The experimental scrambling of the ontological regions of material, animal and human nature by the bio-, cyber- and nano-scientific industries has given rise to the emergence of strange nether lands in which cyborgs, chimeras and other monstrous couplings are experimentally produced and fabricated for the sake of profit. It would be convenient if we could still appeal to nature as a meta-social order that grounds society and culture to set moral limits to what humans in general and the techno-sciences in particular can do. Unfortunately, nature has been modified, demoralised and commodified by human intervention to the point that we can no longer rely on it to impose limits to the colonisation of life by the scientific-industrial complex of late capitalism. To understand how « we », moderns, « progressed » to the « extermination » of nature[65], we have to go back once again to the reflexive emergence of the nature-culture distinction in the sixteenth and seventeenth century but, this time, the story needs to be told from the point of view of the invention of nature.

The rationalising processes of the objectivation of nature and the self-objectivation of culture that are the harbingers of modernity have dispensed with the hypothesis of the divine[66]. Just as God has been demystified and uncovered as a human invention, so, too, nature has been defetichisized and apprehended as a social construction. The humanisation of God and the objectivation of nature are internally related processes in the secular process of the disenchantment of the world. Remember Swammerdam, the Dutch entomologist of the seventeenth century ? He opened his course of zoological anatomy with a divine promise : « With the anatomy of the louse, I'll bring you a proof of God's providence » (cited in Weber, 1992 : 91). Apart from a few well-meaning scientists and credulous new age acolytes, we moderns no longer believe that science and theology are compatible. Although

65. In order to avoid the impression that the realist theory of nature has been rendered superficial by the extermination of nature, I would like to remind the reader of the distinction between deep and surface nature. When I speak about the extermination of nature, I obviously aim to refer to the latter. Even if humans were to destroy themselves and their environment, deep nature would still remain and retain its essential properties, though there would be no scientists left to investigate them, no sociologists to investigate and deconstruct the investigations of their colleagues, and no meta-sociologists either to criticise the irresponsibility of their deconstructions.

66. Latour (1991 : 23) also defines the modernity in terms of the co-emergence of nature, culture or society, and the disappearance of God : « Modernity arises first from the conjoined creation of those three entities : [humans, non-humans and a crossed-out God] ». But whereas he contends that modernity has obscured the continuing proliferation of hybrids, I would like to propose that the hybridisation of humans and non-humans characterises late modernity and that the post-humanist indistinction between humans and non-humans obscures and obliterates the experimental machinations and colonisations of the capitalist megamachine.

scientism has become a religion in itself and scientists seem to have arrogated the divine power of conception to themselves, science, if anything, is the secular power par excellence that eradicates the infamous superstition at its very root. The scientific objectivation of nature secularises the order of being and transmutes nature into a cultural construct. No longer God-given, detranscendentalised and secularised, nature becomes a contingent, meaningless order of regularity, subject to the laws of causality. Since Galileo, the natural sciences do no longer deal with nature, but with a theoretical-mathematical conception of possible nature of which the phenomenal nature only represents and realises a particular instance (Cassirer, 1994, I : 314-318, 377ff.). Instead of understanding nature as some kind of a substance that is a given to the senses, it is theoretically constructed as a theoretical contexture of functional relations of causal determination that can be disclosed in and through scientific experiments. Together, the epistemological disconnection of scientific experience from its pre-scientific origins and the mathematisation of mechanics have allowed the modern sciences to break with the traditional metaphysics of substance and to effectuate the transition to a constructivist, functional or relational and experimental conception of nature (Böhme, Van den Daele and Krohn, 1977 : 7-10). Once the laws of nature are known, the experimental knowledge can be systematically applied and used to control and manipulate, transform and fabricate nature. Knowledge is power, as Bacon said, and power is the will to dominate nature and harness it to serve human purposes. What he did not say, but what is also sociologically implied in the linkage of science and technology, is that knowledge does not only increase the power of humans over nature, but also over people.

Recoding the distinction between nature and culture as a cultural distinction, modernity has introduced the reflexivity it has about its own culture into the realm of nature. With Latour (1991), we could even say that the separation of nature and culture is a precondition for the scientific analysis and the technological transformation of nature. Unable to separate out nature as an independent realm, separated from culture, pre-modern cultures could not experiment on the modern scale. « We », moderns, can, and this cultural difference explains in part why we have become the « masters and possessors of nature », to use Descartes's consecrated phrase, and colonised, exploited and dominated nature on an unprecedented scale. While the modern separation of nature from culture has allowed for the scientific investigation and technological transformation of nature, the techno-scientific succcesses of late capitalist modernity have paradoxically, and rather perversely, resulted in the « end of nature », which raises, of course, the timely meta-scientific question of the « mastery of the mastery » of nature.

Indeed, three or four centuries after the techno-scientific revolution, modernity has so thoroughly modified and commodified the natural environment that nature itself appears now as an artefact and an artifice of human enterprise. Radically

reshaping the connections between social life and the material world, industrial capitalism's culture of mastery has transformed the natural environment into a created environment. As a result, nature is no longer « given » as something that exists outside of society (and culture), as a kind of self-evidential ground and background of society (and culture), but rather as something that can be transformed, manufactured and changed at will. Modifiable, modified and manufactured, nature has become as contingent as culture. Neither necessary, nor impossible, it is no longer perceived as something that exists outside of society and that we can take for granted, but as something that is increasingly threatened by the modern culture of mastery that characterises industrial capitalism. From this vanishing perspective, we can even understand the emergence of the ecological movement in terms of the disappearance of nature. It is because nature is disappearing that it is so central and that everybody talks about nature, whether it is to preserve it, to further exploit it or to deconstruct it. In any case, when nature is threatened by human enterprise, we end up discovering that it was never autonomous : « The distinction between the natural and the cultural is revealed for the construction it always was » (Strathern, 1992b : 55).

Of course, nature does not really disappear. Rather what disappears and implodes is the distinction between nature and culture (Lau and Keller, 2001), or nature and society for that matter, as society and culture are not distinct entities, but different aspects of the same socio-cultural reality. The implosion of the distinction between nature and culture not only means that nature is recognised as a cultural artefact and a social construction, but also, and perhaps, above all, that the natural sciences that socially construct nature are themselves now explicitly recognised as cultural artefacts and social constructions. Attacking the « culture of no culture » of the natural sciences, exposing the social relations of production and definition that are responsible for the scientific objectivation and technological exploitation of nature, the constructivist turns, twists and returns in the social studies of science and technology have demolished the wall that separated science and technology from politics and radically politicised the production of knowledge in the natural and social sciences.

The politicisation of the sciences adds the contingency of culture to the contingency of nature. When both nature and the scientific production of nature are susceptible to all kinds of transformations and redefinitions, nature becomes optional and, so to say, optical. Depending on the perspective one takes on nature, it can either be considered as a social construct or a natural given, as *thesei* or *phusei*, with the result that it is for us to decide what we consider natural. The hole in the ozone layer, global warming and BSE can all be analysed, for example, either as a social construction or as a natural state of affairs. When macro-sociologists (like Beck) show that natural states of affairs are, in fact, non-intended consequences of

human action and decision ; when micro-sociologists (like Latour and Woolgar) next demonstrate that scientific facts are literally constructed in the lab ; and when critical scholars (like Haraway) finally uncover the racist, capitalist and gendered subtexts of the micro-sociologists, no layer of scientific practice remains outside the reach of the sociological techniques of interpretation, defetishisation and politicisation of natural facts.

*The Reinvention of Nature*

Until recently, we lacked the knowledge and the capacity to transform and reconstruct human nature. We could therefore take it for granted and consider it as a basic precondition beyond our purposes and outside our responsibility. But now that human nature itself has become modifiable and optional, we come to realise that there are no natural barriers to artificial intervention and technological engineering. Thanks to the revolution in the techno-sciences, humans can now control human evolution, alter the biological make up of humans and their offspring, and literally create new species that scramble interfere with the lines and the times of spontaneous evolution. As creators of humans, humans have become gods, or at least god-like, not in their wisdom, though, but in their knowledge and transformative power. Humans have always made history, but not under conditions of their own choosing. Now they also make biology. By altering human nature for the sake of profit, the techno-sciences short-circuit history and speed up evolution, while courting the risk of destroying humanity in the name of health. One thing is clear, however : « Biology under control is no longer nature » (Strathern, 1992b : 35). Being no longer a symbol for the given parameters of human existence, we can no longer rely on nature, human or otherwise, to impose limits on human enterprise.

And yet, if we want to ensure that humanity does not destroy the biological foundations of civilisation, if we want to hold fast to the idea of *humanitas* and the future of humanity, it seems to me that we have to reinvent nature and reintroduce it as a normative convention that sets limits to its reconstruction. Now that the natural and the social sciences have technologically reconstructed nature and discursively deconstructed essences, it may seem a bit quaint and queer, however, to want to introduce nature as a convention. Now that the boundaries between nature and culture, between humans, animals and machines, and also between life and death, have been eroded, it may seem unreasonable and unseasonable to want to reintroduce the distinction between nature and culture as a conventional context that grounds society and culture. And yet, to be on the safe side and to avoid the modification of human nature beyond recognition, I would like to suggest that instead of changing nature, we start to change culture.

Now that nature has become optional, we need a conscious decision to moralise human nature and not to reconstruct it – « one we take knowing that we could also act otherwise » (van den Daele, 1992 : 543)[67]. To reduce the contingency of nature I would like to propose a conventional redefinition of human nature as something « sacred », or at least as something that inspires awe and deserves respect and should therefore not be experimented or tampered with without precaution[68]. Or, as Hans Jonas (1987 : 218) says in quasi-theological vein : « We should learn again to fear and tremble and, even without God, learn to fear the sacred ». Although I have intentionally used the term « sacred », the strategy I want to pursue is not the one of the sacralisation, however, but the one of the moralisation of nature. Divested from its mystical envelope, the rational core of the religious intuition can be redeemed through a consequent linguistification, immanentisation and secularisation of the sacred. Unlike the sacralisation of nature, which presupposes somehow that human nature is divine and that only God has the right to reconstruct human nature, the moralisation of nature is humanist in intent and purpose : it accepts that humans have the right to reconstruct nature, but stresses that this right has to be balanced by a duty to preserve human nature and to defend it against arbitrary control. Using Weberian terms, we could say that the moralisation of nature is first and foremost an « ethics of responsibility » and not simply an « ethics of conviction ». If it accepts in principle the transformability of human nature, it is only to open up the ends and the means of the techno-sciences to public discussion and scrutiny[69]. Given that it most emphatically subscribes to the precautionary principle, it does not absolve politicians and scientists from their responsibilities but urges them to take explicitly into account the unintended, unforeseeable and potentially uncontrollable consequences of technological decisions into their prudent decisions.

In the age of high reflexivity, the traditional conceptions of nature can obviously not simply be restored. Defending a traditional conception of nature in a

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67. In the age of contingency and reflexivity, everything can in principle be changed and every intervention has to be justified. « Even the decision not to intervene [in nature] is an act of production that has to be justified in the light of the possibility that one could act otherwise » (van den Daele, 1986 : 149).

68. If the attempt to technologically reconstruct nature is modern, the attempt to redefine the human in terms of human nature is not, as Gernot Böhme (2001 : 65-66) has correctly noted : « In the past, he says, one could leave aside what human nature is. In modernity, humans have in fact not defined themselves in terms of nature, but in terms of rationality, reason and mind, because those are the faculties in which they recognised self-determination. Today, however, nature has to be explicitly brought in and related to the self-understanding of humans ».

69. In a truly Weberian spirit, Van den Daele (1985 : 209) has rightly stressed the inverse relation that exists between conviction and responsibility : « Sticking to the unchangeability of human nature relieves us from having to really decide about what is decidable in principle and also from having to justify the consequences ».

traditional way would be tantamount to fundamentalism[70]. And it would bring us dangerously close to the reactionary romanticism of (some naive versions of) deep ecology. What we need is not « second nature », but « third nature » : nature self-consciously posited by spirit as a highly reflexive, consciously formulated conventional and consensual, nomic and normic conception of nature. What I am thinking of is some kind of a communicative update of the Kantian theory of the postulates of practical reason for the age of genetics (cf. Kant, 1956b : A215-241). For Kant, the postulates of practical reason are not theoretical dogmas but rather necessary conditions for obedience of a finite being to the moral laws which determines its will in general and the categorical imperative in particular. As is well known, the (second) formulation of the categorical imperative stipulates that one should always act « so as to treat the humanity, in your own person or in the person of another, as an end-in-itself and never simply as a means » (Kant, 1956a : BA67), always as a person and never as a mere thing. This imperative remains valid, of course, for humans in the age of technical reproducibility, but instead of postulating the existence of god, freedom and immortality, I would like to suggest that we introduce human nature as a theoretical postulate of practical reason and a normative presupposition of « gen-ethics ».

Gen-ethics is understood here as the bio-ethical division of the species-ethics (*Gattungsethik*) that conventionally and consensually defines the nature of the human and thereby sets normative limits to the human freedom to technologically alter human nature and change it beyond recognition[71]. The intent of a modern and modernist gen-ethics is obviously not to forbid once and for all genetic engineering or other human experiments in bio-, cyber and nano-technology, but to regulate them : « What has become technically at our disposition through the sciences,

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70. Giddens (1994 : 100) defines fundamentalism as the attempt to defend tradition in a traditional way. Cheekily, I am tempted to add that in his later and lighter work he defines socialism (away) as the statist way to defend the state against the free market and proposes the Third Way and New Labour as a kind of historical compromise between liberalism and socialism that aims to defend the state by opening it up to the free market.

71. Species-ethics represents, in fact, the normative-evaluative branch of philosophical anthropology that seeks to answer the metaphysical question : « If and why humanity should be ; why the human should be maintained as evolution has produced it and why its genetic material should be respected ; or, in short, why there should be life in the first place ? » (Jonas, 1987 : 48). Habermas (2001a : 70-80) has recently introduced species-ethics as an anthropological « embedding » of his discourse ethics. If discourse ethics deals with « moral questions », that is with questions that pertain to justice and are universally valid, ethics deals in his vocabulary with « ethical questions » that pertain to the « good life » of an individual or a community. Unlike norms, visions of the good life are not universally valid, but hold only for particular individuals and communities. Although species-ethics deals with ethical questions, those questions are relevant for the universal community of human beings. Technically speaking, species ethics thus deals with the ethical value of a moral form of life.

should again be made unavailable (*unverfügbar*) through normative control » (van den Daele, 2000 : 24)[72]. From this gen-ethical perspective, a definition of « third nature » that is counterfactually valid for the whole of humanity should be consensually formulated and validated in an « ideal speech situation » and consciously introduced as a necessary precondition of practical reason and as a guarantee that humans do not treat human beings and their genes as simple means for one's own ends or the ends of others, but that they pay due respect to the humanity in each and every person. Of course, we can not pre-empt what the outcome of those counterfactual discussions would be, but we can nevertheless safely presume that the participants will, for instance, consensually decide that genetic engineering with eugenic intent, human cloning and breeding between animals and humans enter into conflict with the commonly accepted ideas about the identity and the dignity of human beings. Be that as it may, the intent of a discourse-ethical redefinition of human nature is not so much to define once and for all what it means to be human as to decide about the techno-scientific interventions in human nature that are incompatible with the « humanity of humanity » (Morin, 2001), that is with the self-identity of humanity that defines the human by distinguishing it both from nature and from the animal, while recognising that the human has emerged out of nature and remains an animal.

Knowing that we could reconstruct human nature and consciously deciding not to do so on the basis of scientifically informed normatively orientated discussions between scientists, citizens and politicians about the unintended, unforeseeable and uncontrollable consequences and risks that humanity would be confronted with if it were to authorise the cloning of humans or genetic engineering without restrictions, that is the prospect of a gen-ethical politics that takes the precautionary principle seriously[73]. Reformulating Beck's explanation of the precautionary principle, we obtain the following gen-ethic devise :

72. This line echoes another one : what the market has deregulated should be re-regulated by politics. In the same way as the political regulation of the market does not mean to eliminate the market, the normative regulation of the techno-sciences does not mean to abolish the autonomy of scientific research, but to force scientists to take into account the unintended and unacceptable consequences of scientific experimentations with humans. The call for a normative regulation of the techno-sciences is not anti-science : « It is something else than the expression of musty anti-modernist resistance. […] The perspective is not the one of re-enchantment, but of a becoming reflexive of modernity that becomes enlightened about its own limits » (Habermas, 2001a : 49-51).

73. What is needed is not simply a survey about what the citizens think about the biosciences (44 % of the French confuse the latter with phytotherapy anyway) but a roundtable discussion in which citizens, scientists and politicians take part (Habermas, 1971 : 104-145). Having informed the citizens and the politicians about what is possible from a techno-scientific point of view, the citizens and the politicians inform the scientists about

> *Even when we don't know what we have to know* [about the possible consequences of techno-scientific reconstruction of human nature]*, we have nevertheless to decide* [on the basis of a conventionally defined and consensually validated concept of human nature] *that we will not decide and to take a decision when we will decide* [not to allow the reconstruction of human nature] (Beck, Bonß and Lau : 2001 : 40).

*Sub-politics and The Technological Performance of Morality*

To learn or not to learn ? That is the gen-ethical question of the age. Should we adapt our norms to the world or the world to our norms ? Should we adopt a cognitive attitude to norms, pragmatically revise them when the circumstances demand it and opportunistically redefine our vision of humanity as human nature is occasionally reconstructed by the techno-sciences (Luhmann, 1969) ?[74] Or should we perhaps stubbornly stick to our norms, maintain our normative intuitions against all odds, and insist on the dignity of the person to normatively re-regulate the techno-sciences (Habermas, 1998 : 243-256) ?

I must confess that I am internally split. Looking at the future and the unprecedented risks that humanity is confronted with, I feel inclined to stress the unconditional validity of our norms, normative intuitions and visions of humanity. Looking at the past, however, I observe how our norms and normative intuitions have been periodically revised as techno-scientific advances required it and how, accordingly, our visions of humanity have been performatively redefined and differentially performed as human nature was technologically reconstructed. Initially, the dissection of corpses by Mondino and Vesalius was condemned by the Church as a profanation that would render the resurrection of the body impossible, but by the end of seventeenth century the opening of the body had become generally accepted by the educated fractions of the population who attended *en masse* the anatomical theatres and the cabinets of curiosity (Le Breton, 1993 : 169-219). Moving closer to us, the transplantation of organs, which was also originally attacked as morally unacceptable, became quickly established as a revered practice, even if it

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what is desirable from a normative point of view and together they take a well-informed and well-founded bio-ethical decision.

74. « Expectations that are adapted to reality in case of disappointment are experienced and treated as cognitive. The opposite holds for normative expectations : one doesn't drop them when someone acts against them. […] Normative expectations are characterised by a determination not to learn in case of disappointment » (Luhmann, 1972, I : 42-43).

redefined our visions of life and revised our definitions of death (Kimbrell, 1993 : 36-44 ; Sharp, 1995 : 361-362). Prior to 1968, death was recognised by the absence of easily detectable signs, such as pulse and respiration. To facilitate the acquisition of viable organs from potential donors, death has been redefined since 1968 in terms of irreversible coma. Of late, new definitions of death have been proposed so that babies and neo-morts (also known as « vegetables » in common parlance) with lower, but without higher brain function can be declared officially brain-dead before they die. The implication of this new « performance » of death implies that, legally and technically speaking, a brain-dead, heart-beating, breathing cadaver is considered alive till the organs are « harvested » and the plug is finally pulled.

In vitro fertilisation (IVF) is another good case that instructs us about the inbuilt obsolescence of our visions of the human and of our normative resistances to change human nature. In 1978, the first test tube baby, Louise Brown, was born in Great Britain. Until then, it was considered unthinkable that a human being could be conceived without sexual intercourse and as normatively unacceptable that a human being could be fabricated in a petri dish and implanted in a surrogate mother. Having sex, transmitting genes and giving birth was simply a natural sequence that could not be changed. But what was unthinkable and unacceptable yesterday has become almost generally accepted today, as can be gathered from the fact that since 1978 some 50,000 test tube babies have been born around the world. Included in the right of self-determination of childless couples, IVF and other baby making techniques, such as GIFT and ZIFT (gamete and zygote intro-fallopian transfer) or MESA (microsurgical epididymal sperm aspiration) and DI (donor insemination), have now become an option for childless couples, and increasingly for single mothers and homosexual couples as well. The speed with which the transplantation of organs and artificial insemination have been diffused through society and accepted by the population at large shows that the half-life of our norms is steadily declining. What is considered as unacceptable and intolerable today may very well appear as normal and beneficial tomorrow. Leaving aside trans-humanists and techno-industrialists, I presume that today most, if not all of us are against human cloning, and yet I can almost predict that in ten or twenty years time human beings will be cloned for therapeutic reasons and that cloning will be a most profitable industry. Or, in the words of an Indian doctor : « Ten years from now, I will be able to grow you foetuses like popcorn » (quoted in Cohen, 2001 : 23).

Although the Kantian perspective of a Habermas tempts the philosopher in me, and I am inclined to start preaching like an unreconstructed humanist about the *Unantastbarkeit* of human dignity, the sociologist in me is tempted to correct the naïveté of the philosopher and to enlighten him sociologically about the limits of the Enlightenment. Such a sociological analysis of the limits of philosophical En-

lightenment does not aim to undermine its premises, but to strengthen its promises : *Auklärung*, not *Abklärung*[75], that is the perspective of a critical social theory that presents a philosophically informed and normatively orientated analysis of the techno-scientific risks of dehumanisation and alienation in late capitalist, post-industrial consumerist societies. That a critique of alienation is only possible if and as long as the alienation of human beings is not total is self-evident. As long as humans are human and resist the total objectivation of themselves, they can in principle criticise the system, change it from within, and practically reorient its course. Nuclear power, germ line engineering and cloning can not be disinvented, but confronted with the manufactured uncertainties and dangers of the risk society, citizens can still exert pressure on the politicians they have elected and democratically press for a political domestication of capitalism, as well as a normative regulation of the techno-sciences.

Personal reflection and resistance are always possible and always necessary, but not sufficient. What is needed is not only ethical behaviour, but also sociological insight into the « sub-politics » of the bio-technological sciences that technologically push through fundamental decisions that concern every individual without any legitimation, without any control and without any consultation of parliament. Exposing the political power and the bio-politics of the medical-industrial complex, Ulrich Beck (1986 : 335-336) compares the politics of the *fait accompli* of medicine with a silent and undemocratic social revolution :

> *Despite all the criticism and scepticism regarding process, what continues to be possible, even taken for granted, in the area of medicine would, if transferred to official politics, be equivalent to the scandal of simply implementing epoch-making fundamental decisions on the social future, while bypassing the parliament and the public sphere, and making debate on the consequences unreal by virtue of their realisation in practice.*

To normatively regulate and socially domesticate the techno-sciences, the sociological analysis of the depoliticising mechanisms and the sub-political processes that bypass the checks and balances of parliamentary democracy has to be supplemented by social critique and political reform. Given that the political demands of a moral regulation of the techno-sciences will be formulated and worked out in the medium of the law, the political reform will in any case be implemented through the formulation of juridically binding norms. Although the struggle is ultimately a spiritual one, it will be waged as a legal one.

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75. The pun could be liberally translated into another one : ReKanting, not recanting of the Enlightenment.

*The Slippery Slopes of Liberal Eugenics*

Although we can counterfactually presume that a normative consensus exists about bio-ethical norms of decency and that such a virtual consensus is sufficiently solid and universal to justify a ban on germ line engineering with eugenic intent or human cloning, a sociological analysis of the limits of the moralisation of nature informs us that we cannot rely on this consensus to regulate the bio-sciences and to assure that humans will not be genetically engineered and cloned in the next decade or so. Norms are only constraining and binding as long as the technical projects remain in the realm of science fiction. Once the technological development turns the fiction into a fact, moral judgments tend to become ambiguous and the taboo on the reconstruction of human nature quickly vanishes among large parts of the population. Usually, medical purposes have spearheaded technological interventions in human nature. Using military language to describe the demoralising effects of medicine, Wolfgang van den Daele (2000 : 25), a former member of the Starnberg-Group and now a distinguished member of the bio-ethical committee of the German Bundestag, considers « the medical intervention [a]s the open flank of all taboos concerning human nature ». Indeed, the history of the medical sciences and the bio-medical industry in the last quarter of a century shows that medical interventions and therapies (from the transplantation of human organs and the implantation of artificial ones via IVF to somatic and possibly also cell line engineering) have always provided the initial justification for the technical transgression of sacrosanct boundaries.

The reason for that regular transgression of binding norms by bio-medical technologies is to be found in the fact that good health generally trumps all other values. As a result, « an ethics of rigorous respect for the naturalness of human nature cannot be defended against peoples' interests in life and good health » (van den Daele, 1992 : 551). The valuation of good health and the promises of the medical industry to cure illnesses explain why normative regulations are always provisional and why technological prohibitions, such as the current ones on PGD (preimplantation genetic diagnosis) and somatic cell engineering, should rather be read and understood as « moratoria » (van den Daele, 2000 : 27) that can and will be lifted when and as soon as a medical therapy for a cure becomes available. On this basis, we can not only expect that some of our normative resistances to genomics are going to vanish in the near future, but we can also almost predict that in the interest of reducing suffering and the promises of a cure for a whole spate of illnesses will lead us down the slippery slope of « liberal eugenics » (Agar, 2000).

Unlike the authoritarian eugenics of the past, which is state-driven and aimed to improve the genetic stock of the population, the new eugenics is market-driven. On the basis of access to information about the full range of genetic tests and

therapies, prospective parents will use all the new genetic technologies on offer to select a desirable genotype for their future children. Although the prospective parents do not directly aim to improve the genotype of future generations, the aggregated demand for corrections and enhancements of the genome of their offspring will nevertheless undercut the distinction between « positive » (or ameliorative) and « negative » (or defensive) eugenics. Indirectly, but almost inescapably, the individual demand for « biologically correct » children will pave the way for a return to eugenics that is no longer imposed by an authoritarian state, but driven by the market and freely chosen by the parents : « The distinguishing mark of the new liberal eugenics is state neutrality. […] Authoritarian eugenicists would do away with ordinary procreative freedoms. Liberals instead propose radical extensions of them » (Agar, 2000 : 171).

Although the technologies of somatic and cell line engineering that promise a cure for diseases such as neubrofibromatosis, Lesh-Nyhan or Huntington disease and hemophilia are more spectacular, and therefore more likely to receive attention in the media, most of the diseases that can be cured through genetic engineering are in fact rather rare[76]. Although the bio-medical industry will undoubtedly search to explore the commercial possibilities of therapies that correct genetic defects (« a cure in search of a disease »), they will more likely invest in all kinds of genetic screenings that can be offered and sold to the families « at risk » (« a test in search of a disease »). Given that the diagnosis techno-logically precedes the cure, it is in any case more logical and profitable to start with the development of genetic tests that screen the genetic material of the parents for defects and risks. Moreover, unlike the cure, which concerns only the sick, diagnosis interests all prospective parents, or initially at least those who are « at risk », and obviously their children as well.

Initially introduced to screen the genetic material for specific diseases, the genetic tests will, however, quickly be proposed to all parents. After all, parents do

76. The illnesses may be rare, the cures are even rarer. The asymmetry between genetic diagnosis and therapy may be hard to bear for the patients : they are diagnosed as « virtually ill », even if no cure is in sight. Promising health, the medical profession all too often tends to underemphasise the extent to which health and well-being may be incompatible and prefers to ignore or minimise the existential anguish and the moral pain that inevitably accompany the « retarding questions » that unhinge the life-stories of the patients when they are confronted with the collateral effects of medical treatment. In a moving testimony of his own heart transplantation and of the cancer that broke out eight years later as a result of the medical treatment, Jean-Luc Nancy (2000 : 40-41) evokes, for instance, how he (it ?) went from pain to pain and estrangement to estrangement as he submitted himself to a permanent regime of medical intrusion : « To the more than daily intake of drugs and the controls in the hospital were added the deucitis, candidose or polynevritis, and the general sentiment of no longer being dissociated from a network of measures, observations, chemical, institutional and symbolic connections that cannot be ignored ».

not simply desire children, but they desire healthy children[77]. Once again, the alleviation of suffering and the promise of health will act as a spearhead for the generalisation of genetic « quality controls ». The scenario for the marketisation of genetic tests is always the same. Looking back at how the reach of IVF was extended over the years, Elisabeth Beck-Gernsheim (1991 : 42) has already described the typical pattern of generalised diffusion of medical innovations :

> *New biomedical help is first introduced to prevent or alleviate suffering for a narrowly defined catalogue of unambiguous problematic cases. Next comes a transitional phase of habituation during which the domain of application is extended further and further. Eventually, the final stade* [*sic*] *is reached : all women and men are defined as clients* (Beck-Gernsheim, 1991 : 42).

Although genetic screening is not compulsory, there's nevertheless a strong social pressure to act responsibly and to undergo a test, if only to be informed about the medical risks and to be able to prevent predictable illnesses. Talk about prevention and prophylaxis should not hide, however, what is really being proposed : « More is at stake than oral hygiene. What is really meant is the prevention of the birth of genetically damaged children through renouncement to the desire for children or (and this is the most likely option) through "experimental" pregnancy and abortion in case of an unfavourable diagnosis » (Beck-Gernsheim, 1994 : 326-327). So, what is really being proposed, if not imposed, is not so much the prevention of illnesses, as of the existence of an ailing individual[78].

Moving from genetic testing to genetic engineering, the prospects for avoiding the slippery slope of eugenics do not look much better. Some « scientific tourism » has taught me that, when talking about genetic engineering, we should distinguish between germ line and somatic cell engineering. Germ line engineering embraces several techniques that permit the alteration of genetic material such that genetic changes become permanently encoded in the sex cells of the resulting adult. Germ cell alterations can be distinguished from somatic cell ones by virtue of their

77. Parents do not only desire healthy children, but they also wish and dream of beautiful, creative, original, sensitive and intelligent ones. Although genes for einsteinian intelligence, habermassian morality and latourian wit may be impossible to find – though they might possibly be cloned – the move from a desire for children to a desire of dream children explains why some rich parents would be only too willing to follow up the proposals for « designer children » that the market already has on offer, which raises the prospect of an impending genetic divide between the poor and the rich.

78. If the genetic tests fail to locate a genetic disease with the result that an ailing individual is born, the latter may theoretically sue the doctor for medical error or even the parents for infliction of pain, as has already happened in the United States.

intergenerational consequences. While techniques of germ line engineering have already been successfully used in animals to accelerate the genetic improvement of livestock, the technical feasibility of germ line engineering of the human genome remains so far only theoretical. Notwithstanding all their disagreements, bio-ethicists seem to agree that germ line engineering that directly attempts to change the genotype of future generations amounts to eugenism and cannot be ethically justified. « However, when such changes arise as an indirect and otherwise unavailable consequence of an approved form of somatic cell line engineering, they are morally acceptable » (Lappé, 2000 : 164)[79]. Morally acceptable or not, through appeals to health and promises of a therapy, the commercialisation of technological advances in medicine point almost inescapably to the liberal application and market-driven implementation of a non authoritarian and humane form of eugenic politics that risks to destroy the dignity of humanity, while advancing under the cover of human progress. The sociological prognosis that humanity will soon go down the slippery slope of « liberal eugenics » may seem demoralising, but one never knows, perhaps this prediction might actually function as a warning and help to prevent us from the worst. *Wir haben es nicht gewusst*, this time at least, unlike last time, we won't be able to say that we didn't know what was going on.

*Posthuman Humanist Postscript*

Nothing is certain, however, not even the worst. But to avoid the self-destruction of the human, we have to invent a new humanism that distinguishes between the inhuman and the posthuman in order to combat the new forms of alienation and reification of the human. Edgar Morin (2001 : 242) is right when he says that « the battles of tomorrow will be waged in the spiritual domain », the domain of the *Geist*, not the one of the mind. In the name of the human, humanists of all sorts and all continents have to track and unrelentlessly criticise the categorical mistakes of those who, willingly confusing the worst with the millennial advent of the best, celebrate the overcoming of the human, while actually accompanying and ideologically cautioning the progress and progression of the inhuman. Although the end of the human is looming and the future of humanity is not assured, we have only started the human adventure. We may have lost the confidence in the future, but we have not lost the

79. Coming back from the United-States, Habermas (2002: 283-285) has noticed a discrepancy between the perspectives on bio-technology of his European and American colleagues. Whereas the Germans are still debating if further developments in genomics should take place, the Americans seem as confident about scientific progress as the Europeans were at the beginning of the twentieth century and no longer question the advance of genomics. Instead, they simply accept the therapeutic implementation of genetic therapies and wonder how the shopping in the genetic supermarket should be regulated.

battle yet. The posthuman is our destiny ; the inhuman is not our fate. Although and precisely because the coming century will most likely be Deleuzian, we have no choice. In the name of humanity and in the hope that the era of the posthuman will not be inhuman, we have to reject the anti-humanism of the neo-Nietzscheans and try to define a new humanism for the coming age. Against Foucault, but with Malraux, we thus conclude with a warning : the twenty first century will be spiritual, or it won't be.

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