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Deleuze and Philosophy

The Difference Engineer

Edited by Keith Ansell Pearson

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Oppenheimer, J. (1959) 'An Embryological Enigma in the *Origin of Species*', in B. Glass et al. (eds) *Forerunners of Darwin: 1745–1859*, Baltimore: Johns Hopkins University Press, pp. 292–323.

Raff, R. A. and Kaufman, T. C. (1983) *Embryos, Genes, and Evolution*, New York: Macmillan.

Reuleaux, F. (1876/1963) *The Kinematics of Machinery: Outlines of a Theory of Machines*, trans. A. B. W. Kennedy, New York: Dover.

Sahal, D. (1981) *Patterns of Technological Innovation*, Reading, MA: Addison-Wesley.

Sapp, J. (1994) *Evolution by Association: A History of Symbiosis*, Oxford: Oxford University Press.

Schick, K. D. and Toth, N. (1993) *Making Silent Stones Speak: Human Evolution and the Dawn of Technology*, London: Weidenfeld & Nicolson.

Serres, M. (1982) 'The Origin of Language: Biology, Information Theory, and Thermodynamics', in Serres, *Hermes: Literature, Science, and Philosophy*, Baltimore: Johns Hopkins University Press, pp. 71–84.

Simondon, G. (1992) 'The Genesis of the Individual', in J. Crary and S. Kwinter (eds) Incorporations, New York: Zone Books, pp. 297–319.

Theweleit, K. (1992) 'Circles, Lines, and Bits', in J. Crary and S. Kwinter (eds) *Incorporations*, New York: Zone Books, pp. 256–64.

Tipler, F. (1995) *The Physics of Immortality: Modern Cosmology, God, and the Resurrection of the Dead*, London: Pan.

Tudge, C. (1995) *The Day Before Yesterday: Five Million Years of Human History*, London: Cape.

Vaneigem, R. (1994) *The Revolution of Everyday Life*, trans. D. Nicholson-Smith, London: Rebel Press.

Vernadsky, V. I. (1945) 'The Biosphere and the Noosphere', *American Scientist* 33: 1–12.

Williams, R. (1994) 'The Political and Feminist Dimensions of Technological Determinsm', in M. R. Smith and L. Marx (eds) *Does Technology Drive History?*, Cambridge, MA: MIT Press, pp. 217–35.

Wolpert, L. (1991) *The Triumph of the Embryo*, Oxford: Oxford University Press.

12

Machinic Thinking

Alistair Welchman

The only thought adequate to the reality of the machinic continuum is a thinking that is itself machinic. It was through Deleuze and Guattari that machinism was first introduced into philosophy, with the publication in 1972 of volume 1 of *Capitalism and Schizophrenia: Anti-Oedipus* (Deleuze and Guattari 1972: 1ff.). According to this model machines themselves have two (inseparable) components: matter and engineering. The machinic continuum is material engineering and machines are engineered matter, although matter engineered by nothing other than matter itself.

The notion of a thinking that is plastic enough to be responsive to the unknown – empiricism – is by and large anathema to philosophy; even to philosophical empiricism. Although machinic thought contains components that are still approachable philosophically, it meshes these components with other machinic elements that are flusher with the real. Thus, the image of thought constituted by the model of recognition and reflection – characterized notably by the transitive nature of the construction of philosophical problematics, as in, for instance the philosophy *of* technology – cannot begin to comprehend the specificity of machinism.

It is true that the central elements of machinism – as the first part of this chapter shows – have indeed been misrepresented by the history of philosophy; and equally true that in order to liquidate such misunderstandings one can also refer to some philosophical machinery first erected by Kant; that is, as the second part of the chapter demonstrates, the weapon of critique. But such an account is not yet machinic in that it still presupposes a certain autonomy of the thought *of* the machine, rather than making thinking itself a machine.

To mechanize thought – a process considered in the third part of the chapter – is to go to the edge of philosophy, and, in the first instance to Nietzsche's genealogy.

Conceptual error does not occupy a space separate from the real; and critique is also a machine. On the one hand paralogisms occur directly in the real, and respond at least in part to the production of the real under certain determinate conditions; and, on the other hand, what conceptual errors remain are *themselves* also the result of the conditions of production, this time, of the conditions of production of cognition.

Whilst nothing real corresponds to the great and gross metaphysical concepts of philosophy – or indeed to their deconstructive refinements – there are real systems whose extensive structure may, on occasion, be grasped by simplified concepts related to those of philosophy.

The State, for instance, clearly has very few of the managerial powers ascribed to it, as a base assumption, by political theory; but it nevertheless has a real existence and real effects, although they are of rather restricted importance, and concentrating on them leads one to miss most of what *is* important. Correlatively, the cognitive misunderstandings by which the State is elevated into the transcendental repository of the law have their origins in a genealogical history – although one that Deleuze and Guattari argue must be extended to *geological* scales – and are not simply failures of rationality.

This extension is a broadening of Wilhelm Reich's question asked repeatedly in *Anti-Oedipus*: why do we love what oppresses us? As ideology is for *Anti-Oedipus* just the wrong question to pose; so for *A Thousand Plateaus* is the question 'why is transcendence a conceptual error?' simply inadequate. Both questions presuppose an autonomy of the intellect that is co-terminous with the over-valuation of consciousness characteristic of Western philosophy.

The last part of the chapter addresses the precise nature of the illusions that Deleuze and Guattari diagnose in the 'Geology of Morals' section of *A Thousand Plateaus*, and discusses the machinic thoughts of abstraction and deterritorialization.

* * *

The three terms most central to Deleuze and Guattari's machinism – engineering, machine and matter – have all been subjected to a curious antinomy in the history of representation theory. As Deleuze suggests, 'representation is the site of transcendental illusion' (Deleuze 1968: 265). In a structure that closely tracks the relation between Christian theology and evil, all three have been represented as essentially deprived and merely negative; but also at the same time as the source of a mysterious and often threatening positive power.

Engineering, as Dennett observes (Dennett 1995: 188), has not been considered worthy enough even to be the object of philosophy: there is no sub-discipline of the

philosophy of engineering. Science, in this representation, wears the mantle of theoretical dignity; and engineering is merely the technical application of the results of science. The thought that philosophy actually *is* engineering – a thought at the core of Deleuze's writings – is catapulted beyond the objectionable into the simply not thinkable. It is several orders of magnitude more problematic than the already objectionable possibility that philosophy might be mistaken for or taken over by science (scientism).

On the other hand, almost from its inception, engineering has been associated with the development of the most threatening of technologies: the military. On the threshold of the industrial revolution, in *Paradise Lost*, it is Satan and his cohorts who mobilize a 'devilish enginery' (Milton 1667: VI, 553) of rebellious war. Indeed, in the middle of the seventeenth century the term 'engine' was reserved *only* for the military industrial: 'engine of war' is a pleonasm. The development of military technology has always operated on a level different from that of science: nomad rather than royal science (Deleuze and Guattari 1980: 367–8). Closely concerned not only with the practical and the pragmatic, but with a cunning born of accelerated decisions of survival, military engineering has been – and continues to be – less a matter of the materialization of scientific theorems than of patchwork and botching and *bricolage* and still somehow getting something right in the end, or if not, then not surviving to tell the tale. Machines similarly have been thought privatively by the tradition. This definition of the machine reaches a certain apogee with Kant's philosophy. For Kant a machine is a system with at best only motricity and not 'formative force or drive',[1] and is therefore a system that acts as the 'mere tool of external moving forces' (Kant 1786: 'Dynamics; General Observation'; Ak. 4: 532). Machines are the transmission site of an activity given from elsewhere, and are therefore deprived of any capacity to act themselves. Perhaps most significantly, for Kantian machines, systematicity is in the same position as motricity: external. Insofar as machines constitute systems at all, therefore, they describe the class of transcendent or intentional systems whose condition of unity is not to be found within them but elsewhere. It is this externality that prompts Kant to argue, with the tradition, directly from the existence of articulated artefacts to the existence of an artificer (the argument from design): 'vestigium hominem video' (Kant 1790: §64; Ak. 5: 370). Machines lack, and always stand in need of, something else: motor force or design force. On the other hand machines have also been seen as a major source of threat, despite their apparently merely privative character. Mechanization – a conversion into machines – is the dominant trope of reactionary rejection of economic industrialization. From Burke to Eliot the dissolution of the social under the impact of the economic has been thought through a series of terms

orientated rhetorically around this concept of the machine: rationalization (Weber); calculation and *techne* (Heidegger); dehumanization; etc.[2] The conversion of the socius, which is contrasted to the organic – both in the dominant theoretical account of the machine in Kant and in the practical attempts at political intervention to 'save' the social – into a mere machine evacuates it of any intrinsic principle of unification. It follows from the dogmatic technical definition of the machine that attempts to resecure unity must be externally imposed; and the worst excesses of twentieth-century political management – both modernist and anti-modernist – follow in their turn from this. Again, a devalorized and negatively defined concept of representation is antinomically capable of positive, and positively threatening, activity.

The structure of this antinomy is, however, most clearly visible in the philosophical treatment of the thought of matter. Matter is *the* devalorized concept of the philosophical tradition; and its devalorization is repeatedly stamped with an absolute quality: matter is repeatedly defined *a priori* as what precisely does *not* have the qualities attributed to the non-material; matter is motionless, lifeless, incapable of knowing itself, etc. Locke, for instance, argues that:

> [I]t is as impossible to conceive that ever bare incogitative Matter should produce a thinking intelligent Being, as that nothing should of itself produce Matter. . . . Matter by its own strength cannot produce in itself so much as Motion.
>
> (Locke 1690: IV. x. 10)

Kant equally writes that:

> [W]e cannot even think of living matter as possible (The very concept of it involves a contradiction, since the essential character of matter is its lifelessness, *inertia*).
>
> (Kant 1790: §73; Ak. 5: 394)

And even Pascal – in an unsurprisingly rare moment of agreement – writes similarly of there 'being nothing so inconceivable as to say that matter knows itself' (Pascal 1670: §72–199).

It is paradoxically precisely this passivity of matter that can constitute a (theoretical) threat: Kant goes on elsewhere to suggest that even the possibility of living (i.e. active) matter 'would be the death of all natural philosophy' (Kant 1786: 'Mechanics', Proposition 3, Observation; Ak. 4: 544). But there is also a sense in which matter is not (or not only) the pure patient of monotheistic theology but also the pure (although unformed) *act* of Chaos. Chaos is matter as threat; and the

neutralization of this threatening conception of matter is a condition of the installation of inert or dead matter. Milton's God performs a paradigmatic act in book VII of *Paradise Lost* when He is depicted by Milton engaging in a pre-creative act of the repression of the formless activity of Chaos, which is the condition of possibility of the creation as such. Milton's God's role is that of 'circumscribing/The universe' (Milton 1667: VII, 226–7), of simply containing and setting bounds to the limitless chaotic sea, of converting it into a reservoir of employable energy. Milton has God perform an act of binding upon the active materiality of the 'vast immeasurable abyss/Outrageous as a sea, dark, wasteful, wild' (VII, 211–12) whose *product* is dead matter, the matter of the tradition: 'matter unformed and void' (VII, 233). And this is the 'watery calm' (VII, 234) over which the spirit may now, and only now, move. For the creation even to appear that it occurs responsibly, there must, as condition, be a pre-creative move which serves primarily to repress (primary repression), stunt and constrain the irresponsible activity of the wilderness/ocean. It is only then that the creation may proceed according to its plan laid out in Genesis, and be provided with its now lethargic and receptive, patient and passive, primary matter.

In each of the three cases there is a transcendent evacuation of the terms. They are emptied of any possible content or effect; and something else is suspended above them, separating, guiding, controlling: 'a dead rat's ass suspended from the ceiling of the sky' (Artaud, cited in Deleuze and Guattari 1972: 124–5). They become impossible, uninhabitable philosophical terrains, which hardly even require the effort of refutation. Engineering is subordinated to a properly epistemological science as its mere application; the machine is subordinated to an external force, or equally to an external principle of systematicity, that acts as a transcendent *telos* for which the machine itself can only exist as a mere instrument; and matter is separated from what it can do and is a mere patient for form.

Equally, though, and again in each case, something remains, an insoluble remainder. In stark contradiction (antinomy) to the vacated inefficacy of the position of the term – mere application; mere instrument; mere patient – each also has a subterranean complexity, an ineradicable intransigence. 'Since World War II the discoveries that have changed the world were not made so much in lofty halls of theoretical physics as in the less-noticed labs of engineering' (Nicholas Metropolis, cited in Dennett 1995: 187). Purely instrumental machinery seems bent on prosthetic revenge. Matter produces an excrescence of complexity independent of form. '[T]he noumenon tends to appear as such in complex systems' (Deleuze 1968: 256).

* * *

Kant's method exhibits two great, and related, mistakes: aborting the specificity of the transcendental at the moment of its inception; and, whilst inventing critique, failing to take it far enough.

Firstly, the transcendental component of Kant's thinking fails to respect the autonomy of the transcendental (even though Kant was the first thinker to have opened up this transcendental field). The Kantian transcendental is, as Deleuze argues in *Difference and Repetition*, still merely empirical:

> It is clear that . . . Kant traces the so-called transcendental structures from the empirical acts of a psychological consciousness: the transcendental synthesis of apprehension is directly induced from an empirical apprehension, and so on. In order to hide this all too obvious procedure, Kant suppressed this text in the second edition. Although it is better hidden, the tracing method, with all its 'psychologism', nevertheless subsists.
>
> (Deleuze 1968: 135)

This psychological grounding is the basis of what Deleuze describes as the nexus of common sense and good sense (Deleuze 1968: 131–7; 223–7). It is the aim of critique precisely to call these uninterrogated presuppositions into question. Similarly, and this is the second point, the critical aspect of Kantianism fails to carry through the task that Kant nevertheless had himself invented. The objects of Kantian critique (World, Soul, God) are subject to an only apparent critique; after it they remain intact – indeed not only intact, actually immune to any further critique – but removed to a different level, that of practical and hence unquestionable revelation rather than theoretical cognition. Deleuze writes: 'We cannot accept that the grounded remains the same as it was before, the same as when it was not grounded, when it had not passed the test of grounding' (Deleuze 1968: 154). An effective critique eliminates its objects, and does not, like Kant's attempt, redeem them.

In fact the critical works represent a close collaboration of the traditional dogmatic understandings of engineering as mere application, of the machine as mere instrument and of matter as mere patient. Kant's commitment to a matter that is completely dead is clear. But this also ties closely into a thought of transcendental production that is dogmatically machinic, and engages Kant in a series of problems that are recognizable as engineering problems but that are also insoluble given the subordination of engineering to science.

Nature for Kant is a product, that is to say, ultimately it is engineered. This is his break with philosophical empiricism, which treats nature as simply given, and hence not engineered at all. However, his model for the engineering of nature specifically

requires that the unity of nature be thought in exteriority to nature itself (this could serve as a definition of the transcendental). Indeed Kant appeals to one and the same model in characterizing the construction of nature and the externality of the controlling intention or concept in the use of machines: the model of an artisanal production, or what Kant importantly calls desire (Kant 1790: Introduction III note; Ak. 5: 177–8).

On this model, there is an engineering problem posed; but it is posed dogmatically, in terms simply of how to *apply* science (both in the more restrictive English sense and the more extensive German sense of *Wissenschaft*) to the world. The application of pure *a priori* geometry and mathematics to the world (i.e. the possibility of Newtonian dynamics, science in the English sense) is the problem that transcendental idealism sets out to solve. The answer (the synthetic *a priori*) is *Wissenschaft*: the pure concepts of the understanding, which are responsible for the construction of nature in accordance with nature construed as that which is described by dynamics. The result is a purely technical machinism: mathematically calculable science is presupposed; matter is thought transitively as the mere recipient of science; and engineering (Kant's primary term is schematization) is thought just as the application or one-to-one mapping of science to its material object domain.

It should be noted, however, that this residual engineering problem caused Kant no little difficulty; and his sensitivity to the difficulties of this project attest to his modernity. From the start Kant was unsure how science (a transcendental logic of concepts) could be *capable* of application; how the real could be made exhaustively characterizable in terms of science. The real always escaped conceptual determination (conceptual difference), as Kant's use of the paradox of incongruent counterparts shows: there is always 'a power peculiar to the existent, a stubbornness of the existent in intuition which resists specification by concepts no matter how far it is taken'; there is 'an always rebellious matter' (Deleuze 1968: 13–14; 264).[3] And consequently, Kant was always forced to suggest another impossible piece of machinery that could present the engineering problem of nature as the result of calculable conceptuality and science: he gives us two deductions; a schematism; the theses of time-determination; the theses of space-determination; the whole of the *Critique of Judgement* (a meditation on the conditions of possibility of application as such); and still has not satisfactorily solved the problem by the *Opus Posthumum*.[4]

Kant grasped the problem of the production of nature as a problem of engineering; but was simultaneously unable to solve it without appealing to uncritical or purely technical concepts of machinism. What is required is a critique

of technical machines, a critique that demands that thinking itself become machinic. It is through Deleuze and Guattari that this critique is operated.[5]

* * *

Critique is also a history, a genealogy; and there is a whole material history or history of materiality that underlies this critique. Something was extracted from the continuum: the continuum was flattened out, and the something held on high above the flatness. Matter has been separated from what it can do and there is now a matter on which something else – representing a reactive focusing of activity into a central single point – may now act.[6] A dual performance repeated again and again on different levels: the separation of plasma into energy and matter; the agglomeration of matter into lumps (the Kant/Laplace hypothesis); construction of replicators and correlative production of an environment constituted as fuel, etc. The Despot resides in monotheistic religion, in individual consciousness ('God or the Self, it is the same thing' (Deleuze 1968: 203)), in the State, even in the genes. Once matter is patient, and any capacities it appears to have must be referred elsewhere, then machines have become technical (aggregates with external sources of design or motricity) and engineering has become sheer application (of external sources of energy/design to material aggregates).

Henceforth everything is dangerous. Every philosophical hypothesis is apt to be understood only in terms that are subsequent to and therefore presuppose this separation; every deterritorialization is apt to be reterritorialized. Take, for instance, the attitude of the tradition to matter. It is true that the 'inconceivability' of matter as act is susceptible of a positive reading; that the activity of matter is different in kind from the activity normally attributed to non-materiality. To this extent the inability of philosophy to think active matter is not *just* a symptom of the intensity with which the tradition repudiates immanent materiality. But it is nevertheless the case that the understanding of activity which is attributed (*per impossible*) to matter is perpetually in danger of being recast as the sort of activity that only comes after the separation of matter from what it can do. That is, the mode of material production is understood, uncritically, only on the basis of its *products*. In this way, immanent matter is persistently confused with hylozoism – the idea that matter is imbued precisely with that form of activity that is supposed to be characteristic of life. The kind of activity that is the *result* of draining out the distributed capacities immanent in matter and focusing them in a single point (subject or substance, structure or origin) is then *reprojected* out onto matter; and this is treated as the only possible understanding of the action of matter.

The absurdity of matter doing anything to the tradition is an analytic *a priori*: once action is *defined* as a singular focused point and once design is assimilated to intentional intelligence, then it is indeed inconceivable that just these could be distributed among matter. Hence, when the tradition even deigns to represent the kind of activity that matter can have, it is in terms of already previously separated activity: consciousness, thinking, intelligence, etc.

There is a rigorous conception of critique at stake here: that an account of activity or production cannot presuppose the constitution of its own products. The antinomies of materiality, machinism and engineering – that they are merely dead, merely technical, merely applicatory and at the same time active threats – are generated by a single basic paralogism according to which activity is concentrated into a single point that functions as its subject; according to which machines and their production are separated out into a dead machinism sourced from outside; according to which engineering is separated from its technologically generative capacities and subordinated to an externally acting science or theory. In each case products constituted through a long material history, and only under certain limited conditions, are projected backwards as the origin of what in fact produces them.

It is, however, a complex conception of critique. It involves both a conceptual component and a historical-genetic component. On the one hand, conceptual misunderstandings (paralogisms and their associated antinomies) are implicated to the extent that the functioning of real systems is confused with something that impossibly overhangs systems and controls them from the outside. On the other hand, systems that lend themselves to this misunderstanding are real configurations of machinically engineered matter, and as such have specific properties more (or less) amenable to analysis.

Deleuze condenses these two components of critique through his account of nineteenth-century thermodynamics in *Difference and Repetition*. There he suggests that 'not only are there sensory illusions, but there is also a transcendental physical illusion' (Deleuze 1968: 228). For Deleuze this illusion is of inevitable increase in entropy; in Freud's vocabulary, the working off of vital differences. Such an illusion represents a conspiracy of extensive physics with royal philosophy. Difference – one of Deleuze's early words for matter – is equalized into long-run identity as much by the technical outcome of statistical physical process as it is by the dictates of a pure reason.[7] As Deleuze writes, with thermodynamics '[t]he words "the real is the rational"' found a new sense, for diversity tended to be reduced in Nature no less than in reason' (Deleuze 1968: 224). There is a transcendental illusion; but one that is invested in the real:

> There is an illusion tied to intensive quantities. This illusion is . . . the movement by which difference in intensity is canceled. Nor is it only apparently canceled. It is really canceled, but outside itself, in extensity.
>
> (Deleuze 1968: 240)

There is a transcendental *physical* illusion; there *really* is stratification. This thought is vital to Deleuze and Guattari. Without it the machinic engagement of their texts would still retain a residual Enlightenment form: that of the criticism of conceptual errors, presupposing a backdrop of enlightened rationality (however complicated by its own internal torsions, as in Horkheimer and Adorno).

This is also the importance of Bergson to Deleuze. However much Bergson is carried off into the naivety of a kind of vitalism or specific hylozoism (and it is arguable exactly how much that is), he is always showing that our incapacity – always relative – to understand what kind of products we are is a result of our being the kind of products that we are (Bergson 1907: 1ff.). Machined by innumerable stratifications – material, biological, social – the human animal is engineered on the strata, feels at home there; but the strata just are (turned towards) the body without organs, the intensive continuum, immanence.

Equally important is the fact that this thought of transcendental physical illusion enables an understanding of Deleuze and Guattari's *prima facie* contradictory argument-pair that humans are machinically constituted, and at the same time chronically becoming-machine; subject to deterritorialization and overflow into the technically machinic. What is really immanent in transcendence – certain special-case systems exhibiting restricted capacities for interaction with the outside and characterized by self-sustaining feedback loops orientated towards homeostasis – is itself engineered and therefore already machinic; but the overall tendency of general-case engineering processes is towards the wastage of transcendence, and therefore the special-case systems are simultaneously becoming-machine. Machinism engineers both stratic transcendencies and perpetual destratification: the greatest strata are the result of great deterritorializing movements; the inauguration of the Despot is also a great schizophrenic levelling.[8]

There are a set of transcendental illusions (grounding paralogisms and consequent antinomies of matter, machines and engineering) constitutive of representation theory. These illusions, however, are grounded in the real, in the intensive continuum. Matter as intensity expresses itself in extensity (Deleuze 1968); the body without organs stratifies itself, without any help from anything else (Deleuze and Guattari 1980). These illusions are therefore transcendental physical illusions. To describe an extensive system is to arrange a genealogy of the materially

engineered machines that contributed to its production as a stratified, but still immanent, system.

Cognition is itself such a system; perhaps, indeed, the *most* stratified feedback system; cognition was not engineered to understand its own conditions of production. Indeed, it was not engineered *for* anything: it was just engineered. There therefore remains the tendency to think transcendental physical illusions as constitutive of the real, ignoring their immanent basis. By-passing the immanent basis of transcendence in turn overlooks the perpetual instability of stratified systems: their tendency to degenerate, to deterritorialize.

Interestingly and perhaps surprisingly, the American analytic philosopher of mind Daniel Dennett develops a vocabulary to describe this situation: there are no skyhooks; there are only cranes (Dennett 1995: 74ff.). In general, cranes are immanent machinic accounts of systems that tend to be interpreted as transcendent, as skyhooks. More specifically, cranes are catalysts of (evolutionary or more generally auto-productive) processes; but they are accelerators that have their basis in the very processes they catalyse. Natural selection is perhaps the paradigm crane: a simple process that in itself contributes nothing to engineering design, but that makes possible a systematic selection of embryonic designs and, over geological time-scales, facilitates a relatively complex exploration of design-space.

Another, more interesting, example of a crane broached by Dennett is genetic engineering (even if understood only in the Darwinian sense of artificial selection).[9] Such engineering speeds up mutation rates, and sets new local optima for selection; but it 'is no miracle – *provided that genetic engineers . . . are wholly products of earlier, slower evolutionary processes* (Dennett 1995: 76–7, italic in original). Skyhooks are attempts to explain craning phenomena through the intervention of a mysterious transcendence that is problematic, but somehow necessitated, because one doesn't have the concept of cranes – skyhooks are dead rats' asses.

It is clear that we are not built to have the concept of cranes: it ranks as a perversion of thinking to have generated even the idea of them. The great tendency in biological thinking – initiated by Aristotle, and solidified into a recognizably modern form by Kant – has been to project the anthropomorphic characteristic of intentionality onto the biological world in the form of teleology. This tendency has been parodied by the ultra-Darwinians, who utilize a vocabulary of 'interests' explicitly to describe purely machinic processes: 'selfish' gene theory (set out most popularly in Dawkins 1976).

The vocabulary of intentionality and interests in the work of ultra-Darwinians has been badly misunderstood. They feel entitled to use such terminology – which was previously frowned upon in modern biology as symptomatic of a regression to

theological or teleological biology – precisely because it is completely inappropriate. *Of course* genes do not have interests. And it is only when any residual tendency to think that they do has been ruthlessly expunged, that is, when one has an impersonal and machinic account of morphogenesis, that one can freely (but obviously ironically) use anthropomorphic terms, in the sure hope that no one will fail to get the joke.

Unfortunately there has indeed been a collective sense of humour failure amongst many of those responding to Dawkins' work. The situation is exactly akin to assimilating Deleuze and Guattari to a standard (rather than a technological) vitalism; or Schopenhauer's account of the world as will to a voluntarism. Intentions, vitalism and voluntarism are the names for activity after it has been paralogistically separated out from matter and projected into an imaginary point outside and transcending nature. Material activity immanent engineering, is what matter does to itself. One completely misconstrues machinism when one simply takes the concepts of transcendent activity, and applies them to matter (standard vitalism).

What is interesting is how much further Dennett is prepared to go than Dawkins about the result of this. Culture is a crane (Dennett 1995: 335f.); and the intentional resources of (say) genetic engineers, or artificial selectors, have the same status as the parodic intentions of selfish genes – they are ironic short-hand for sets of self-assembling machinic processes; cascading cranes (Dennett 1995: 75); unconscious engineering.[10]

> [H]ow could the products of our own 'real' minds be exempt from an evolutionary explanation? Darwin's idea thus . . . spread[s] *all the way up*, dissolving the illusion of our own authorship.
>
> (Dennett 1995: 63)

Where Dawkins hangs on at least to the idea that humans have interests, Dennett demolishes the basis for *any* interests. Rigorously thought, machinic materialism *must* also apply to primates, and our own ascriptions of intention must be as parodic as those of 'selfish' genes. Such an extension of machinism clearly goes further, to the *products* of primate activity, and that includes works of philosophy: machinic thinking.

Dawkins (1982) introduced the notion of the extended phenotype in a rigorous but consciously restricted manner. As an ethologist, he was quite comfortable because of his research speciality with the idea that genes could code for animal behaviour. The extended phenotype is merely the suggestion that it is essentially arbitrary (or dependent on some arbitrary variable like preferred zone of

experimentation) where one decides to stop locating phenotypic effects: molecular biologists, for instance, might stop at specific protein constructs. The external boundaries of the organism are just as arbitrary. For a limited set of cases, building up from external morphology, through animal behaviour and animal artefacts (beaver dams and termite mounds) to phenotypic effects of one organism's genes on the behaviour and morphology of an organism of a different species (for example, *Leucochloridium* flukes and snails; Dawkins 1982: 213) to phenotypic action at a distance (in the Bruce Effect; Dawkins 1982: 228f.), Dawkins argues compellingly for a limited 'extended genetics' (1982: 203).

Dennett's argument has very considerably more scope: there is no rigorous way of thinking of the technical artefacts of the human species except as extended phenotypic effects. The 'unity of design space' (Dennett 1995: 135f.) demands that *all* artefact productions be viewed on the same level, as impersonal engineering programs.

Cranes are what is immanent in transcendence; skyhooks are transcendence, motivated by the limitations of primate cognition, limitations that themselves are produced by recursively craned engineering processes. But cranes do not stop getting built, and that they are already machines does not stop an increasing index of machinism.

* * *

Linguistics and abstract expressionism – the practical wing of formalism – develop the long obsession of philosophical abstraction with the conditions of representation into a recognizably modern form.

Guattari (1992: 39) criticizes (structural) linguistics both for being too abstract and for not being abstract enough. It is too abstract in the sense that it assures an all-too-easy inter-translatability of every one of the strata within language; everything must be represented in language. It is, on the other hand, too abstract to be able to encompass non-linguistic elements on the same level as language, what Guattari calls 'ontological heterogenesis'.

Deleuze similarly criticizes representation in general for not being abstract enough when he suggests: 'The theory of thought is like painting – it needs that revolution which took art from representation to abstraction' (Deleuze 1968: 276); but later he also criticizes abstraction (in painting) for being itself too abstract: 'One wants to say about abstract painting what Péguy said about Kantian morality, it has clean hands, but it doesn't have any hands' (Deleuze 1984: 67).

In 'The Geology of Morals', Deleuze and Guattari (1980: 39–75) describe a succession of destratifications and restratifications that correspond to the inorganic,

organic and cultural strata (Deleuze and Guattari's term for this last is 'alloplastic' (1980: 60)). Using a matrix of terms derived from Hjelmslev 'the Danish Spinozist geologist' (43), they characterize each stratum on the basis of differential distributions of content and expression. In particular, expression gains an increasing autonomy. Initially expression and content, although bound together, are separated only by orders of magnitude (the one molar, the other molecular). On the organic stratum, however, 'expression and content are both molecular *and* molar' and expression (forming nucleic acid sequences out of nucleotides) has become an independent line from content (forming proteins out of amino acids (59)). On the alloplastic stratum, finally, vocal signs achieve a superlinearity or temporal linearity whereby not only is expression independent of content, but *form* of expression becomes independent of substance of expression (62).

This huge deterritorialization is fraught with dangers: the 'imperialism of language', the overcoding of the Despot, the illusions of linguistics (62; 65). But it also begins to frame a thought of machinic abstraction that is of extreme importance to machinic thinking: abstract machines are increasingly implementation-independent or substrate-neutral non-computable programs (Dennett 1995: 82). '[Challenger's] dream was less to present a paper to humans than to propose a program for pure computers' (Deleuze and Guattari 1980: 57).

The deterritorialization that Deleuze and Guattari assign to the production of the alloplastic is itself generated by the increasing autonomy of forms of expression from forms of content, as well as of expression in general from content. Today it must be acknowledged that the organic stratum itself is undergoing a similar deterritorialization and abstraction. The forms of expression aligned with living entities are increasingly seen as capable of implementation in different substrates. This deterritorialization is demonstrated by Dennett's analysis of biological processes.

Dennett defines natural selection as an 'algorithmic process' (Dennett 1995: 48f.) and at least implies that it is a computable process; that is to say, he is in danger of identifying an open-ended and essentially unpredictable and problematic engineering process with a theorem of royal science. But what he is getting at is better thought of as an abstract machine for four reasons. Firstly, he explicitly includes 'heuristics' in his definition of an algorithm (Dennett 1995: 210), and heuristics or pragmatics are incapable of formalization as a computable function. Secondly, natural selection is a process only to the extent that it is randomly seeded with difference in the form of variation. The introduction of randomness also defies computational capacity. Thirdly, natural selection is not an algorithm *for* anything in particular; it is intransitive (Dennett 1995: 308). Fourthly, lastly and most importantly, it is *extremely* platform-independent.

An old but interesting problem in biology is that of the origin of replication. If construction processes are dependent on the existence of replicators, then it is difficult to see how replication could have got started, could have bootstrapped itself. That this has been a problem is an index of a failure of abstraction. Machinic replication can be implemented in multiple domains; and at least one compelling speculation as to the solution of this problem appeals to this abstraction. Cairns-Smith (1985), for example, argues that strictly biological replicators are the results of parasitic take-over of older and less sophisticated replicators embedded in a different substrate.

A machine deterritorializes, and becomes *more* abstract, when its codes spill over from one implementation (substance) to another. Carbon replication is already a deterritorialization; neural pattern replication ('memetic engineering') is another; computational replication – artificial life – another. It is important to disengage deterritorializing engineering tendencies from technical-scientific projects. This has always been the dream of the West: a pure despotism of knowledge; the West is, in a profound sense, technocratic: 'Transcendence [is] a specifically European disease' (Deleuze and Guattari 1980: 18).

The currently fashionable Human Genome Project is structured identically with the expert systems artificial intelligence programs of the 1970s. In both cases science attempts to construct a model of a complex object, and then treats engineering as a direct, point-to-point, remapping of the model. Thus, taking intelligence as its object, artificial intelligence attempted to produce a logical model, directly remapped into the gated logic of computer circuits; similarly, the Human Genome Project is attempting to construct a model of human embryological development that can be mapped one-to-one onto a database for patently technocratic reintervention in development. The complicity between these two attempts is not coincidental. The mapping of (complex) dynamical systems (like embryological development) onto formal logical systems is the essence of (royal) science, embodied in the Church–Turing thesis (Kampis 1991: v).

As Deleuze and Guattari never fail to emphasize, however, there is *no* 'correspondence or conformity' (1980: 44) between content and expression (for instance, between phenotypic proteins of content and nucleic acids of expression). Contemporary artificial intelligence (connectionism) and artificial life are pure Deleuzian engineering: deterritorialized intelligence and life implemented in new media and, in a phrase of Tom Ray's that could equally characterize a postmodernist aesthetic, 'search[ing] out the possibilities inherent . . . in the medium' (Ray 1995: 181).

This new alliance between Deleuze's machinic thinking and Anglo-American analytic engineering philosophy is of some importance. Deleuze's reception in the

Anglophone world has been, along with all the other French *maîtres à penser* since 1945, carried out mostly in conjunction with aesthetic preoccupations. But Deleuze's machinism breaks up the Saxon traditions of Humboldtian disciplinary 'separate but equal' Jim Crowism: *Geistes- und Naturwissenschaften* (rather palely reflected in Britain as the 'two cultures' debate). This academic division is the institutional realization of the philosophical antinomies already discussed; it reflects all the most questionable dichotomies of the West: value/fact; autonomy/heteronomy; non-determinism (understood juridically as responsibility)/determinism, etc.[11]

The simple aestheticization of Deleuze's work – its relegation to being a new tool for the production of critical texts in the humanities departments of universities – effectively neutralizes its critical bite. It does this in a way that directly follows the structure of other misunderstandings of Deleuze's work. Apart from being in such a context of clearly no more than instrumental – that is, uncritically machinic – use, its association only with the *Geisteswissenschaften* places Deleuze's work in the structural position of humanitarian anti-scientism.

This is why it is always important to insist upon Deleuze and Guattari's own repeated claim that desiring-machines are not literary tropes: 'Everywhere It [the id] is machines – real ones, not figurative ones' (Deleuze and Guattari 1972: 1). That would be the most obvious submission to the imperialism of the signifier.

Not that this is to argue that Deleuze and Guattari have *no* relation to aesthetics. In fact the aesthetic flows of German idealism were some of the first outpourings of the impersonal into Western thinking, the first thoughts of material morphogenesis. Indeed, it would be far from paranoid to argue that the organization of the university into its modern form, undertaken by von Humboldt, was directly a response to the threat of this incipient machinism.

If the current structure of the Academy was born as a bulwark against the convergent tendencies of the nineteenth century, and probably helped to exterminate them, then the deterritorialization of intelligence into silicon substrates currently underway demands a simultaneous deterritorialization of research, or the by-passing of the blockage. Machinic thinking cannot engage with two cultures.

Notes

1 Kant usually uses the term '*bildende* Kraft' in contrast to a machine's merely '*bewegende* Kraft' (see, for example, Kant 1790: §65; Ak. 5: 374), but he also cites – without criticism – the biologist Hans Blumenbach's rather stronger term '*Bildungstrieb*' (Kant 1790: §81; Ak. 5: 424).

2 This issue is covered in great historical detail in Williams 1963.

3 Deleuze argues that '[d]ifference can be internal, yet not conceptual (as the paradox of symmetrical objects shows)' (Deleuze 1968: 26). The argument is taken from Leibniz (Leibniz 1715–16: 26), and shows that an object and its mirror-image exhibit a difference – left-/right-handedness or cheirality – that cannot be thought conceptually. Kant's critical use of the paradox is supposed to be an argument for the transcendental ideality of space. But Kant also alludes to the same argument – with a purpose closer to that of showing that spatial intuition is irreducible to conceptual determination – in his *Inaugural Dissertation* (Kant 1769: 28).

4 Paul Guyer argues that the theses of time-determination (which pre-date the critical enterprise) are designed to perform the same task as the deduction(s); and, he suggests, the former succeed where the latter fail (Guyer 1987). Eckart Förster argues that the *Metaphysical Foundations of Natural Science* – which performs a task for space analogous to that performed for time by the analytic of principles in the first *Critique*; hence thesis of space determination – and the *Opus Posthumum* (with its continued problematic of the 'transition') are different solutions to the same problem of engineering (Förster 1987).

5 It should be noted that Kant's attempts to make an apparently irreducible intuition directly compatible with concepts are wholly reactionary; but it would be unfair not to note that the texts in which he makes these attempts (and most notably the *Critique of Judgement*) involve his tabling a number of extremely interesting ideas, and ones that were to have an important impact on the philosophical developments of machinism. A mode of production characterized by a *Zweckmässigkeit ohne Zweck*, for instance, pre-empts both Schopenhauer's and Nietzsche's conceptions of active matter.

6 See Deleuze's account of Nietzsche's critique/genealogy of reactive forces as forces separated from what they can do in Deleuze 1962.

7 It is by no means a trivial fact that nineteenth-century thermodynamics was initiated by an engineering-industrial investigation into the functioning of the processes – both technically and socially machinic – of the industrial revolution.

8 'Far from seeing in the [Despotic] State the principle of a territorialisation . . . we should see . . . the effect of a movement of deterritorialisation'; 'The Despotic State . . . forms a new deterritorialised machine'; 'the despotic sign . . . *the signifier is merely the deterritorialised sign itself*' (Deleuze and Guattari 1972: 195; 198; 206).

9 Dennett's other examples are sexual reproduction and the Baldwin Effect (Dennett 1995: 76f.).

10 Even Darwin noted (1859: 35) that artificial breeding can induce 'unconscious selection'.

11 Arguments about the relative scope of scientific methodology do nothing to alter this structure. The question there is merely where the dividing line should be drawn, even in the case where there is no space for the *Geisteswissenschaften*.