

In and Out of Control: Self-Augmenting and Autonomous Technique

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Introduction

In the three hundred or so years following the industrial revolution, technology has become a zone of philosophical and political contestation. Modern technique is capable of transforming environments on a planetary scale and – with the development of technologies of ubiquitous computation, nano-scale engineering and genetic engineering – may fundamentally augment human subjectivity and embodiment, to the point at which our enhanced descendants would not appear recognisably human to us. The prospect of an enhanced ‘posthumanity’ is greeted enthusiastically by transhumanists who see the freedom to modify the forms of our minds and bodies – morphological freedom - as an extension of liberal rights (Bostrom 2005). By contrast, conservative critics such as Francis Fukuyama, see developments in human enhancement technology as a threat to liberal conceptions of equality (Fukuyama 2002). For many theorists of a ‘deconstructive’ bent, on the other hand, the transhumanist itinerary aims at a banal transcendence belying the ‘humanist’ will-to-power at its core (See, for example, Badmington 2003).

A common gambit among the deconstructionists is based on the defensible claim that technology is not alien to humanity but integral to our existence. This thesis of ‘originary technicity’ is formulated in a number of philosophical traditions. We find it articulated in ‘quasi-transcendental’ terms in Derrida’s work, and given a more empirically based interpretation in the work of the philosopher of technology most closely aligned to him, Bernard Stiegler (Stiegler 1998). However, it is also expressed in Daniel Dennett’s conception of consciousness as a virtual machine implementing serial schema for the ‘meta-representation’ of cognitive or affective states on the

parallel hardware of the brain and Andy Clark's creative recapitulation of Donna Haraway's cyborg metaphysics (Dennett 1991, Clark 2003). If, as Clark claims, capacities for higher order abstraction or calculation are predicated on the recursive properties of public symbol systems, then much of what the philosophical tradition sees as distinctively 'human' may be predicated on scriptural operations whose history is phylogenetically late. The massive hypertrophy of cognitive technologies over the past fifty years would thus be the latest stage in a sequence involving no categorical break with our status as 'natural born cyborgs' (Clark 2003, 142).

This broadly 'deconstructive' intervention into philosophical discourse on technology is salutary. Nonetheless, even if we concede that human subjectivity is mediated by technical infrastructures, it remains to be seen whether the planetary technology which has emerged during the modern period may not constitute an unprecedented break with previous technical mediations. If this is the case, then it may be possible to concede the 'originary' status of technique while holding that there is something about the trajectory of *modern* technique that implies a decisive new phase in the invention of the human; for which the term 'posthumanism' could well be merited.

In what follows, I aim to address this issue in a very preliminary and (it should be conceded) highly speculative way by using conceptual resources supplied by the *substantivist* account of technology set out in Jacques Ellul's book *The Technological Society*¹. In the philosophy of technology the term 'substantivism' denotes a range of theories that are opposed to the instrumentalist conception of technique. For instrumentalists there is a clear tripartite distinction between 1) a technique, 2) the agent who employs it and 3) the goal it is used to achieve. Since techniques have no agency, only the ends they secure are morally evaluable.

Most significant philosophy of technology has entertained revisions of the instrumentalist schema. Thus critics of modernity from Rousseau to Heidegger have argued that technique does not merely *supplement* or enhance our native capacities - making it easier to hunt, kill or cook - but

¹ Published as *La technique ou l'enjeu due siècle*, Librairie Armond Colin, 1954.

can supplant our powers for 'authentic' thought, sociality or experience. According to the position famously espoused by Heidegger in 'The Question Concerning Technology', the essence of modern technique is an impoverished mode of phenomenological access to beings, revealed only in terms of their functionality within wider technological systems. For the instrumentalist, there is nothing ontologically distinctive about techniques as such, since they acquire 'technicity' in virtue of their use. For the substantivist however, there are essential characteristics of technique other than usage which, as Peter-Paul Verbeek puts it, constitute 'a determining and controlling influence on society and culture' (Verbeek 2005, 11). Moreover these characteristics may be evaluated independently of the specific technical aims and – in the work of both Heidegger and Ellul – inform a critique of the cultures of modern technical societies.

In what follows, I will address certain strains within the substantivist account of technique presented in *The Technological Society*. My aim here is not exegetical. Rather it is to see whether we can reconfigure some of its core ideas for a kind of 'Substantivism without substance': a philosophy of technology which engages with the singularity of technical modernity without indulging in either precipitate essentialism or nostalgic anti-modernism.

The substantivist theory presented in Ellul's *The Technological Society* is usually referred to as 'the theory of technical autonomy' since it claims that technique in the modern era develops according to its own logic of efficiency and in so doing displaces non-technical norms and values. Modern technique, for Ellul, is autonomous because, like a Kantian moral subject, it prescribes its principles of operation (Winner 1977, 16). The content of this prescription can be expressed as the injunction to maximise efficiency; a principle overriding conceptions of the good adopted by human users of techniques. Technique is not, then, a system of means – as the instrumentalist assumes – but a *system of uses*, continuously adapting human beings to its functional requirements. If Ellul's account is a form of technological determinism it is best seen, I think, as a case of what Bruce Bimber calls 'normative determinism' (Bimber 1994). That is, Ellul does not

attribute causal agency to the physical means underlying technique – machines, physical plant, tools, etc. – but to technical practices.

Unlike Heidegger, Ellul does not use a transcendentalist methodology to formulate his substantivist account. If anything, his approach is naturalistic, treating autonomy as a function of socio-technical complexity rather than as a phase in the dispensation or ‘destining’ of Being. He thus avoids the charge of deducing the character of modern techniques from their transcendental conditions of possibility that has been levelled at Heidegger (Verbeek 2005). Nonetheless, Ellul has been criticized by theorists of a more social constructionist bent for divorcing the notion of efficiency from social or cultural contexts of use. I think this criticism can be rebutted from within Ellul’s theory. However, seeing how Ellul obviates the efficiency criticism helps us see where the real conceptual tensions of the theory of autonomous technique really lie.

In outline, I will argue one of the main conditions of technical autonomy – which Ellul refers to as ‘self-augmentation’ – is in fact incompatible with autonomy. ‘Self-augmentation’ refers to the propensity of modern technique to ‘catalyze’ the development of further techniques. Thus while ‘technical autonomy’ is a normative concept, ‘self-augmentation’ is a dynamical one. I claim that technical self-augmentation presupposes what I call *technical abstraction* - the independence of techniques from culture, use and place - and that technical abstraction is incompatible with technical autonomy. The reason for this is that where techniques are relatively abstract they cannot be *functionally individuated*. Self-augmentation can only operate where techniques do not determine the uses to which they are put. Thus a theory which posits a self-augmenting technique is incompatible with any normative technological determinism such as we find in substantivist theories. However, while self-augmenting technique is not *in* control, there are prima facie grounds for claiming that it may be outside our capacity to control. Indeed the historical shift from a technique largely constrained by culture to a technique that catalyzes its own development may supply precisely the conceptual demarcation between pre-modern and modern technique required by an adequate theorisation of the posthuman.

1) Essentialism and the Efficiency Criticism

Ellul's theory of autonomous technique has two main components: 1) a theory of the essence of technique which sets out necessary and sufficient conditions for something being a technique; 2) an account of the historical conditions for the emergence of autonomous technique.

All techniques, according to Ellul, are goal-directed operations (Ellul 1973, 19). The technical operation is distinguished by being the result of an intelligent search for added efficiency. This rational quest through design space - which Ellul terms the 'technical phenomenon' - is not the exclusive preserve of modernity. It characterises Zulu military technology and Roman law as much as object-oriented programming or nuclear fission (ibid. 77). As we shall see, however, in contrast to autonomous technique, pre-modern technical development is characterised by a slow rate of diffusion and by its subordination to conceptions of the good other than efficiency.

Now, a technique is never just efficient but efficient *in certain respects, measured against certain implicit or explicit goals*. A process may be energy efficient but environmentally wasteful (Tiles and Oberdeik 1995, 27). A program may be computationally efficient in terms of the number of statement executions required in 'worst case' situations yet less easy to maintain than one requiring more statement executions for worst case inputs.

Thus, it is arguable that 'efficiency' is not an invariant property and cannot be invoked in specifying what is invariant or essential to technique. Against the autonomy thesis, it can be objected, moreover, that it is naïve to claim that modern societies are dominated by the imperative of efficiency optimization since the extension of the concept is fixed by its context of

use. There are a range of efficiency criteria reflecting the extra-technical contexts in which techniques are used rather than any putative 'essence' of technique.

However, according to Ellul a technique "*is a use*"² and not *merely* a means to some independently specified end.

Every technique – automobile technology, to take one example – involves norms which determine what counts as the appropriate use of a given set of technical means. A technical operation, for Ellul, can be embodied in a technical artefact such as a calculating machine, but can also be embodied in any social practice oriented towards the maximisation of efficiency. Thus automobile technology does not merely consist in the cars and their material infrastructure, it is also constituted by technically sanctioned uses for these items:

The use of an automobile as a murder weapon does not represent the technical use, that is, the one best way of doing something. Technique is a means with a set of rules for the game. It is a "method of being used" which is unique and not open to arbitrary choice; we gain no advantage from the machine or from organization if it is not used as it ought to be. (Ellul 1975, 97).

There are many conceptions of efficiency but only *some* efficiency relations will be pertinent to a given technique if it is understood in this way. The prescriptive force that Ellul ascribes to efficiency considerations comes from this tacit contract: 'If you desire X and if you have chosen the appropriate means to X, then you must supply all the conditions for the means to operate' (Winner 1977, 198, 101). In adopting a given means, for Ellul, we also buy into the norms that constitute it as a social practice.

² *My emphasis.*

Thus it can be argued that the notion of efficiency employed in Ellul's essentialist account is a second order concept, which applies to any of a multiplicity of conceptions of operational effectiveness *while still capturing the essential core of technicity*. Moreover, we should not confuse the claim that there are multiple relations satisfying the concept of efficiency with the claim that their salience depends largely on non-technical factors. Techniques are not found in state of nature, waiting to be choreographed by the human will. Rather, it can be argued, cognition, desire and action, are comprehensively *shaped* by our technique. If I learn the piano I develop skills of finger and hand independence and acquire an ordinal conception of pitch relations. To programme computers I must learn the syntax and semantics of a relevant language, but also internalise the aesthetic standards entailed by some or other approach to software design. If I purchase a gun or tazer, actions that had been objects of sadistic wish-fulfilment become things I can *desire or intend to do* (Latour and Venn 2002).

It is consistent with Ellul's account that particular conceptions of efficiency are acquired while using particular techniques to do what they are designed to do. Thus if technical use mediates cognition and desire we should expect contexts in which efficiency conceptions arise to be technically formed even if their character is not wholly determined by technical factors. However, if we allow that efficiency constitutes a second order concept that applies to these contextually determined efficiency relations, this does not constitute a fatal objection to the autonomy thesis.

2) Self-Augmentation

Nonetheless, technical mediation on its own is patently insufficient for technical autonomy. Even if we allow that a particular technique is constituted by norms governing technical activity, we might not want to make a covenant with it because it is incompatible with our plan of life. Thus becoming a competent driver may result in me internalising the norms which distinguish between effective and ineffective car use. However, I may still prefer to walk to work rather than drive because being a driver conflicts with my conceptions of the good: I may want to decrease my

carbon footprint or enjoy the scenery around my rural workplace. Moreover, even if we suppose that a particular society has industrialised to the point at which a majority of everyday activities such as travel and work are subjected to technical norms, there is no logical reason why this should not be altered through collective action.

So wherever the 'covenant' with technique is optional at either an individual or a political level, it is hyperbolic to claim that technical demands can override human conceptions of the good.

As Langdon Winner emphasises, however, Ellul does not subscribe to a global technological determinism. He does not claim that technical needs trump non-technical ones under all historical conditions (Ibid, 77; Winner 1977, 118-119). Technical autonomy is predicated on the technical basis of a culture expanding its hold on everyday life to the point at which the covenant with technique can be regarded as both individually and politically mandatory. This stage is reached when the pace and scope of technique is determined exclusively by technical requirements. According to Ellul this stage occurs when technique becomes *self-augmenting*.

'Self-augmentation' refers to the tendency for techniques to have multiplicative effect on the development of other techniques in adjoining or separate domains. Technique is self-augmenting, according to Ellul, where it 'tends to act, not according to arithmetic, but according to a geometric progression' (Ellul 1973, p. 89). We should not take this particular mathematical representation too literally – for one thing, it seems unlikely that all the relevant variables by which we might measure the development of a technical system will grow indefinitely! The important thing about self-augmenting technical systems (SATS) is that their development is *critically dependent upon the technical state of such systems at a particular point in time*. Thus understood self-augmenting technical change is 'autocatalytic': resembling chemical reactions whose reaction products influence the rate of the reaction (Mainzer 1996, 288).³ It is important to note that the claim that a

³ Whether this dependence is best expressed geometrically or exponentially (where the rate of change would be expressed a power) or in some other mathematical form, it is nonlinear.

technical system is self-augmenting does not preclude a role for human agency. We are in a position to create technical objects that can replicate and possibly even evolve without human intervention, but this is far from being a necessary condition for self-augmentation. Self-augmentation can take place, Ellul claims, where the development of a technique results from thousands of efforts and decisions so that an action in one technical domain incrementally influences developments and decisions in other areas. Self-augmenting technique does not remove human agency but mediates it through networks where no single agent or collectivity is able to exercise decisive control over the technical system.⁴ Ellul thinks that this situation justifies the claim that the ensemble of techniques or technical system can constitute an effective reality in its own right.

One way self-augmentation can occur is through a technique generating a problem which can only be fixed through a series of supplementary fixes, some of which initiate a cascade of further problems and fixes. Plausibly, *this will happen more as techniques become more complex, interconnected and multiply applicable*. In the 1980's Tim Berners-Lee developed hypertext protocols in response to file-sharing problems experienced by scientists at the European Particle Physics Lab (CERN).⁵ The problem confronted by Berners-Lee was that work at CERN required a very large quantity of information to be made available to computers using different viewing software: for example, with incompatible fonts or formats. His solution was to create a way of encoding metadata about the relevant files which could be interpreted by any other computer running his browser software. The invention of freely available browser software and html in response to these highly specific and local problems led to the development of the world wide web as we see it today. It also influenced the development of other languages, particularly interpreted platform-independent languages such as Java. Java is particularly significant because

⁴ For this reason, we might think of self-augmentation as a mode of what Massumi (2002) refers to as *relationality*: a mode of *pre-individual becoming* rather than a set of relations between already constituted agents and objects. See also Mackenzie (2002) on the relevance of this notion to Simondon's conception of *transduction*.

⁵ *Conseil Européen pour la Recherche Nucléaire*'.

a Java program is initially compiled in a platform independent format on a Java Virtual Machine which effectively simulates the operation of a real computer. On runtime the 'intermediate code' created by the virtual machine is interpreted by the host computer and executed. The interpreted character of Java allows a single program to be ported to a variety of different devices allowing a protocol for communicating between them. It has thus contributed to the development of so-called ubiquitous computation, the diffusion of information processing capacity throughout an ever increasing range of human artifacts.⁶

Ellul cites John Kay's invention of the flying shuttle in 1733. This greatly increased the amount of cloth producible by a single weaver but necessitated increases in the production of yarn, later addressed with the invention of the spinning jenny. However, this initially caused an *over-production* of yarn – a problem resolved by the invention of Cartwright's power loom (Ellul 1975, 112). This in turn allowed introduction of 'adjunct' techniques such as steam power and the development of mechanised textile production, with all its concomitant demands on transportation, raw materials and the organisation of factory life (Winner 1977, 102).

Both processes are instances of technical self-augmentation insofar as both innovations addressed problems that could not have existed without a pre-existent proprietary technique: whether computer mediated communications or factory based textile production. However, Ellul emphasises that additional 'stage setting' is required for technology to become self-augmenting. Prior to the eighteenth century, according to Ellul, technique was dependent on culture and locality, and tended to diffuse relatively slowly (Ellul 1973, p. 68). As long as technical dissemination was spatially constrained an invention like Hero of Alexander's simple steam engine (the aeolipile) in the first century AD can be 'forgotten' and is unlikely to be subject to further innovation or deployment. Although Ellul is unspecific about the causes of self-augmentation, it seems plausible to suppose that a number of key developments at the threshold of modernity - including de-skilled factory production, the development of patent law and the

⁶ The Open University (2006),

development of technologies for the rapid transfer of information and materials - contributed to technique becoming relatively *abstract, independent of culture and place and capable of propagating globally*. What I will refer to here as 'technical abstraction' is thus a precondition of self-augmentation in Ellul's sense. However, abstraction is itself a consequence of specific technical developments *and not an essential feature of technique*.

Technical abstraction increases the likelihood of nodes of technological development influencing other nodes: for example, propagating beyond a cabal of nuclear physicists in Switzerland. The more techniques have the capacity to combine, converge or prompt further technical development, the more interrelations become possible (Ibid. 92). Self-augmenting technique thus has an independent reality and causal power: '[In self-augmenting technical systems] it is possible to speak of the "reality" of technique – with its own substance, its own particular mode of being, and a life independent of our power and decision. The evolution of techniques then becomes exclusively causal; it loses all finality' (Ibid. 93). The result of a sustained process of self-augmentation, of course, is that technology-use becomes normative or a matter of practical necessity. In a twenty first century capitalist economy, one is notionally free to relinquish computer technology, for example, but not if one wants to pursue almost any non-manual occupation.

Ellul acknowledges technical abstraction at some points in his text but fails to address its systematic implications for his distinction between modern and pre-modern technique (Ibid. 90-91). *Self-augmentation presupposes replicable abstract techniques*. Where technical dissemination is spatially restricted by cultural usage the capacity for disparate technical factors to combine and mutually augment is correspondingly decreased (Ibid. 69). Techniques are more abstract the more they are susceptible to reapplication or reconfiguration in disparate contexts. Relatively abstract techniques are (relatively) functionally indeterminate. The internal combustion engine, for example, can be used for 'producing electricity, or pumping air in order to drive a sledge hammer, or moving a car or an airplane' (Dumouchel 1992). A cell phone also makes a

serviceable detonator. A module of code which extracts the elements of a list from computer memory can be used to faithfully print a series of library borrowers with overdue books or could be modified to randomize note values for an algorithmic music composition.

The more functions that a technique can undertake or be involved in, the less its use is determined by proprietary norms; the more configurations it can adopt, the more responsive it can be to the local or idiomatic and the more susceptible it is to various forms of 'creative abuse'. Thus technique cannot be both prescriptive – in the way that Ellul's autonomy thesis requires – and relatively abstract. If self-augmentation presupposes abstraction, it follows that the claim that technique is self-augmenting and the claim that it is autonomous are incompatible. If planetary technique is a SATS, then, it cannot be autonomous.

3) An Ontology of Abstract Techniques

However, to pursue this argument further we need an adequate theory of abstraction for technical entities. Faced with this demand some may be tempted to adopt an ontology of techniques as abstract procedures (algorithms). However, an algorithm is distinct from its implementations while a technique is not distinguishable from its instances in the same way. A given technique can be instanced in different ways; but this does not entail a Platonic technique transcending these instances. Thus the petrol engine and diesel engine instance the internal combustion engine but implement different algorithms. The first compresses air and fuel then ignites it with an induction coil. The second involves a compression ignition system.

Furthermore, while the algorithm/implementation distinction is 'brute' metaphysics, modern technique involves *distinctive mechanisms of abstraction*. There is a massive difference in capital outlay between reproducing car engines and re-compiling Java code on one's PC or Mac. This is not related to a difference of complexity - software objects can be multiplied with infinitely greater ease than engine parts – but to the singular replications involved. Different mechanisms of abstraction entail different speeds of change, different scope for local modification, democratic

legitimation, etc and thus different possibilities for multiple causal influences to operate in technical change.

Derrida's account of 'generalised writing' and iterability in the area of language and representation provides a theoretical schema which helps address the 'abstract particularity' of technique while leaving room for a more detailed metaphysical treatments of technicity. Derrida starts from the plausible assumption that sign's functioning in normal contexts requires its transferability ('iterability') into semantically 'deviant' ones. Any signifying essence would constrain the scope for 'deviance' contradicting the initial assumption. There is accordingly no pure semantic essence analogous to the algorithm – a principle that Derrida extends to contentful states of all kinds (Derrida 1988, 10-12; Roden 2004).

By analogy, mechanisms of technical abstraction which – like writing – are more easily divorced from sites of production – allow more abstract techniques that are more transferable between cultural or functional contexts.

Iteration exhibits the incompleteness of semantic or functional taxonomies faced with the world's inherent variability (Roden 2006, 84). *Iterabilia* are neither eternal nor ephemeral (see Roden 2004, 204). They are repeatable particulars without transcendent criteria of reinstantiation. There is no essential beginning to an iterative series. Thus to the extent that techniques are iterable there are no 'hard' rules determining what counts as instancing a given technique.

The distinction between the technical and the non-technical is, consequently, porous. Is a theory of pure mathematics, like Boolean algebra, technical? However we arbitrate between technics and theory, nineteenth century Boolean logic *acquired* technicity during the twentieth century through iterative transformations. No computer program could make a decision or control statement repetition without evaluating to Boolean values ('true' or 'false'). Iterative repetition crosses categorical distinctions between technical and non-technical entities. Thus as well as

accounting for technical abstraction, the iterability of technique entails anti-essentialism regarding technicity as such.

4) In or Out of Control?

If planetary technology is a self-augmenting system, it cannot be the system described in Ellul's normative technological determinism. A theory of self-augmenting technique is thus incompatible with the substantivist picture of an all controlling technology.

However, the claim that modern planetary technique is self-augmenting throws up questions for the politics of technology comparable, in many ways, to those Molochs of Heidegger and Ellul. Andrew Feenberg has argued that the democratic legitimation of technology is possible where design choice is underdetermined relative to individual techniques. For this allows the instantiation of techniques to be shaped by diverse social constituencies. Thus MS DOS lost out to Windows not because it was a worse interface *period* but because it failed to reflect the new social context of computation and the conceptions of efficiency these entailed (Feenberg 1999, 79). The process of design fixing is likely to be mediated in democratic fashion where multiple shapes for a particular technique can be actively considered within a population of consumers or deciders. But it is arguable this is only likely to happen in a meaningful way where techniques are sufficiently abstract to be simultaneously available in multiple forms and subject to development in the light of democratic preferences. Thus if abstraction contributes to self-augmentation, democratising technique turns the control knob up on self-augmentation. In so doing it may also render a technical system of which it is a part less susceptible to prediction or control.

To control a system we need some way of anticipating what it will do next. It is arguable that SATS have many of the characteristics of complex dynamical systems – the propensity for self-catalytic behaviour being a case in point. The precise trajectories of complex and chaotic systems are impossible to control because of their extreme sensitivity to initial conditions. However, their global properties - like the distribution of attracting and repelling points - can often be predicted

and controlled. Thus sensitivity to initial conditions of itself does not entail uncontrollability. Nonetheless, it is still conceivable that planetary technique is, as Ellul argues, a distinctive causal factor which ineluctably alters the technical fabric of our societies and lives without being controllable in its turn.⁷ This hypothesis is, as I have conceded, speculative but there are some principled reasons for believing it which can be sketched out here:

- In a planetary SATS local sites – like the particle accelerator community at CERN - can exert disproportionate influence on the organisation of the whole but their very singularity means that they may not 'show up' for those lacking 'local knowledge'. Thus even encyclopaedic knowledge of current 'technical trends' will not be sufficient to identify all future causes of technical change.
- The categorical porousness of technique as a category adds to this difficulty. As the case of Boolean algebra demonstrates, the line between technical and non-technical is systematically fuzzy. If technical abstraction amplifies the potential for 'crossings' between technical and extra-technical domains, it must further ramp up uncertainty regarding the sources of future technical change.
- Technical change may yield new, posthuman forms of life or intelligence that are conceptually and epistemically 'closed' to us. We may simply lack the cognitive equipment to understand our posthuman 'children', let alone control them.
- Any computationally tractable simulation of a SATS would be part of the system that it is designed to model and would, moreover, be a disseminable, abstract part likely to alter the very dynamics it is designed to model.

⁷ Though this is not to say that it controls us, since, pace Ellul, it prescribes nothing.

Even if planetary technique is substantially more controllable than these hypotheses would imply, we ought to disentangle the claim that technology is 'out of our control' from the claim that technology is in control. Confusing the two has caused both critics and proponents of substantivist philosophy of technology to fall prey to the pathetic fallacy. If technology is, 'out of control', our lost autonomy, it seems, must now be attributed to technique itself: under the guise of efficiency norms, say, or Heideggerian 'enframing'. However, in Ellul's case, at least, this inference should be resisted: if technique is self-augmenting, it is functionally indeterminate and thus issues no prescriptions. If our planetary technical system is a SATS, then, there are reasons for believing that it is:

- a) Uncontrollable
- b) A decisive mediator of social action, but
- c) Not a controlling influence.

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