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Let Them Eat Laptops: The Limits of Technicism

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Nicholas Negroponte, the MIT Media Labs 'onlie begeter' and one of digital techonologies most persuasive salespersons, has a new project. With undeniable logic and unimpreachable intentions he wishes every Third World child to be given a laptop. His reasoning is that without education, all other attempts at development are doomed to fail and that since education can be accomplished by computers, the way to make good its grievous failings in the South is with computers. He has therefore developed an elegant device of considerable sophistication but great ease of use – a brightly-coloured, plastic-encased clockwork-powered computer which costs (or rather, he promises, will cost) around $100. This contrivence, a toy in appearance but a serious machine in operation, is what he intends to give away in millions and, according to his own publicity, he has already apparently had great success both in persuading Southern governments – Rwanda, Libya, Uraguay – and manufacturers – Quanta Computers -- to back his scheme. Negroponte's website is somewhat coy about how much money the initiative will involve but the budget is clearly in the order of billions: two billion children in the developing world x $100 a machine. Seed money alone -- from the likes of eBay, Google and Norstar, all at $2 million each -- would seem to exceed $12 million (<wiki.laptop.org> June 2007).

Bill Gates, Negroponte explained at a presentation I witnessed in February 2007[1], does not like the idea merely, Negroponte suggested, because he is jealouse: Microsoft has never produced anything so elegant (and fun). 'Get a proper computer instead,' Gates is reported to have said (Johnson 2007:1). But there is perhaps another reason for Gates's hostility which Negroponte was ignoring. 20 to 30 watts of electricity can be easily generated with a few minutes of effort, he told his healthly, wealthy European audience, using the machine's pull-string; 'and,' he went on, 'a malnourished Third World child can manage 5 or 6 watts.'

A Malnourished Third World Child?

I would suggest that here Negroponte becomes a Marie Antoinette, but, instead of advising the French 18th century poor to eat cake as a substitute for bread, he proposes letting the South's huddled masses have little computers rather than life's other more obvious necessities. Could it be that the 'let them eat laptops' implication of his grand plan was what upset Gates? Perhaps Gates thought, as many might, there were more pressing priorities for the malnourished child than using her strength to fire up a product of high Western technology however much she might, or might not, learn from it.

[1] INNOVACTION 2007 conference: Il Salone della Conoscenza, delle Idee e dell'Innovazione al servizio delle imprese, Udine, Italy, 15 -18 February.

I raise this not as a matter of debate around the issue of appropriate Third World technology, although that is obviously a serious concern, but rather as an extreme example of technicist hyperbole. Technological determinism, or technicism or diffusion theory (Rogers 1962), assumes, in the words of Raymond Williams (a hostile observor of the phenomenon) that: 'a new technology -- a printing press or a communications satellite – "emerges" from technical study and experiment. It then changes the society or the sector into which it has emerged' (Williams 1989, 2007:120). This vision of the nature of technology 'is an immensely powerful and now largely orthodox view of the nature of social change. New technologies are discovered by an essentially internal process of research and development, which then sets the conditions of social change and progress' (Williams 1974:13). It is this frame that underpins Negroponte's 'One Laptop Per Child' scheme. Within a general unexamined assumption as to technology's overall irresistible effectiveness, Negroponte further presupposes that in education, machines can substitute for traditional teaching methods.

There is a history here of which he, and most, would appear to be unaware. Every new communication device has been hailed in these terms –-- a revolutionary educational tool, transforming (or indeed, as potentially in this case even removing) the need for schools and schoolteachers. For Johann Creiling, lecturing at Tübingen University in 1702, it was the magic lantern that was going to revolutionise face-to-face teaching (Eder 1978). Three centuries later, for Negroponte, it is a plastic clockwork computer. This is not to say that the computer has no more educational capacity than does a magic lantern. Obviously it does; but Negroponte is ignoring how teaching actually happens just as Creiling did and he therefore, like Creiling, hyperbolises the effectiveness of the machine. The result is that, like Creiling's, his claims are overstated and the outcomes, as is already becoming manifest, are likely not to be as he prophesies. For him, apparently, the machine will *of itself* overcome poverty, war and pestilence in the South because those who use it, however malnourished, will be educated enough to avoid these perils. This is not, though, self-evidently the case.

Negroponte's is the essence of the technicist vision. But like all monocausal views – a crude Marxist economic determinism, say – technicism is inadequate as a way of explaining the world. And, because of its inherent inability to do so, the social effects it envisages are as often as not wildly at odds with what actually occurs. This is not to say that technology is not an immensely powerful social force. It is merely to point out that it is just one such force in the social sphere and thereby to deny it an overarching *determining* social role. So, a clockwork computer and teachers and classrooms and clean water and drugs and peace, etc., etc. might well achieve Negroponte's laudable goals but the one machine alone will not. And the billions he proposes spending on it might well be better used in more direct ways.

The view of technological developments underlying Negroponte's scheme and his rhetoric is therefore of considerable moment. Technicism is no abstract mode of thought, no mere body of words without effects in the world. It is an intellectual construct with, like Marxism or religious belief, salient consequences.

Technicism's gravest problem is that it is disempowering. As Raymond Williams put it: '"We" adapt to it, because it is the new modern way' (1989:120). In effect, supposedly, we have no choice. At a

most basic level, for example, technicism offers a justification for late capital's consumerist drive. "We" cannot help ourselves when faced with a new technology but are forced in some way to adopt it.

And the "we," it can be noted, includes those selling the technology as well as those buying it. Apparently these sellers, in our case the global media conglomerates, can no more influence the communications industries than we can curb our consumerist instincts. Instead of explaining their actions with (again, supposedly) outmoded concepts such as the concentration of capital, technicism understands these moguls to be the victims of 'convergence.' (This is not, of course, convergence in its prime -- albeit naïve -- technical sense that digitising pulse-code modulation renders signals, whether from microphone, camera or mouse, more or less identical electronically speaking; although it can be said, given human eyes continue to see and ears to hear, that how the visual and aural signals are encoded before reaching them is really not that significant.)

The conglomerates' oppressive, as it were, convergence arises from a secondary sense that technically similar infrastructural elements, such as PCM, force concentrated multi-media commercial structures into being. By this account, a Rupert Murdoch then, is not engaged in a search for world media domination for reasons of profit or even personal aggrandizement: he is merely in technology's grip. As one British politician put it: 'Technological changes are *driving* different sectors of the industry -- newspapers, television, telephony, video, computers, cable and satellite -- closer together.' Of course, there are no necessary reasons whereby even identical technological means require single formations of capital; but for the technicist the technologies are the determining factor so this observation is unexamined.

More than just communications are at stake here. Twelve years ago, to take a random example, the then President of France, Francoise Mitterand, was articulating this received and unexamined contention in all embracing terms: 'Science and technology are going to develop forcing humans to conceive of a different society.' We were (and are) being asked by our leaders and the technicists who have their ear to see technology as, in some sense, an external force determining the social sphere even as, for example, we are also being called upon by these same politicians to deem actions conditioned by irrational ancient religious beliefs as the chief challenge confronting the West. And that is the essence of technicism's dangers. It becomes a shill for late capital and its monocausality fails to take cognizance of social realities such as the malnourished children of the Third World.

The roots of this failure of analysis lie in its way with history. Technicist accounts are history written by amnesiacs and, because they largely disregard the significances of social sphere, they comprehensively fail to explain why technologies appear when they do and for what purposes. Here, at random, is the conventional story of one such technology – and story it indeed is – taken from a recent textbook:

> 'The basic principles of photography were described in a paper given in 1802 by the Englishman Thomas Wedgwood. Another Englishman, Henry Fox Talbot, invented the negative process in 1839 and was awarded a patent in 1841. The first photograph of a scene of nature was made in 1826 using the camera obscura invented in France by

> Joseph Nicéphone Niépce. Metal plates coated with silver idodine were first used by another Frenchman, Louis-Jaque-Mande Daguerre. Celluloid film was introduced in 1888 by George Eastman in the United States. Color film was invented by Leopald D. Mannes and Leopold Godowsky, and was first marketed in 1935 by the Eastman Kodak Company' (Noll 2007:40).

It is not that this parade of dead white males (of whom we need know, it seems, nothing more than their nationality) is wrong – although it is in error in a number of particulars; rather, it does not explain why this somewhat confused chronology took place. The implication is clear: these events, these 'inventions,' happen when they happen because that is when the technology becomes available in some way and individual genius realises this. But, for example, could Wedgwood have given his paper before 1802? Indeed he could, given that the *recorded* investigation of the effects of sunlight on silver oxides, the science at the heart of making a photograph, dates from half a century earlier. Why then 1802?

And why 1826? The *camera obscura* was not 'invented' by Niépce, neither the box itself (which was a 16th century device which possibly existed some centuries earlier as it is derived from Arab astronomical practice of the 9th century at the latest); nor the lens (early medieval period at the latest); nor the plate (*vide* Wedgwood who not only wrote about but actually used silver nitrate, never mind the general observation of the darkening or bleaching properties of light on certain metals and fabrics which had been known for millennia). Celluloid had been developed decades before 1888 and George Eastman entered a well-established field of business activity (actually in 1884, but let that be). And colour film, in a practical marketable form, dates from 1907 with a number of late 19th century precursors. Mannes and Godowsky produced the first successful 'tripack' which was certainly the most viable method, but other systems were in existence and continued to be marketed for some time after – Technicolor for example (Winston 1996:39-57).

The problem is not the errors, for even if a full and accurate history of the great men were inscribed we still would be none the wiser as to why things happened when they did exactly because, in fact, they did not occur when scientific understanding was to hand. The reasons for the rising interest in reprographic systems at the outset of the 19th century are entirely due to the emergence of the middle class and the beginnings of the establishment of a necessarily literate urban proletariat. It is, primarily, a middle-class appetite for images to hang on their walls, illustrations for their books and cheap portraits of themselves which 'invents' photography. The great men, who curiously all (and always) emerge at about the same time, do so less curiously because they are responding to general social forces around them.

In this way it is not the Lumières, Edison, Prince, Arnott, Fox-Talbot, Dickson and co who 'invent' the cinema in 1895 – it is the vaudeville theatre's audience who do so. One million tickets for popular theatrical entertainment were being sold a week in the United States alone. The term 'show business' (as opposed to 'shows') appears in print for the first time. The economic and social drivers demanded the mechanisation of entertainment and this produced in these years the cinema (and, it can be added, the phonograph, radio and the rest). It is in the social sphere, not the technological, we can find an answer the question posed by the critic Andre Bazin of cinematography – 'why 1895?'

This is not just a phenomenon of the 19th century. The first digital device operated in the French Labs of an American telephone company in 1938. The man who 'invented' this as part of telephone exchange was Alan Reeves (an Englishman as it happened). But the science he was using, the formulae establishing necessary sampling rates dates back to the 1920s. And the concept of the binary can be traced back centuries earlier. The first digital audio recorder, 'in the metal' as the engineers say, was brought to market in 1971. Technological advance alone will not account for these delays since the bases for the technology were already to hand – with 20th century technologies as much as with 19th ones.

The tendency to ahistoricism is well illustrated by the current insistence on a 'digital revolution' in general. The digital devices, including the computer, that were to suffuse the market in the last quarter of the 20th century relied on solid state electronics which were not 'invented' (as is commonly believed) at the Bell Labs in 1948 but go back to experiments with semi-conductors in 1879. Cats' whiskers radios were the first solid-state technology to be widely diffused from the 1920s on (Winston 1998:208 et seq.). This is why one can claim that all too often technicist accounts, insofar as they are necessarily historical – else how can 'revolutionary' impact, for example, be established – tend to be histories written by amnesiacs.

Puzzled by the lack of innovation in a basic sense at the time of the Industrial Revolution --- after all the power of steam had been known in antiquity – the *Annaliste* historian Fernand Braudel conceived of technology as existing in a social context where it is subjected to both pull and push: 'First the accelerator, then the brake: the history of technology seems to consist of both processes, sometimes in quick succession: it propels human life onward, gradually reaches new forms of equilibrium on higher levels than in the past, only to remain there for a long time, since technology often stagnates, or advances only imperceptibly between one 'revolution' or innovation and another' (1979:430). Braudel's vision lies at the heart of a totally different approach to the issue of technological determinism. The *Annaliste* historians do not conceive of technology developing outside of the social sphere. For them it is not something to which '"we" adapt'; it is the product of what might be called 'supervening social necessities' (Braudel's accelerators) and forces containing potential technologically-based social disruption, a process that might be called 'the suppression of radical potential' (Braudel's brakes) (Winston 1998:3-15).

In the specific area of media technological history there has been a move over recent decades toward this view as a second less popularly understood approach that, in essence, denies technology as the main driver of social change. Instead, society is conceived of as the major factor determining the technological agenda and conditioning the diffusion of the technologies it produces. This 'social shaping of technology' – SST for short –puts the technologist into a broader social sphere where he or she, far from imposing the outcomes of their genius on us, is, as much as we are, the prisoner of social forces.

SST as a concept emerges from the work of the *Annaliste* school (which pre-dates Braudel). *Annales d'histoire economique et sociale*, the journal, was founded in 1929 by Marc Bloch and others. Typifying the breakthrough these historians achieved is Bloch's classic essay on the diffusion of the watermill in Medieval Europe. It says little about the technical knowledge leading to its development but concentrates on charges in feudal relations to explain its spread (Bloch 1935, 1967: 136-138). According

to SST, then, the technological agenda is primarily determined by social needs and the successful diffusion of any given technology depends on its social acceptability, its 'fit' (as it were).

SST has been making some progress. Under the impact of the dot.com fiasco of the late 1990s, even resolute technicsts can be seen to acknowledge that social forces other than technology might be in play. Facts intervene and not all technicists are like the Bourbon kings of whom it was said that they forget nothing and learned nothing. Even in the midst of accounts which retain their essential technological monocasuality, one can now find current hyperbole being characterized as 'a new wave of overpromotion and hype' which is 'again beginning to swell.' Now, obviously since it has not happened, convergence of computers and telecommunications with hyperbolic consequence was merely a '*supposed* coming together' (Noll 2007: 151, 136 *emphasis added*).

But there are limits to this growing understanding. Technicsts all too often display some of the characteristics of those Evangelicals who confidently predicted the Second Coming of Christ on 22 October 1844 and, when this did not happen, just recalculated.

Nicolas Negroponte, though, is not even yet in the recalculation business. He remains a true a believer although thus far all his highmindedness has achieved is to spot a new Western market. The children of the South no more have his computer than they have adequate shelter, clean water, health care or peace. But in the First World the possibilities of a really cheap laptop are now being actively explored. Computer manufacturers, ignoring Negroponte's purposes, see merely a rival device which of itself questions their profit margins. Negroponte is infuriated with Intel, for example, which is now marketing *Classmate*, a small laptop with much the same specifications as his at $285. They think they can get theirs down to under $200. Negroponte has said, 'Intel should be ashamed of itself' (Johnson 2007:1). Others might think that cheap full service laptops are overdue and thank him for opening up the market.

This row, of course, socially 'fits'; it is the way the First World's economic system works. It is the social sphere (in which the technological is but one of many forces) where the fate of entities like Intel or the One Laptop Per Child not-profit organisation is determined. Negroponte, faced with this reality, is attempting to water-down the essential technicism of his plan: 'It's an education project,' he now claims, 'not a laptop project.' But a 'laptop project,' as Intel and others clearly understand is what it is. Negroponte's vision, narrowed by his belief in the machine, is producing not the social amelioration he so confidently predicted but cheaper computers for privileged Westerners. One Laptop Per Child is rapidly becoming a classic example of the limitations of technological determinism, essentially because as a technicist, Negroponte ignored essential social realities in his initial vision. These are now returning to haunt him.

Meanwhile, the malnourished Third World child, to the surprise of the technicist perhaps but not to those who put societal forces first, will, laptop-less, have to starve a little longer.

References

Bloch, Marc (1935) (1967) trans. J. E. Anderson, 'The Advent and Triumph of the Watermills' *Land and Work in Medieval Europe,* Berkeley: University of California Press.

Fernand Braudel (1979). *Civilisation and Capitalism 15th -18th century Volume 1: The Structures of Everyday Life, The Limits of the Possible,* New York: Harper Row.

Eder, J-M (1978). *Geschichte der Photographie* (trans. E. Epstean: *History of Photography*), New York: Dover.

Johnson, Bobby (2007). 'Which laptop per child?' *Guardian IT*, 5.31.

Noll, A. Michael (2006). *The Evolution of the Media*, Lanham, Mass: Rowman & Littlefield.

Rogers, Everett (1962). *Diffusion of Innovations*, The Free Press, New York.

Williams, Raymond (1974). *Television: Technology and Cultural Form* London: Fontana.

Williams, Raymond (1989) (2007). *The Politics of Modernism,* London: Verso.

Winston, Brian (1996). *Technologies of Seeing: Photography, Cinematography & Television,* London: British Film Institute.

Winston, Brian (1998). *Media, Technology & Society A History from the Telegraph to the Internet,* London: Routledge.