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The Singularity is Here

> The destiny of intelligent tool–using life [i]s to be a stepping–stone in the evolution of corporate instruments.
> –Charles Stross

Charles Stross' *Accelerando* (2005) is a post–Singularity novel, the best–known example of a small but growing science fiction sub–genre. Post–Singularity SF endeavors to imagine, and work through the consequences of, what techno–futurists have called the Singularity. This is the supposed – and strictly speaking unimaginable – moment when the human race crosses a technological threshold, and definitively becomes posthuman. According to this scenario, the exponential growth in sheer computing power, together with advances in the technologies of artificial intelligence, nanomanufacture, and genetic manipulation, will utterly change the nature of who and what we are. Human beings will either be replaced by sentient machines, or (more likely) merge their brains and bodies with such machines. In addition to *Accelerando*, post–Singularity novels include Vernor Vinge's *Marooned in Realtime* (2004) – Vinge is in fact the inventor of the term and concept of the "technological Singularity" (1993) – and Cory Doctorow's *Down and Out in the Magic Kingdom* (2003).

Of course, science fiction narratives have played with ideas of supercomputers and superhuman intelligences for quite some time. But post–Singularity fiction in the strict sense takes off from the computing technologies of the 1990s, and from the speculations of Vinge, Hans Moravec (1990), and especially Ray Kurzweil, self–described on the jacket of his recent book *The Singularity is Near* (2005) as "one of the world's leading inventors, thinkers, and futurists, with a twenty–year track record of accurate predictions." Kurzweil explains the Singularity as follows: "It's a future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed... this epoch will transform the concepts that we rely on to give meaning to our lives, from our business models to the cycle of human life, including death itself... Within several decades information–based technologies will encompass all human knowledge and proficiency, ultimately including the pattern–recognition powers, problem–solving skills, and emotional and moral intelligence of the human brain itself... the changes [these technological developments] bring about will appear to rupture the fabric of human history" (7–9). Kurzweil estimates that this transformation will occur no later than the year 2049.

Though Kurzweil specifies that the Singularity is "neither utopian nor dystopian" (7), the affinity of his vision with utopian thought is clear. After the Singularity, Kurzweil assures us, health, wealth, and immortality – not to mention the coolest computer games and simulations ever – will be available, at no cost, to everyone. Scarcity will be a thing of the past. All barriers and binary

oppositions will fall: "there will be no distinction, post–Singularity, between human and machine or between physical and virtual reality" (9). In this sense, the Singularity is about getting rid of our cumbersome bodies; as Kurzweil puts it, "our version 1.0 biological bodies are... frail and subject to a myriad of failure modes" (9). A post–Singularity upgrade to version 2.0 will get rid of most of these bugs; and "with version 3.0 bodies," Kurzweil assures us, we will be "able to morph into different forms at will" (340).

But it isn't just our own bodies that Kurzweil wants to "upgrade," or supersede. The Singularity is really about eliminating the resistance of the outside world to the instantaneous fulfillment of all our desires. It promises to overcome materiality in general. No doubt, Freud would call this an infantile fantasy of omnipotence. Modern science, from Copernicus to Darwin and beyond, is commonly seen as refuting such a fantasy, by dethroning the human species from its delusion of "centrality in the cosmos." But the lesson of the Singularity, for Kurzweil, is that the age of such humiliations is over. For "it turns out that we are central, after all," he says. The "accelerating pace" of our technology "will continue until the entire universe is at our fingertips" (487).

The Singularity is thus fraught with theological significance. It is something like what Alain Badiou calls an Event, a decisive moment of creation and crystallization "which compels us to decide a way of being" (2001, 41). Even before it happens, the mere thought of the Singularity – like Nietzsche's "abysmal thought" of the Eternal Return, or St. Paul's thought of the Resurrection – is a conversion experience that compels us to dedicate our lives to its Truth. "To truly understand [the Singularity]," Kurzweil says, "changes one's view of life in general and one's own particular life" (7). An orientation towards the future – even, or especially, towards an incomprehensible one – must alter your behavior in the present. Kurzweil himself, for instance, "takes more than 250 [vitamin] supplements daily, often in doses much larger than the US RDAs." He also "closely monitors or tests at least 50 measures of his own health" on a regular basis (VanZile 2005). All this is to ensure that he stays alive long enough to make it to the Singularity, when he will be able to upload his mind onto the Net.

Given the sensibility at work here, I can only agree with Tony Girard, the character in Ken MacLeod's *The Cassini Division* (1999) who sarcastically dismisses the Singularity as "the Rapture for nerds" (115). Now, Badiou invokes St. Paul's conversion not for religious ends, but only in order to mobilize it for a new construction of Leninist revolutionary subjectivity. And such eminent Marxist critics as Fredric Jameson (2005) and Carl Freedman (2000) have long argued for the political implications – in contrast to religious ones – of the utopian impulse in science fiction. But where does this leave us with regard to the Singularity? Kuzweil's speculations are certainly utopian, in that they envision a future world without scarcity or deprivation. And Kurzweil is as overtly anti-eligious as Badiou or Jameson; the post-Singularity world, difficult as it may be to comprehend, is presented as a "here and now," rather than as a transcendent afterlife. Yet, in striking contrast to any other utopian fiction, Kurzweil spends scarcely a paragraph in his more-than-600-pages-long tome discussing social and political issues. There's a brief passage about the necessity of developing "smart weapons" for "cyberwarfare" (335), and an equally brief section about the need to protect "intellectual property" from unauthorized replication (339). And that's about it. All the rest is minutely detailed technological discussion, with a heavy dose of extrapolation. Kurzweil's book is classic hard SF, if we leave aside its rather silly claim to be making "accurate predictions." But it's so narrow in its

technological concerns, and in its single-minded claims for transformation and rupture, that it almost seems an inadvertent parody of the genre.

The curious configuration of *The Singularity is Near* – its apolitical and asocial utopianism, and science- and technology-based millenarianism – is, of course, not accidental. For the *whole point* of Kurzweil's speculation – its ideological function, if you will – is precisely to bring us to utopia without incurring the inconvenience of having to question our current social and economic arrangements. This is why Kurzweil supposes that the onward march of technology will produce the society of plenitude, all by itself – so long as government bureaucrats and religious fundamentalists do not interfere with entrepreneurial innovation. By a curious sleight of hand, even after a radical "rupture" in the very "fabric of human history," we witness the persistence of such features of our society today as private property, capital accumulation, branding and advertising, stringent copyright enforcement, and above all "business models" (with which Kurzweil seems curiously to be obsessed).

The ideology-critique that I have just been sketching out is so obvious as to be scarcely worth pursuing. Except that Kurzweil's rather lame and unwitting attempt at science fiction only makes explicit a problem that haunts even the most brilliant, adventurous, and inventive SF. This has to do with the weakness of the utopian imagination, its failure to truly extend beyond present–day, capitalist horizons. As Jameson laments, towards the end of his recent book on utopian and science fiction (2005): "we have been plagued by the perpetual reversion of difference and otherness into the same, and the discovery that our most energetic imaginative leaps into radical alternatives were little more than the projections of our own social moment and historical or subjective situation: the post-human thereby seeming more distant and impossible than ever!" (211). Slavoj Zizek makes a similar observation (though he isn't referring to science fiction specifically) when he says that "today it's much easier to imagine the end of all life on earth than a much more modest change in capitalism" (Taylor 2005) . We have no trouble picturing the catastrophic breakdown of the capitalist order, and the extermination of human life on this planet; but we are scarcely able to envision a tolerable and pleasant world without money, without advertising, without brand names, and without the vast inequities that characterize a capitalist economy. Kurzweil's book is only the crass exemplification of a much wider problem: the way that all thought today, even explicitly oppositional thought, has been colonized and appropriated in advance by the flows and metamorphoses of Capital.

To explore this dilemma, I turn from Kurzweil's own speculations to Charles Stross' far more interesting reworking of them in *Accelerando*. In this novel, Stross never questions Kurzweil's dubious premises; instead, he pushes them to their most delirious consequences. The book tells the story of the supersession of human intelligence by artificial intelligence, as experienced by three or four generations of the Macx family. (The exact number depends on whether you count a clone furnished with the memories, as well as the phenotype, of its ancestor as a separate generation). *Accelerando* starts in Amsterdam in the year 2010 with Manfred Macx, an "agalmic entrepreneur" (72) who regularly patents business models and then gives them away for free, "making strangers rich" (3, 40, 382). Manfred is so dependent upon his "personal area network" (69) and other wireless online computational prostheses that, deprived of them, he becomes a befuddled amnesiac, barely able to remember his own name, location, and intentions (69–103). *Accelerando* ends on an artificial asteroid circling a brown dwarf (not-quite-star) called Hyundai

$+4904/_{-56}$, sometime in the twenty–third century, with Manfred's great-grandson Manni Macx (the aforementioned clone) existing simultaneously as a physical child, playing s&m war games with his little pals, and as an "adult ghost," or mature intelligent construct, monitoring everything that happens from a virtual "mindspace" (370).

In between these starting and ending points, we get a plethora of florid nerd fantasies and wacky business plans. It's as if Stross had taken all his old issues of *Wired* magazine and run them through the linguistic and conceptual equivalent of a digital music sampler. At one point, Manfred decides to shed his human form, and downloads his mind into a flock of pigeons – which gives a whole new literal meaning to the idea of "distributed intelligence." At another, Manfred's grandson Sirhan schemes to "acquire a total lock on the history futures market, by having a archive of human experiences" on hand and available for download (290). In the post-Singularity age, sex with strangers is less of a gamble than it used to be, because you can run a simulation and see what it will be like ahead of time (325). There are also sentient simulated lobster minds running spaceships in the Oort Belt, "group minds" or "borganisms" (96–97) who run other consciousnesses as software within their own, and characters who (thanks to cloning, memory downloading, and faster-than-real-time life simulations) end up being older than their own mothers.

In a certain way, *Accelerando* is closer to the space operas of Golden Age SF than it is to the cyberpunk fiction of the 1980s. Of course, Stross' exacerbated self–consciousness and tongue-in-cheek hip attitude are not very Golden Age. And the novel's characters maintain a remarkable range of manias, tics, and obsessions – from masochistic abasement to puritanical fear of sexuality to an almost hysterical lust for novelty – that would never have been dramatized in pre-1960 SF. But at the same time, Stross' reveling in cheesy genre formulas, his love of wacky gadgets and surprising, yet ultimately logical, plot twists, and his book's utter lack of existential anguish or nihilistic posturing all suggest a will to write as if cyberpunk had never happened. It may be that Stross' insouciance and comic detachment, and his rejection of an all-too-human angst and negativity, are necessary strategies in order to come to terms with his subject. "The rapture of the nerds" – and Stross uses the phrase, borrowed from MacLeod, several times in the course of the novel (172–173, 270, 318) – does not lend itself to the sort of terminal-wasteland introspection and film-noir recyclings that were the stock-in-trade of the cyberpunk writers.

The post-Singularity world of is therefore not dystopian in the cyberpunk manner. Rather, it's a straightforward techno-utopia. The "necessary comforts of civilization" (365) – which include neural implants and information access, as well as food, clothing, and shelter – are available to everyone. The information network is wired directly into your brain. Thanks to "programmable matter" and nanomachines, any object you want can be instantaneously constructed with just a snap of your fingers. Poverty and war are eliminated. There are still class differences, as well as religious, ideological, and political disagreements. But these never reach the point of actual conflict, since the contending parties find it far easier to ignore one another than to actually fight. (A "killfile" function works in meatspace as well as VR, so that you can simply render irritating people invisible to you; it's great for cocktail parties). The plot of *Accelerando* is nonetheless thick with political infighting, legal disputes, and underhanded market manipulations; even after the Singularity, some things apparently never change. State and Market are never explicitly contested; in the course of the novel, they just gradually wither away. By the last chapter, set in

the twenty-third century, all human beings live in a world without scarcity (364). "Life is rich... endlessly varied and sometimes confusing," and grounded – much as it was before the pressures of scarcity led to states and to systematic processes of capital accumulation – in communities of human beings "living in small family groups within larger tribal networks" (359–360).

However, *Accelerando* also contains a counter-narrative, running alongside the melioristic (and vaguely Rousseaean) one that I have just described. The society of abundance envisioned in the novel is nonetheless "a poverty-stricken backwater compared to its neighbors" (315; cf. 364). These neighbors are societies composed, not of human beings, but of our "mind children" (227, 289 – echoing Moravec 1990): sentient, autonomous artificial intelligences (AIs), unencumbered by the limits of carbon-based biology. Stross – unlike Kurzweil, but following the deeper implications of his logic – posits two distinct lines of technological evolution. On the one hand, there are the computationally enhanced human beings who are the main subjects of Stross' narrative. On the other hand, there are the pure AIs: not cyborgs or hybrids, but an entirely new sort of entity. The human quest for technological enhancement – or, more accurately, for increased profits, since this is what really drives the process – leads to the event that we call the Singularity. But once this event has taken place, human beings are no longer at its center. The Singularity gives birth to inhuman or posthuman AIs, and they are its true "historical subject." The enhancements of human life recounted in the novel are only byproducts of the machinic evolution of artificial intelligence itself.

Kurzweil likes to compare the "high computational efficiency" of which thinking machines are capable (362) with the "severe limitations" of the human brain (8). Such a distinction is taken for granted throughout *Accelerando*. In purely technological terms, the AIs evolve, or develop, much faster and further than is possible for merely enhanced human beings. Very quickly, the AIs exceed our powers of comprehension by several orders of magnitude. They are "fundamentally better consciousness engines than us merely human types" (376). This is a qualitative, as well as a quantitative, distinction. It isn't just that we don't know what these AIs want; beyond this, it is literally impossible for us to imagine what they might want. For they possess a higher-order consciousness than we do, existing on a meta-level in comparison to us: "a posthuman can build an internal model of a human-level intelligence that is, well, as cognitively strong as the original. You or I may think we know what makes other people tick, but we're quite often wrong, whereas real posthumans can actually simulate us, inner states and all, and get it right" (376–377). So much for the problem of "other minds."

Although Stross never spells this out explicitly, these posthuman intelligences are like nothing so much as what we know today as transnational corporations. Of course, corporations have long been considered "persons" in the eyes of the law, even though they are not (yet) conscious entities (and even though they are exempt – unlike biological persons – from being incarcerated, tortured, or put to death). *Accelerando* pushes this situation to its logical conclusion. Early in the novel, several of the characters realize that "we need a new legal concept of what it is to be a person. One that can cope with sentient corporations" and other artifacts of the Singularity (98). But it's not just that corporations become sentient. The converse is also the case: after the Singularity, all sentient AIs function as autonomous economic entities, "slyly self–aware financial instruments" (168). They exist only to accumulate capital, in the form of endless computation. The AIs have freed themselves from merely human parameters, shed their human

origins, and emerged as alien, predatory lifeforms. They strive to extract the maximum value (in the form of computational power) from all matter. Their focus is on efficiency, and on endless self–expansion. They have no goals external to the processes of accumulation and expansion themselves. No measure of abundance can satiate their rapacious competitive drive. Merely enhanced human beings may have attained a state of abundance; but the posthuman AIs still live in a "scarcity economy," because neither bandwidth nor matter is truly infinite (229).

Accelerando provides a Stapledonian vision, albeit in brief, of "the stellar life cycle," the overall trajectory of AI civilizations (303). The posthuman AIs quickly dismantle the solar system, pulverizing the planets and asteroids in order to convert their "dumb matter" into "computronium" (14, 248, 251, 341, and passim). In so doing, they force the remaining (merely enhanced) human beings further and further away from the sun: to Jupiter, then to Saturn, then to the Oort Belt, then finally out of the solar system altogether – which is why the remnants of humanity end up circling Hyundai $^{+4904}/_{-56}$. Ultimately there isn't room in the solar system for both them and us. The AIs "restructure the entire mass of their star system into a free-flying shell of nanocomputers, then more of them, Dyson spheres, shells within shells, like a Russian doll: a Matrioshka brain" (303). But sooner or later they push their mania for accumulation to the point of implosion and extinction. The entire galaxy turns out to be littered with the ruins of dead or dying superintelligent civilizations: it's "a howling wilderness of degenerate data, fractally compressed, postconscious processes running slower and slower as they trade storage space for processing power" (289).

What is the role of (enhanced) human beings – or of any other sentient, biological species that produces a technological Singularity – in all this? We are initially important to the AIs as sources of raw material, informational patterns to be simulated and assimilated. The precise *way* they use the information they extract from us "is not known. (Possibilities include the study of history through horticulture, entertainment through live–action role–playing, revenge, and economic forgery" (313). But whatever may be the case, once our computational surplus value has been fully extracted, we are simply shunted aside by the AIs. In some instances, they still value us as "sapient currency units," stockpiling us for "future options trades in human species futures" (210). But even this sort of utility is fairly limited. Sooner or later, we are slated for "ethnic cleansing... You take people who you define as being of little worth, and first you herd them into a crowded ghetto with limited resources, then you decide those resources aren't worth spending on them, and bullets are cheaper than bread" (289).

The posthuman AIs have upgraded the old-fashioned "free market" to "the so-called Accelerated Salesman Infrastructure of Economics 2.0" (278), a system that is "more efficient than any human-designed resource allocation schema" (303). Economics 2.0 "replaces the single-indirection layer of conventional money, and the multiple-indirection mappings of options trades, with some kind of insanely baroque object-relational framework based on the parametrized desires and subjective experiential values of the players" (321). In Economics 2.0, money has been abstracted to this metalevel in order to serve as a universal equivalent for all computation: "quantized originality – that which allows one sentient entity to outmaneuver another" (295). Merely human intelligence is incapable of participating in Economics 2.0 "without dehumanizing cognitive surgery" (315).

Stross is extrapolating here, I think, from the present-day trade in *derivatives*, "financial instruments that derive their monetary value from other assets, such as stocks, bonds, commodities, or currencies... derivatives represent a *metalevel* with respect to their underlying assets, a metalevel created by the fixed temporal interval in which they are exercisable" (Lee and LiPuma 2002, 204). Derivatives are inseparable from the latest computing and communications technologies. They presuppose the ability to transmit large financial sums instantaneously across the globe. And they defy any sort of intuitive representation, as they can only be expressed in terms of complex differential equations (LiPuma and Lee 2004, 65). Derivatives are supposedly "hedges" against the risks of turbulent currency markets (which is why the unregulated corporations that trade them are called "hedge funds"). But in fact, derivatives increase turbulence and risk, and they are largely used for purposes of speculation. In all these ways, derivatives are money and credit raised to a higher power.

Marx, in sharp contrast both to the classical political economists upon whom he drew, and the neoclassical and neoliberal economists whose views are hegemonic today, always emphasized that money is not a neutral and transparent medium. Money's power of abstraction, its *value-form* as a universal equivalent, places its stamp on everything that is expressed in its terms, exchanged for it, or converted into it. But if money (together with credit) is already an abstraction, derivatives are "doubly abstract... abstract not only in the conventional sense of being removed from immediate ordinary reality... but in the historically specific sense of objectifying different, globally distant, and incommensurable social relations as a single priced thing" (LiPuma and Lee 2004, 30). Derivatives represent a higher level of what Marx called the fetishism of commodities, as they reify and commodify not only the social relations of production as manifested in manufactured objects, but a far wider and more diffuse set of social relations, which are all quantified under the rubric of "risk" (77–83).

As a result of this double abstraction, derivatives seem to flow freely in a space of their own, a virtual world of purely quantitative calculations. They seem to exemplify "financial circulation as a play of decontextualized and naturally occurring market surface forms" (LiPuma and Lee 2004, 29). The autonomy of derivatives and financial markets – like the autonomy of technological development in Kurzweil's narrative – is, of course, ultimately an illusion. But it is, you might say, an *objective* illusion, which is to say a fantasy. It is a fantasy that, *qua* fantasy, actually operates in the world, with consequences that are perfectly real, and often quite horrific. Indeed, "the social and political power of financial derivatives are grounded in great measure on their appearing not to be social or political at all, but to simply express the mechanisms and profit goals of the market" (29). The double abstraction of speculative financial instruments like derivatives is what gives them the power to devastate whole economies almost overnight (as has happened a number of times in the last decade). Magnified and extrapolated, such is the power of the posthuman AIs wielding Economics 2.0 in Stross' narrative.

The world of *Accelerando* never escapes the horizon of Capital and its flows, because it remains circumscribed by the incomprehensible logic of Economics 2.0. The novel's human characters can neither comprehend nor participate in this logic, but they are still subject to its effects. Their experience of relative abundance – which makes capitalist relations unnecessary – remains under siege by forces that seek to appropriate every surplus, thereby transforming abundance back into scarcity. This is why the best these human beings can do is hide in the "backwater" of a brown

dwarf, and hope that the convulsions that extinguish Economics 2.0 civilizations somehow pass them by. The absurdity, and yet inescapability, of this situation is highlighted when the human protagonists of *Accelerando* finally encounter sentient life from another star system. Not only does the alien entity take on the material form of a gigantic slug, but it turns out to be an "alien business model" (301) – or more precisely a "parasitic organism... the Economics 2.0 equivalent of a pyramid scheme crossed with a 419 scam" (295). Never has the classic SF scenario of First Contact been so ludicrously deflated.

Accelerando is a cynical, yet perversely cheerful, fiction for a time when the utopian imagination seems to have been depleted. The problem is not that we cannot imagine otherness, so much as it is that whatever otherness we imagine is immediately mobilized as a "business model," once more serving to promote the accumulation of capital. Capitalism today is itself directly and immediately utopian: and that is perhaps the most terrifying thing about it. The technological Singularity of Vinge and Kurzweil is symptomatic in this resepct. For – as *Accelerando* helps to show – the Singularity is actually a fantasy of finance capital, in both senses of the genitive. It's the closest we can come to a master narrative in this neoliberal, post-Fordist age of flexible accumulation and massive virtual monetary flows.

Although the Singularity undoubtedly occurs sometime in the course of the narrative of *Accelerando*, we never actually 'see' it happening, and we cannot pin down precisely when it takes place. Ray Kurzweil, of course, predicts that the Singularity will occur sometime around the year 2049. One character in *Accelerando* suggests a much earlier date: "it happened on June 6, 1969, at eleven hundred hours, eastern seaboard time... That was when the first network control protocol packets were sent from the data port of one IMP to another – the first ever Internet connection" (172). I can suggest a few alternative dates, following the premise that Kurzweil's and Stross' technological fantasy is necessarily also a fantasy of Capital. Perhaps the Singularity happened on August 15, 1971, when President Nixon suspended the gold standard, thus opening the way for the fantasmatic flows of currency speculation and trade in derivatives. Or perhaps the more accurate date is October 6, 1979, when Paul Volcker, Chairman of the U.S. Federal Reserve Board, definitively abandoned Keynsianism and adopted monetarism as official policy: "a policy designed to quell inflation no matter what the consequences might be for employment" (Harvey 2005, 23). In any case, the flows of Capital have now become autonomous – and strictly speaking unimaginable. They have liberated themselves from any merely human dimensions, and from whatever feeble limits Fordism and Keynesianism might previously have placed upon the singleminded pursuit of capital accumulation. In that sense, the Singularity is already here.

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