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Torque Control

Vector Editors

An Inquiry into the Nature and Causes of the Wealth of Notions

Someone once said, "It is easier to imagine the end of the world, than the end of capitalism." But it's 2018 now, and there are signs that maybe – just maybe – things are starting to change.

It's the ten-year anniversary of the last major financial crisis. Like a vanguard of spring daffodils, ancient plagues wriggle free from the thawing permafrost. Science has moved from mere 'consensus' to 'complex choral polyphonic harmonization': yes, we've been way too slow on climate change, and these floods and famines, heatwaves and hurricanes are only the beginning. Meanwhile, economic inequality is as brutal as ever. But the decade gone by has also seen digital monsters like Amazon, Facebook, Airbnb and Uber rummaging around in the global economy's roots, rewiring capitalism in ways which hint that bigger and better changes are possible. Teens aged 13 to infinity are sharing mystery memes about fully automated luxury gay space communism. Economics students are demanding new pluralist, relevant, open and inclusive curricula. Diverse economic experiments are proliferating – start-ups, co-operatives, apps, fads, communities, art projects, the uncategorizable – offering theoretical and practical challenges to the dominance of capitalism.
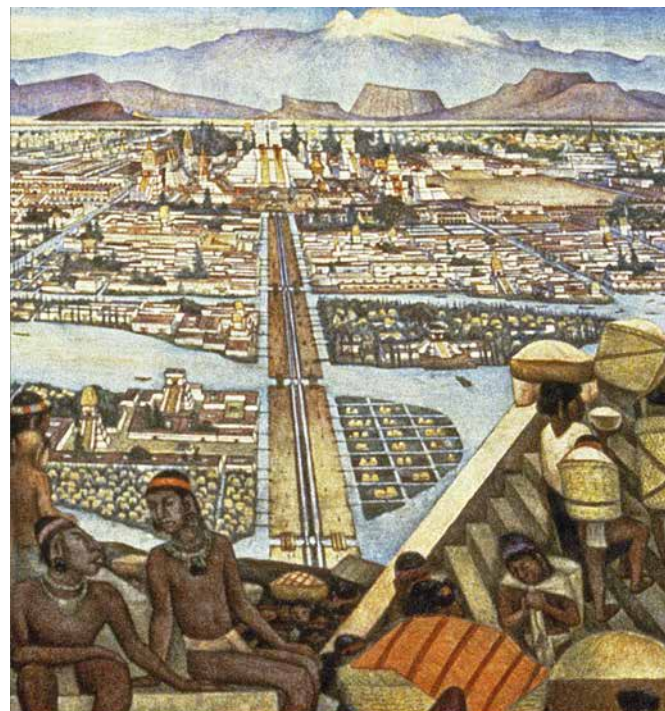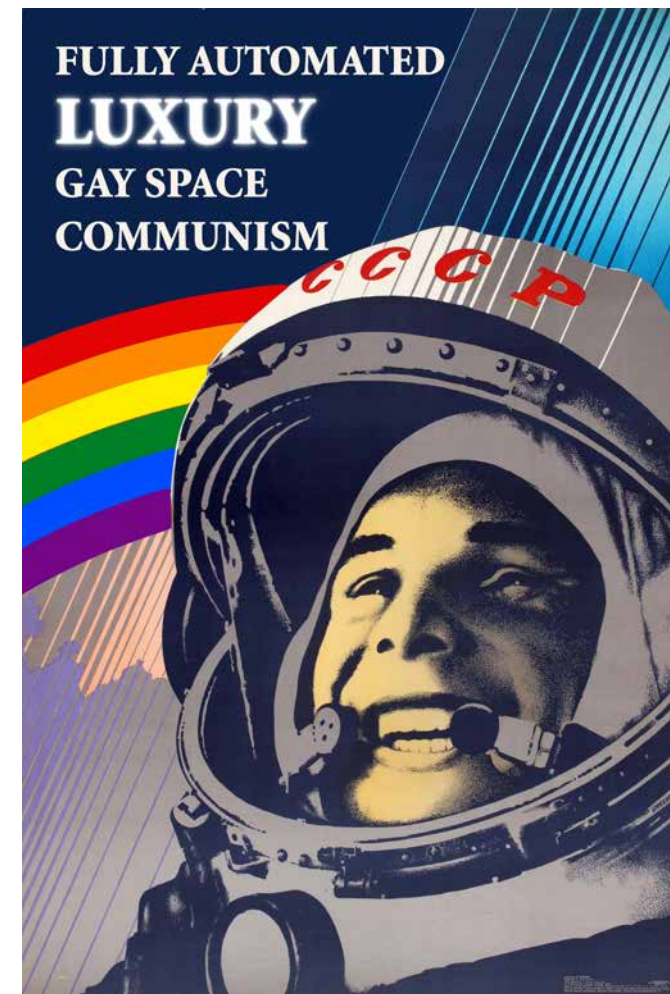
It seems like, for once, there is widespread will to seriously try radically new economic models, and a real appetite for fresh economic ideas. Science fiction – as a literature of ideas, of technology, and of the future – is playing a part of this quantum LARP, this projected six-meter sea-change. More and more SF seems to be incorporating explicitly economic themes: labour and automation; AI and smart cities; exotic forms of finance; post-scarcity utopias, dystopias, wtf-topias. When it comes to forecasting the future, SF is notoriously hit-and-miss. But that hasn't stopped society from turning to SF to help us understand what we're headed for, and what we can build with it. The working title of Cory Doctorow's *Walkaway* – discussed just over the page by Kirsten Bussière – was *Utopia*. It's fitting that title changed: utopia is *always* a work in progress.

Then again … what if this is all just a load of squee, hooey, and theorybabble? What if there's a speculative bubble in speculative thought-bubbles? What if, the more SF you read, the less convinced you are that it contains any of the answers that we crave to the pressing social and economic problems of the future? In this issue, Robert Kiely and Sean O'Brien's article 'Science Friction' is more interested in SF in which new technologies, and new social and economic

institutions, merely reinforce and amplify existing power imbalances and existential threats. And while it is thrilling that theorists from beyond Science Fiction Studies now champion the power of SF to disrupt the default capitalist worldview, it feels faintly fishy that they have their own naming convention – 'science fictions' plural? – perhaps suggesting they're perched on the edge of SF, rather than immersed in its midst. Is there a risk that they're romanticising the potential of SF – maybe even because their own fields are bereft of answers?

But regardless of whether SF has any role to play in it, economic reality looks set for mega metamorphoses in the not-too-far future. Deadlines demand Deed Lions. With or without a map, we are going someplace new. Ostrom's Law posits that if a resource arrangement works in practice, it should be able to work in theory. Unimaginable does not mean impossible.

Found Farewells

As well as our special themed feature on economics, we bring you all our regular features … and this issue will be alas the last to carry Andy Sawyer's Foundation Favourites column, as Andy retires from his role as Librarian of the Science Fiction Foundation Collection at the University of Liverpool. Foundation Favourites began in *Matrix* in 2003, and found a home in *Vector* #255 during the great shake-up of 2008, which saw *Matrix* move online. Andy's first Foundation Favourite for *Vector* was R.C. Churchill's *A Short History of the Future* (1955), a book whose "central joke" is that "all fictional accounts of the future are as 'true' as accounts of the past"; the next two columns highlighted Arthur C. Clarke's first-ish novel *Prelude to Space* (1951/1953) and then the first issue of some magazine called *Vector* (1958). Over the years, Andy's column has been a firm foundation for *Vector*: bouncy, insightful, humane, and always exceedingly good company. In this column, Andy places two very appropriate cherries on the fifteen-year tall cake: *The Sandman,* annotated by Leslie S. Klinger, and the extensive archive of SF convention material donated by Pete Weston.

THE SPECULATIVE ECONOMIST'S SCRAPBOOK

"This planet has – or rather had – a problem, which was this: most of the people living on it were unhappy for pretty much of the time. Many solutions were suggested for this problem, but most of these were largely concerned with the movement of small green pieces of paper, which was odd because on the whole it wasn't the small green pieces of paper that were unhappy."
Douglas Adams, The Hitchhiker's Guide to the Galaxy (1979)

STONE MONEY OF UAP, WESTERN CAROLINE ISLANDS.
(From the paper by Dr. W. H. Furness, 3rd, in Transactions, Department of Archaeology, University of Pennsylvania, Vol. I., No. 1, p. 51, Fig. 3, 1904.)
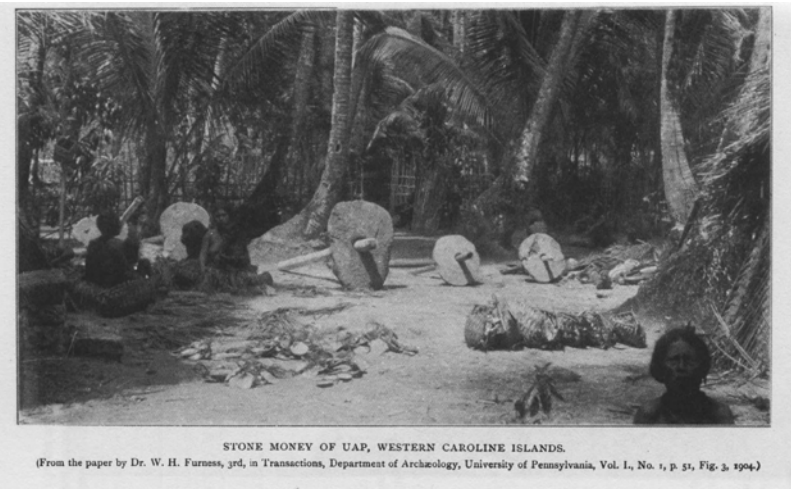
"Then the makers and the things made turned alike into commodities, and the motion of society turned into a kind of zombie dance, a grim cavorting whirl in which objects and people blurred together till the objects were half alive and the people were half dead. Stock-market prices acted back upon the world as if they were independent powers, requiring factories to be opened or closed, real human beings to work or rest, hurry or dawdle; and they, having given the transfusion that made the stock prices come alive, felt their flesh go cold and impersonal on them, mere mechanisms for chunking out the man-hours."
Francis Spufford, *Red Plenty* (2010)

"'Are digital currencies used by people, as well as by things?'
'Certainly,' said the doctor, 'it's just that nobody ever bothers. Best just to leave it to your stuff. After all, money is pretty boring, isn't it?'"

David Birch, *Before Babylon, After Bitcoin* (2017)
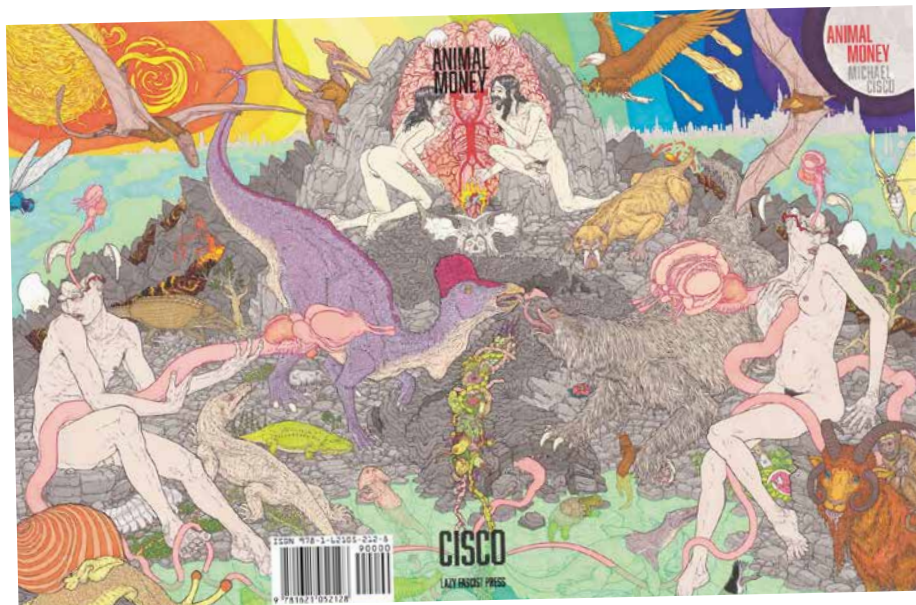
Digital Humanity: Collaborative Capital Resistance in Cory Doctorow's *Walkaway*
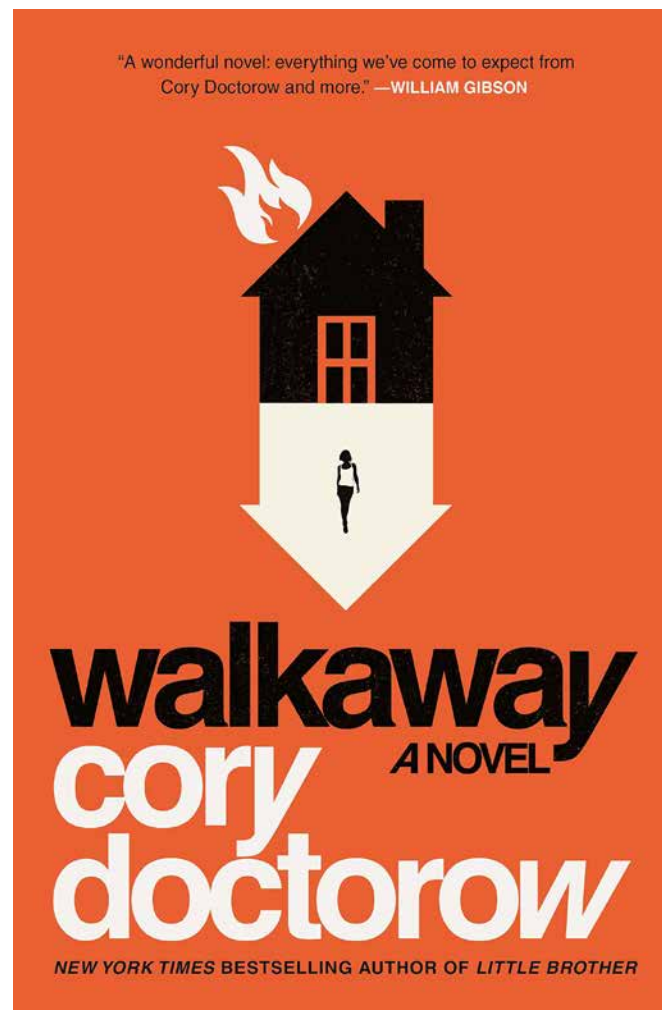
Kirsten Bussière

Since the 2008 global financial crisis, social movements which once pursued scattered causes are increasingly united against a common enemy: capitalism. In his recent article "The New Combinations: Revolt of the Global Value-Subjects," Nick Dyer-Witherford recounts how the "landscapes of globalized capital" are riven by scenes of political unrest. We have witnessed a decade crossed with an "ascending arc of struggles": demonstrations across different cities "mark the convergence of a range of campaigns and activisms," while coalitions of political groups "often exceed single issues and specific identities," and find means to converge on shared anti-capitalist perspectives – pushing back against a society built on purposeful scarcity, a society that predicates the wealth of the few on the poverty of the many (Dyer-Witherford 156-158).

Capitalism, in spreading wealth at an unequal rate, "can set all its subjects in competition with each other." This separation of the population ensures that the masses will not rise up against their oppressors. That's why the mobilization of different political activism groups as one anti-capitalist multitude is particularly dangerous to the existing hierarchy. So what has changed? There are many factors, but one which stands out. Modern day demonstrations and protests take place not only in the streets, but also in the realm of cyberspace. Information technology allows resistance groups to communicate and co-ordinate as never before, and what starts as a hashtag can quickly sprout into

a powerful movement for change. Plenty of cyberactivism isn't even that overtly political, but nevertheless strikes a blow against capitalism by de-commodifying capitalist products through "piracy; open source and free software initiatives; peer-to-peer production; and gift economy practices" (Dyer-Witherford 175-180).

Building on the longstanding tradition of social science fiction, the 2017 novel *Walkaway* by Cory Doctorow explores the extension of the digital community beyond the realms of cyberspace and into the physical world. It imagines a symbiotic post-digital relationship between humans and machines. The communal nature of producing digitally rendered objects in the non-digital world provides a technotopian solution to the anti-utopian capitalist regime – unyielding in its commitment that there is no better world possible.

However, at least to start with, the members of Doctorow's new society don't confront capitalism head-on. Instead, they reach a critical mass and are able to simply *walk away* from capitalism. Functioning as teams, these walkaways can focus on "collective action" in which individuals get together "with a *lot* of other people" and make a difference (Doctorow 78). Using technology to work together, the walkaways move beyond artificial scarcity, and start to produce abundance. In an essay about *Walkaway*, Doctorow describes abundance as "a function of what we have, divided by what we

"A wonderful novel: everything we've come to expect from Cory Doctorow and more." —WILLIAM GIBSON

walkaway
A NOVEL
cory doctorow
NEW YORK TIMES BESTSELLING AUTHOR OF *LITTLE BROTHER*

want, multiplied by how well-distributed things are" (Doctorow 2017, n.p.). In *Walkaway*, it is the communal enterprise of fabrication itself, as well as the transformation of scarcity into abundance, that creates utopia.

As a utopian experiment, *Walkaway* is not rooted in the tradition of "an imagined alternative reality" so much as it is "firmly anchored in a modern and 'realistic' context," through its focus on technological advancement – making it a potential future reality (Unwin 335). In other words, Doctorow's novel is self-consciously aware that our lives are already "thoroughly intertwined with technological devices" (Winner 995). As a result, the seemingly totalizing integration of digital technology into everyday human lives has effectively redefined commonly understood notions of community, and created a space where "humans and software [coexist] in a state that could be called *dancing*" (Doctorow 49).

The walkaways refer to the world they have walked away from as "default." Though they

may agree on the importance of technology in overcoming default, not all the walkaways agree on what system should succeed it. Outside of the default capitalist system, they generally adopt one of two possibilities: the reputation economy, or the gift economy. Doctorow explored the idea of a digital reputation economy in his debut novel, *Down and Out in the Magic Kingdom*. Now in *Walkaway*, Doctorow decisively stages the superiority of the gift economy over the reputation economy. In her article "The Reputation Economy" Kathleen Fitzpatrick suggests that the term "peer" has been reconfigured in online communities to mean "everyman," as opposed to its original definition of being a "professional of equal rank." As a result, there is a rise of "peer to peer networks" involved in online modes of productivity that take account of the wisdom of crowds to let "new models of authority to" develop – allowing for the emergence of peer created and reviewed projects that benefit from community feedback in a structured and hierarchical way (Fitzpatrick 1). Under this system, those who do the best work are thus provided a higher degree of "reputation and authority" (Fitzpatrick 8).

So reputation offers a tantalizing alternative to the money economy. However, the value of a user's contributions "can become subject to manipulation and attack," making the reputation economy a fallible system (Fitzpatrick 10). Effectively, the implementation of such a system creates a meritocracy, and as Doctorow argues in a recent essay looking back at *Down and Out in the Magic Kingdom*, "Meritocracy is a tautology […] There's no objective measure of 'merit' so there's no way to know whether your society is meritocratic or not" (Doctorow 2016 n.p.). Similar to capitalism, reputation economies function through the imposition of a form of "artificial scarcity" that applies value to reputation – meaning that a person's worth in society is intertwined with their ability to perform specific tasks (Fitzpatrick 14). Reputation, like money, "only works if there [is not] enough to go around" (Doctorow 37). Due to the fact that not all aptitudes are considered to have equal value, people are not designated the same economic compensation for their labour. Low value subjects are exploited for cheap or free labour,

while high value subjects have "forced up wages and working conditions" (Dyer-Witherford 173). In other words, meritocracy means some people deserve to be poor in the same way that some people deserve to be rich – making it easy for people to rationalize the fact that their comfort is predicated on the suffering of others. To make things even worse, a good or bad reputation may become a self-fulfilling prophecy: "once a lot of people hold you to be reputable […] other people bend over backwards to give you opportunities to do things that make you even more reputable […] If this sounds familiar, it's because that's how money works" (Doctorow 2016 n.p.).

Not all those who walk away are able to fully separate their thinking from the capitalist system they were once a part of. These individuals struggle to abandon the hierarchies that they were raised with. And while Doctorow points out that "every walkaway had been default, once," he does so in a way that demonstrates their advantage against the default community (355). This points to a general problem with the first generation of people working to build a utopia, in that they have deep knowledge of another society that influences their thinking. That's why even in walkaway communities there are small subsets that organize themselves around a twisted version of utopia, the reputation economy. Under this model "everyone gets out what they put in" through the implementation of a system of "reputation capital." This sets up a "system that makes people compete for acknowledgement" because their livelihood becomes tied to the ranking of their work, which recommodifies skill. Based on her performance, the work of Limpopo is considered the most valuable to the walkaways. Limpopo "put more lines of code […] than anyone" into the Belts & Braces, the first Walkaway tavern, which means that she has introduced the most additions and adjustments to the foundation of the community at large – increasing and maintaining its functionality off the default grid. As a result, if the reputation economy were implemented at B&B, Limpopo would be provided the opportunity to "stay for years without lifting a finger." And yet, this sort of system invites "game-playing and stats-fiddling, even unhealthy stuff like working

stupid hours to beat everyone," and this can only result in "a crew of unhappy people doing substandard work" (Doctorow 81-83).

By contrast, using the gift economy system, individuals are not obligated to give anything back to the community in order to live a sustainable life. Society is organized around a post-scarcity model in which "everything is freely given" and "nothing sought in return," whether or not people contribute (Doctorow 15). In default society, the concepts of "useless" and "useful" are too often represented as "properties of people instead of things people do." Within the gift economy, it is understood that "a person can perform usefulness, or anti-usefulness, depending on the circumstances" (208). But regardless of contributions, all people are provided with what they need. The point of the walkaway gift economy is to live in a state of "abundance," which means that people do not need to "worry" if they are "putting in as much as" they take out, because there is always enough for everyone (49). This accommodates all members of society, ensuring that they are treated the same regardless of their varying abilities – all people are considered valuable.

The focus on equality does not erase what is distinctive about different people's different skills. The walkaway projects allow everyone to participate, but certain people, because of their specific skill sets, can be considered indispensable in certain contexts. For instance, when the character Dis is being brought back as a simulation, she is indispensable because they cannot "bring her back without *her*." By contrast, Iceweasel has done a good job "keeping her spirits up and distracting her," but if Iceweasel had not been there "someone else would have done the job" (155). It is thus not the usefulness of an individual that has shifted but rather their relationships with each other. Automation has changed the connections between people to the point where all individuals can perform usefulness, regardless of innate skill level.

Not every gift economy requires abundance. But in Doctorow's vision, gift-giving, technology, and abundance are deeply interwoven. This plays on one of two dominant conceptions of the digital world detailed by Mehta and Darier,

in which the "neo-utopian vision" of technology can be understood through a "global village" metaphor (107). Thus, in developing a culture of making, walkaway communities are able to function with the goal of democratizing technology and technological innovation through their commitments to "democratic participation" (Ames et al. 1088). Digital technology is used and improved for the overall betterment of the society as a whole. Contemporary social practices push us to "take what exists now and restructure or replace it in a digital format" (Winner 993). As Jentry Sayers argues in his article, "Why Fabricate?", digital fabrication "demonstrates how media are in constant iteration, undergoing shifts from objects in hand […] to objects on screen" (Sayers 7). In Doctorow's *Walkaway*, the use of three-dimensional printers allows for three-dimensional objects to be rendered into a two-dimensional form on the computer screen and then reproduced as tactile objects (Sayers 2). The "smart adaptive" technologies used in walkaway communities make it nearly "impossible" to create "non-viable" items (Doctorow 59). B&B uses "more automation than default" which means that "the number of labor-hours needed" to keep the population "fat and happy for a day is a lot less" than in the inefficient capitalist system, which forces people "to scramble just to scrape by" (309). Technological advancement allows "human contribution" to be "quickly whittled away," but because walkaways function outside the capitalist world of default that makes people work to live, this diminishing of human labour maintains a positive effect on society (Winner 990). Innovation, separate from the "gradual increases in incomes, profits, stock prices, and living standards," can be focused on betterment for all members of a community, not just those with the largest income (Winner 991).

Moreover, the influx of new technologies has long been involved in "changing the practices and patterns of everyday life" (Winner 992). On this point, Unwin argues that "technology can and should enhance our respect for the world we live in, and increase our ability to create constructive, generous societies" (334). Digital networks thus have the ability to create new multitudes – interconnected through a system of sharing. Moving into a post-scarcity system,

the walkaway communities have the ability to generate a world where you cannot convince people to compete with one another. More broadly, they are creating a world that wants what people have to give, making it hard to encourage the population "to kill each other" (Doctorow 331). Functioning in partnership with all members of a community, society slowly loses the sense that you will either "take or get took" (Doctorow 375).

Throughout *Walkaway,* it is technology that allows a communal enterprise of fabrication to form, and scarcity to become abundance, thus creating utopia. Saying this, technology's propensity to encourage utopian thought doesn't mean that technology is inherently utopian. The digital world functions as a set of tools that can "can be used in different kinds of projects and for several different purposes, each with its own positive, or negative, value characteristics" (Sundström 42). The digital world can also have "a social impact extending far beyond the intentions and circumstances of the initiators of the process" (41). In that vein, *Walkaway* suggests that while technology's role is subject to the ideological position of the user, certain technologies maintain higher potential to perform certain tasks and cannot be considered completely value neutral. Access to technology is access to power. So in its attitude toward technology, *Walkaway* invites us to think beyond simplistic instrumentalism (where a technology is good or bad depending on how it is used), and beyond simplistic determinism (where technologies can be built intrinsically good or bad). Technology is inherently linked to "the world of purposeful human action" and can thus never be considered value-neutral (41), but technologies have effects far beyond what they are designed for, and the social consequences of a new technology depend on political struggle and collaboration, as much as they do on technology itself.

Technology has great significance for how the walkaways learn and share knowledge. People within the community are thus well situated to "answer administrative and public demands to make knowledge useful" (Raley 32). Spaces such as Walkaway U harken back to what Rita Raley

terms an imagined "golden age of knowledge," in which knowledge was procured for the benefit of society and "universities were disentangled from the capitalist knowledge regime" – progress is acquired just for the sake of moving forward (33). This can be seen throughout *Walkaway* through the attempts at "life extension" – a technological feat being worked on all over the world (Doctorow 52). In the capitalist conditions of default, there are people "worth more than most countries" who are so committed to staying alive that they are "just organs and gray matter in a vat" – "enduring unimaginable pain" because of their "superstitious belief" that they can buy immortality (52). Under a capitalist system, life is commodified so that only the rich have the potential to live forever, while the poor give their lives to another – slaving away to save somebody else from death.

By contrast, experiments at Walkaway U aim for immortality for anyone who wants it. "The 3D printing and consciousness uploading […] and so forth are all there to illustrate the astounding fucking *magic* of lowering the cost of coordinating our labor" (Doctorow 2017 n.p.). With an integration of human consciousness and technology, the potential emerges for virtual versions of real people to be manufactured and brought into the non-virtual world. Building out from "captured life-data," the researchers at Walkaway U are "booting [simulations]" that effectively bring people back from the dead (Doctorow 102). Technological advancement has allowed life to continue on a spectrum between human and robot. Human reliance on the digital world has already caused us to be "kinked by our computing platform" (105). That is, a post-digital, symbiotic relationship between person and machine already exists, and simulated people merely act as an extension of this. The most recently uploaded version of the self thus functions as a backup to the original. Should an individual undergo human death and they have a backup in place, they can be rebooted as a simulation – potentially extending their life interminably.

This system allows an individual to "run multiple copies of themselves to back up different versions of themselves and recover

those backups" – thus drawing a past-self back into existence (300). But these simulations are not mere copies. Rather, they maintain the ability "to think everything they used to be able to think […] and also to think things that they never could have thought" (300). This means that the simulation is not merely a copy but rather something stemming out of a previous self. For instance, when they were alive, "Limpopo and Etcetera had been soul mates," but as simulations they had gotten to a point "where they hated each other and never wanted to speak again" (322). So perhaps the technology is not infallible. On the other hand, perhaps this isn't a failure, but rather a sign that the simulations are in fact viable sentient beings capable of growth, change, and free will. Either way, the walkaways are still perfecting the process of life extension, and as a result, there are concerns that when people "ditch [their] bodies, upload" and create a simulated version of the self, the human race will be "unable to survive without whatever makes us terrified of losing our bodies." The work being done could turn out to be the "engineering" of "the mass suicide" of an entire population (197). However, Tavera suggests that "if capitalism continues, humans will not" (30), which means capitalism can be understood a form of mass suicide too.

The simulations of Doctorow's text can be understood as cyborg figures. In the 1980s, the philosopher Donna Haraway influentially theorized cyborgs as "creatures simultaneously animal and machine, who populate worlds ambiguously natural and crafted" (Haraway 49). For Haraway, the point of the cyborg wasn't just that some parts are 'natural' and some parts are 'artificial': the more you think about the cyborg, the more these rigid distinctions break down. Haraway invited us to think about how many simplistic dualities – human and animal, the organic and the machinic, man and woman, self and other, material and immaterial – are generated and sustained, and whose interests they serve. Furthermore, she didn't just treat the cyborg as a way of improving our understanding of ourselves and the world: the cyborg also represented a kind of practical political strategy, a strategy of blurring boundaries and resisting top-down imposition of identity. The

cyborg figure in *Walkaway*, in a slightly different way, also represents a political strategy. In the contemporary epoch of the Anthropocene, in which humans are the dominant influence on the planet, and yet humanity have been made hostages of our own capitalist system, the cyborg offers a potential solution. Understanding the cyborg as a fusion between "human and nonhuman" (Tavera 21) allows us to see them as one extension of the utopian possibility embedded in technological advancement. The creation of a new sentient being comes with the potential of "generating a race that, in subsequent development, could possibly move beyond human control" (Slusser 47). Slusser asks: "What sort of future might a race of such creatures bring?" (47) Combining the powers of the human with the abilities of the machine could have disastrous consequences – though perhaps this may be used to dismantle the overarching capitalist system, if only because they do not require the same products that allow a capitalist post-scarcity system to run.

One role for science fiction is that it functions as a "thought experiment" meant to "depict future things" (Slusser 46). Applying this to Doctorow's *Walkaway*, the text can be considered both a science-fictional allegory that criticizes the problems of the present as well as a realistic near-future speculation. *Walkaway* never arrives at a world that has fully achieved utopia, but rather the utopian vision is fully recognized, and presents us with a means to push back against the capitalist system to produce a world that can sustain everyone. In other words, Doctorow exposes the ways in which current social problems may bleed into the future, while still providing a framework for making a better world than we have now – transitioning into a critical-utopian future that refuses exact blueprints or easy answers. More simply, the future is up to us.

Individually, people's actions, however noble, appear to have little impact on changing the societal makeup for the better. People have long used mass scenes of political unrest to influence those in power – organizing so that their presence is noticed. Information technologies, enabled by the digital world, allow for new means of communicating with those who share

an ideological viewpoint, or a material interest. Many people, from all walks of life, share a material interest in dismantling capitalism and transitioning to a more just and ecological system, even if we don't necessarily share ideological viewpoints. Information technology can be a way of changing ideology, inventing ideology, or maybe even co-ordinating action despite differences in ideology.

The world is more connected than ever before, allowing those who have access to the internet to find new means of connecting and creating communities that go beyond geographic proximity. That is not to say that digital networks alone will create new technologies or multitudes, but rather it increases the possibility that these communities will form. Doctorow's post-digital world redefines the spaces in which a genuinely utopian collective might yet emerge.

In conclusion, walkaway culture aims to move beyond the overly simplistic opposition between individualism and collectivism, through a form of anarcho-syndicalist politics that, ideally, provide a means to remain an individual within a collective. Thus, Cory Doctorow's *Walkaway* advances the argument that the communal nature of technological advancement holds the potential to create a utopia – one in which we are equal but remain different. The biggest threat to a utopian future is not the implementation of a dystopian regime, because these two worlds are mere reflections of each other, but rather we are threatened by the belief in anti-utopian sentiment that insists on what it claims is 'realistic,' and pushes forward the idea that the world cannot get better than it already is. These pressures from the elite, urging the impoverished workers to be satisfied in their suffering, ensures societal indifference to inequality. These pressures from the elite, urging the impoverished workers to be satisfied in their suffering, ensures societal indifference to inequality. One question which Doctorow's novel does not satisfactorily answer is how this critical mass can be built deep within our default society, rather than at its edges. Often 'walking away' is not really an option. Walking away from a society that predicates comfort on other people's suffering only causes those who have left to be complacent in the continued injustices committed against the poor. Rather, working together, revolutionaries committed to

improving our world can use technology to build a utopia. Doctorow's *Walkaway* merely provides a starting point for the imagining of a better future.

I hope to see you there.

Works Cited

Ames, Morgan G., et al. "Making cultures: empowerment, participation, and democracy-or not?." CHI'14 Extended Abstracts on Human Factors in *Computing Systems*. ACM, 2014.

Baudrillard, Jean, and Arthur B. Evans. "Simulacra and Science Fiction (Simulacres et science-fiction)." *Science Fiction Studies* (1991): 309-313.

Bussière, Kirsten A. "Digital Humanity: Collaborative Resistance in Cory Doctorow's *Walkaway*". *Seminar*. N.p.: n.p., n.d. Print.

Darier, Michael D. Mehta Eric. "Virtual control and disciplining on the Internet: Electronic governmentality in the new wired world." *The Information Society* 14.2 (1998): 107-116.

Doctorow, Cory. *Walkaway: a Novel*. Head of Zeus, 2017.

Doctorow, Cory. "Wealth Inequality is even Worse in Reputation Economies." *Locus*, March 2016, locusmag.com/2016/03/cory-doctorow-wealth-inequality-is-even-worse-in-reputation-economies.

Doctorow, Cory. "Coase's Spectre." *Crooked Timber*, May 2017. crookedtimber.org/2017/05/10/coases-spectre/

Dyer-Witheford, Nick. "The new combinations: Revolt of the global value-subjects." *CR: The New Centennial Review* 1.3 (2001): 155-200.

Feenberg, Andrew. *Questioning technology*. Routledge, 2012.

Fitzpatrick, Kathleen. "The Reputation Economy." Planned *Obsolescence*, pp.1–15, mcpress.media-commons.org/plannedobsolescence/one/the-reputation-economy.

Haraway, Donna. "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century." *Simians, Cyborgs and Women: The Reinvention of Nature*. New York; Routledge. (1991): 149-181.

Raley, Rita. "Digital humanities for the next five minutes." *differences* 25.1 (2014): 26-45.

Sayers, Jentery. "Why Fabricate?" *Scholarly and Research Communication* 6.3 (2015).

Slusser, George Edgar. "The Frankenstein Barrier." Fiction 2000: *Cyberpunk and the Future of Narrative*, University of Georgia, pp.46–71.

Sundström, Per. "Interpreting the notion that technology is value-neutral." *Medicine, Health Care and Philosophy* 1.1 (1998): 41-45.

Tavera, Stephanie Peebles. "Utopia, Inc.: A Manifesto for the Cyborg Corporation." *Science Fiction Studies* 44.1 (2017): 21-42.

Unwin, Timothy. "Vernotopia (utopia, ecotopia, technotopia, heterotopia, retrotopia, textotopia, dystopia)." *Australian Journal of French Studies* 43.3 (2006): 333-341.

Winner, Langdon. "Technology today: Utopia or Dystopia?" *Social research* (1997): 989-1017.

IN A CYBORG MANIFESTO DONNA HARAWAY CRITICIZES TRADITIONAL NOTIONS OF FEMINISM, PARTICULARLY ITS EMPHASIS ON IDENTITY, RATHER THAN AFFINITY. SHE EXPLORES THE POTENTIAL OF THE CYBORG CONCEPT IN ORDER TO CONSTRUCT A POSTMODERN FEMINISM THAT MOVES BEYOND DUALISMS AND THE LIMITATIONS OF TRADITIONAL GENDER, FEMINISM, AND POLITICS.

A CYBORG MANIFESTO
SCIENCE, TECHNOLOGY, AND SOCIALIST-FEMINISM

DONNA HARAWAY

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Lunar Labour: A Review of *Moon* (2009)

Benjamin Franz

Moon (2009)

Moon was a remarkable first time effort by then young filmmaker Duncan Jones. The son of David Bowie, Jones chose to follow his father's second line of work, cinema. His debut, which was produced for five million dollars, explored the extreme cost optimization used by Lunar Industries to mine an element called He-3. *Moon* not only portrays the process of mining He-3 in exacting detail, but it imagines a brutal human cost associated with such economising strategy.

In *Moon*, we are introduced to Sam Bell, brilliantly portrayed by Sam Rockwell. Sam is – or at least, he *thinks* he is – an astronaut on a three-year contract with Lunar Industries. As the movie opens, Sam is just weeks away from completing his contract and returning home. Sam's job is overseeing the automated mining system, and relaying batches of Helium-3 (He-3) back to Earth. The process is nearly entirely automated, and to keep costs down Lunar Industries use only one human overseer, who is meant to spend the three year term in isolation.

The set design, cinematography, and editing is deft, invoking both claustrophobia and a dizzying vastness. As Sam is generally and virtually alone, the only space that concerns him is the one he is currently occupying. It's only in the sequences outside the base that we feel a sense of scale, as Sam stares at the enormity of creation and the beacon of planet Earth. There's a real-world sense of texture to the moon bases and automated miner units. In Sam's recreation room, we have a ping-pong table set up for one player, a ceiling mounted punching bag, and a growing cardboard model of Sam's hometown. Out on the lunar surface, the harsh crisp lighting captures the effect of living somewhere without an atmosphere. There's little to no debris in the sky, and the Earth is visible from nearly everywhere on the Moon.

In the past, most of the astronauts who fulfilled this role experienced a crushing sense of loneliness. As we see from the opening act, Sam Bell is not immune. Sam's only companion is his AI, Gerty, whose rudimentary design is more evidence of Lunar Industries' cost-cutting. The robot helper is nothing more than an industrial robot arm, a display screen with a basic animated emoji face, and a disembodied voice emanating from a set of speakers.[1] While Sam does rely heavily on Gerty to provide materials he needs, Gerty is no substitute for human companionship.[2] In fact, Sam is starting to have hallucinations of a young brown-haired girl, bearing an eerie resemblance to his daughter, but older than the child Sam expects is waiting for his return to Earth.

Sam is wrong and right at the same time. His once infant daughter has since grown up. An astronaut called Sam Bell probably did, at one time, serve a three-year stint on the Moon mining He-3. But there has not been a new astronaut ferried up to the Moon in a very long time. The big reveal is that Lunar Industries has made a great many clones of Sam Bell, concealed in a secret basement level suspended in cryogenic sleep. Once the current Sam Bell has 'left,'[3] Gerty is programmed to thaw out a fresh clone, and impress upon him that he is the current astronaut, just beginning his three year contract. Lunar Industries think they have established a cycle which can continue indefinitely: a clone is revived; the clone then oversees the robotic miners, and sends fresh He-3 to Earth; at the end of the term of service, the clone is recycled, and a fresh clone resumes the process.

This, of course, is where the drama of the film's text disrupts an otherwise elegant economic ecosystem. The system 'works' so long as there exists only one Sam Bell clone alive at a time. In *Moon*, we see what happens when an unanticipated event occurs.[4] On this particular cycle, Sam Bell crashes his rover into an automated miner. Gerty awakens a fresh clone. But, as it turns out, the earlier clone survives as well. With Sam Rockwell performing double duty as both versions of Sam Bell, an old disfigured clone and a fresh hale and hearty one, we witness an actor fully commit to the chaos of such a disruption. Rockwell chooses to portray the older Sam as much more in touch with his feelings, and desperately lonely. The young Sam is full of vigor and a sense of disdain for the prior iteration of himself. It's the younger model who almost instantly figures out they are clones. "It's a company, right?" he says. "They have investors, shareholders – shit like that. What's cheaper? Spending time and money training new personnel or just have a couple of spares here to do the job?" Even so, the younger Sam is prepared to start working.

The older Sam simply wants to go home. Even after he realises that there's no way to return to the world he remembers, he desperately wants to leave the Moon. In an especially poignant and compelling scene, older Sam manages to drive a rover past the jamming towers, and makes contact contact with his family back on Earth. As he learns what has become of his family from his now fifteen-year-old daughter,[5] older Sam is bowled over by the revelation he experiences.[6] Scenes like these forcibly remind the viewer

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1. The voice is Kevin Spacey's, which gives another dimension to Sam's vulnerability, following recent revelations of Spacey's sexually predatory behaviour.
2. At one point in the film Sam will ask the only other person he meets in this narrative if he can shake his hand, just to have some human touch.

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3. In point of fact, when each Sam 'leaves' he enters an alleged transport pod, and is then incinerated.
4. To ensure the perfect encapsulation, Lunar has established 'jamming towers.' They are antennae focused on preventing the Sam Bell clone from directly contacting the Earth. Instead, the clone is given pre-taped media and video messages from his wife and daughter. A story about a broken communications satellite completes the illusion.

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5. Through video messages, the Sam clones watch their daughter grow from an infant to a three-year-old. As we learn when the young dark haired girl answers the phone, his daughter has matured, and his wife is now dead.
6. Which is still tolerable, until he hears the original Sam Bell's voice very much alive and at home.
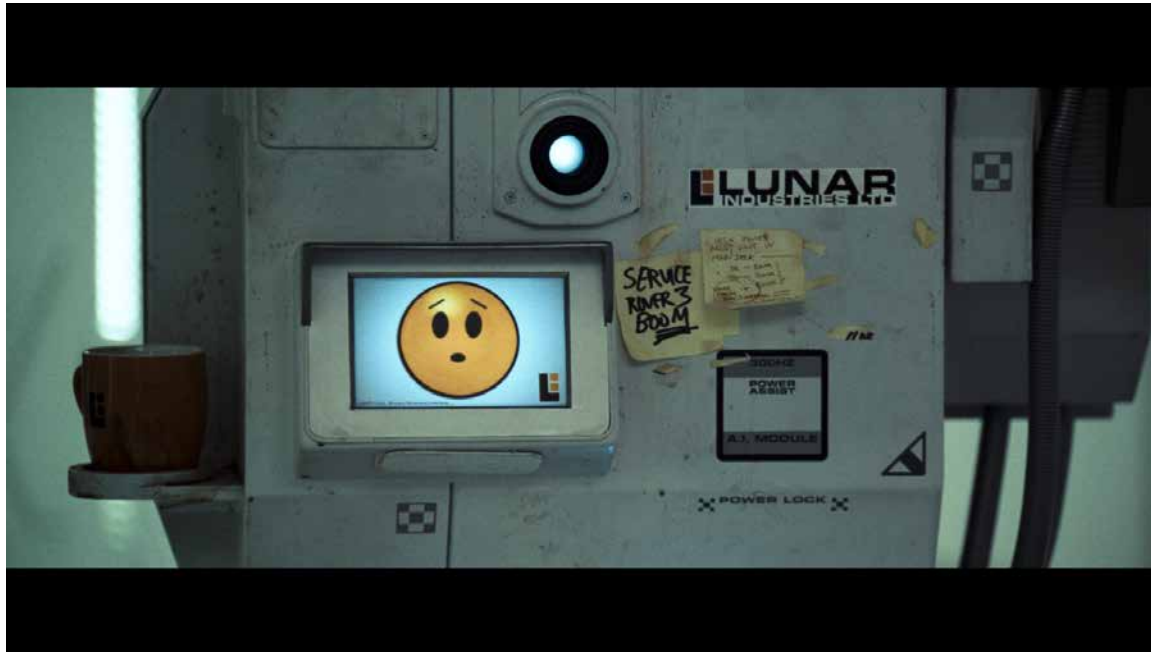
Moon (2009)

that Sam is a person, an invaluable entity who deserves to be treated with empathy and dignity. He should not be reduced to his economic function, or treated as a resource.

Economics, in Lionel Robbins' influential definition, is about how people deal with scarcity of resources.[7] *Moon* itself is a marvel of low costs. The special effects are practical, and the use of green screen is supremely limited. Duncan Jones optimizes his budget, and the result is a film that feels authentic – the austerity of the budget is turned into the austerity of the setting that serves a narrative purpose. And in a way, *Moon* is even a movie *about* budgets. That is, the movie asks questions about how we put costs on things, and what 'low cost' really means, especially when it comes to human life. Clearly, it is very expensive to train mining supervisors, to shuttle them to the Moon, to provide them with a safe working environment, and to deal with accidents in the workplace. Furthermore, few people would willingly sign such a contract. It is expensive, in other words, to treat human beings like human beings.

Given the scarcity of such skilled and willing workers, Lunar Industries has turned to the peculiar institution of slavery powered by clones.

Slavery takes many forms, but it always involves dehumanization. Sometimes it disguises itself as some kind of contract. The worker is treated not as a complete human being, but simply someone bound by legal obligations, even when they are unjust. *Moon* certainly evokes this kind of slavery. But it also alludes to chattel slavery, that is, complete 'ownership' of a human being. Although Sam is a white character, his circumstances suggest the Atlantic triangular slave trade, and the racialized dehumanization of kidnapped Africans. At the heart of Sam's grief is that he has been stolen from his family. Meanwhile, the wealth extracted from the lunar colony is shipped elsewhere, for the benefit of people who don't concern themselves with its source. Presumably the people at Lunar Industries who know the truth claim that clones are 'subhuman.'

Of course, under 'normal' circumstances, the clones don't think of themselves as slaves. In this way, *Moon* also poses unsettling questions about the relationship between slavery and paid labour. The tatty blue-collar aesthetic may recall the early Alien films, but *Moon* is highly contemporary. It imagines how technology can make an industry more 'efficient,' while dehumanizing its workers in insidious ways. For any warehouse packer whose productivity gets tracked by a wearable device, or any worker in the gig economy whose income barely covers

the costs of doing the work itself, this may be a familiar story.[8]

Another economic theme in the movie is the mining of natural resources. In *Moon*, the element He-3 is being used as an energy source.[9] Of course, coal and oil are certainly non-sustainable, and their widespread use has already caused irreversible environmental damage, political disruption, and loss of life. At the same time, *Moon* warns us not to romanticise alternative energy sources. Although it is necessary to turn to cleaner source of energy, there may be damaging consequences to be considered. In this case, the model used by Lunar Industries can be seen as anti-renewable, since it emphasizes exploration, and innovative technology to extract difficult-to-access reserves. But even truly renewable energy has its dangers. Shifting to any new form of energy means shifting to a new legal and regulatory framework. This creates new

loopholes and new opportunities for unethical activity. We tend to associate green energy with a more just and caring society, but in theory even green energy could involve incalculable human exploitation.
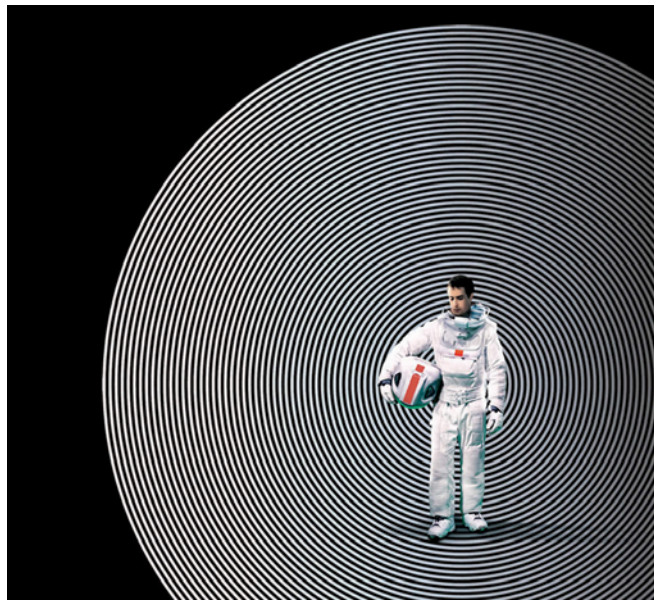
The film is also a microcosm of emerging class consciousness. At first, Sam cannot even recognise how he is being exploited. This is because he lives inside an illusion which serves the economic interest of Lunar Industries. He thinks he is alone on the Moon by choice. Even when the spell is broken, there is understandably some tension between the two clones. In the real world, people are made to compete for jobs, and employees are made to compete for promotion. For this pair of clones, the situation is even more extreme: they may feel they are rivals for the role of 'the real' Sam Bell. Will their tension break out as violence? Or will they join forces – unionize, effectively – against the people who put them in this position?

Moon is a very potent first effort from filmmaker Duncan Jones. To date, he has crafted two more wonderful films, *Source Code* (2011) and *Mute* (2018). He also prepared the more forgettable *Warcraft* (2016), an adaptation of the popular epic fantasy game. Clearly Jones' bailiwick is science fiction. It is thus the hope he continues to create powerful, socially and economically aware science fiction films like *Moon*.

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7. Robbins called economics "the science which studies human behavior as a relationship between ends and scarce means which have alternative uses" (Robbins, 1932).

8. Gerty's presence in **Moon** adds another layer of complexity. On one hand, Gerty is a sinister presence in the first act, monitoring everything Sam does, and reporting back to Lunar Industries. Viewers will no doubt be reminded of Kubrick's HAL. On the other hand, just like the clones, Gerty is ultimately stuck on the Moon, in perpetual servitude to Lunar Industries. Near the end of the movie, Gerty decides to erase part of their own memory. This means that just like the clones, Gerty will end up with memories which don't match reality. "The new Sam and I will be back to our programming as soon as I have finished rebooting," Gerty says. Sam is so quick to insist that he is *not* programmed, he misses the rich implications of Gerty's statement. Gerty sees Sam as a programmable machine. But for Gerty, this is not necessarily dehumanizing. And at the same time, Gerty implies that both Sam and Gerty can *depart* from their programming, and exercise free will. The movie invites us to consider the ethics and laws governing machines that are sentient, that simulate sentience, and the blurred area in-between. How do machines deserve to be treated in the workplace? What implications does their treatment have for how we treat each other? What compromises will we be tempted to make, especially in a future characterized by the upheavals of climate change?

9. There are nine known isotopes of helium, including two that are stable. More than 99% of all helium on Earth is Helium-4, which has two protons and two neutrons. Helium-3, which has two protons and one neutron, is thought to be relatively more abundant on the Moon, having been woven into the Regolith by billions of years of solar wind. Helium-3 could in theory be used to release nuclear energy (through fusion rather than fission), but without the radioactive waste produced by traditional nuclear reactors. It could also go in birthday balloons.

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THE SPECULATIVE ECONOMIST'S SCRAPBOOK

Moon (2009)

"Employers who turn up for work day-in, day-out are essentially cast as outsiders: a production cost to be minimised, an input to be hired and fired as profitability requires. Shareholders, meanwhile, who probably never set foot on the company premises, are treated as the ultimate insiders: their narrow interest of maximising profit comes before all [...] But this set-up is, of course, just one among many possible enterprise designs."
Kate Raworth, Doughnut Economics (2017)

"What, am I to argue that it is wrong to make men brutes, to rob them of their liberty, to work them without wages, to keep them ignorant of their relations to their fellow men, to beat them with sticks, to flay their flesh with the lash, to load their limbs with irons, to hunt them with dogs, to sell them at auction, to sunder their families, to knock out their teeth, to burn their flesh, to starve them into obedience and submission to their masters? Must I argue that a system thus marked with blood, and stained with pollution, is wrong? No! I will not. I have better employments for my time and strength than such arguments would imply. [...] The time for such argument is past. At a time like this, scorching irony, not convincing argument, is needed. O! had I the ability, and could I reach the nation's ear, I would, to-day, pour out a fiery stream of biting ridicule, blasting reproach, withering sarcasm, and stern rebuke. For it is not light that is needed, but fire; it is not the gentle shower, but thunder. We need the storm, the whirlwind, and the earthquake."
Frederick Douglass, "What to a Slave is the Fourth of July?" (1852)

We have perhaps a general principle: to make something saleable, in a human economy, one needs to first rip it from its context. That's what slaves are: people stolen from the community that made them what they are. As strangers to their new communities, slaves no longer had mothers, fathers, kin of any sort. This is why they could be bought and sold or even killed: because the only relation they had was to their owners.
David Graeber, Debt: The First 5,000 Years (2011)

"The scarcity of money is always the result of very carefully constructed social and political arrangements."
Geoffrey Ingham, The Nature of Money (2004)

The real price of every thing, what every thing really costs to the man who wants to acquire it, is the toil and trouble of acquiring it. What every thing is really worth to the man who has acquired it, and who wants to dispose of it or exchange it for something else, is the toil and trouble which it can save to himself, and which it can impose upon other people.
Adam Smith, The Wealth of Nations (1776)

Economic Science Fictions reviewed: Speculate to innovate

Madeleine Chalmers

Economic Science Fictions, edited by William Davies (London: Goldsmiths Press, 2018), 400 pp.

Fantasies are things that can't happen, and science fiction is about things that can happen.
— *Ray Bradbury, interview with Joshua Klein for* The Onion (1999)
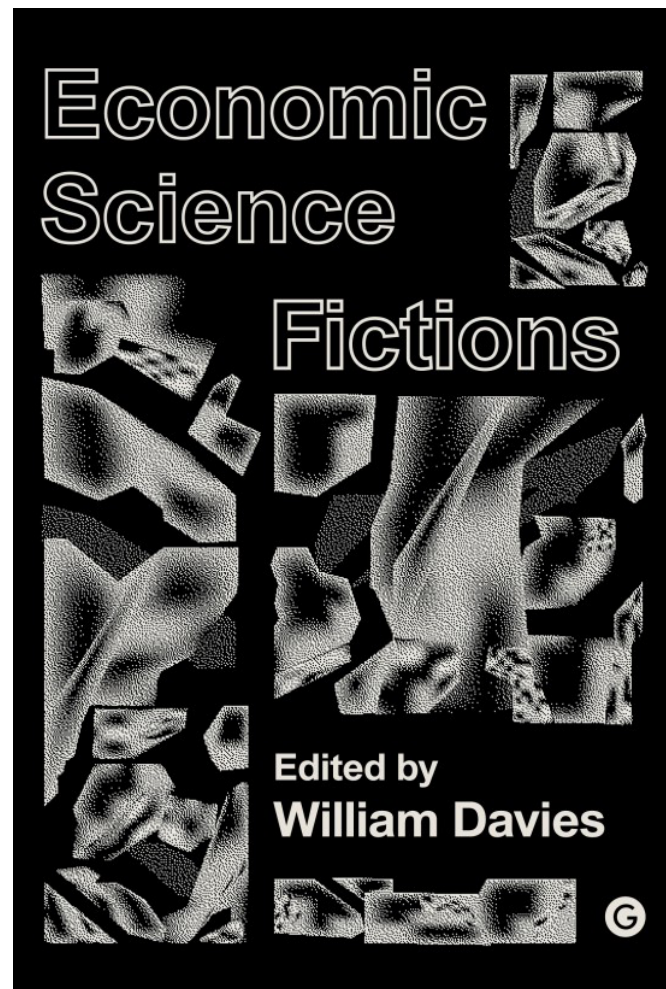
If self-proclaimed 'not a science fiction writer' Ray Bradbury ever needed an academic publication to bolster his sprightly quip, then *Economic Science Fictions* is it. In this bold and exciting collection, William Davies and his contributors offer us an unapologetic manifesto for the power of 'can', pushing Bradbury's statement to its limit to issue a call to arms: economic science fictions are not just 'about things', they *do* things – and so can we.

Taking a firm stance amid the contemporary swirl of fake news and financial, political, and ecological hyperobjects, this major interdisciplinary contribution confronts the porosity between fiction and reality head-on, to interrogate the rigid boundaries we often impose, the assumptions we make, and the mental and social habits we forget to question.

As such, Davies's collection is a welcome addition to a growing canon of post-2008 crash literature which seeks to combine critique and clear political statements with intellectual rigour, reconnecting academia with 'the real world'. It takes its place alongside such titles as the late Mark Fisher's *Capitalist Realism* (2009) and Nick Srnicek and Alex Williams's *Inventing the Future* (2015). From Fisher's luminous foreword, in which he posits economic science fictions as 'effective virtualities' (xiii), onwards, this collection aims to counter the fiction that is capitalism. It invites readers to turn from speculative finance and its logic of accumulation (with the permanent risk of catastrophe), to speculative fiction and its potential to write – and set right – the world.

This title forms part of Goldsmiths's PERC (Political Economy Research Centre) series, which defines itself as a 'pluralist and critical approach to the study of capitalism'. This commitment to interdisciplinarity and dialogue between the academic and non-academic spheres is made absolutely manifest in the collection's diversity. It has an echo of the democratic ecumenism of the underground 1990s zines, as theory-fictions intermingle with more canonical forms of academic writing. Indeed, the title of Judy Thorne's 'Speculative Hyperstition at a Northern Further Education College' raises the spectre of that mid-1990s phenomenon, the Cybernetic Culture Research Unit. Today, in 2018, writers, artists, architects and musicians mingle polyphonically with founders of think tanks and consultancies, as well as journalists, early career researchers, and established academics.

at least not wholly alien) to non-academic and academic readers alike. While it is only possible to pick out highlights here, what consistently impresses is the interweaving of analyses of science fictions, evocations of personal practice, theories of global megastructures, and creative riffs. Interlocking in surprising yet harmonious ways, within and across the various essays, these texts probe disciplinary boundaries in provocative and illuminating ways.

The collection's first section – 'The Science and Fictions of the Economy' – grounds us in the nuts and bolts of the dream-mechanics of economics, with contributions from distinguished academics on the corporate imaginary (Laura Horn), the anthropology of money (Sherryl Vint) and automation (Brian Willems). Alongside these, Ha-Joon Chang's contribution ('Economics, Science Fiction, History and Comparative Studies') stands out – as much for its laudable inclusion in a collection overwhelmingly dominated by 'non-economists', as for its content. A second section on 'Capitalist Dystopias' gives us a whistlestop tour of different dystopias in which capitalism is pushed to its limits. Here, accelerationist nightmares rub shoulders with the more ambiguous vision of Dan Gavshon Brady and James Pockson's gloriously-titled 'Fatberg and the Sinkholes: A Report on the Findings of a Journey into the United Regions of England by PostRational'. Readers wary of discourse about discourse will find the 'Design for a Different Future' section refreshing, for its pragmatic yet playful turn towards architecture, urban planning, and design.

But it is perhaps in the final section, 'Fumbling for Utopia', that *Economic Science Fictions* offers the ideal meta-reflection on the collection as a whole. Featuring four economic science (theory-) fictions, it closes with Jo Lindsay Walton's 'Public Money and Democracy' – a fiction with footnotes, which perfectly encapsulates the collection's aspiration to break down the barriers between the real and the imagined.

This collection makes no secret of its political stance. Readers looking for neutrality, dry objectivity, or dissent from the valorisation of science fiction and its role in building a post capitalist future will not find it here. The voices of economists who – unlike Ha-Joon Chang – are not avowed SF fans, sceptical SF writers, or interviews between converts and sceptics might have helped to redress this balance, and add a new dynamism to what remains an invigorating discussion – but not really a debate. Greater granularity in the definition of capitalism as it manifests itself in different national contexts (including non-European and non-US contexts) would also have added even greater bite to a collection that seeks to cross wires between the abstract and the pragmatic.

Quibbles aside, this collection is stimulating for believers and dreamers, but also provides ample material to dig into and with which to productively disagree for those who are not quite converts. Its return to political and social commitment represents a passionate and urgent response to our contemporary situation, and an astute and convincing argument for – and illustration of – interdisciplinarity and the interweaving of theory and practice, inside and outside the academy. It is a collection which empowers us to speculate – to invest in fiction not just as a means to provoke but as a means to intervene in our confused and confusing world.

MADELEINE CHALMERS IS STUDYING FOR A DPHIL IN FRENCH AT THE UNIVERSITY OF OXFORD, FUNDED BY THE OXFORD UNIVERSITY AHRC DOCTORAL TRAINING PARTNERSHIP – SIR IVOR ROBERTS GRADUATE SCHOLARSHIP AT TRINITY COLLEGE. HER RESEARCH PROJECT ON 'UNRULY TECHNICS' EXPLORES HOW AVANT-GARDE FRENCH LITERATURE OF THE LATE NINETEENTH AND EARLY TWENTIETH CENTURIES NEGOTIATE THE INCREASINGLY TIGHT IMBRICATION OF TECHNOLOGY INTO HUMAN LIFE, AND THE CHALLENGE IT POSES TO HOW WE THINK ABOUT OURSELVES, OUR RELATIONSHIP TO OTHERS AND TO OUR WORLD. IT SEEKS TO PLACE THESE TEXTS OF THE PAST IN DIALOGUE WITH CURRENT PHILOSOPHICAL REFLECTIONS ON TECHNOLOGY, TO EXPLORE HOW THIS ENCOUNTER CAN HELP US TO THINK ABOUT OUR TECHNOLOGICAL PRESENT, AND FUTURE.

William Davies's shrewd editing allows these very different contributions to speak to one another and shine. His opening 'Introduction to Economic Science Fictions' grounds the discussion in classic liberal economic theories of value. Taking as his sparring partners Ludwig von Mises and Friedrich Hayek, Davies teases out how capitalism is constructed around the flexible 'division between "real" and "imaginary" value"' which, as he points out, 'is how financial bubbles occur: when collective imagination starts to become mistaken for an empirical reality' (23). Lucidly and compellingly, Davies reconfigures this instability as an opportunity, positing politically progressive economic science fictions as a means to engage with capitalism on its own oscillating ground, poised between the fictional and the non-fictional.

The four sections which follow – each with a clear and concise introductory overview – develop this core thesis. The texts within them move fluidly from theory to practice and back again, with examples which will be familiar (or

FIVE STORY PROMPTS

1) A world where everyone gets paid what they feel they deserve for anything they consider to be of value; honesty controls inflation/deflation. The protagonist is a member of a dissenting group of ascetics who refuse to be part of the money-based system of exchange.

2) Write a thriller, a love story, a murder mystery, a coming-of-age-fable, and/or a comedy of manners. Set it in the near future, during the transition to a Universal Basic Income system. Make sure there are lots of kinks in the process.

3) A story featuring a designer market or a complementary currency whose purpose is not to solve a specific set of social problems, but to create them. If you want to research complementary currencies, Bernard Lietaer is a great place to start.

4) A magic system based on the stock exchange.

5) Something new has replaced 'ownership.'

Keep an eye out for the next *Focus*, which features more economic SFF writing ideas.

Rapparitions

AUDINT (Toby Heys)

The Holo Accords of 2056 map out an alternative constitution for discord management, a whole new way of engaging in conflict that reduces the massive costs involved in such endeavours and unconditionally removes flesh from the messy equations of political turbulence. From this point on all military operations will be conducted via holographic forces. Detachments, units, and divisions of encoded light fields, tactically mobilised for transparent effect. Gone are the days of collateral resource damage or civilian casualties along with their subsequent cover-ups that reek like insipidly cheap perfume in the toilet of public opinion.

This is good for business, however you look at it, especially for newly emerging Holography companies. But this is not, in essence, a modern industry, not by any stretch of the imagination; Giambattista della Porta first conceiving of its inception by describing an illusion – 'How we may see in a Chamber things that are not' in his 1558 work of popular science *Magiae Naturalis* (Natural Magic).[1] Nearly 300 years pass by the time that John Pepper and Henry Dircks manifest his idea into a (virtual) reality by making a ghost appear on-stage in Charles Dicken's theatrical rendition of 'The Haunted Man' in 1860.[2]

Two centuries on, the notion of conducting territorial, political, and natural resource struggle via holographic armies is a predictable extension

Tupac Hologram

and militarisation of the most populist form of entertainment that projects itself into mass public consciousness in 2007 – holographic concerts from musicians who had died and more arrestingly from those that were yet to be born. Fitting obliquely into the latter category is one Hatsune Miku, a prophetic pop princess channelled by Sapporo-based Crypton Future Media.[3] With her vamped up Kabukichō style and cerulean pigtails she could not be more aptly monikered, her name translating to 'first sound of the future.' She is the first truly digital 3D crush for a slew of Japanese fans and her presence works the salivary glands of technologists, teenagers, and posthumanists alike.

She is also the first enunciation of a flight path taken by the military-entertainment complex that simultaneously traverses the reproduction and negation of original vibrating matter. Following closely, as ever, US companies respond. In the first event of its kind, a dead rock star is brought back to life with voodoo fidelity as the exhumed holographic corpse of Elvis Presley performs

a duet version of his 1968 hit 'If I Can Dream'[4] with Celine Dion on the TV show American Idol. Through this endeavour, North America spells out its rationale for mapping out the emerging era of the wraith, as, pixel by pixel, it disinters the dead.

The year 2012 is ground zero for the popularisation of holographic projections or 'original virtual performances' as they are sometimes referred to in this era.[5] The Digital Domain Media Group revivify the rapper Tupac in order for him to play live from the grave alongside Snoop Dogg (who claimed the encounter to be 'spiritual') and Dr. Dre at the Coachella festival in California. In his own inimitable way Tupac intones the audience "To lead the wild into the ways of the man. Follow me; eat my flesh, flesh and my flesh."[6] A zombie-call for future bloods to become immortalised by digital divinities.

Initially there is some unease about the sanctity of the posthumous performance of hits such as 'Hail Mary'[7] but the unease is overwhelmed by public desire to bring back young African Americans whose lives have been cut short. The Tupac production is quickly followed by zombie cameos from Ol' Dirty Bastard[8] as he joins Wu Tang Clan on stage to perform 'Shame on a Nigga'[9] and 'Shimmy Shimmy Ya'[10] at the Rock the Bells Festival and

from Easy-E who appears with Bone Thugs-n-Harmony in 2013.[11] Then to cap it all, the king of the dead, Michael Jackson, is brought back to life to perform in Cirque de Soleil's extravaganza 'One' at the Mandalay Bay Hotel in Las Vegas; the man, now on the other side of the mirror, returning as the transposed picture of Dorian Gray.

The emergence of Holotech culture and the Lazarian industry it spawns in the USA are the final parts of the fiscal equation that multiplies young African Americans with the morgue. The future figures of the body (and the income that will be accrued) rotoscope an amortized economy in which "not only the labor but the laborer himself has been rendered immaterial, conjured up, and put to work. Outsourcing here takes on the character of 'outsorcery,' a conjuring of the dead to do work once the sole province of the living."[12]

There is more to be made when the redivivus are birthed in light so that they can once again render material (wealth) through sound. In the 2020s the holo industry expands exponentially and a rapparition index that hierarchizes hip-hop stars, according to their estates and earning rates after death, is established. Only those towards the top of the list will be holographically resurrected. Ghost money[13] adorned with Daedalian patterns and the revenant outlines of scrubbed throw-ups is made printable with downloads of albums and singles. When the currency is burnt by the purchaser, phantom royalties are paid, improving the rapper's social standing in the afterlife. On the dead presidents face of it, the dollarization of Hell money has

1 Giambattista della Porta, *Magiae naturalis, sive, De miraculis rerum naturalivm libri IIII* (Naples: Matthias Cancer, 1558).
2 For further reading on the evolution of Pepper's Ghost through to its holographic manifestation, see Jim Steinmeyer, *The Science Behind the Ghost!* (Burbank, 1999).

3 See www.crypton.co.jp/miku_eng (accessed 14 February, 2018).

4 Elvis Presley, 'If I Can Dream' (USA: RCA, 1968).
5 Lindsay Zoladz, "Ghost Riding," Pitchfork, 21st November, 2013. pitchfork.com/features/ordinary-machines/9265-ghost-riding/ (Accessed 14th February, 2018).
6 Tupac Shakur, 'Hail Mary', 7" (USA: Death Row Records, 1997).
7 Ibid.
8 The 'appearance' of ODB took six months of labour for six minutes of airtime, according to his digital creator Chris Romero. See, Lindsay Zoladz, 'Ghost Riding,' *Pitchfork*, 21st November, 2013. pitchfork.com/features/ordinary-machines/9265-ghost-riding/ (Accessed 14th February, 2018).
9 Wu-Tang Clan's 'Shame on a Nigga' was originally released as track number 2 on side 1 of the vinyl - Wu-Tang Clan, *Enter the Wu-Tang (36 Chambers)*, (USA: Loud, 1993).
10 'Shimmy Shimmy Ya' is the second single released from Ol' Dirty Bastard's first solo album in 1995, *Return to the 36 Chambers: The Dirty Version* (USA: Elektra, 1995).

11 Together they performed the tracks 'Straight Outta Compton,' 'Boyz-n-the-Hood,' and 'Foe tha Love of $.'
12 John Freeman (2016) "Tupac's "Holographic Resurrection": Corporate Takeover or Rage against the Machinic?," *Ctheory, Theorizing 21c: 21C014* (Accessed 14th February, 2018). ctheory.net/tupacs-holographic-resurrection-corporate-takeover-or-rage-against-the-machinic/ (Accessed 14th February, 2018).
13 Also referred to as joss paper or Hell money, ghost money comes in sheet paper format (currency) or as crafted objects such as smart phones. Used predominantly in China and Vietnam, it is burnt as an offering to the spirit of a deceased friend or relative, in order to improve their social standing in the afterlife.

been jacked and diffracted; time to scratch off the worn heads of the Benjamin Franklins.

Each printable piece of ghost money is algorithmically illustrated according to the musical note count of the track or album it relates to. Thus the three dominant musical notes (in terms of how many C1s or F1 sharps appear in a track or album, for example) are visualised and translated into cymatic patterns by a CymaScope[14]; the normal mode of the music being broken down into a trio of granulated snap shots that resemble symmetrical spider webs by the way of orange sunshine. These patterns also contain encrypted data relating to the overall musical note counts that exist in any associated piece of music. Given the drill down nature of each track's acoustic profile it means that no two Audio Data Maps (ADMs) can be identical. The cymatic patterns are subsequently laid over a ghosted bomb[15] that is relevant to the music and the overall design finally printed onto joss paper bills.

Each digital track is treated as an oscillating system that has its own waveformed logic, all parts moving sinusoidally in reaction to a frequency and fixed phase relation. At odds with this system of waveformed teleology is the value of the hell notes. While the price of the music is set, the value of the corresponding ghost money is not fixed, at least not until the consumer decides how much of their cryptocurrency they wish to part with. The final sequence of the purchase involves the reckoning of the phantom royalty, which must be made above the fluctuating minimum base rate that is itself dependent on how the relative artist is currently ranked within the Rapparition Market Index.

The smoke created by the burning of the ghost money is captured by a remote sensory system called a Polsen – a satellites and aircraft bound technology that was once used to measure respirable suspended particulate matter. Here it is retooled and miniaturised for use in hand-held devices on the ground. These small pieces of apparatus can be jacked so that they become ultra sensitive to temperature as well as to sonic and optical information. As a result they are capable of detecting nanoscopic deviations in air quality and the patterns produced by gaseous emissions. When a paper offering is burnt the Polsen detects the patterns of the gases and particulates, so that in effect, the ghost money emits cymatic smoke rings, which are captured and digitised. This data subsequently feeds back into the rapparition index, so that the phantom royalties can be tracked. Modal vibrational phenomena dictate holo market flow in this way; the liquid agency of the rapparition being based in part, upon their smoked assets.

As well as the rapparitions' standing in the afterlife being improved according to the burning of the ghost money, their futures market is also adjusted and down or upgraded. The higher their stock climbs, the more investment goes to fund the 'reality engine' of their holographic form, which as a result, will become increasingly stable, life-like, and of course, ubiquitous. Music industry executives compete for 'black chip investments', the highest economic honour that can be bestowed upon dead rappers. In financial circles, the term 'catching a body' is reverse engineered and given a holo makeover; killin' it in the afterlife being the first step to gaining pounds in the present. The spectranomics of ghost money, then, equate to a temporal spread spectrum. Somewhere between quietus and revivification, the rapparitions are finally getting paid in full.

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AUDINT IS A SONIC UNIT THAT: RESEARCHES THE WEAPONISATION OF VIBRATION; DEVELOPS CARTOGRAPHIES OF LIMINAL WAVEFORMED PERCEPTION (UNSOUND); AND INVESTIGATES THE WAYS IN WHICH FREQUENCIES ARE UTILISED TO MODULATE OUR UNDERSTANDING OF PRESENCE/NON-PRESENCE, ENTERTAINMENT/TORTURE, AND ULTIMATELY LIFE/DEATH. MORE INFORMATION CAN BE FOUND AT WWW.AUDINT.NET

14 In the words of the www.cymascope.com web site – "A Cymascope is the first scientific instrument that can give a visual image of sound and vibration in ways previously hidden from view." (Accessed 14 February 2018).
15 The outline of a piece of complex graffiti.

THE SPECULATIVE ECONOMIST'S SCRAPBOOK

"In the new economy, human invention increasingly makes physical resources obsolete. We're breaking through the material conditions of existence to a world where man creates his own destiny […] we're returning to the age-old wisdom of our culture […] In the beginning was the spirit, and from this spirit the material abundance of creation issued forth […]"
Ronald Reagan's description of the new economy from 1988, quoted in Annie McClanahan, "Investing in the Future"

"At the same time, the rise of the so-called 'sharing economy' brings under renewed scrutiny the notions of value and measure […] [T]he Marxian notion of value and the whole debate around value creation seem to be challenged anew. […] a peer-to-peer economy is founded on the prominence of use value over exchange value and, in varying degrees, on a partnership between the peer economy and the market. The way that sharing practices have arisen, however, fundamentally calls into question the particular conception of value that sharing practices are built around and foster, how value is formed and what relationship this has with digital metrics."
Arcidiacono, Gandini, Pais, "Sharing what? The 'sharing economy' in the sociological debate" (2018)

"Building a union at Amazon can't be done on the shop alone. A union at Amazon will be the product of organizing the class, down to the neighborhood level, and engaging the full person in their political, social, and cultural life."
Martin Harvey, 'A Union at Amazon?' (2018)

"Behind cyberactivism, however, lies an array of other activities that, though less overtly politicized, challenge capital's law of value equally or more severely by de-commodifying its digital products."
Nick Dyer-Witheford, 'The New Combinations: Revolt of the Global Value-Subjects'
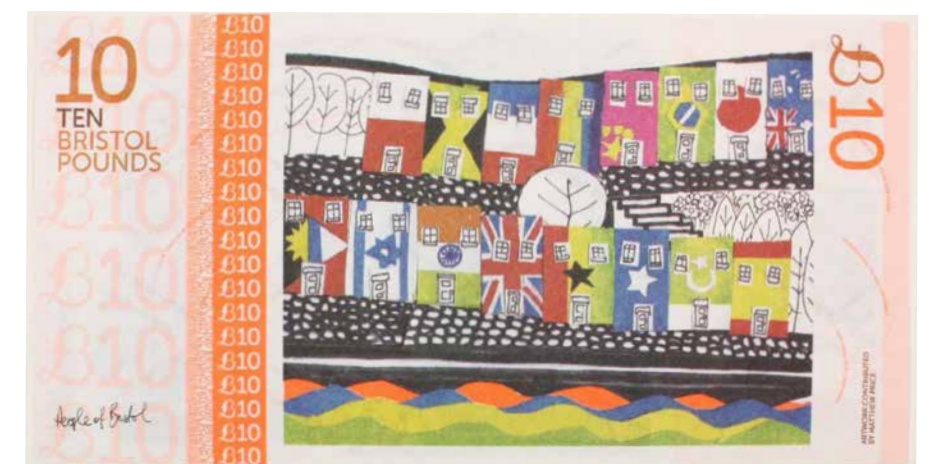
"The strike was a success, with only 5% of workers logging on."
Rebel Roo bulletin #9, July 2018

Living on Borrowed Time

Erin Horáková
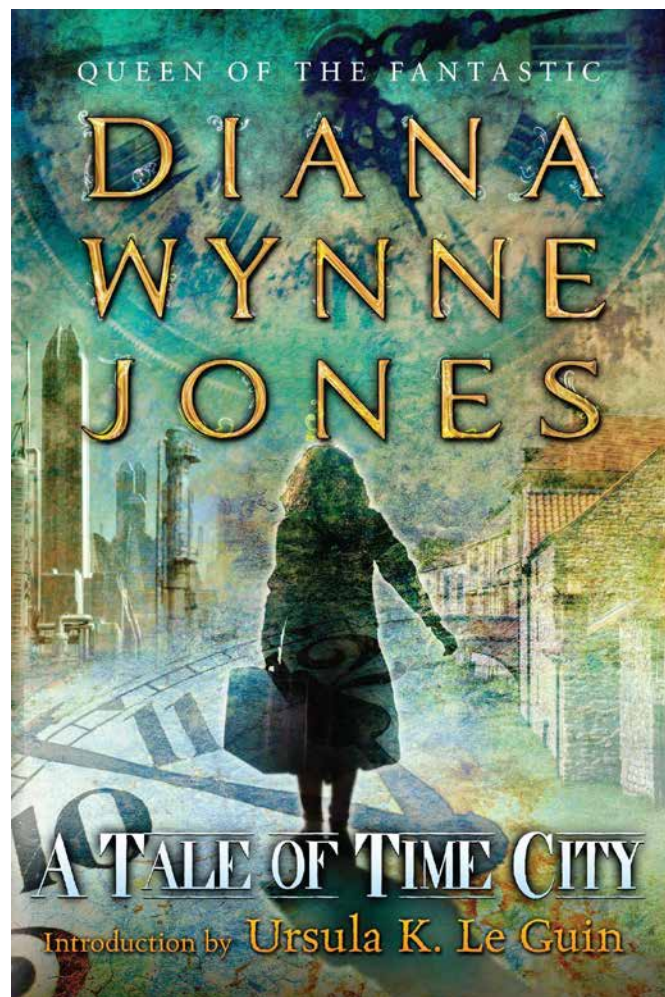
More than anything else, Diana Wynne Jones' children's science-fantasy novel *A Tale of Time City* (1987) is about the eponymous micro-civilisation: a city-state outside of time. Time City monitors the events of the whole anthropocene, trades with sufficiently advanced civilisations,

and partakes of the best of every era. This article conducts a 'world factbook' style survey of this economy, to the extent that's possible based on the information the book gives us (and with markedly less dodgy CIA involvement). We'll look at the state's sources of income, labour within it, economic immigration to the city, and finally the ultimate effects of Time City's colonial trade relations with what its citizens call 'history.' Via this case study, I hope to provide a way into thinking about time travellers and other agents outside of time as economic actors.

I'm acutely conscious of Jones' own cautions against forgetting that worldbuilding is primarily a means to tell particular stories rather than a practice of generating sociologically consistent artefacts—a contention expressed eloquently and at length in her *The Tough Guide to Fantasyland*. This parodic guidebook to the archetypal locations of genre fiction mocks authorial lazy thinking, but in doing so it reminds us of the constructed nature of fantasy worlds and their total involvement with narrative aims:

> INDUSTRY. Apart from a bit of pottery and light metalwork or some slagheaps around the domain of the DARK LORD, most Tours encounter no industry at all. Even the EMBROIDERY factories are kept well out of sight.

See also ECONOMY.[1]

So I'm not going to shake the book down for its demographic data and jeer at any irregularities therein, as though the point of a novel was to provide me with material for a sociology thesis. Instead I'm going to think about what this economy, as an inherently fictive narrative artefact, says about the underlying thought that enabled it to be written, and that then enabled it to be cogently read. Though she is in many ways an extraordinarily tight plotter, Jones' novels often ask questions she can't answer, and suggest messy externalities.[2]

Time City has, for instance, 'automat' machines that can produce food seemingly from nothing in the fashion of *Star Trek*'s replicators. Citizens almost universally possess a belt that functions rather like a smart phone, enabling contactless monetary transactions within the

1 Jones, Diana Wynne. *The Tough Guide to Fantasyland*. Firebird, 2006,. p.34.
2 In Jones' *Chrestomanci* series, for example, it's not clear what Christopher Chant was offering to do for Cat Chant's parents in order to prevent their children from being, like him, iterations in the multiverse, and thus, physical laws, extremely magically powerful. Neither is it clear how Christopher's own children, born of a 'singular' parent and a woman from another world, could possibly avoid being singular 'Chrestomancis' themselves. The book that focuses on Christopher's own childhood, however, features a plot-important weapon that has the power to strip magic from a person. Thus we have in-universe means, motive and opportunity: a plausible explanation for both what Christopher could have been offering to do for Cat's family and for what happened to his own children. (in part rather than in full—the children still have some magic). Given what we know of how this world works (though our information is, granted, incomplete), this is the *only* explanation we can offer. But given how the weapon is described, even its partial, 'benign' use is a rather frightening prospect. I can't speak to whether Jones intended it to be, and indeed the question's hardly important as such. My point is that when establishing the mechanics of her worlds, Jones sometimes (and intentionality or the lack thereof is, again, the wrong thing to focus on here) creates snarls at the structural level that have the potential to give rise to troubling and interesting intellectual and emotional conflicts. (Horáková, Erin. "The Afterlives of Christopher Chant: Handing Down Formative Trauma in the Chrestomanci Series." Diana Wynne Jones: A Fantastic Legacy. 6 Sept. 2014, Newcastle.)

discrete economic sphere of the city itself. The city's energy supply, explicitly predicated on 'energe functions' rather than fossil fuels, seems infinite. Given that the city's forward-looking planner designed its original key buildings to withstand even the pressures of the city's final cataclysm, we might also assume that it was at least constructed with the capacity to feed itself. Yet despite its unparalleled access to technology, Time City does not appear to be self-sustaining in this most basic capacity, opting to engage in trade rather than attempt to produce everything that its citizens need (let alone want). Jones imagines Time City as part of 'global' economy—which is, of course, the ultimate fantasy of the late capitalist post-imperial corporation.

During one of several tours of the city-state (sometimes the novel feels a bit like *News from Nowhere* in this respect) we see significant expanses of farmland. These might almost be ornamental—their description is pastoral rather than reminiscent of industrialised agriculture. There are no reeking, crammed chicken barns or processing plants. On that same tour we also pass a vast barge carrying 'meat from Forty-two Century.' Is this a luxury good? Neither the conversation about the barge, nor the scale of the operation ('a great barge as high as a house and nearly as long as a football pitch') imply that it is. The relationship between the farmland, the automats and the meat shipments is not obvious.

Perhaps Time City could improve its agricultural infrastructure and become self-sufficient or exclusively use automats, but simply finds trading for such commodities a better use of its resources. Why make something yourself if you can get more in exchange using the same amount of effort?[3] The manufacturing processes involved in producing certain complex consumer goods might be too difficult or expensive to replicate in-house. Perhaps the city trades for cultural reasons, as well as 'purely' economic ones. Or perhaps, as with contemporary humans and global warming, a matter that

3 The third chapter of Farah Mendleson's book on Diana Wynne Jones deals with her various time-travel fictions, and has substantive information on the temporal mechanics of Time City. "Time Games". Mendlesohn, Farah. *Diana Wynne Jones The Fantastic Tradition and Childrens Literature*. Taylor and Francis, 2013.

could be addressed by current technology and infrastructure *isn't* because people lack the will to do so, or struggle to coordinate their efforts.

Trade in commodities is far from the only way in which Time City's economy is intertwined with 'history.'

Vivian sat beside him, watching tourists walk through the square and cluster to look at Faber John's Stone in the middle. More tourists sat at the other tables or went in and out of the rich-looking shops under the arcade. Vivian had never seen so many peculiar clothes and strange hairstyles in her life. She heard strange languages, too, jabbering all around her.

"Time City relies a lot on the tourist trade," Jonathan said.

"Where do they all come from?" Vivian asked.

"All the Fixed Eras," Sam said, quite cheerful now. "A hundred thousand years of them."

"There's a tour for every ten years of every century, except when there's a war on," Jonathan said. "The Time Consuls arrange them. Time Patrol checks everyone who wants to come, but almost anyone can come really."

"How much does a tour cost?" Vivian asked. But the waitress arrived to take their orders just then.

It's as if the book is dodging the question. 'Relies' seems a significant term here. Even Vivian Smith, a Londoner, finds the quantity of tourists swarming the city's major landmarks remarkable.[4] Are Time City's many historical monuments (some with expensive entry costs) and byzantine civic rituals for the city's technocrat inhabitants, or are they at least equally serving, and perhaps designed for, the active tourist trade?

4 Admittedly Vivian's 1939 London was not as developed for tourism as either the city Jones knew when she published the book in 1987 or the London of 2018, but to a significant degree the point stands.

These visitors do more than look. Some use the situation of Time City, at a fixed point in time, as a resource in itself for their own ends.

"What happens," Vivian asked, "if a tourist meets his own grandchildren and hates them and decides not to get married? Wouldn't that change history?"

"There's a whole branch of Time Patrol checking to make sure that won't happen," said Ramona. "Hush, Sam."

"But quite a lot of people come here specially to meet their ancestors or their descendants," Jenny said. "We have conference rooms in Millennium where they can get together."

One wonders how dynastic arrangements and cross-temporal business deals figure into this. Not to mention the shopping opportunities: "Secular Square was [...] crowded with stalls under red and white awnings, where people were buying and selling everything from fruit and meat to tourist trinkets." The ability to buy items from the relative future, however, would seem to contravene Time City's information brokerage policies:

"There goes meat from Forty-two Century," said Ramona.

"All that!" said Vivian. "Who pays for it?"

"We all do," said Jenny. "Time City trades in exchange—only what we trade is knowledge, Vivian. There are records in Perpetuum, Erstwhile, Agelong, and suchlike of most things the human race has ever known or done. Students come to study here. And anything anyone in history wants to know, we can tell them for a fee—provided it's something from *before* the date they ask, of course."

"Oh, we stretch a point sometimes, Jenny," Ramona said. "My

department gives weather forecasts, remember?"

Jenny laughed. "Yes, and Ongoing Science quite often gives hints to make sure science goes the right way. But we do have to be careful about sending history wrong."

"We can't have all of it going unstable," agreed Ramona.

It is unclear if Time City barters knowledge with the outsiders or uses some form of money as a mechanism of exchange. Time City could also use its historical observers as purchasing agents. How Time City interacts with financial markets, if at all, also goes unaddressed; presumably it would be possible to move money back in time to capitalise off yet-to-happen inflation.

Jenny's conception of her people's ownership of the past is predicated on universality, a sort of interchangeability between histories and peoples. While Time City is interracial, the idea of all humanity's past being somehow a powerful group of humans' rightful heritage is linked with a particular western Enlightenment tradition of thought. The trans-historical idea of knowledge underpinning and legitimising this trade is thoroughly decoupled from the contexts and trajectories of those knowledges' development. Time City holds its antiquities as comfortably as the British Museum holds the Rosetta Stone and pieces of the Parthenon.

They moved to the right, and Vivian found herself facing a shining thing, misted with more violet light, that seemed to crown the end of a row of seats. It was like a winged sun, and it seemed to be studded with jewels.

"The Sempiternal Ensign," Jonathan whispered. "Solid gold. That's the Koh-i-noor diamond in the left wing, and the Star of Africa's in the right." He gave the thing a fond pat as they passed it.

This was too much for Vivian. I must be dreaming! she decided. I know both those diamonds are somewhere else.

"Given to Time City by the Icelandic Emperor in Seventy-two Century," Jonathan added as he undid a small heavy door. But Vivian felt too dreamlike to attend. She went dreamily down a long dark passage, through a door that creaked horribly, and out into a place like a Stately Home, where they hurried up what seemed endless dark wooden stairs.

Given these mentions of particularly historically loaded gems and the evocation of a stately home, Jones almost seems to be drawing a deliberate parallel between this collection and British imperial hoards, and thus between the methods of their attainment – what about the items on display that aren't explicitly gifts? Given the relative power of impregnable Time City, can we take the assertion that these treasures were gifts (historically often a dubious claim) at face value? And how did the Emperor obtain the diamonds in the first place? Can the passage of time naturalise bloody appropriations if all of time is equally immediately accessible?

Is it merely narrative convenience that the people of Time City speak modern English? Jones could easily have given some excuse for it, or invented some translation device. It's even easier to simply dismiss their doing so as an enabling fiction or an overlooked detail. But I think, as much as a question of narrative convenience, their doing so is a matter of fit. Time City speaks 20th century British English because that's the language its citizens think in: they are, similarly and crucially, the heirs of imperial trade relations they seem unwilling to understand or acknowledge. A dash of multiculturalism seems to excuse rather than challenge the deeply hierarchical capitalism at work here.

This fantasy of totality also offers a consoling fiction, plaster with which to cover over the irrevocable sins of history. Lose something valuable in the genocide of the Aztecs? Not to worry, it needn't be lost forever. You can still access those cultural productions. Find the formula for Coade stone or Greek fire, settle the question of the composition of the mob in the French revolution. Sell your findings to

builders, arms manufacturers, political pollsters or bookies. Jones' vision of the anthropocene involves several periods of devolution, so we're talking about lost 'high' technologies as well as historical curiosities. The villains of the piece only economically differ from Time City's legitimate capitalists in that they'd like outsiders to pay more for such knowledge.

Since finance is so intimately bound up with the passage of time, and since Time City's economic activity seems almost wholly dependent on its temporal status, it's really rather surprising that their business dealings seemingly aren't all that different from simple expressions of modern capitalism. By and large, Jones is uninterested in more extrapolative, SFnal approaches to the premise of a society and economy outside of time.[5] Time City's currency is instead rather straightforward, and seems deeply involved with those ubiquitous smartphone-like belts:

> "How many units credit did he give you?" said Sam. "No—that stud, stupid!"
> Vivian put her finger on that stud, and the palm of her hand lit up. VSL/90234/7C TC Units 100.00, she read, rather awed.

If the belts are a consumer good ("And mine's made in Hundred-and-two Century, so it's got a low-weight function"), in a way Time City is like a country that's reliant on other nations' currency to carry out internal transactions. It's hardly unheard of: many medieval nations used Florins, and in several modern countries the American dollar is a preferred and sometimes even official

5 An entry in the Economic Science Fiction & Fantasy database draws attention to "the Days currency in Terry Pratchett's *Strata* (1975), and the Oubliette's currency in Hannu Rajaniemi's *The Quantum Thief* (2011). Also compare real-life LETS currencies and the Economy of Hours, which can in principle use demurrage (naturally dwindling value) to encourage circulation." None of these monetisations of the stuff of time itself, or attendant opportunities for speculation, catch Jones's eye. (Walton, Jo Lindsay. "Falk, Lee. Time Is Money." Economic Science Fiction & Fantasy. economicsciencefiction.blogspot.com/2016/04/falk-lee-time-is-money.html.)

method of exchange. Time City theoretically has its own digital currency, but the only or chief method for accessing and interacting with that currency is 'foreign' and as vulnerable as paper money, if not more so. We see that the system can be hacked by even a clever child. The transactions are cashless, though Jones imagines the exchange as something more like a cashier working a register than like a contactless card payment:

> "I'm paying," said Jonathan, and recited a string of numbers. "Yes, but are you in credit?" said the waitress. "Show."
> Jonathan pressed one of the buttons on his belt and held his hand out with a row of signs shining on his palm. The waitress looked, nodded, and pressed buttons on the pink matching belt round her pajamas.

The existence of a waitress in Time City becomes jarring when we consider another of Jones' key plot points. Students from history's advanced civilisations (or perhaps simply the comfortable, stable eras—it's not clear whether all stable eras are technologically advanced) are allowed to temporarily live in Time City and then to compete in exams with children born there. Good results earn students the right to live and work in this safe-haven, with its access to near-infinite and atemporal resources. Failure results in banishment: even Jonathan Lee, a privileged native and the last scion of the most important ancient family within the city, has an obsessive fear of being exiled, as his uncle, aunt and cousin were. The meritocratic, classed brutality and pedagogic antiquarianism of UK school qualifying exams is apparently to be thus preserved throughout time. Jones doesn't discuss how one applies to study in Time City. She also doesn't mention whether this educational opportunity and chance of a work permit benefit Time City's economy. They're certainly important to that of the UK, which, again, is very much the model for this micro-civilisation. Perhaps educational tourism is another thing the city 'really relies' on.

What happens when people from the City and student-visa-holders from other eras fail to make the cut? How can their knowledge of the future and its technology *avoid* disturbing the timeline when they return to live in it? The three villainous Lees, Jonathan's aforementioned uncle, aunt and cousin, speak of having been made Observers and forced to 'live in history' against their preference, if not their will. (Though they have retained their inherited property in the city, are apparently allowed to visit home at long intervals, and there are several indications that Jonathan's cousin will be allowed to compete for citizenship in her own right.) The dubious wisdom of making the prime agents of your control over the timeline a disgruntled Roman auxilia aside, does one need to master complex temporal science to be a waitress? (Having been a waitress I'm inclined to say yes, but not in quite this fashion.) What about the domestic servants in Jonathan's home, or the people working in this very developed tourist industry? Did they all pass these daunting exams? What *for*? Or are they economic migrants, occupying something like the 'conditional, limited citizenship' status that workers from poorer EU countries currently do in the UK?

As far as we can judge from the text (though granted, Jones' choice to focus on the city's 'first families' does influence who we're exposed to in the course of the narrative), Time City's economy seems primarily organised around the state. The Observers dwell outside the city but work for it, and are presumably remunerated. There are also related law enforcement officers, government officials, 'departments' involved in selling information to 'history', teachers, scientists, and people working in the tourist trade for the government, or what could in some cases be private enterprise. There must also be people involved in processing and distributing the domestic and foreign goods from the farms and meat barges the narrative sails past. (Does the butcher have a degree in quantum theory too?) It seems an almost entirely white-collar economy with a heavy knowledge focus, and while we see no class tension in the story, traditionally classed jobs like domestic service are very much in evidence. I'm not sure anyone actually pays the singular sentient 'android' butler.

The city seems strangely depopulated. Tourists cover the place, but there's a *Harry Potter*-ish sense of a world as sparsely peopled as Wyoming (and, like that of the Potterverse, this economy doesn't quite make sense). Time City could clearly fit more people into the fields, and/or those fields could feed more people. Living in Time City seems very desirable, and demand seems very high, yet the city's hardly bursting at the seams. The villains of the piece are Time City natives who didn't make the grade and are thus sent to live in history as time-stream monitors, but nonetheless Jones doesn't evince more general interest in the broader social implications of this highly restricted citizenship. There's almost no anti-immigrant sentiment against foreign students, for example. There seems to be no institutional bias against their success, and the citizens seem not to resent that their children could be banished to a 'foreign' era with fewer resources and limited opportunities for contact with their family in the city.

Jones' strong anti-authoritarian streak gives us a critical reading of the city's privilege relative to other eras, but despite making that privilege the *lynchpin* of her plot and a major feature of the book's climax, Jones doesn't touch on the power relations involved in the current balance of trade as a whole. A crisis arises when the child main characters inadvertently bring back a trainload of evacuees from an alternate World War II London.

> "That's not fair," said Sam. "Those children would be dead if we hadn't been there. Their train blew up."
> "What's that got to do with it? These children are *history*!" Mr. Donegal shouted, waving his arm around the crowding evacuees. All of them heard him. They stood and looked at him wonderingly.
> "Is he an Air Raid Warden?" one of them asked.
> Vivian found herself shouting back at Mr. Donegal, "They are *not* history! They're real people! You people in Time City make me *sick* the way you sit here studying things. You never raise a finger to *help* anyone! This is

all Time City's fault anyway! It was *you* that tinkered with history. And now it's gone critical, and people like these kids are getting hurt all over time, and all *you* think about is getting your beastly Observers out!"

"What do you expect me to do about that?" Mr. Donegal roared back. "There must be over five hundred damn children here!"

The evacuees were now in a ring all around them, staring and listening, but Vivian was too angry to feel shy. "Then look *after* them!" she screamed in Mr. Donegal's face. "You've got things in Time City to help the whole human race! It won't hurt you to help just these few. There are far too few children in this city anyway. It's a disgrace!"

Time City's control over history can't escape being a political and economic act, even, as Vivian suggests, in the action of non-intervention (a non-intervention that is always framed, however, by other significant interventions that apparently enable the situations Time City subsequently 'impartially' refuses to involve itself in).

The narrative suggests that the smooth running of history is a quantifiable, scientific question, but in addition to science's being quite vulnerable to subjective, self-advantaging perspectives, Time City also has economic reason to keep the development of technology going 'how it's supposed to go.' They have reason, too, to keep intact the stable eras with which they trade, and on whose tourism they rely. If helping the wrong bit of the human race might jeopardise that, Time City-zens are clearly willing to watch a few eggs break in order to wait for the omelette they want. We know almost nothing, really, about the laws or moral codes that govern Time City's interactions with history.

Jones is less interested in the SFnal potentialities of creating a place out of and adjacent to all of time than she is in the social ramifications of such a place's existence. She

understands colonialism and can deal with it startlingly deftly, as in *Dark Lord of Derkholm*[6], illuminating the social fallout of unequal power structures in a way that can vex post-colonial scholars. Here Jones sees her world (or worlds—both the one she occupies and the one she's written) clearly enough to make this aspect of its infrastructure its key problem. And yet she simultaneously doesn't seem to understand the dimensions of that problem quite well enough to grasp its whole shape, much less know how to rigorously answer the question she's posed.

We're treated instead to a signature Jones messy ending[7]—a *Return of the King* scenario where the city's reborn founder Faber John re-assumes power. The denouement tells us that a great deal of the city's population has escaped into history, and that the group left is comprised of refugees, tourists and 'natives'. These remaining people seem startlingly cavalier about how they're going to run the city with this random lot they've half kidnapped, and uninterested in fetching back their co-workers (and family members?), who are probably out there inventing illicit technology willy-nilly. The resurrected Faber John approves of Vivian's interventionist leanings, but no one really mentions that the villains of the piece responded destructively to having actually been somewhat hard done by, nor brings up the fact that their accomplice had real reason to cheat his way into the city and to help them, nor substantively addresses the difficult paradox of the City's relationship with the outside world.

We leave the city in a time of flux, not knowing quite what comes next. While Jones' economy can be usefully held up against the generality of more individualist time traveller narratives, giving us a model with which to think about the economic fantasies embodied by *Doctor Who*, *Back to the Future* et al., it doesn't

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6 Subramanian, Aishwarya. "The Colonisation of Fantasyland." Diana Wynne Jones: A Fantastic Legacy. 6 Sept. 2014, Newcastle.
7 Readers often comment on Jones' endings, and a paper at the Fantastic Legacy conference specifically addressed them (Bar-Hillel, Gili. "Shark-Infested Custard: On chaos as a force for good in the works of DWJ." Diana Wynne Jones: A Fantastic Legacy. 5 Sept. 2014, Newcastle).

offer many answers to the core problems of theits colonial situation. Because Jones focuses on a civilisation rather than an individual actor, certain generic assumptions about time travel rise to the surface, are strained more than is usual, or have different pressure on them. What *A Tale of Time City* does with its core conceit, the fantasies of recuperation and universality and colonial power it its time travel enables, speaks to important aspects of a motif in various texts. In looking at how Jones uses time travel, we can begin to see the same logics and affective pulls strongly at work in, for example, the long-serving British national epic *Doctor Who*.

Ultimately, Jones has not written an 'imperfect novel'—or rather, no one has ever written a perfect one. The idea of such a text is a bit horrifying, and said text would probably be about as much use to anyone as teats on a boarhog. Jones has instead offered up a mechanism with which to approach issues, which is valuable in itself. Her ambitious questions—how do we negotiate power to ethically interact with others economically, for one—are so vast and vexed that they are probably to a degree insoluble, but the very process of wrangling with them can be morally necessary, productive and salutary, like meditating on a koan. "And that," as Rosa Dartle would say, "shows the advantage of asking—don't it?"

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MARVELLOUS MONEYS QUIZ

Fact or fiction? Which of these twenty-five currencies are for real, and which are imaginary … at least for now? Bonus points if you can name the currency or the fictional source. Answers on the next page!

1) Reputation-based money?
2) Money in animal form?
3) Money with 80 billion percent inflation?
4) Smokeable money?
5) Money that eats you?
6) Money designed to lose value?
7) Wearable money?
8) Edible money?
9) Money that actually talks?
10) Money that values every hour of labour equally?
11) The Flainian Pobble Bead, only exchangeable for other Flainian Pobble Beads?
12) Triangular rubber money six thousand eight hundred miles along each side?
13) Money whose value depends on your emotions?
14) Money that can buy magic but not vegetables?
15) Money that can be twenty feet wide and made out of stone?
16) Money that remembers everywhere it's ever been?
17) Money that makes death threats?
18) Money that's good against vampires?
19) Legendarium Specie, "A distributed ledger system implemented using a literary collection of legends, as of a saint"?
20) Money that grows on trees?
21) Poem-based money?
22) Bottle-cap currency?
23) Gene-imprinted crystal currency?
24) Golem-backed currency?
25) Calorie currency?

MARVELLOUS MONEYS QUIZ ANSWERS:
FACT OR FICTION?

1) Reputation-based money: FICTION, pretty much. Examples include Whuffie in Cory Doctorow's *Down and Out in the Magic Kingdom* (2003), Kudos in Iain M. Banks's *The Algebraist* (2004), the 'trust' currency in Michael Swanwick's "From Babel's Fal'n Glory We Fled" (2008), and financial credit / social credit in Karen Lord's *The Galaxy Game* (2014). But as with the best fantasies, it's wrapped around a grain of reality: money nowadays is created, more or less out of thin air, to make loans to customers that banks regard as 'creditworthy.'

2) Money in animal form: FACT. Throughout human history, livestock has often been used as a store of value and means of exchange. Livestock has also been used as a unit of account: for instance, in Homer's *Iliad*, heroes price their armour in cows. Speculative fiction also imagines weirder versions of living money, for instance Michael Cisco's *Animal Money* (2015).

3) Money with 80 billion percent inflation: FACT. Hyperinflation of the Zimbabwean dollar allegedly reached 79.6 billion percent in November 2008.

4) Smokeable money: FACT-ish. During World War II an economics student, Richard Ranford, spent several years in a German prisoner-of-war camp in southern Bavaria. After his release he wrote 'The Economic Organisation of a POW Camp,' describing how cigarettes came to be used as currency among prisoners (including non-smokers). But there is disagreement over whether the circulation of smokes really constitutes a true currency. Intriguingly, Ranford's essay ends with a kind of gesture to post-scarcity: "On 12th April, with the arrival of elements of the 30th US Infantry Division, the ushering in of an age of plenty demonstrated the hypothesis that with infinite means economic organization and activity would be redundant, as every want could be satisfied without effort."

5) Money that eats you: FICTION, probably. We're thinking of Terry Pratchett's The Luggage, a large suitcase made of sapient pearwood, which occasionally sprouts hundreds of little legs and "lots of big square teeth, white as sycamore, and a pulsating tongue, red as mahogany." The Luggage, described as "half suitcase, half homicidal maniac," follows its owner everywhere, and tends to devour people it thinks of as threats. Sometimes it contains neatly pressed laundry, sometimes sacks of gold.

6) Money designed to lose value: FACT. The technical term for this is 'demurrage.' The main reason is to discourage hoarding and help the money to flow. Silvio Gesell writes in *The Natural Economic Order* (1916): "Only money that goes out of date like a newspaper, rots like potatoes, rusts like iron, evaporates like ether, is capable of standing the test as an instrument for the exchange of potatoes, newspapers, iron and ether […] we must make money worse as a commodity if we wish to make it better

as a medium of exchange." Freicoin is a cryptocurrency a bit like Bitcoin with built-in demurrage.

7) Wearable money: FACT. There are many examples, e.g. wampum belts among Iroquois and colonial Europeans in the sixteenth century. Sometimes currencies are adapted into ceremonial ornamentation, like when dollar bills get folded into flowers to make graduation garlands (influenced by traditional Polynesian leis). In 2015, the Reserve Bank of India issued a plea to the public to cease using banknotes for garlands, religious ornamentation, and making it rain at celebrity events.

8) Edible money: FACT. There are many examples, e.g. turmeric wrapped in coconut leaves in the Solomon Islands. People posting themselves eating dollar banknotes was a big thing around 2011 or 2012 (it was probably hiphop artist Tyga who started it).

9) Money that actually talks: FACT-ish. In 2007 Mongolia issued a limited edition 500-Tugrik coin that plays a short clip from John F. Kennedy's 1963 "Ich bin ein Berliner" speech.

10) Money that values every hour of labour equally: FACT. There are hundreds and hundreds of time-based currencies worldwide, and many of these use a fixed rate, so that one hour of your labour is swapped for another hour of someone else's labour. Robert Owen's National Equitable Labour Exchange, founded in 1832 in Birmingham, is one of the earliest known examples of timebanking. London-based Echo ("the Economy of Hours") is one contemporary example, and Timebanking UK is a national charity which supports timebanking schemes across the UK. A related term is LETS, as in "Local Exchange Trading System" or "Local Energy Transfer System" or "LET'S DO THINGS TOGETHER!"

11) The Flainian Pobble Bead, only exchangeable for other Flainian Pobble Beads: FICTION, probably. From Douglas Adams's *The Restaurant at the End of the Universe*. Could there be a grain of reality in there? There are forms of special-purpose money that can't really buy much, but move around to say things about social status and social connections. The anthropologist David Graeber proposes "a distinction between commercial economies and […] 'human economies' – that is, those where money acts primarily as a social currency, to create, maintain, or sever relations between people rather than to purchase things" (*Debt: The First 5,000 Years*).

12) Triangular rubber money six thousand eight hundred miles along each side: FICTION, probably. The Ningi, also from *The Restaurant at the End of the Universe*. Not necessarily as impractical as it might sound: compare the Yapese Rai stones below.

13) Money whose value depends on your emotions: FICTION, probably. Affective Accounts was the 2017 winner of the annual Future of Money Design Award. "Instead of monitoring and manipulating affect

[emotions] to increase consumer demand, Affective Accounts uses people's emotional insight to price in the real-life costs of products and processes." The 2016 winner was Escudo da Comporta, "a currency based on the real time landscape surveying of a twelve and a half thousand hectare agricultural estate in Alentejo, Portugal"; the 2015 winner was Peck-as-You-Go, "Hacking micro-organisms from our oral cavities and creating digitally-accountable biological currency" in order to "put the money where the mouth is, both on literal and philosophical terms."

14) Money that can buy magic but not vegetables: FACT-ish. Among the Tiv of northern Nigeria, brass rods were the special purpose money used in the 'prestige' sphere of exchange. With brass rods, you could buy magical charms, medicines, ritual titles, ivory, cattle, woven tugudu cloth … and slaves. You could use brass rods to buy substitence things in the marketplace if you really wanted to (the 'everyday' sphere of exchange), but it would probably be seen as a pitiful act.

15) Money that can be twenty feet wide and made out of stone: FACT. Rai stones on the island of Yap. Ownership is mostly a matter of collective memory, rather than physical location: famously, one big stone sank to the bottom of the ocean, but it's still in 'circulation.'

16) Money that remembers everywhere it's been: FICTION-ish. Stories where a coin tells its adventures were a popular subgenre of 18th Century British 'it-narratives,' e.g. Charles Johnstone's *Chrysal; or, The Adventures of a Guinea* (1760) and Thomas Bridges' *The Adventures of a Bank-Note* (1771). A more modern example is TRAIL$, the winner of the 2011 The Future of Money Design Award. Nowadays, Bitcoin – or any blockchain-based currency – creates a public record of transactions from one account to another. But the purpose of blockchain transactions and the identity of the account owners remains hidden, so we'll have to await *The Adventures of a Bitcoin* to discover the details …

17) Money that makes death threats: FACT. At least, if you're a potential counterfeiter. Some US colonial dollars bore the warning "to counterfeit is Death."

18) Money that's good against vampires: FACT-ish. Palau's 2007 limited edition silver dollar coin contained holy water. So if you did meet a vampire, it might be worth a shot.

19) Legendarium Specie, "A distributed ledger system implemented using a literary collection of legends, as of a saint": FICTION, probably. It's one of many imaginary currencies (over 20,000 to date) generated by the Twitter bot @speculativecash, written by Greg Borenstein. Some of them sound like gibberish. Others sound like a good idea for a story … or maybe just a good idea full stop.

20) Money that grows on trees: FICTION, probably. There is this one dog who lives at the Diversified Technical Education Institute of Monterrey Casanare in Colombia who – after craftily observing a snack store for a spell – has begun to 'pay' for cookies with leaves. Leaf currencies abound in science fiction and fantasy. There's one in

Adams's *The Restaurant at the End of the Universe* (a group of interstellar colonists find a hospitable new planet, choose the leaf as their currency, and then, to deal with their inflation problem, adopt a policy of burning down all the forests). There's also one in Adam Roberts' *Stone* (2002) on the planet Rain (luckily it is always raining on Rain, so the deforestation policy probably won't happen).

21) Poem-based money: FICTION, probably. "The moon people do not eat by swallowing food but by smelling it. Their money is poetry – actual poems, written out on pieces of paper whose value is determined by the worth of the poem itself." Paul Auster, *Moon Palace* (1989).

22) Bottle-cap currency: FICTION, probably. Bottlecaps, e.g. Nuka-Cola bottlecaps, are currency in the Fallout games.

23) Gene-imprinted crystal currency: FICTION, probably. From John Brunner's *Total Eclipse* (1974).

24) Golem-backed currency: FICTION, probably. From Terry Pratchett's *Making Money* (2007).

25) Calorie currency: FICTION, probably? See Starhawk's 1993 *Fifth Sacred Thing* ("our basic unit of value is the calorie. So a product is valued by how much energy goes into its production, in terms of labor and fuel and materials that themselves require energy to produce") and also Kim Stanley Robinson's Mars trilogy (1992-1996). People in Paolo Bacigalupi's *The Windup Girl* (2009) are also pretty calorie conscious.

So what is money anyway? The answer given by most economics textbook sidesteps the question somewhat, by focusing on the three major functions of money: a store of value, a unit of account, and a means of exchange. Many strange science fictional currencies can be read as attempts to go a little deeper, and ask more challenging questions about the true nature and potential of money.

> "We live in a monoculture of money, one so familiar and established that – like fish that have never noticed the water – we are barely aware of it. The money we know, be it dollars, euros, rupees or yen, is based on just one among many possible currency designs."
>
> Kate Raworth, *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist* (2017)

Science Friction

Robert Kiely and Sean O'Brien

This article examines a series of near-future SF stories that offer snapshots of an immediate future dominated by the intensification of contemporary economic tendencies, including increased automation and the rise of digital platforms. Much twentieth century SF tends to traffic in a certain techno-optimism in its outlook, not so much to suggest that technological advances would produce positive outcomes but that they would continue to develop and expand in their complexity and productivity. Today this utopian legacy is carried forward both by literary science fiction studies and by the uses of science fiction within contemporary political theory. In a different vein, and in tension with this outlook, is what we call 'science friction': a literary practice of slowing down visions of technological and social progress.

Two recent collections, *Futures and Fictions* (2017) and *Economic Science Fictions* (2018), look to SF to counter the dominant cultural narrative of what Mark Fisher calls 'capitalist realism'—the Thatcherite idea that 'there is no alternative' to capitalism—with alternative visions of the future based largely on emerging technological innovations.[1] To puzzle over this position, as we'll do below, is not to be fatalistic or to concede political ground on the terrain of the imaginary. Rather, it is to question the capacity of capitalist technology to usher in a postcapitalist future,

especially under contemporary conditions of stagnation and precarity. As these works of science friction suggest, further development of capitalist technologies are likely to offer more of the same, but worse.

Critics such as Simon O'Sullivan, William Davies and Peter Frase have argued that a visionary SF can offer much-needed screenshots of a postcapitalist future, challenging the neoliberal status quo and bolstering a left that suffers from a perceived poverty of imagination.[2] In the discussion that opens *Futures and Fictions*, for example, O'Sullivan argues that 'future fictions have a more general traction on the real, not least insofar as they can offer concrete models for other ways of life in the present.'[3] Several of the essays in the collection suggest that the intensification of late capitalist technological developments will provide the means to realize a postcapitalist utopia if the economy were managed by a socialist state. Here, full automation and universal basic income (UBI) constitute transitional demands on the way

to what Aaron Bastani brands 'fully automated luxury communism.'[4]
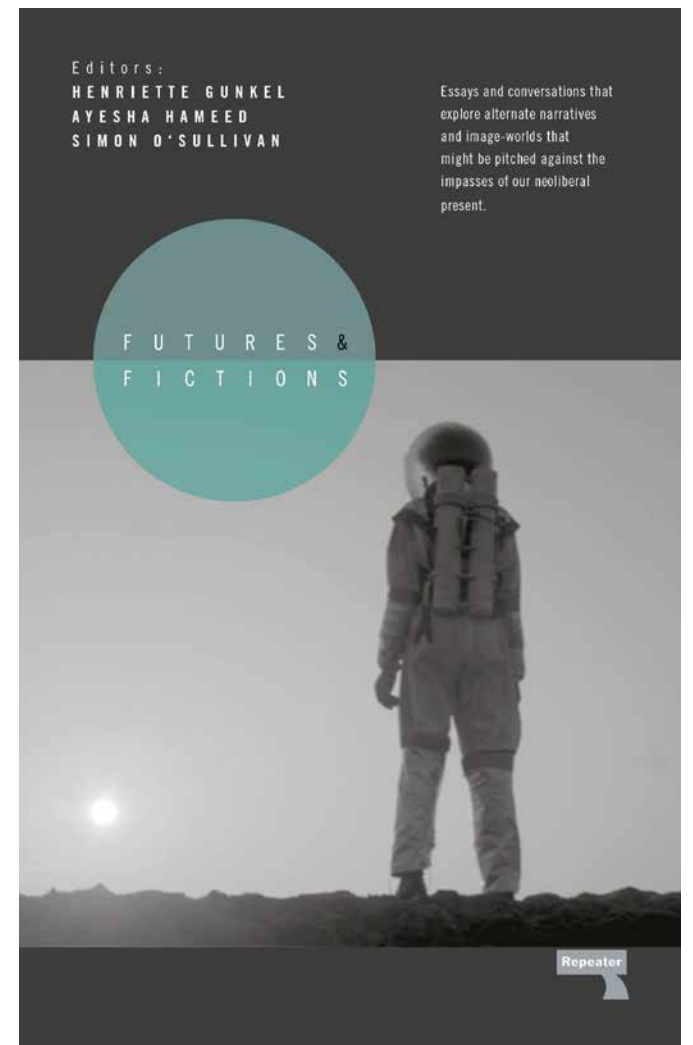
Building on the accelerationist thought of Nick Srnicek, Alex Williams and the Cybernetic Culture Research Unit, techno-optimist SF criticism suggests that SF can contribute to the political project of countering one 'hyperstition' (a kind of 'hyper-superstition') with another, replacing the dominant narrative of capitalist realism with an alternative vision of the future, one that offers a more sustainable and just future.[5] In this view, capitalist dominance is a matter of naturalized systems of belief, and thus alternative visions of the future can help prompt a real-world jump from the present to postcapitalism on the backs of contemporary technological and economic developments which, if retooled and presented in a new light, might yet deliver the precarious proletariat of the present to the promised land of post-scarcity.

Davies' introduction to *Economic Science Fictions,* for its part, states that the most influential economic critique of the twentieth century was the socialist calculation debate.[6] At the heart of this debate was the question of whether it is possible—and if so, *how*—to run an economy whose means of production (factories, infrastructure, land, etc.) belong to the people as a whole, not to private interests. It is the themes of this calculation debate, Davies claims, that keep recurring in science fiction (and throughout the collection Davies is introducing), themes such as: how money is created and distributed, alternatives to money, technological

advancement, planned economies of scale.[7] If market pricing offers a means of correlating a mass of allegedly subjective valuations, liberal economists argued, socialists must come up with an improvement on this mechanism. For techno-optimists, we now have the technological means to solve these problems. Questions about how an economic system values different things, and about where we should devote our resources, are essentially problems about gathering and analysing data. That said, techno-optimists are also aware that the true potential of our data infrastructure remains impossible to unlock as long as it is administered by private interests.[8]

1 Mark Fisher, *Capitalist Realism: Is There No Alternative?* (London: Zero Books, 2009).

2 Simon O'Sullivan, Ayesha Hameed, and Henriette Gunkel, eds, *Futures and Fictions* (London: Repeater, 2017); William Davies, ed. *Economic Science Fictions* (London: Goldsmiths Press, 2018); Peter Frase, *Four Futures: Life after Capitalism* (London: Verso, 2016).
3 Simon O'Sullivan, Henriette Gunkel, and Ayesha Hameed, 'Futures and Fictions,' *Futures and Fictions* (London: Repeater, 2017), pp.1-20: p.1.

4 Aaron Bastani, *Fully Automated Luxury Communism* (London: Verso, forthcoming).
5 The term 'hyperstition' is a neologism coined by the CCRU to describe the manner in which historically variable ideas or narratives become naturalized belief systems such that they appear as self-evident truths. See the Cybernetic Culture Research Unit (CCRU), *Writings 1997-2003* (Falmouth: Urbanomic, 2017). The term has been used to explain the manner in which capitalism in the neoliberal era comes to be regarded as the only possible system of social organization. See, in particular, Mark Fisher and Judy Thorne, 'Luxury Communism,' *Futures and Fictions*, ed. Simon O'Sullivan, Ayesha Hameed, Henriette Gunkel (London: Repeater, 2017), pp.145-169.
6 Arguably this debate sparked off in the late nineteenth century and continues to this day, but its peak intensity was around the 1930s.

7 'Economies of scale' refers to the cost savings that often occur when making more of something.
8 For a critique of big data and an exposition of algorithms as black boxes that lock down contemporary conditions into the foreseeable future, see Cathy O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (London: Penguin Random House, 2016).

Davies points out that under neoliberalism 'cyborg ideals of personal and physiological enhancement come to displace those of economic emancipation or progress.'[9] So-called economic emancipation is in fact harnessed for the neoliberal project, as articulations of desire become mere commodity data to be harvested and sold. To challenge neoliberal dominance, Davies argues, new narratives are necessary, but these are apparently lacking. Echoing the arguments found throughout *Futures and Fictions*, Davies' stance is that the left exhibits a failure of imagination:

> If we remain stuck in the cybernetic and financial imaginary of the perpetual present, constantly churning information to ensure that nothing truly changes, we will be doomed. A revived historical consciousness is therefore a matter of political urgency, though that doesn't guarantee that it will occur.[10]

This position reflects that of many others such as Fisher, Frase and O'Sullivan, as well as Srnicek and Williams, as we explore below. But note too the tension between the emphasis on 'historical consciousness' and the insistence that only by breaking the imaginary bonds of the present can we avoid catastrophe. What is needed, Davies suggests, is more rather than less innovation in imagination and technology. Or, to put it another way, if the emphasis here is on excavating futurities from the past as a means of breaking with the present imaginary, we want to highlight the interesting ways in which grappling with the ostensibly limited imaginary of the present might be the more important and forward-looking project for considerations of economics and SF.

If we consider a great deal of the most recent developments in SF, it is clear that some of the most thoughtful and incisive contemporary SF

does not share this techno-optimistic utopianism. To this end, we explore some of the many contemporary SF texts that pose a challenge to the claims which buttress *Futures and Fictions* and *Economic Science Fictions*. This science friction ruminates on the resistances that any accelerationist project must encounter, not simply to pump the brakes and decelerate but to carefully trace the trajectory of technological developments and economic tendencies in the present as they might unfold in the near future.[11] If science fiction is typically defined as fiction based on imagined future scientific or technological advances that lead to seismic social changes, this economic science friction dwells on the fetters technological advances place on the forces of social transformation. The near-future fictions we explore take real-world conditions in the present as their point of departure to concentrate on the forces of inertia built into the hardware and software of capitalist technology.

Though not without important differences, groups on the British left such as Momentum, Plan C and Novara Media have to varying degrees embraced the accelerationist demand for the future, calling for a transition to postcapitalism rooted in the vote and the state's capacity to implement UBI, which, when coupled with mass automation, will increase leisure time and liberate modern society from the drudgery of tedious, time consuming work. Paul Mason offers perhaps the most succinct articulation of this position when he writes, 'to properly unleash the automation revolution we will probably need a combination of a universal basic income, paid out of taxation, and an aggressive reduction of the official working day.'[12] The idea that money itself is a technology available for transformation and democratization—explored by the Positive

Money campaign—is hovering at the edge of that vision. Such a vision of the future reflects a conviction that the modern notion of progress can be detached from capitalist development—arguably the very engine of modernization—and that the nation-state is the political organ best suited to such a project.[13]

In contrast, the near-future fiction we examine imagines the state primarily as a security apparatus for managing low growth economies, implementing UBI alongside mass incarceration while automation spurs an explosion not only of unemployment but also of service work, a definitively low growth sector in which precarity reigns. Technological advancements are seen in these works as part and parcel of a stagnant economic future, developing in response to shrinking profit margins and ever slacker labour markets. How could the state finance robust social services in such a world? Perhaps the reason the intermediate period between the present demand for the future and the utopian future itself escapes productivist visions of technological liberation is because the content of this demand is already an economic reality in the present. If accelerationism emphasises the progressive development and repurposing of technology, these texts focus on the ways in which capitalist technologies tend to lock down a particular political-economic configuration.

Attending to contemporary, technologically-mediated transformations in the capitalist economy, science friction presents dystopian near-future scenarios that amplify current tendencies for dramatic effect, isolating and/or exaggerating one or another of these developments but always in the context of a generally shared techno-pessimist vision of advanced capitalist centres of commerce. Our archive brings together a series of short speculative works that blend near-future fiction, economic SF and the short story. Common characteristics of this emergent genre include the capitalist takeover of sleep time, which
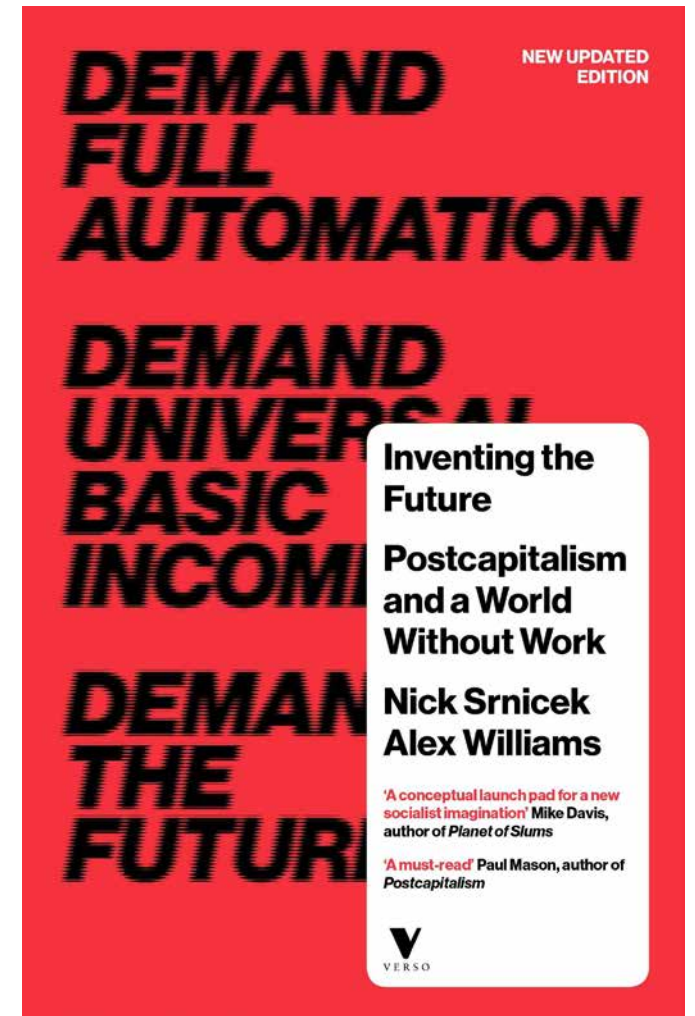
features in Seamus Sullivan's 'Dream Job,' in which Sullivan's protagonist sells her dream time to the wealthy; the automation and digitisation of both the labour process and the distribution of commodities, as in Adam Rothstein and Brendan C. Byrne's 'Flesh Moves' (Parts I and II), a story about life as a trucker in the age of automated shipping; the proliferation of new border zones and heightened constraints on the circulation of labouring bodies in stories such as Tim Maughan's 'Zero Hours' and Aaron Gordon's 'The Worst Commute'; the reappropriation by capital of ameliorative measures such as UBI, as in William Squirrell's 'They Built the New Jerusalem on the Ruins of the Old'; the formal blurring of literary writing and computer generated language in Katherine Inskip's 'Congratulations on Your Recent Purchase'; the development of performance-enhancing drugs for the workplace which figures in Tim Maughan's 'Dialed Up'; a prevalence of affective, immaterial or performative labour, as in Jo Lindsay Walton's 'Froggy Goes Piggy' and Julianna Baggott's

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9 William Davies, 'Introduction to Economic Science Fictions,' *Economic Science Fictions* (London: Goldsmiths Press, 2018), pp.1-28: p.20.
10 William Davies, 'Introduction to Economic Science Fictions,' *Economic Science Fictions* (London: Goldsmiths Press, 2018), pp.1-28: p.27.

11 For a critique of accelerationism that builds on Walter Benjamin's notion of activating the emergency brake on the locomotive of history as revolutionary interruption, see Benjamin Noys, *Malign Velocities: Accelerationism and Capitalism* (London: Zero Books, 2013), pp.83-92.
12 Paul Mason, 'Automation May Mean a Post-work Society but We Shouldn't Be Afraid,' *The Guardian*, February 17, 2016, www.theguardian.com/sustainable-business/2016/feb/17/automation-may-mean-a-post-work-society-but-we-shouldnt-be-afraid. See also Paul Mason, *Postcapitalism: A Guide to Our Future* (London: Penguin, 2016).

13 Nick Srnicek and Alex Williams write: 'the left needs to reclaim the contested legacy of modernity and advance visions for a new future'. See *Inventing the Future: Postcapitalism and a World Without Work* (London: Verso, 2015), p.85

'Posey Girl'; the development of surveillance technologies and a concomitant increase in hacking tools designed to evade detection, a dialectic that unfolds in Surian Soosay's 'Portrait of an Amazonian,' among others; and the intensification of climate change, which colours the setting of Devon Maloney's 'A Job Opening' and many more.[14] Platform technologies, digital currencies, automation and AI all loom large here.

In their emphasis on stasis and impasse, the stories we collect under the term science friction are tragedies of a sort. Many of them open *in media res*, offering brief snapshots of a day in the life of the near-future worker wherein very little changes by the end of the narrative. Protagonists are sympathetic to varying degrees, but the ethical question of identification is secondary here to a representational commitment to capturing precarity in starkly realist terms, even in the fantastical mode of SF. Characters experience no heroic moments of triumph and renewal, but neither do their tragic tales offer the redemptive tones of the elegiac. Rather, these texts tarry with the negative, dwelling in the tortured spaces of historical impasse, political foreclosure and economic scarcity. The genre further subdivides into stories that focus primarily on precarious work, sex work, social

14 Seamus Sullivan, 'Dream Job,' *Vice Motherboard*, Jan. 2018, motherboard.vice.com/en_us/article/7xeq3q/dream-job; Adam Rothstein and Brendan C. Byrne's 'Flesh Moves,' *Vice Motherboard*, Jun. 2018, motherboard.vice.com/en_us/article/evkbyn/flesh-moves; Tim Maughan, 'Zero Hours,' *Medium,* Sept. 2013, medium.com/@timmaughan/zero-hours-f68f17e8c12a; Aaron Gordon, 'The Worst Commute,' *Vice Motherboard*, Jun. 2018, motherboard.vice.com/en_us/article/bj3b3w/the-worst-commute; William Squirrell, 'They Built the New Jerusalem on the Ruins of the Old', *The Future Fire*, 2018, futurefire.net/2018.45/fiction/theybuiltnewjerusalem.html; Tim Maughan, 'Dialed Up,' *Vice Motherboard*, Nov. 2015, motherboard.vice.com/en_us/article/53dzqx/dialed-up; Jo Lindsay Walton, 'Froggy Goes Piggy,' *The Long+Short*, July 2016, thelongandshort.org/forecasts/collective-fiction-froggy-goes-piggy; Julianna Baggott, 'Posey Girl,' *Vice Motherboard*, May 2015, motherboard.vice.com/en_us/article/9k8kd5/posey-girl; Surian Soosay, 'Portrait of an Amazonian,' *Vice Motherboard*, Jan. 2017, motherboard.vice.com/en_us/article/mg7wgp/portrait-of-an-amazonian; Devon Maloney, 'A Job Opening,' *Vice Motherboard*, Oct. 2015, motherboard.vice.com/en_us/article/3da845/a-job-opening.

media, virtual reality or militarization and warfare. We are primarily interested here in the first of these subdivisions, but given the space we would be keen to develop our argument further with references to these other compelling lines of literary development.

Maughan's 'Zero Hours' is a story of the working day of a future Londoner in the year 2023, a nineteen-year-old retail contractor named Nicki. In the story, Nicki wakes up early and immediately begins bidding for work in an auction on her RetailWarrior app. Nicki has saved up £3,467 to go to Wanstead Community Academy to study Graphic Design, which does not yet cover the first term – living at home, this is her prime motivation for working. Two of the jobs she vies for on RetailWarrior are achievable, and another from Starbucks dangles tantalizingly as a lofty mission that can only be unlocked once Nicki gets a Barista badge. Workers bid against each other for work and are unaware of how low below the national minimum wage other workers have gone. There's no wage solidarity for these aspirants. For three hours at Pret a Manger, she earns £12.64, and a 'Sandwich Stuffer Pro Badge.' Nicki's yearned-for Barista badge would require extra labour of a different kind, mainly hanging around and flirting with other workers at the coffee machine, but Nicki clearly finds this difficult and distasteful. She has read accounts of how others earned the badge and this is apparently the only way to get it. Nicki's next shift is four hours at Boots, where she sees another worker using RetailWarrior steal two lipsticks. She later sees this girl get paid £19.84, 60 pence more than Nicki gets. Outraged at being underbid, she rats on her fellow precarian and earns herself a 'Shop-cop Pro' badge.

In the early twenty-first century, platforms akin to RetailWarrior have emerged as a new business model, a means of generating profits through infrastructural arrangements. Platforms, which have a built in monopolistic tendency, provide infrastructure to intermediate between two or more user groups, extract data from the interactions on the platform, and sell that data. Nick Srnicek's *Platform Capitalism* (a notably more pessimistic text than *Inventing the Future*) offers a taxonomy of platforms, including

advertising platforms such as Facebook, product platforms like Spotify, and lean platforms with no assets, which mainly select, incentivise, and intermediate between users, such as Airbnb and Uber. These lean platforms are a 'hyper-outsourced model,' only retaining a 'bare extractive minimum' through a monopoly rent – RetailWarrior is thus a lean platform similar to TaskRabbit.[15]

While some apps and platforms in 'Zero Hours' separate workers, others assist them in their efforts to evade the police. Nicki uses CopWatch, an important tool for navigating London with hacked Oyster cards (kept in RFID-blocking bags), as randomized checks on the tube rise in response to workers fighting to keep costs down while underbidding each other. In Maughan's sketch, we also get a glimpse of heightened constraints on the movements of workers, who deform their faces with 'QVC home botox injections' to avoid being identified by facial recognition technology. This is all done simply to 'do business' in the area of the city with the most employment opportunities as this group have presumably been banned from zones 1 and 2 in London.

A few things are clear – a vast amount of administrative and emotional labour is being undertaken on the RetailWarrior auction from the moment Nicki wakes up. Also, the gamification of work shows the manner in which a kind of infantilization remains in play, and the Quantified Self is there too – the shelves at Boots are 'smart' and collect data on the efficiency of Nicki's shelf-stacking. This is nothing more than the 'time-and-motion man' automated, the man who would stand behind your grandmother at the checkout in 1950s Ireland with a clipboard and a stopwatch measuring her efficiency. It is an intensification – the time and motion man would walk away, check someone else, but the shelf never stops. At the same time, the narrative distance exhibited in 'Zero Hours,' its cold objective style, might itself be mimetic of *homo oeconomicus*: its brevity and refusal of lyric intensity, with the mere impulse to save for education in order to get a better job serving

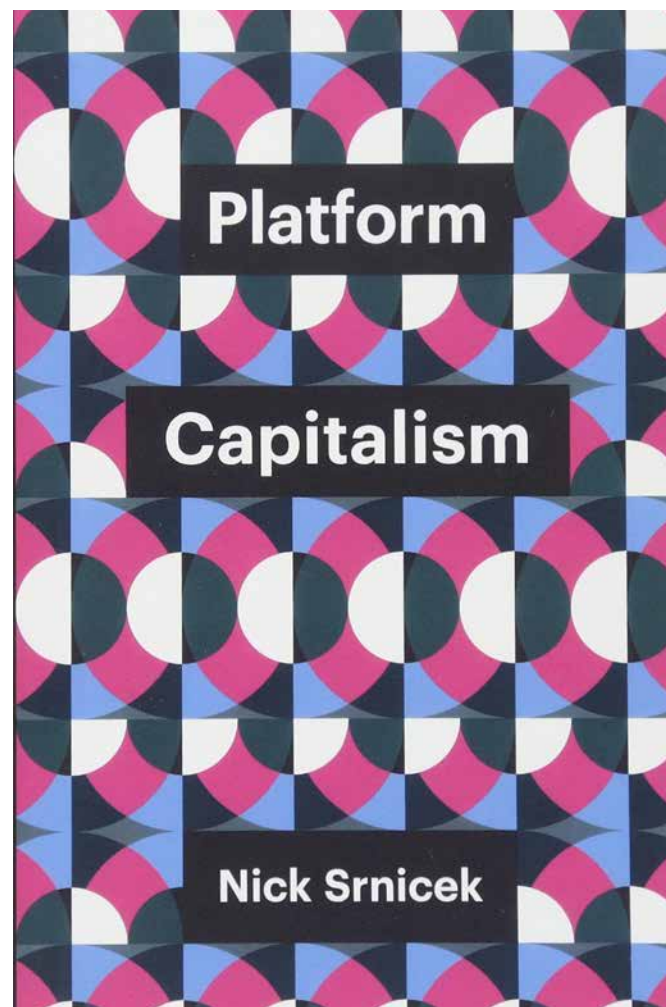15 Nick Srnicek, *Platform Capitalism* (London: Polity, 2017), p.76.

as sole character motivation. If this text exhibits a radically diminished speculative capacity, we would suggest that this is keyed not only to finance capital's contemporary inability to generate profits and escalate investment, but to the foreclosure of certain historical left political possibilities at the *material* level. In this manner, this brief text offers a filibuster of techno-optimists, hurled from the wings.

This near-future fiction refuses to help its readers to modify their horizons of possibility, and in this way its realism is as stifling as it is emotionally devastating. Take, as another example, Maloney's 'A Job Opening,' a story that features many of the generic elements of science friction listed above: window shades block the toxic atmosphere and a dangerously hot sun, and greenery exists only in climate-controlled buildings; sleep time is short and medically regulated with Soyquil Z, a drug designed to replace REM cycles and various regenerative sleep processes; education is largely digitised and lessons are delivered via platforms such as the Teecher console; the vast majority of services are automated save for some feminized care work performed by cheap migrant labour. But the story focuses first and foremost on the future of work, and in particular on the impossible promise the wage offers the precarious protagonist, who toils daily to secure her own social and biological reproduction and that of her son Tony in Maloney's dystopian vision.

'A Job Opening' is set in near-future Astoria, a neighborhood in the New York burrough of Queens, and follows care worker Maya through a day of domestic drudgery and dashed dreams. Astoria is home to mass unemployment, designer work drugs, and self-contained high rise tower-blocks like Brynn-Rockefeller, a 'luxury condominium fortress' that provides its affluent tenants with all their reproductive requirements, including gainful employment and climate controlled living. In this the story is reminiscent of JG Ballard's *High Rise* (1975), but without any of the drama of bourgeois decline to a Hobbesian state of nature. The story begins, like 'Zero Hours,' with Maya awakening in the early hours, and ends without any progress

or redemption for the protagonist. Maya is a single mother who provides child minding services to middle class families who work at Brynn-Rockefeller, 'employees whose Brynn salaries didn't quite allow for the purchase of Rosiebots, but could sometimes afford to outsource errands.' In Astoria, job opportunities are scarce and positions open up at places like Brynn-Rockefeller only on the rare occasion that an employee dies or is otherwise incapacitated. And then, unexpectedly, a position opens up in the nursery.

Maya wakes at 5AM with a plan to try and get in ahead of the inevitable crowds that will be lined up outside Brynn-Rockefeller to apply for the job. Daniela Madison, a member of the three income household for whom Maya currently works, has offered to sneak Maya in the back using her employee ID card. When Daniela suggested the plan, 'Maya's heart leapt. Working at Brynn-Rockefeller wasn't the same as living there,' she reminded herself, 'but that kind of salary, that kind of education for Tony would mean . . . she stopped herself from thinking about what it would mean. No use getting her hopes up just yet.' Now, on the morning of the open call, the gravity of a possibility she can barely admit to herself crashes down on her:
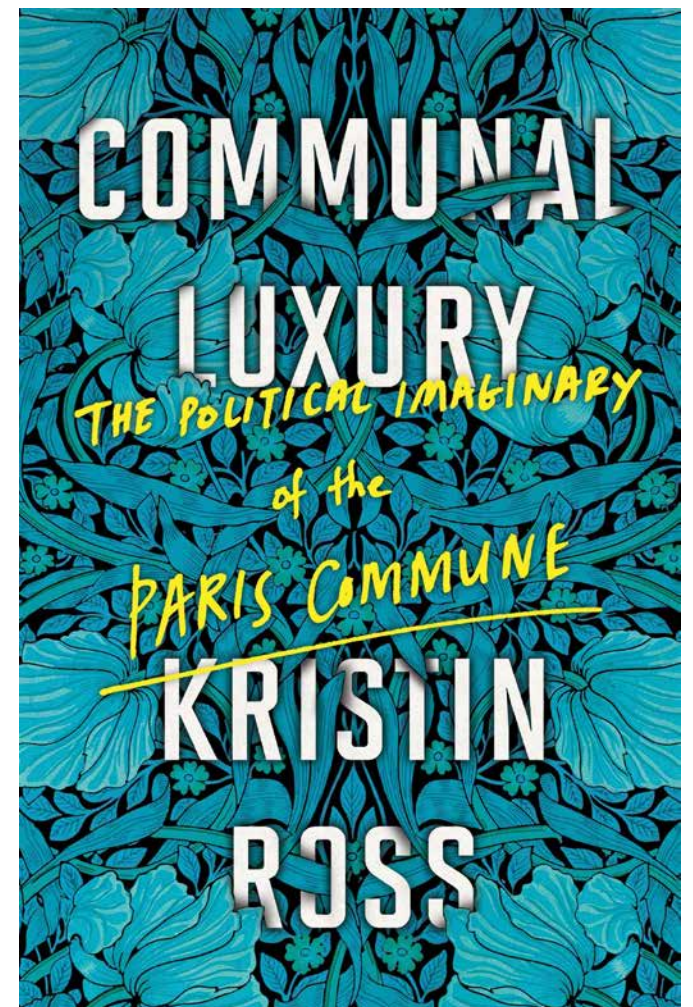
> As she slipped her least-wrinkled button-down off its hanger and pulled on aerated leggings and Circumventilated boots, Maya suddenly felt like vomiting. She had to sit down on the bed to regain her composure before she could go wake Tony and assemble breakfast. She thought of her neighbors, Carl and Sylvia Munoz-White, who'd gotten so hard-up they'd started volunteering for fast-track experimental drug trials—the last time she'd seen them, after the Soyquil Z trials had packed it in, they were standing in the street a few miles from their cul-de-sac, blankly staring into the darkness beyond the community fences, like paranoid ghosts. A shiver went up her spine, despite the heat.

Here is a glimpse of the existential vertigo and corporeal abjection precarity entails for the economically determined subject of a near-future in which food comes from replicators and children are educated by Teecher consoles. As Maya dresses for the opening, her body threatens convulsion and upheaval while her mind recounts the horrors of a population forced to offer itself up for the most abject forms of exploitation, momentarily preventing her from tending to her son and the basic necessities for their survival. And though she musters the courage to try to sneak into Brynn-Rockefeller with Daniela, her efforts are wasted when she is stabbed by an angry and unemployed acquaintance in the line, waking three days later to learn that the position has been filled. Science friction thus suggests that this is the world capitalist technologies portend, not a transitional space on its way to postcapitalism, but an immiserated space going nowhere at all, a wasted landscape of inequality and insecurity built on the backs of precarious workers and hardwired to keep them in their place at the bottom of the slagheap.

We have been tracking a shift of emphasis in SF away from cultural transformation through technological progress to the inexorable slowness of significant change if current trends continue. It is our contention that there are material reasons why techno-optimist SF was readily available in the twentieth century, just as there are material reasons why it is less readily available now, and we would suggest that this is not because people had better imaginations back then. Politics is more than a war of ideas. As Kristin Ross writes in her discussion of the Paris Commune, 'the thought of a movement is generated only with and after it […] Actions produce dreams and ideas, and not the reverse.'[16] Techno-optimist thinking is not naively enamoured of detailed, inflexible plans for what the future should look like, but it arguably leans too heavily on a vision of technology as a relatively neutral, repurposable and ever-proliferating resource. To return to Davies' point about the socialist calculation debate, the reason it was key to twentieth-century science fiction is because it was an actually existing form of political possibility particular to that historical moment, a real-world economic practice of actually existing socialist states. It is, then, the exhaustion of that particular political possibility that science friction encourages its readers to mull over.
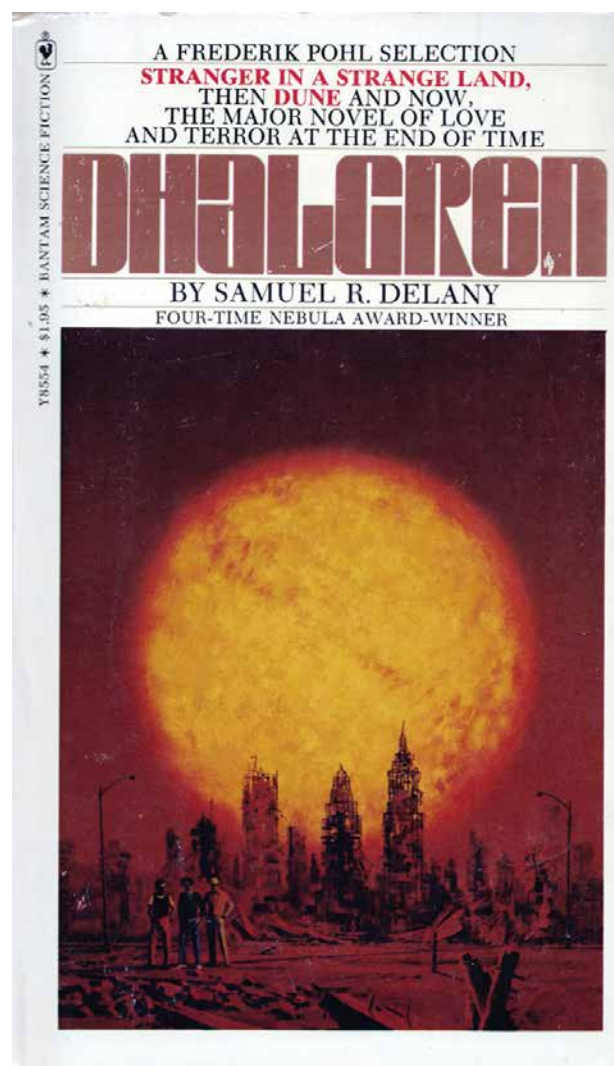
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16 Kristin Ross, *Communal Luxury: The Political Imaginary of the Paris Commune* (London: Verso, 2015), pp.6-7.

Samuel Delany's *Dhalgren*: Mapping economic landscapes in science fiction

Josephine Wideman

Samuel Delany's 1975 novel *Dhalgren* is lengthy, hallucinatory, and at times unnavigable science fiction. Its form is as dense and as wavering as the urban landscape it depicts, where Delany's protagonist, Kid, can wonder whether 'there isn't a chasm in front of me I've hallucinated into plain concrete.'[1] Bellona – the fictional city where events take place – is a space 'fixed in the layered landscape, red, brass, and blue, but [...] distorted as distance itself,' a place where 'the real' is 'all masked by pale diffraction.'[2] Although the scenery and scenarios of Bellona may be fictional, and perhaps even fantastic, they are also true representations of real experience. The unfixed landscape we live in becomes 'fixed' before us in Delany's book. The distortions and diffractions by which it is fictionalised only increase its representational precision. The gaps in our experience, usually masked, are made visible. For although it takes an unusual form, we can recognise

> this timeless city [...] this spaceless preserve where any slippage can occur, these closing walls, laced with fire-escapes, gates, and crenellations are too unfixed to hold it in so that, from me as a moving node, it seems to spread, by flood and seepage, over the whole uneasy scape.[3]

In looking at Dhalgren, I have borrowed from the political theorist and sociologist Giovanni Arrighi in order to trace the presence and effects of capitalist accumulation in Delany's fiction. Arrighi, in *The Long Twentieth Century*, describes the 'interpretative scheme' of capitalism as a 'recurrent phenomena.'[4] Drawing on work by the historian Fernand Braudel, Arrighi follows the Genoese, the Dutch, and the British cycles of accumulation to the current North American cycle. By examining past economic patterns and anomalies, he suggests that we may be able to gesture at the fate of our current cycle. Arrighi sets out to demonstrate that the rise and fall of these hegemonies, while never identical, tend to follow a set of stages that begin 'to look familiar.'[5] To make his argument, he proposes a new use for Marx's 'general formula of capital':

> Marx's general formula of capital (MCM') can therefore be interpreted as depicting not just the logic of individual capitalist investments, but also a recurrent pattern of historical capitalism as world system. The central aspect of this pattern is the alternation of epochs of material expansion (MC phases of capital accumulation) with phases of financial rebirth and expansion (CM' phases).[6]

In *Das Kapital*, Marx initially proposes the formula CMC to theorise how capital functions. This theory begins with the assumption that people have needs and desires they can't satisfy by themselves. Thus we create the commodities we know how to make (C), which are sold for money (M), which allows us to buy the commodities we want (C). As this cycle repeats, those who are skilled presumably accrue more value than others, being able to sell their commodities for a greater profit. This theory centres around the individual and his role in a capitalist system. But Marx then sets CMC aside in favour of another formula – the formula borrowed by Arrighi in *The Long Twentieth Century* – MCM'.

In MCM', circulation does not begin with the dissatisfied individual, but with capital itself. Money is invested (M) into the materials and labour necessary to produce a commodity (C), which is then sold for money (M). The difference between CMC and MCM' is subtle but crucial. The first formula implies that capitalism recurs, and things are made and exchanged, in order to satisfy human desire and need. The second formula implies that money is in charge, that production and exchange are ultimately subservient to profit, and that money begets more money. For Marx, what drives capitalism is not only MCM, but MCM' – the apostrophe signifying 'prime' – or the concept that money increases in value through circulation. The source of this additional, or 'surplus' value, is where capital really loses its lustre. This value is gained within labour – in the time spent on the creation and production of a commodity from raw material – and for Marx, its appropriation by capitalists is inherently exploitative.

Viewed alongside this rough sketch, Arrighi's description of 'historical capitalism' becomes clearer. He sees Marx's formula for the 'logic of capitalist investments' as recognisable on a larger scale. According to Arrighi, former hegemonic powers – the Genoese, the Dutch, and the British – each went through their own version of an MCM' cycle, with an early phase focused on trade and production (MC) and a later phase focused on banking and finance (CM'). The MC phase of North American capital accumulation is, according to this model, placed in the Fordist-Keynesian growth period of the 1950s and 1960s, defined by its mass-production and the rise of consumer-culture.

This MC phase was of greater 'speed, scale, and scope' in the US cycle than had been previously seen,[7] and from the 1970s onward, has been rapidly followed by a CM' phase of deregulation, privatisation, and financialisation.

1 Samuel Delany, *Dhalgren* (New York: Vintage, 2001) p.429.
2 Ibid. p.426.
3 Ibid.

4 Giovanni Arrighi, *The Long Twentieth Century: Money, Power, and the Origins of Our Times* (London: Verso, 1994), xi.
5 Ibid. p.4.
6 Ibid. p.6.

7 Giovanni Arrighi, *The Long Twentieth Century: Money, Power, and the Origins of Our Times* (London: Verso, 1994) p.307.

The effects of this cycle are imprinted on the landscape. Delany's Dhalgren, published in 1975, was constructed in the midst of these cyclical phases of North American hegemonic power. Published two years after the oil shocks of 1973, at the beginning of the second great depression of the US cycle of accumulation, the novel emerges at a time of 'discontinuous change,'[8] when it must navigate the shifting capitalist landscape.

More literally, the novel navigates the emerging landscapes of economic obsolescence – impoverished, de-industrialising, depopulating urban landscapes. The power of Wall Street grows as manpower is made redundant across industrial USA and iron oxidises along the Rust Belt, starting to create the kind of landscape which would later inspire Danny Brown's 2011 release 'Fields.' The chorus of 'Fields' is a penetrating account of Detroit's urban landscape – filled with gaps:

And where I live it was house, house, field
Field, field, house
Abandoned house, field, field.[9]

I want to explore how Dhalgren might be shaped by a vision of the cyclical nature of capitalist power, and how it deals with what is invisible, or only glimpsed sidelong, within this power. That is, how does Dhalgren confront the opacity of hegemonic structure, the ways in which capitalism obscures itself? And how does Dhalgren engage with the exploitative features of these cycles – features which Jason W. Moore describes as 'processes and projects that reconfigure the relations of humanity-in-nature, within large and small geographies alike'?[10] Put simply: how are economics writ onto North American landscapes and into the fiction that portrays them?

For Arrighi, the mid-Seventies marks a signal crisis of North American economic dominance.

Just as Arrighi finds 'it is not by chance that Braudel used the […] metaphor – "a sign of autumn" – to characterise financial expansions,' I find it is not by chance that Delany opens with and repeats the phrase 'to wound the autumnal city'[11] throughout Dhalgren. In 1970s North America, the old order of capitalism is fading and the new order's nature is not yet apparent. US economic orthodoxy is struggling to explain the simultaneous high levels of inflation and unemployment; Keynesian economics are on the decline, and libertarian economics are gaining influence. Meanwhile, the 'Bretton Woods' international monetary system – whereby all nations had a fixed exchange rate with the US dollar, and the US government promised to convert dollars into gold upon request – is in ruins, and international currencies are autumnally 'free floating.'

Read against this background, a city which is 'autumnal' is marked as a post-industrial cityscape. Delany's Bellona could be substituted for Detroit, Milwaukee, St. Louis, Harlem: any urban area with an industrial past that has been left impoverished, sucked dry of its harvest and vitality in the MC phase, and left bereft as the CM' phase of financialisation begins. These are spaces with high rates of unemployment and urban layouts designed to segregate, places where value has been extracted from black communities which have been excluded from the wealth they have created. They are spaces in which crumbling and disintegration are the material signs of progress, where backwards movement becomes equivalent to forward progress, and where surplus has been found in exploitation of population and place. Dhalgren, much like these urban landscapes, offers a plenitude of confusion and contradiction, both in time and in space. It begins with Kid, a Native American protagonist, entering city and is then being unable to leave, cyclically bound 'to wound the autumnal city'… 'come to'… 'wound the autumnal city.' Here the word 'wound' can signify 'injury.' Yet there is also another trace of cyclicality, if the verb is taken as signifying 'to wind' in the past tense. So this 'wound' is reminiscent of both the violent nature of capitalist accumulation and of its cyclical

temporality. It suggests that Kid means harm and, simultaneously, it brings to mind the image of a clock which must be periodically 'wound.'

Delany's obscure and chaotic style refuses to conform to a traditional narrative form, mixing poetry and prose, changing scene and setting, rejecting linear temporality and any characteristic plot devices. The characters and their environment become alien, unpredictable; disoriented and disorienting. This urban space, rendered so strange and unmappable, is reflective of the economical 'systemic chaos/turbulence'[12] of the 70s and 80s. The effects of this turbulence are uncertain. It could be seen as a signal of the breakdown of US hegemony, or as a symptom of a 'reconstitution of the system on new foundations.' Likewise, methods of retaining economic power in this chaotic CM' phase are conflicted, as the 'system seems to be moving "forward" and "backward" at the same time.'[13] Like the economic circumstance which surrounds it, Dhalgren is a plenitude of directional confusion and contradiction. Bellona is a city where the sun does not rise and set in a fixed direction – therefore there is no longer a set east and west – and there appears a second moon in the sky. The North American's relation to time and space – or the epistemologies they are understood by – is altered. Beneath a sky like 'burning metal,'[14] Reverend Amy Tayler preaches of 'God's womb punched inside out and blazing with her blood':

Being is a function of time, ey, Martin? Well, now, where does that get us? Now seems pretty specious to me … for it's just a hole, a little hole on whose rim we've been allowed, for an eye's blink, to perch, watching that flow, terrible for all of us, tragic for some of us, in which the future hisses through to heap the potter's field of the past […]

Was it a heart of fire, up there, today? Or just a dollop of what burns, squeezed out of the cosmic gut […]
Maybe it was our sun, hurtling by, on its way somewhere else; and all that's left to us now is to grow colder and older, every day in every way, gracefully as possible. How long did this light last?
Oh, my poor, sick, doomed, and soon to be obliterated children, ask instead how long is the darkness that follows it![15]

The Reverend draws upon an ancient rhetorical tradition; she reminds her congregation of the brevity of human existence and the inevitability of death, a sermon of memento mori, of carpe diem. Yet as she presents an idea of time as predictable, irreversible, and linear and thus fatal, her speech does not conform to a stable concept of the temporal. While it is typical to imagine time as flowing onward into the future, the Reverend seems to envision time as also flowing backwards, pouring into the unmarked graves of a potter's field. Here past and future are not discrete, but interdependent.

Additionally, the day is not something to be seized as much as something which does not exist; the moment is a hole which time flows through. Circular imagery decorates this turbulent temporal flow in the 'hole' and its 'rim,' in the 'eye,' and perhaps even in the image of clay turning in the potter's wheel, while the sun is not round but is a 'dollop of what burns […] hurtling by.' Forms and the abstractions by which we understand and measure them are uncertain and unsettled in their cyclicality.

So how are we to think through all this chaos and confusion? The theorist Fredric Jameson claims that 'the city itself […] has deteriorated or disintegrated to a degree surely still inconceivable in the early years of the 20th century, let alone in the previous era.'[16] He suggests that we might think about

8 Ibid. p.9.
9 Danny Brown, 'Fields,' XXX (2011), Fool's Gold Records (1:00).
10 Jason Moore, 'The End of Cheap Nature,' Structures of the World Political Economy and the Future of Global Conflict and Cooperation, ed. Christian Suter and Christopher Chase-Dunn (LIT, 2014), p.286.
11 Samuel Delany, Dhalgren (New York: Vintage, 2001), p.3.
12 Giovanni Arrighi, The Long Twentieth Century: Money, Power, and the Origins of Our Times (London: Verso, 1994), p.80.
13 Ibid. p.80.
14 Samuel Delany, Dhalgren (New York: Vintage, 2001) p.481.
15 Ibid. p.525.
16 Jameson, Frederic, Postmodernism, or the Cultural Logic of Late Capitalism (1984), p.76.

the cultural evolution of capitalism (and about capitalism itself) 'dialectically, as catastrophe and progress all together.'[17] In other words, we have to commit to contradictory positions; maybe we have to recognise capitalism as 'the best thing that has ever happened to the human race, and the worst.'

Why must contradiction lie at the core of our thinking? The term 'dialectical' has meant many different things to many different Marxist thinkers. In this case, what seems relevant is that the world is too complex for straightforward formulas and facts. Our minds are not equipped for truth, perhaps precisely because it is singular truth that we usually seek. Every time we fully understand some urgent moral or political problem, we find we have left something forgotten or unsolved, or that our definitive answer contains its own antithesis. So we must rely on dialectical theory that is in constant motion, contradicting or 'negating' itself, approaching things in reversals of the flow of our thinking, seeking truth within the opposite of what we claim to know. This is demonstrated in *Dhalgren*, as Kid remembers a 'math instructor' at 'Columbia.'

> "A true proposition," she had explained, rubbing chalky fingertips on one another, "implies only other true propositions. A false one can imply, well, anything, true, false, it doesn't matter. Anything at all. Anything…" As if the absurd gave her comfort, her perpetual tone of hysteria had softened momentarily.[18]

At the same time, it is not only because the world is messy and complicated that such dialectical thinking becomes necessary. It is also because the intellectual tools we are equipped with have evolved within a system – capitalism – that constantly generates misinformation and opacity, a system that must divide and mislead us in order to propagate itself; a world which

generates 'knowledge' and expects belief without any real experience but only on the basis that it is named fact; a system within which dialogue such as this can occur:

> "A thousand people are supposed to be here now. Used to be almost two million."
> "How do you know, I mean the population?"
> "That's what they publish in the paper."[19]

Jameson also acknowledges that the demand to think dialectically is troubling. In fact, dialectical perspectives are potentially paralysing, 'systematically obliterating possibilities of action under the impenetrable fog of historical inevitability.'[20] Is this not the same feeling expressed in Delany's science fiction as the Reverend speaks of 'watching that flow, terrible for all of us, tragic for some of us'? The same doctrine of inevitability, of apocalypse, and of fluidity and chaos which is both liberating and immobilising?

Bellona is presented as a space of urban segregation, where 'the poor people … and that pretty well means the black people – have never had very much,' and now have 'even less.'[21] When Reverend Amy Tayler preaches, it is to black people; it is to them that she delivers her deterministic sermon. The chief protagonist, Kid, wanders the streets of Bellona and wonders whether the shape and the language of the city – the 'line[s]' of it – could be known by anyone from outside the urban space:

> Anyone sensitive to language, living in this mess/miasma, must applaud it. Is there any line in it, however, that would be comprehensible outside city limits? Five were sitting on the steps. Two leaned against the wrecked car at the curb. Why am

I surprised that most of them are black?[22]

There are levels of opacity in Delany's Bellona. In this moment, Kid considers how opaque the city's lines would seem to anyone looking at it without having directly lived it. As he ponders this, Kid's own reactions seem strange to him. He sees black men leaning against a wrecked car and wonders why he is 'surprised' that they are mostly black. Understanding of the cultural lines and sensitivity to the language of the urban space is beyond Kid. This mingles with an image of immobilisation, as the five men who provoke his reaction are posed around a 'wrecked car.'

In Bellona, cars are rarely mobile. The only vehicle movement which takes place is outside the city limits and on the highway, seen as Kid enters Bellona and when he fails in his attempt to leave. Cars drive past Kid only when characters such as Newboy leave Bellona, as 'the car diminished between the grills of cable, hit the smoke, and sank like a weight on loose cotton.'[23] Those who are permitted to leave Bellona are the privileged visitors of Mr. Calkins, publisher and editor of The Bellona Times. Their departures invoke imagery resonant with the exploitation at the roots of North American capitalist power, sinking on 'loose cotton.' The city does not provide such an exit for everyone. This is all too accurate in terms of North American geography and infrastructure, where getting around often depends on owning at least a little capital: your own car.

The first cars Kid sees on his entry into Bellona are creatures 'squatted on skewed hubs, like frogs gone marvelously blind.'[24] In Bellona, the motor car not only represents geographical immobility, but social and economic immobility: the broken-down, decaying vehicles foreshadow the decline of the US automotive industry, the decline of paternalistic Fordism, and the decline of the consumerist dream of mass-produced abundance. The figures beside the car represent

the black working class. These were the people who enabled an automobile industry, and who were fighting in the 1960s and 1970s – through groups such as the Dodge Revolutionary Union Movement – for workplace safety and for a fairer share of the prosperity they created. Delany's image foreshadows the firing of hundreds of thousands of workers, and the offshoring of production away from these class-conscious communities.

Jason Haslam writes insightfully of Bellona as 'a metaphor for both the material existence of racial and class inequity […] and their erasure from the metanarrative of "American life".'[25] Bellona can be read as a surplus location: the region of appropriation and exploitation at the foundations of US economic dominance. It is a city specific to the cycle of accumulation under North American hegemony, an urban space which has been depleted of its energy and resources. In Delany's novel, the effects of economic turbulence are not hidden. Bellona exists on the basis of such turbulence; it is defined by it. Its 'streets seem to underpin all the capitals of the world,' and simultaneously seem 'an ugly mistake, with no relation to what I know as civilization, better obliterated than abandoned.'[26]

As a Native American protagonist, Kid is representative of the colonial violence at the origins of the USA. Arrighi considers an anomaly within the US cycle of accumulation: that this colonial violence has lingered within the very borders it established. Cycles of accumulation have often required the hegemonic state to plunder abroad, but US capitalism has also required the constant creation of frontiers within its frontiers. Colonial violence in the USA is also an 'internal history,' a kind of 'territorialism "at home".'[27] The harvesting of the "four cheaps" – labour, food, energy, and raw materials – occurs both abroad and inside the North American city. Neighbourhoods are spatialised and divided in order for profit to be made.

17 Ibid. p.86.
18 Samuel Delany, *Dhalgren* (New York: Vintage, 2001) p.423. The math instructor is probably thinking of what, in formal logic, is sometimes known as the principle of explosion.

19 Ibid. pp.22-23.
20 Jameson, Frederic, *Postmodernism, or the Cultural Logic of Late Capitalism* (1984), p.76.
21 Samuel Delany, *Dhalgren* (New York: Vintage, 2001) p.663.

22 Ibid. p.830.
23 Ibid. p.425.
24 Jason Haslam, 'Memory's Guilted Cage: Delany's *Dhalgren* and Gibson's *Pattern Recogniton*,' *English Studies in Canada* 32.1 (2006), p.48.

25 Ibid. p.83.
26 Samuel Delany, *Dhalgren* (New York: Vintage, 2001), p.395.
27 Giovanni Arrighi, *The Long Twentieth Century: Money, Power, and the Origins of Our Times* (London: Verso, 1994), p.60.

Kid wonders: "Do you think a city can control the way the people live inside it? I mean, just the geography, the way the streets are laid out, the way the buildings are placed?"[28] In North America, places have come to be defined by their economic function: Detroit, Michigan becomes the "Motor City"; Wilmington, North Carolina named the "Chemical Capital of the World"; Rockland, Maine known as the "Lobster Capital of the World"; Minneapolis, Minnesota as the "City of Flour and Sawdust"; and Tulsa, Oklahoma nicknamed the "Oil Capital of the World." The deforested Portland, Oregon is "Stumptown"; Huntsville, Texas is the "Prison City"; and Milwaukee, Wisconsin is the "Brew City." Places are nicknamed according to industrial use or post-industrial disuse, definitions which certainly have control over the lives of those who call those places home.

Another aspect of Arrighi's theory which is perceptible in Dhalgren is that of the opaque layers of life, both above and below, which are present under capitalism. Again drawing on Marx and Braudel, Arrighi suggests that the sunlit 'middle layer' of the market economy is what is most easily seen, and therefore the focus of most historical social science and economic study. The layers less easily seen lie at the top and bottom. The 'top layer' is that of complex, mysterious capitalism – where power is presumed to be held – and the 'bottom layer' is the underside of accumulation, a realm of material life where the formalities of capitalism no longer apply, where everyday household labour and provisioning occurs, and exploitation takes place outside the law.

Both the arcane top layer and the everyday bottom layer become shadowy zones, zones d'opacité;[29] 'erasures' which power the North American 'metanarrative.' The convoluted, opaque landscape of the 'shrouded city, like something crusty under smoke' that Kid navigates contains elements of this opaque lower zone of everyday life you cannot quite see clearly, 'its streets stuck blind in it, its colors pearled

and pasteled; so much distance [...] implied in the limited sight.'[30] Additionally, in Kid's desire to find and get answers from those within the upper zone, the difficulties of accessing the top layer are demonstrated. He searches in vain for Mr. Calkins and for the monastery. Even once Kid is invited to the Calkins,' what he desires most – 'information' about his host – is denied him by the 'overdetermined matrix.'[31] Kid finally reaches the monastery and speaks to Mr. Calkins, asking him, 'is the Father a good man?' while trying not to sound upset, wanting to know so he can 'live here [...] in Bellona.'

> "You're afraid that for want of one good man the city shall be struck down? You better look back across the train-tracks, boy. Apocalypse has come and gone. We're just grubbing in the ashes. That simply isn't our problem any more. If you wanted out, you should have thought about it a long time back."[32]

Kid receives no answers; the opaque upper layer is not breached. He does not know if the Father is a good man or a bad man. His questions are openly denied answers. Bellona is defined as a post-apocalyptic city: a place of survival and not a place of industry, progress, and prosperity. Yet while it is post-apocalyptic, it is not post-capitalist. Rather, Bellona is representative of the exploited ecological surplus of urban space; no longer a frontier because it has been emptied of resources, left as the waste of a cycle of accumulation which it is bound to but does not benefit from. Bellona, like many other American cities, is named according to its use – after a Roman goddess of war – fitting for a place of empire, tumult, disorder, and violence which is frequently racialised and sexualised. This is an urban landscape which reflects cycles of capitalist accumulation in multiple senses. It is reflective in its chaotic instability, particularly when regarded in its mid-Seventies moment of publication. It also

reflects the cycle's dependency on exploitation for value. It provides insight into the layers which constitute human life: the opacity which keeps answers hidden, keeps capital elusive, and keeps hegemonic power in place. A city where 'time . . . leaks; sloshes backwards and forwards, turns up and shows what's on its . . . underside. Things shift.'[33]

Delany, in an interview, speaks of Dhalgren as a book which 'confirms' and 'redeems' experiences of unstable and disrupted city life.[34] This is science fiction which elucidates the exploitation which lies in the middle of a 'Megalithic Republic' founded on territorialism and oppression, whose cycle of accumulation pockmarked it with many Bellonas as it moved through its extended phase of CM' accumulation. Delany demonstrates what Donna Haraway claims, that 'the boundary between science fiction and social reality is an optical illusion.'[35] Bellona exists. It existed at the time of Dhalgren's publishing and it exists today. If it is difficult to pin down Dhalgren as science fiction, it is perhaps because it is too real, too relevant. Dhalgren is a book which is aware of 'the black market underside of this constant economy of misrecognition, this misery cognition.'[36] Delany's characters are bound to the cycle of the sporadic narrative just as we might perceive ourselves as bound to economic circumstance. In writing this science fiction, Delany is perhaps 'trying to get with that undercommon sensuality, that radical occupied-elsewhere, that utopic

commonunderground of this dystopia, the funked-up here and now.'[37]

Dhalgren is concerned with the fate of US hegemony, and with the uncertainty that capitalism has produced: the duality of its unsustainability and seeming inevitability. Bellona is a cityscape which has been devastated by the cycle of accumulation and taken off the map. It echoes postmodern anxieties expressed by Jameson as he suggests that we must find new methods of spatial and social mapping in order to navigate a land so affected by late capitalism and the culture produced by it. Dhalgren sits somewhere between dystopia and utopia; it refuses categorisation. Bellonas, not only in North America, but perhaps in every area of urban exploitation, become their own kind of 'mess/miasma' with unique languages and codes which offer glimpses of the underside of accumulation. While perhaps transparency at the top level of the economy is not finally possible, books such as this can help us reach a better understanding of the bottom economic level: the district of everyday material life, where neither free markets nor capitalist-monopolists rule, but where value is nevertheless often taken by force and where exploitation is felt.

By engaging with these urban complexities, Delany does not prophesy of what will come of late US capitalism, but gives insight into the complex historical and apocalyptic consciousness that has been cultivated. Those who read Dhalgren and who consider the power

28 Samuel Delany, Dhalgren (New York: Vintage, 2001) p.279.
29 Giovanni Arrighi, The Long Twentieth Century: Money, Power, and the Origins of Our Times (London: Verso, 1994) p.24.

30 Samuel Delany, Dhalgren (New York: Vintage, 2001), p.425.
31 Ibid. p.715.
32 Ibid. p.820.

33 Ibid. p.462.
34 'The Semiology of Silence,' www.depauw.edu/sfs/interviews/delany42interview.htm [Last accessed: 03/01/2018]
35 Donna Haraway, 'A Cyborg Manifesto,' The Haraway Reader (New York: Routledge, 2004), p.8.
36 Ibid. p.51.

37 Stefano Harney and Fred Moten, The Undercommons: Fugitive Planning and Black Study (New York: Minor Compositions, 2013) p.5. The undercommons has to do with fighting the existing system of oppression, while also recognising that being inside this system makes it almost impossible to know in detail what you want instead. In a 2012 interview with Stevphen Shukaitis, Harney suggests the undercommons is "a kind of way of being with others." The undercommons also recognises that nothing can make up for the damage and loss that has already occurred. But it is a poetic term, as well as a theoretical term, and it is difficult to summarise: you need to read the book. In fact, since the undercommons also has a lot to do with conducting resistance stealthily, while putting up the appearance of a professional career (e.g. as an academic), maybe the term is deliberately mysterious. Perhaps anti-capitalist activism has learned a trick or two from capitalism?

of economics in the world today, may identify with Kid, knowing that

It is not that I have no future. Rather it continually fragments on the insubstantial and indistinct ephemera of then. In the summer country, stitched with lightning, somehow, there is no way to conclude; but here, conclusion itself is superfluous.[38]

Works Cited

Arrighi, Giovanni, *The Long Twentieth Century: Money, Power, and the Origins of Our Times* (London: Verso, 1994)

Delany, Samuel, *Dhalgren* (New York: Vintage, 2001)

Delany, Samuel, Sinda Gregory and Larry McCaffery, 'The Semiology of Silence,' *Science Fiction Studies* #42, Volume 14, Part 2 (July 1987), www.depauw.edu/sfs/interviews/delany42interview.htm [Last accessed: 03/01/2018]

Fox, Robert Elliot, '"This You-Shaped Hole of Insight and Fire": Medications on *Dhalgren*,' *Review of Contemporary Fiction*, 16.3 (1996)

Haraway, Donna, 'A Cyborg Manifesto,' *The Haraway Reader* (New York: Routledge, 2004)

Harney, Stefano, and Fred Moten, *The Undercommons: Fugitive Planning and Black Study* (New York: Minor Compositions, 2013)
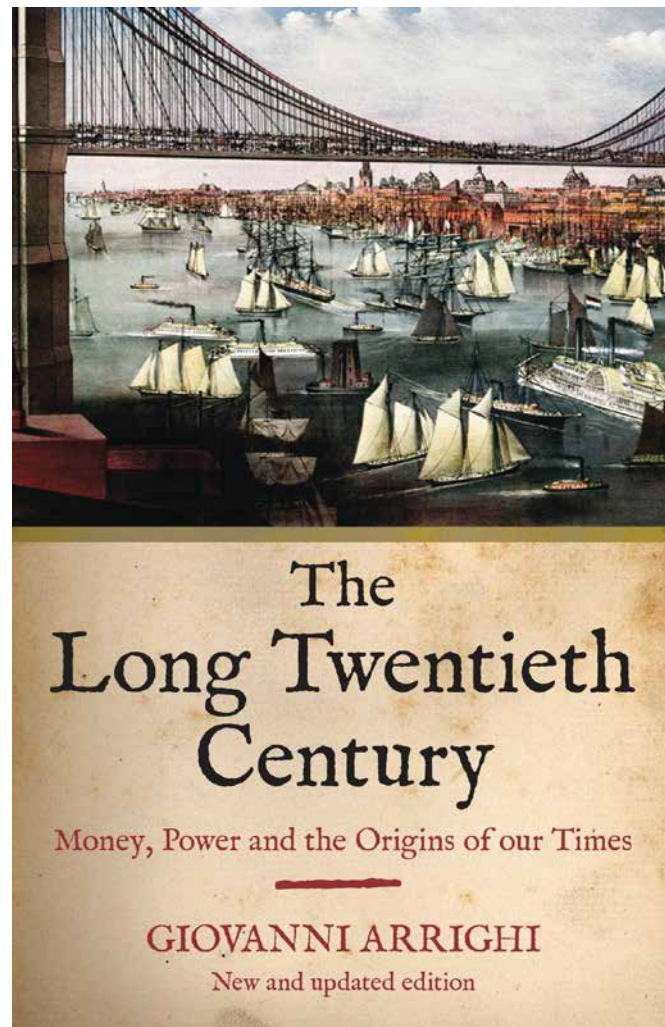
Harney, Stefano, Fred Moten, and Stevphen Shukaitis, 'Studying Through the Undercommons: Stefano Harney & Fred Moten – interviewed by Stevphen Shukaitis' (2012), classwaru.org/2012/11/12/studying-through-the-undercommons-stefano-harney-fred-moten-interviewed-by-stevphen-shukaitis/ [Last accessed: 22/08/2018]

Haslam, Jason, 'Memory's Guilted Cage: Delany's *Dhalgren* and Gibson's *Pattern Recognition*,' *ESC* 32.1 (2006) pp.77-104

Jameson, Frederic, *Postmodernism, or the Cultural Logic of Late Capitalism* (1984)

Marx, Karl, *Capital* Vol. 1, www.marxists.org/archive/marx/works/download/pdf/Capital-Volume-I.pdf [Last accessed: 01/01/2018]

Moore, Jason, 'The End of Cheap Nature,' *Structures of the World Political Economy and the Future of Global Conflict and Cooperation*, ed. Christian Suter and Christopher Chase-Dunn (LIT, 2014)

The Long Twentieth Century

Money, Power and the Origins of our Times

GIOVANNI ARRIGHI

New and updated edition

JOSEPHINE J. WIDEMAN IS A WRITER AND A RECENT GRADUATE OF ENGLISH AT KINGS COLLEGE LONDON. SHE IS AN INTERNATIONALLY-BORN OHIOAN WHO HAS LIVED IN THE UK SINCE 2008. HER STRETCHED SENSE OF IDENTITY AFFECTS HER CURIOSITY FOR CULTURAL PHENOMENA, FOR PLACE, AND FOR THE EFFECTS OUR GEOGRAPHIES HAVE ON OUR REALITIES.

[38] Samuel Delany, *Dhalgren* (New York: Vintage, 2001), p.236 and p.2025.

THE SPECULATIVE ECONOMIST'S SCRAPBOOK

"There will be those who say that a caring economic system guided by what is good for human capacity development is a utopian dream. But economic systems are human creations."
Riane Eisler "Economics and business as if caring matters: investing in our future" (2013)

"Let's face it, the universe is messy. It is nonlinear, turbulent, and chaotic. It is dynamic. It spends its time in transient behaviour on its way to somewhere else, not in mathematically neat equilibria. It self-organises and evolves. It creates diversity, not uniformity. That's what makes it interesting, that's what makes the world interesting, that's what makes it beautiful, and that's what makes it work."
Donella H. Meadows, Thinking in Systems: A Primer (2008)

"We should be ready to 'mine' the existing record of science fiction to separate out future projections that are really just dark visions of our present placed in a slightly different setting, from actual thought experiments of visions for improvement that can be useful in our field."
David Lempert, "What Is Development? What Is Progress? The Social Science and Humanities of Utopia and Futurology" (2014)

"We may be on the eve of improvements in the efficiency of food production as great as those which have already taken place in mining, manufacture, and transport. In quite a few years—in our own lifetimes I mean—we may be able to perform all the operations of agriculture, mining, and manufacture with a quarter of the human effort to which we have been accustomed. [...] Thus for the first time since his creation man will be faced with his real, his permanent problem – how to use his freedom from pressing economic cares, how to occupy the leisure, which science and compound interest will have won for him, to live wisely and agreeably and well."
John Maynard Keynes, "The Economic Possibilities for our Grandchildren" (1930)

"Keynes's predictions are in fact very close in spirit, if not to the letter, to Star Trek's vision of a plentiful post-scarcity society—in other words, trekonomics. [...] Even more pointedly, if we take a step back from Hollywood's romance of space travel, with its gizmos and its aliens, we may soon come to the rather disquieting realization that we already live in Keynes's, and therefore Star Trek's, cornucopia. Economic bliss is just very unevenly distributed, to paraphrase science-fiction author William Gibson."
Manu Saadia, Trekonomics (2016)

"Say farewell to economy-as-machine and embrace economy-as-organism. Let go of the imaginary controls that promised to pull markets into equilibrium and, instead, get a feel for the pulse of the feedback loops that keep them continually evolving. It is time for economists to make a metaphorical career change, too: discard the engineer's hard hat and spanner, and pick up some gardening gloves and secateurs instead."
Kate Raworth, Doughnut Economics (2017)

"To function optimally as a demand, a utopian demand should be recognizable as a possibility grounded in actually existing tendencies. This is not to say that it should be 'realistic' – at least in the sense that the term is deployed in the typical anti-utopian lament about such demands."
Kathi Weeks, The Problem with Work (2011)

"Employers who turn up for work day-in, day-out are essentially cast as outsiders: a production cost to be minimised, an input to be hired and fired as profitability requires. Shareholders, meanwhile, who probably never set foot on the company premises, are treated as the ultimate insiders: their narrow interest of maximising profit comes before all [...] But this set-up is, of course, just one among many possible enterprise designs."
Kate Raworth, Doughnut Economics (2007)

"The medium of exchange in a goldmine is the pickaxe."
Terry Pratchett, Making Money (2007)

Universal Basic Income

Vector Editors

"I think one of the biggest challenges to society is the way work will likely disappear in the next fifty years," says Ta-Nehisi Coates. "We need to start talking about a Universal Basic Income."

The key thing about Universal Basic Income (UBI) is that it is a regular guaranteed payment that goes to everybody, not just to "those in need." There are different ideas about what "everybody" means: every single citizen? Every resident? Some other grouping? And other debates: what's the right level of payment? What existing benefits, if any, could UBI legitimately replace? Would we need rent controls to prevent landlords hoovering up everybody's UBI? Should there be laws against taking out loans against your future UBI streams, and potentially spending a lifetime of UBI "all at once"?

So people *have* started talking. In fact, Universal Basic Income is hot right now. Then again, the idea has been simmering a long time. In Thomas More's *Utopia* – before the more famous bit with the weird holiday – there is the proposal "to provide everyone with some means of livelihood." In the 16th century, Johannes Ludovicus Vives proposed something a bit like UBI not only on ethical grounds, but also as a sound policy to make society safer and happier. Vives argued that resources should be redistributed "before need induces some mad or wicked action, before the face of the needy blushes from shame."[1] In the late 18th century, figures such as Marquis de Condorcet, Thomas Paine, and Thomas Spence developed versions of UBI which closely resemble the proposals and pilot schemes we're seeing today.

Since then, UBI has attracted fans as diverse as Martin Luther King Jr. and the libertarian economist Milton Friedman. Tech celebs such as Mark Zuckerberg and Elon Musk like it, as do lefty political theorists like Kathi Weeks, Nick Srnicek and Alex Williams. For Srnicek and Williams, UBI is partly a necessary response to the rise of the robots. AI and automation are threatening millions of jobs: so should we be demanding the right to work – for instance, a job guarantee programme? No, they argue: what we should demand is UBI and a fully automated post-work society.

When you look at the details of what Srnicek and Williams actually propose, both "post-work" and "full automation" turn out to be slightly misleading labels. They believe political demands need a "utopian edge" to drive real change, so maybe they're trying to be edgy?[2] Whatever the reasoning, they're not saying *Star Trek* is around the corner. Rather, full automation is presented "as an ideal" that is "unlikely to be fully achieved." Furthermore, they argue, automation should be limited by "the moral status we give to certain jobs."[3] In the same way, "post-work" doesn't literally mean no more work. Post-work means, firstly, changing contemporary attitudes to work, so gainful employment isn't seen as a moral duty. As David Graeber puts it, "We have become a civilization based on work – not even 'productive work' but work as an end and meaning in itself. We have come to believe that men and women who do not work harder than they wish at jobs they do not particularly enjoy are bad people unworthy of love, care, or assistance from their communities."[4] Secondly, post-work means normalising a shorter working week – say, a three-day weekend – to give us more free time for leisure, creativity, or work that we ourselves decide is valuable. And thirdly, post-work means Universal Basic Income.

Ian Goldin, writing for the *Financial Times*, suggests five reasons UBI might be a bad idea: **1.** UBI could be used to justify further cutting investment in areas such as health and education. **2.** It is a waste to give money to people who are already rich. Even with the cheaper administrative costs of UBI, he thinks, those who most need assistance would be better served by targeted transfers like unemployment, disability or housing benefits. **3.** UBI could undermine social cohesion. Goldin imagines the emergence of an unemployed underclass who would lack the "meaning, status, skills, networks and friendships" that can be gained through work. **4.** This division will be made more intractable by dismantling the current system which discourages dependency, and creates incentives for work and civic participation. Here Goldin seems to be hinting at the immorality of UBI. **5.** UBI will be a short-term fix, which will prevent economic reforms such as payment for caring responsibilities, more flexible working arrangements, more funding for the creative industries, and a discussion of the future of international development.[5]

Actually, many supporters of UBI might agree with some of Goldin's points … and even think he doesn't go far enough! Srnicek and Williams readily admit that UBI could be a vital plank of a post-work society, or of a "dystopia."[6] To guard against the dangers, Srnicek and Williams suggest that UBI "must provide a *sufficient* amount of income to live on; it must be *universal*, provided to everyone unconditionally; and it must be a *supplement* to the welfare state rather than a replacement of it."[7]

Furthermore, they claim that achieving UBI doesn't mean the fight is won: it just shifts that battle to a new ground, since there will doubtless be constant efforts to corrupt UBI into a tool of social control, and to exclude certain classes of people from it. In fact, such exclusions can already be seen in many supposedly progressive UBI proposals. One prominent UBI proponent, Philippe Van Parijs, assumes it is "obvious that prison inmates should lose the benefit of their basic income for the duration of their imprisonment."[8] Likewise, Bruce Ackerman and Anne Alstott, who propose a "stakeholding" variant of UBI, breezily mention that to be eligible you must "stay clear of crime" and then drop the subject, as if this were no big deal.[9]

Recent SF explores UBI critically. William Squirrel's short story 'They Built the New Jerusalem on the Ruins of the Old' (2018) explicitly imagines a world with UBI, but one still riven by injustice. Efe Okogu's 'Proposition 23' (2012) imagines the government providing all the basic necessities of life through the "neuro," a technology which also ensures surveillance, conformity, and the perpetual threat of having your support withdrawn. Okogu posits that the only way a government can afford to pay UBI is by constantly shrinking the pool of those it deems eligible, thus the slightest infraction or an expression of dissent leads to instant marginalisation. Okey Egboluche's 'Animals on the Run' (2013) explores UBI as a moral hazard, especially for the young.

Here's one final thought. If UBI is one puzzle piece of a future economy, perhaps another is the democratization of money itself? Groups such as Positive Money want to reform the way money is created in the first place. Maybe if we stopped seeing money as an intrinsically valuable substance, produced in limited quantities by hardworking citizens, and started seeing it as it really is – a technology, and one among many imperfect measures of what is truly valuable – then we wouldn't get so readily incensed about the undeserving getting their hands on it.

1 *De Subventione Pauperum, Sive de humanis necessitatibus*, quoted in Basic Income Network's 'History of Basic Income,' basicincome.org/basic-income/history/

2 Nick Srnicek and Alex Williams, Inventing the Future (Verso 2015), p.108.
3 Ibid. pp.112-113.
4 David Graeber, Bullshit Jobs: A Theory (Simon & Schuster 2018), p.xxiv.

5 'Five reasons why universal basic income is a bad idea,' February 11, 2018. www.ft.com/content/100137b4-0cdf-11e8-bacb-2958fde95e5e
6 Srnicek and Williams (2015), p.119.
7 Ibid.

8 'Basic Income: A simple and powerful idea for the twenty-first century' in *Redesigning Distribution*, ed. Erik Olin Wright (Verso 2006), p.8.
9 'Why Stakeholding?' in *Redesigning Distribution*, ed. Erik Olin Wright (Verso 2006), p.45.

Surveillance Capitalism and the Data/Flesh Worker in Malka Older's *Infomocracy*

Esko Suoranta

The cyberpunk dystopia is already here, it's just unevenly distributed. Western democracies appear to be in crisis. Populist nationalisms are on the rise, while an ever-so-free market tightens its grip on our everyday existence, building vast private siloes of personal data. Climate change is spurred on by the rise of new imaginary currencies, mined from pure mathematics and pumping tens of millions of tons of carbon into the sky. Technologies from space travel to nanotechnology take unprecedented leaps. Meanwhile, in fiction, nostalgia appears to be a prime directive. The imagined futures of the 1980–90s receive reboots which appropriate the aesthetics of the past, but often fail to update its politics in the process: see *Blade Runner 2049* (2017) and *Ghost in the Shell* (2017). Against such future-washed conservatism, a counter-project is also emerging. Critics and authors like Monika Bielskyte and Nnedi Okorafor sound the clarion for new ways to imagine the future, and to pave the path for a more equal and sustainable world. [1]

In this context, Malka Older's debut novel *Infomocracy* (2016) explores progressive political and economic alternatives in a near-future setting. Part political techno-thriller, part thought-experiment on global micro-democracy, the novel follows four protagonists in the 22nd century as the third global elections loom. In the micro-democratic system, each geographic "centenal," a unit of 100,000 people, chooses their representatives from a
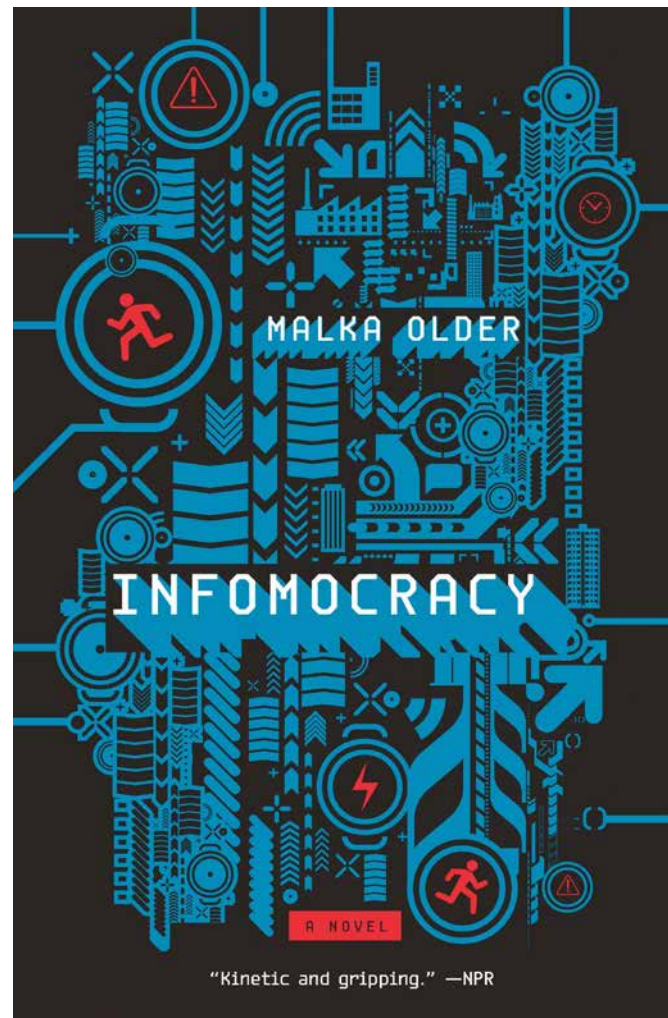
myriad of parties ranging from PhillipMorris and Liberty, to Earth1st and YouGov. Nation states have practically disappeared and the global election process is governed by Information, a descendant of the internet giants of yore, seemingly fused with something like the United

Nations. The organization strives for neutral and truthful management of information and a fair administration of the micro-democratic process.

Predictably, political rivals try to play the system for their own benefit, and much of the plot revolves around such schemes. Through their twists and turns, Older highlights the precariousness of information labor in highly networked societies as workers become interfaces of bodies and computer networks, producing a distributed subjectivity. These themes become clear through an analysis of Older's treatment of her protagonists and her depiction of Information's custodianship of networked data. *Infomocracy* conducts an optimistic thought-experiment on the future of what Shoshana Zuboff calls "surveillance capitalism." I aim to show how, for Older, there are two keys to diverting surveillance capitalism in a more optimistic direction. First, the democratization of skills related to information work. Second, the not-for-profit management of data.

Big Other is Watching You

What exactly is surveillance capitalism? Shoshana Zuboff sees big data as the "foundational component" in surveillance capitalism, a "new form of information capitalism" that produces revenue and controls the market through predicting and modifying human behavior (Zuboff 75), a logic encountered in the commercial internet, for example, where it optimizes marketing and sales by testing and cataloging how people respond to user interfaces.

In a classic surveillance model, Big Brother snoops on you, studies his findings, then makes a decision, and takes an action. But in today's networked societies, things aren't so simple. Data is used in myriad ways to influence human behavior. Governments collect huge amounts of data in areas like education, welfare, defense, healthcare, policing, and tax. Meanwhile, companies like Google, Facebook, Uber, and Airbnb amass extensive records of computer-mediated transactions of their customers.

Crucially, data often moves fluidly between the public and private sectors, and data which is collected for one purpose may be used for another. Opaque algorithms may make decisions based on data which appears irrelevant to the human eye. Furthermore, surveillance capitalism doesn't just passively observe: it actively solicits user engagement, using what it already knows to try to tease out more. We even surveil ourselves, with technology such as Fitbit, in attempts to manipulate our own behaviors.

For Zuboff, all these developments signify a break with industrial capitalism. Under industrial capitalism, the most influential companies often tried to cultivate a growing and prosperous middle class, who would be both workers and customers for those companies. But as "information civilization" has evolved, global data flows have become commodified in ways that fundamentally alter the relationship between companies and the populations they interact with (Zuboff 80). In particular, under surveillance capitalism, the worker is not the expected customer for data companies. That place has been taken by the advertiser. Whereas previously, workers were able to fight to achieve a certain degree of public oversight of companies' activities, this oversight has now been eroded. Regulatory legislation has lagged behind the innovations of companies like Google. This shift has led to a "formal indifference and functional distance from populations" that makes information companies increasingly independent of civil society and democratic principles (Zuboff 80).

The shift from industrial capitalism to surveillance capitalism means that the Orwellian Big Brother can no longer act as the "totalitarian symbol of centralized command and control." Instead, the power structures of surveillance capitalism are better characterized by "Big Other," extending into all aspects of everyday life. There is "no escape from Big Other. There is no place to be where the Other is not" (Zuboff 82). In contrast to the classically panoptical surveillance architectures, or the hierarchical surveillance of the workplace, we now live in a world where "habitats inside and outside the human body are saturated with data and

produce radically distributed opportunities for observation, interpretation, communication, influence, prediction, and ultimately modification of the totality of action" (Zuboff 82).

This saturation of the body with data is closely connected to Pramod K. Nayar's (and N. Katherine Hayles's) posthumanist concept of "the human form as an *interface* rather than a self-contained structure" where "the body is treated as a means of access to the virtual" (Nayar, 64, emphasis in the original). The intertwining of data and bodies results in a shift in the nature of capitalist power. It is surveillance capitalists who enjoy "extensive privacy rights and therefore many opportunities for secrets" (Zuboff 82–83). Thus, it is no longer the means of production that capitalists control, so much as the means of behavioral modification. In surveillance capitalism, the virtual accesses you.

Information and Liberty

There are a variety of point of view characters in *Infomocracy*, but four could be identified as protagonists. Ken and Yoriko gather intel for Policy1st, Ken as a globe-trotting upstart with hopes of an official position within the party, and Yoriko as a taxi-driver supplementing her earnings in Okinawa as an informer. Then there's Mishima, a multitalented security officer and data analyst for Information, and Domaine, a dissident working against the institution of micro-democracy and Information, seeing them as essentially undemocratic. All four are characterized as resourceful operatives with a broad set of skills. I will mostly focus on Ken, as he's the character whose trajectory most clearly showcases the multi-faceted nature of information work and its implications.

In the world of *Infomocracy*, the transition from Big Brother to Big Other has escalated, but its worst possible effects have been simultaneously mitigated. The near-global obsoleteness of nation states has made their various intelligence operations and national architectures of surveillance less significant than before. At the same time, Information has assumed a global monopoly on amassing,

refining, regulating, and publishing data. However, the organization's non-corporate status, and its mandate to serve democratic ideals, seem to help individuals stay in control of their personal data.

Data technologies have become what Andy Clark calls "transparent" – their interfaces form extensions of human action that "become … almost invisible in use" (Clark 37). Information is charged with safeguarding the data, while enabling people to control which personal data is publicly displayed.[3] People in Older's novel walk around accessing visual and aural feeds constantly, but also broadcasting data about themselves, and all that data is annotated, corroborated, and verified to achieve an adequate level of trust. For example, when Mishima and Ken meet for the first time at a party in Tokyo, her personal Information is "completely mute, an opaque absence of facts and figures in the air next to her face," as suits a covert security operative (102). Ken's personal Information, when their night together progresses, displays "his birth control (enabled) and inoculation status (up to date)" (107).

For Zuboff, "populations are targets of data extraction. This radical disembedding from the social is another aspect of surveillance capitalism's anti-democratic character. Under surveillance capitalism, democracy no longer functions as a means to prosperity; democracy threatens surveillance revenues" (Zuboff 86). Older, on the other hand, engages in a thought-experiment, where the gathering and use of data has advanced radically, but democracy has assumed new forms instead of simply withering away. One such form is the system of micro-democracy, where each centenal votes in a way that directly influences their everyday life. Another is the democratization of privacy rights, that is, increased equality in what data is available for everyone to inform decision making.[2]

Workers in the Posthuman Network

There is a trace, however, of Zuboff's "disembedding from the social" in the precariousness of jobs held by Older's

protagonists, especially Ken. Mishima is a privileged insider of Information's organizational monopoly, and Domaine actively seeks to stay out of a mainstream labor culture. But Ken's career trajectory exemplifies the hardships and insecurity of information workers under surveillance capitalism. Even when Ken is swept up in the thrills of a conspiracy to steal the global election, Older takes care to show how the everyday struggles of precarity are never far away. For example, Ken notes that he does not have "any wealth to speak of" (30); he rationalizes reasons for higher-ups keeping him out of "strategy discussions, even if those discussions are based on his intel" (31); he doesn't have a clear demarcation between work and leisure as he "doesn't go on Information these days without opening a minimum of two real-time poll sites" (82); and he attributes his difficulties in sleeping to the fact that his mind "thinks of a million more things" that he should be doing (109). His considerable efforts for Policy1st don't grant him either stability or rank within the organization. After Ken has accomplished impressive results in advocating for Policy1st in Lima and doing street-campaigning in Chennai, one of the party's managers lets slips that a promotion is right around the corner: he might become personal assistant to Suzuki, one of the party's top brass. Ken's feelings about the prospect are ambivalent at best:

> What did he expect, exactly? A real job, he tells himself, disgusted. Something official, in the government. […] But before, when he was nominally a driver, wasn't he doing everything a personal assistant would? This is a promotion in name only. If he takes it. But what else can he do? This is the problem with not having a real job; when you want to look for another one, nobody knows what you've done. (195)

Yoriko's narrative is another example of precarity. Working for the same boss, Suzuki, she

investigates Liberty's dog-whistling in Okinawa, and gets caught by the rival party's security personnel. She manages to lie about who sent her and get released. Policy1st then ships her off to remote Amami, but it remains doubtful that she is fully compensated for the dangers she puts herself and her children in.

So Older conjures a world of somewhat curtailed surveillance capitalism, speculative democratic institutions, and continued worker precarity. Her protagonists navigate this world as information workers whose skill in gathering, managing, and understanding data makes them effective professionals in a variety of contexts. Ken's first mission for Policy1st is to gather information on the ground in centenals that could be persuaded to vote for the party:

> […] to get that intel […] without letting them know that he's looking for it. To that end, he presents himself as an annoying grad student. This is not entirely untrue; since it's extremely difficult to lie in your public Information, Policy1st enrolled him in a cheap PhD program. He can put up more or less legitimate credentials and mute the rest of his public Information, as is common in professional settings. (46–47)

The data Ken displays is not false, but it is misleading, and this is what enables him to complete his mission. He can appear trustworthy and ask questions without raising suspicion or creating bias against his employer. This personal data-gathering is augmented by other similar pursuits to inform policy – within the data/flesh interface, the information worker functions as a collection node.

Right after Ken has met Mishima in Tokyo, the city is struck by a large-magnitude earthquake. The disaster has Ken employ his information worker skills in a different context, as a governmental emergency analyst, collating data on the needs of the people affected. This

time, his work sounds more like the data science of the Microsoft Excel-variety: "Ken focuses on his spreads […] he zooms in on the numbers: heated blankets, diaper sizes, bags of rice. Soon, Suzuki told him, the offers of assistance will begin pouring in, and then they'll need to be able to match them with the needs as quickly as possible" (124). The ability to employ data tools and understand the significance of quantitative data are crucial for the task at hand, and as an information worker, Ken delivers.

Later, he finds himself in the middle of a conspiracy to rig the election. He winds up working with Information personnel to uncover and stop the culprits. When the Information network goes down in the middle of the voting process, he is tasked with verifying the votes already cast for possible wrongdoing: "Roz showed him how to check each record for key data points and what forgery indicators to look for, a string of digits that he has to verify each time using a program she's rigged up" (229). This is not the glamorous cyberhacking of the future. Ken is depicted "crunching some of the ancillary data" (271), running analytics to learn more of the blackout, and later creating a database of fake votes as a decoy by "expanding, embellishing, and keeping careful track of what the correct computer analysis should show" (296). The narrative sticks to mundane descriptions of data analyst's work.

The details of these different professional situations demonstrate the thought that Older has put into data-driven environments, and what it might take to succeed in them. For example, after the election hackers have been found, Ken finally joins Information as a member of a team that works the story of the election treachery "into every conceivable platform […] talk shows, political features, telenovelas, serials, trade shows, cooking classes, tourist brochures, projection games, documentaries, educational programs, celebrity stalking, encyclopedia entries, and dance contests [and] wandering into virtual plazas and spouting propaganda to whomever he meets there" (360). Only after his remarkable achievements as a freelancer does Information offer Ken a job as a permanent member of a SVAT team ("Specialized Voter

Action Tactics" (361)), whose aim is to achieve "better data dissemination in the most underinformed centenals" (378). He is now in a humanitarian role of sorts, depending on social skills as well as analytical ones.[3]

In this sense, Older's professionals join what McKenzie Wark calls the "avant-garde of organizational practice." For Wark, industrial laborers held such a position in the early years of the Russian revolution; Wark also offers Kim Stanley Robinson's "scientific, technical and creative work of hackers" as an analogy. Both examples represent "the labor point of view" that covers "the most advanced, general and complex forms of social activity" to understand and direct societal and ecological human existence (Wark 92, emphasis in original). In contrast to Wark's examples, Older's information workers live in the ultra-networked reality of Information. Their practices of existing with and employing data mark them as a possible democratic unit of a functioning world-system, although Older's vision is still of an Earth profoundly altered by climate change (for example, the centenal of the Adapted Maldives stand on stilts with the original Maldives beneath the ocean). Still, the system of micro-democracy and the abolition of nationalism has led to a period of sustained peace.

Despite their positive democratic potential, Older's avant-garde data/flesh workers are not left unscarred by their position in a networked environment. They experience what Nayar terms "traumatic materialism," in which networked posthuman reality marks individual bodies as interfaces that produce a "distributed subjectivity." This subjectivity is central to the flow of information, produced by "a mix of human and non-human actors" (Nayar 66). Nayar argues that this intersection of the material and immaterial can traumatize the individual body. For Nayar, one example would be Cayce Pollard, the protagonist of William Gibson's *Pattern Recognition* (2003), with her almost supernatural ability to decipher the semiotics of brands and predict their performance on the market, all while suffering from a severe allergy to brand imagery (think Michelin Man or Tommy Hilfiger) (Nayar 66–69).

Older's Mishima exhibits a talent of observing and analyzing data that resembles Cayce's traumatizing pattern recognition. And, like Cayce's, Mishima's boon comes with a bane, since Mishima suffers from "narrative disorder" (156), where the patterns she perceives can take on a life of their own, resulting in false alarms from "knitting together an unsubstantiated narrative" (81). To be able to function as the skilled security operative/information worker she is, Mishima must keep her disorder in check, but it also gives her an edge in comprehending complex situations and deciding on a course of action. Combined with "her high-level clearance and sophisticated analytical software" she possesses skills bordering on "superpowers" (94). She dedicates herself to Information's global mission for open access data and the micro-democratic system, but the work proves traumatic.

Significantly, Older also taps into a societal theme of traumatic materialism in addition to the level of individual addressed above. A major driver for the techno-thriller plot in Infomocracy is the near-subliminal plan of Liberty, one of the corporate conglomerate parties, to influence latent impulses of several nationalistically oriented populations to swing the election in their favor. Their operation is designed to appeal to certain demographic and regional populaces, simultaneously staying off the radar from Information and the other parties. Liberty targets specific areas where histories of tense borders and fantasies of national supremacy have a long history – for example, Aceh, Taiwan, Cyprus, and Okinawa – and caters their message to the age-groups who have a personal connection to those discourses. In this way, Liberty taps into generational trauma by means of data dissemination, thus extending the interface between bodies and data over vast and diverse populations.[4] When Information finally confronts Liberty at the end of the novel, party spokesperson Johnny Fabré chillingly sums up the justification for their illicit actions: "Every system must be refreshed from time to time with revolution" (358).

Infomocracy emerges as a thought-experiment for the transition from Big Brother

to Big Other and describes key tensions caused by the rise of surveillance capitalism. Nation states have relinquished their monopoly on surveillance and corporations have displaced them as legislators and democratic subjects, but both become subsumed in the near-hegemonic Information. In Older's interpretation, it is possible to deflect the dystopian future that surveillance capitalism seems to be leading to, but that optimistic project appears to hinge on the abolition of nationalist politics and of surveillance capitalist monopolies like Google and Facebook. In Older's world, Information is the prime driver of behavioral modification that Zuboff sees at the heart of the surveillance capitalist project, but it strives to do so based on a democratic ideology with communities as stakeholders. In this way, Information's technological and infrastructural hegemony becomes intertwined in and dependent on the project of rethinking public participation in policy. While Older's world is not a utopia, and while it raises significant questions concerning the self-regulation of Information itself, it does suggest an alternative to pessimistic societal imaginaries. Finally, Older's depiction of information workers struggle with precariousness of work and traumatic materialism highlight risks on the road to possible data-driven futures of the labor market. As such, Infomocracy is a central novel in the continued tradition of reimagining work, citizenship, and civilization through speculative fiction.

Notes

1 See, for example, Bielskyte's "Virtual Reality as Possibility Space" at medium.com or Okorafor's TED talk "Sci-fi stories that imagine a future Africa."

2 Significantly, the way Information operates in verifying the data it broadcasts is done by a legion of "Information grunts" (189), that is, professionals the multitude of whose work constitutes the overall breadth and accuracy of data. While algorithms and applications of artificial intelligence are clearly present in Older's speculative network, she continuously emphasizes the interconnectedness of human and computational labor.

3 Information's humanitarian mandate in the novel interestingly suggests that data rights, like those outlined in the European Union's General Data

Projection Regulation, are among rights that need a global equity approach to be meaningfully realized.

4 The resemblance to the way in which Facebook data was used to influence opinions around Brexit and the 2016 United States presidential elections is uncanny.

Works Cited

Clark, Andy. *Natural-Born Cyborgs: Minds, Technologies, and the Future of Human Intelligence*. New York: Oxford University Press, 2003.

Nayar, Pramod K. *Posthumanism*. Cambridge, UK: Polity Press, 2014.

Older, Malka. *Infomocracy*. New York: Tom Doherty Associates, 2016.

Wark, McKenzie. *Molecular Red: Theory for the Anthropocene*. EPUB ed., London and New York: Verso, 2015.

Zuboff, Shoshana. "Big Other: Surveillance Capitalism and the Prospects of an Information Civilization." *Journal of Information Technology*, 30, 2015, pp.75–89.

ESKO SUORANTA IS A PHD CANDIDATE AT THE UNIVERSITY OF HELSINKI DEPARTMENT OF LANGUAGES. HIS THESIS JACKPOTS OF OUR FUTURE: CRITICAL ALLEGORIES IN CONTEMPORARY ANGLO-AMERICAN FICTION ANALYZES THE WAYS IN WHICH CONTEMPORARY SPECULATIVE FICTION DEPICTS AND INTERPRETS INFORMATION SOCIETIES IN THE CONTEXT OF LATE CAPITALISM. HE HAS PUBLISHED TWO OPEN-ACCESS ARTICLES ON WILLIAM GIBSON'S LATE OEUVRE IN FAFNIR - THE NORDIC JOURNAL OF SCIENCE FICTION AND FANTASY RESEARCH. HIS RESEARCH INTERESTS INCLUDE CONTEMPORARY SPECULATIVE FICTION, CYBERPUNK, POSTMODERNISM, POSTHUMANISM, AND MORE. AT HIS DAY JOB, HE ADMINISTERS CUSTOMER REGISTRY MANAGEMENT SYSTEMS FOR FUNDRAISING AT THE FINNISH NATIONAL COMMITTEE FOR UNICEF. HE TWEETS AS @ESCOGAR.

TECHNO UTOPIAS UNDER CONSTRUCTION
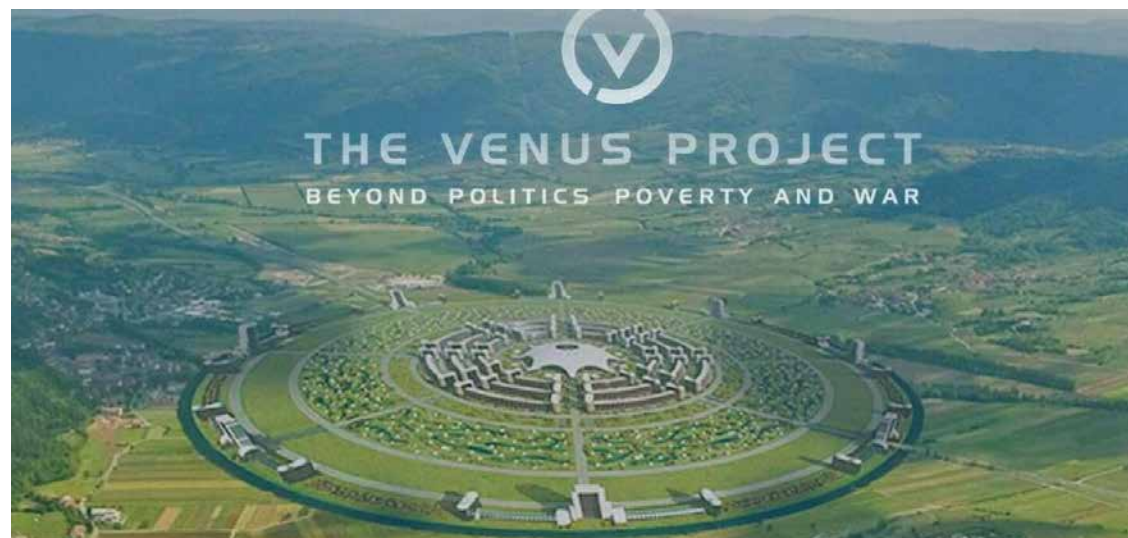
'money is replaced by gratitude trading is replaced by sharing and ownership is replaced by usership'

Source: wiki.p2pfoundation.net/Resource-Based_Economy

Vector at 9

The sixth Nine Worlds convention took place August 10th-12th at Novotel London West. We caught up with a few of the participants. You can read the full conversations on the Vector website, but here are a few snippets touching on our issue's theme.

Laurie Penny

How's your con?

Oh, well, I've always liked Nine Worlds! I missed last year, but that's the first year I've missed. This year, there have been some fantastic panels – the Hidden Histories panel was a favourite. But probably my highlight was playing four hours of The Good Society. It's a Jane Austen based tabletop RPG. And it was really intense.

The theme of the next Vector *is economics. For a long time in leftist economic thought, the word 'utopia' has been straightforwardly pejorative. But it seems like recently that may have changed? With this issue we're hoping to explore connections between science fiction and some more recent radical and alternative economic thinking.*

Well, the idea of utopia itself, I still believe, is sort of inherently fascist. At least in the sense of there being only one perfect world. The only way to maintain that 'perfection,' in the same way that you achieve a society where there is never any crime, never any wrongdoing, is to have a total system of social control. But rather than the binary of utopia and dystopia, I'm far more interested in many different kinds of possible futures.

Sure.

And that includes different kinds of failure modes. That's why I adore N.K. Jemisin's Broken Earth series. It engages in a really thrilling and productive way with different failure modes for the future. It shows mainly women, mainly women of colour, trying to productively build a way of living in a world that is collapsing. And it's not nihilistic. So much dystopian fiction is nihilistic. A dystopian story which is ultimately in some way hopeful is much more interesting. Because that's what

the future actually is going to look like. It's not going to be everything collapsing at once. It's about slow collapses, and working out how to distribute the load of collapsing, so that it doesn't fall and hurt more people.

Florence Okoye

How are you enjoying the con?

I loved how you get a proper introduction to everything when you come in. They're so considerate of every single thing, from pronouns, to whether you want to be spoken to, whether you want to be photographed – like, every single thing! And also accessibility allies which is a fantastic concept. So I'm actually very impressed.

Tell us about Afrofutures UK.

It's a very informal collective I started up in 2015 with some friends, back when I was living in Manchester. We were just like, 'Well, we're really interested in Afrofuturism, and nobody around us really talks about it, so let's just do a thing about it.' We had a conference in October 2015, where over a hundred people turned up, which was amazing. It was just the power of Black Tumblr and Twitter at work to be honest. Since then we've done conferences and events, working with other organisations, trying to raise discussions at that intersection of race, technology, and speculative fiction from a variety of different perspectives. We tend to make sure that there's practical things like Arduino and programming or zine making workshops, really going for an approach that is intersectional, holistic, and creative.

Creating cultural infrastructure, as well as talking about culture that already exists – awesome! So the theme of this issue is economics. Would you like to talk a bit about Afrofuturism and economics?

I think at some point you realise how much everything is dependent on economic infrastructure. So you might say, okay, we want more Black people to be writers. Then you think, hang on, this is also to do with funding, this is also to do with levels of education attainment, this is also to do with just having spare time. I know plenty of creative people who have literally no time to do their creative work. So if the funding isn't there, could Black communities provide funding ourselves? Oh, but we don't have the money either, because

we're historically disenfranchised! And so very quickly you come back to this question of economics and the impact of institutionalised racism.

One thing I've found really interesting – really through Tumblr at first – was how Black people have been really good at taking advantage of digital infrastructure. So that might be someone using Patreon to fund their education, for example. And that's a very practical quid pro quo: 'You're giving me money to help with my education, I'm going to make sure I write this number of books, and share them.' Or that might be somebody using Etsy, and saying clearly, 'Look, this is a Black-owned business, this is how we work, come and support us.' So there are all of these interesting things that have happened through the internet. It's really about people saying, 'Okay, how do we support each other, in financial terms?'

Circumventing structures that might have systemic bias.

Well, yes, even though we're still all using those systems in a sense. It's about doing what we can. And maybe one day, as we have more amazing software developers specialising in financial software, maybe there will be like, say, a Black, co-operative version of PayPal. So we can be like, 'Actually, yes, this is the right infrastructure to use to share our work.' Personally, I like to think what you're seeing now are prototypes.

Right, because the big tech companies that provide this infrastructure are still problematic. They're still bound up in various ways in systemic racism. But the model is there.

Exactly. The co-operative model is there.

Dave Hutchinson

Are you enjoying the con so far?

I always enjoy Nine Worlds. It's different to EasterCon of course. The emphasis isn't quite so much on fiction – it's more multimedia and general culture. There was a panel about villains, which was good … Adrian Tchaikovsky, Jeannette Ng, Anna Stephens and Mike Brooks.

So the theme of this issue is economics.

About which I know absolutely nothing.

Me neither! In your Fractured Europe series, when you were writing your micro-states, did you think about things like –

No. Because if I started thinking about that, I would have wound up overthinking it. I would have wound up sitting down, doing research, learning how to do basic economics, and actually writing how each state traded with each other. It would have got in the way of the writing, I think.

In political discourse, economic terminology comes up. So you're listening to a debate, and it's about the deficit or something. Most of us feel that we don't really understand this stuff, and yet economics seems to kind of be in charge of the world, on some level.

This is the problem. The global economy is just so complicated nowadays. It's semi-sentient. Nobody can understand it, nobody controls it. It just seems to do what it wants when it wants to. Which is a worry.

The 2008 crash, of course, which economists famously didn't see coming. Although they'll point out, 'It's not our job to predict the future.'

Yes, which to be fair was caused by not one factor, but a number of factors. For somebody like me, who has a less than basic knowledge of economics, it's really strange to watch. It's like watching this huge animal.

A sort of enormous blue titan crusted with aeons of moss?

Yes, like the Blob, all-encompassing, inexplicable, and we can't do anything about it.

And yet you get high priests who do claim to command the Blob?

And they don't command it. Tory austerity has just been at most a sticking plaster measure. It's cosmetic. The big thing carries on regardless, and you can only effect little, local changes. Making things a little better or worse for people ... usually worse.

Vector Recommends

Time Was, by Ian McDonald (Tor, 2018)

Anthony Nanson

In any fantasy or SF story set in what appears to be the real world, a decision has to be made about how the characters will react to encountering the fantastic. Will they simply take it in their stride? Best pull yourselves together, guys, because this is a story of the fantastic, and you're going to have to deal with it! Or will they go through the process of doubt and wonder that you or I would undergo if we were to encounter such marvels in our own lives? In this novella Ian McDonald takes the latter course. As much as anything else, it's a story about the sense of wonder. It's meta-SF, threaded with casual references to the SF corpus – Arthur C. Clarke, *Highlander,* even Harry Potter – and resonant with other, unnamed books that mine similar seams: Priest's *The Adjacent*, say; Niffenegger's *The Time Traveler's Wife*. In a fictional world in which the marvellous is already located in imaginative fiction familiar from the real world, how can we yet experience such wonder?

McDonald's protagonist, Emmett, is a second-hand book dealer. He has a bibliophile's geeky general knowledge. He doesn't have a shop. One by one, all round the world, the great bookshops are closing, and Emmett is contributing to that by selling books online from his tiny flat in London, and later his girlfriend Thorn Hildreth's tumbledown house in the Fens. The feel of the setting is mildly post-apocalyptic. Nothing is exactly unfamiliar or futuristic, not even the social media brands that are instrumental to Emmett's work, but there's a pervasive feeling of crappiness about everything. Only later on did the penny drop that this is England after Brexit.

An enclosure, a love letter, inside a book of poems called *Time Was*, puts Emmett on the trail of McDonald's other narrator, Tom Chappell, a poet stationed in the Second World War on Shingle Street on the Suffolk coast, where he falls in love with research boffin Ben Seligman. The research has something to do with the uncertainty principle. Via further copies of *Time Was*, cached in bookshops, Emmett tracks the lovers' fleeting appearances in the records of wars throughout the twentieth century and beyond. In the blurry photographs they never seem to age. Tom's lyrical voice carries a mood of 1940s nostalgia, which stiffens Emmett's awareness that he lives in a 'post-literate age'. Online dealers are not the only reason bookshops are closing. I sense how keenly McDonald himself must feel this. He writes with a simple literary elegance in which language is charged with layers of feeling: 'Words and pictures cannot carry the crunch of sea-rounded stone under the tires as we pulled into the car park, the salt-sweet perfume of the grasses, the scabbing dryness of the air, the knock of a hundred million pebbles rolling in the wave lap.' With descriptions like this McDonald keeps taking us back into the real, the kind of gritty, sensuous experience you cannot get on social media and which cannot be rendered by the flat information-mediating prose that IT media have habituated us to.

It's because of this power of language, as well as the continuous sense of allusion to

a world and a history that extend beyond the 130 pages of this story, that we grieve at the vignettes of war, and when the consensus reality opens to the marvellous then that too feels real. The sense of wonder. The impact of uncertainty, the possibility that anything might be possible. McDonald evokes the wonder so persuasively in his story world that it resonated with my own longings, perceptions, experiences – in this present world whose zeitgeist so insistently demands certainty – that there is much more to reality than there may seem. You don't need me to tell you Ian McDonald is a great writer. *Time Was* is superb. Buy it. Read it. Feel the wonder.

Origamy by Rachel Armstrong (Newcon Press, 2018)

Dave M. Roberts

In the prologue we find our protagonist, Mobius, apparently in an operating theatre and about to undergo some sort of operation. As she slides into unconsciousness, there seems to be a kind of epiphany. As she slips into another world of consciousness, she experiences herself forming anew, in what presumably is a new world. What do we know about this? Initially, not very much. This puts us at no more disadvantage than Mobius. The reader learns about her world as she learns. Most of all, she must relearn the art of Origamy. The first question for the reader is what exactly Origamy is; helpfully there is not just one but two definitions provided:

> Origamy (noun). 'The circus art of spacetime travel',
> Origamy (verb). 'The artful and athletic practice of weaving spacetime fabrics to discover outlandish places and events'.

So, we know right from the off that this is about exploring and manipulating entire universes, which is nothing if not ambitious. The creations are layered up from biological principals to create strange and bizarre worlds, moving swiftly up to full blown tours of the cosmos in Stapledonian fashion. The glory and splendour is underlined with the necessary building blocks. There is an enormous joy in the way that the worlds are constructed, so that however bizarre it may appear at first, there is a satisfying completeness to this. Even the characters names give us clues to what is happening. This is apparent as soon as we encounter Mobius' parents, Newton and Shelley. Immediately we are dropped into the hinterland between science and art. The feeling was that the resonance of the names was so significant, that I actually found myself googling them if I couldn't immediately place them. Far from being annoying, this added an intriguing extra dimension to the book. As the reader is being taken on a tour of weird and intriguing universes, they are simultaneously taken through the history of science and its place in the universe in explaining and enhancing the strange beauty of it.

As the novel progresses, it brings us rather more down to earth. The daily and family life of Mobius becomes more the focus of interest. This does not mean the book dispenses with the universe building, nor does it reign back completely on the awe-inspiring nature of the science that underpins the beauty of it all. It becomes clear that there is something very wrong with Mobius. She is an experienced Origamist, but is still having to relearn the process from scratch. She is also getting interference that breaks up her thinking and is struggling to retain what she has. The novel is now running on two distinct levels. Her thoughts become darker and more concerned with endings and decay. Whereas earlier in the book the joy was in the innovative sense-of-wonder world building, and often in the learning, as it progresses this is still present, but the universes start to feel transient. It is as if, as they develop into fully-fledged entities, entropy comes into play and they must decay. In parallel with this, Mobius is also clearly losing her thoughts. The reader comes to realise there is a point to all this, and the story gradually mutates into a fascinating quest to track down her identity and the meaning of her place in the universe.

This book is unlike almost anything else I've ever read. Armstrong has weaved together a story of many fractured parts and, much like Mobius the origamist, pulled them into something rather glorious. A journey through multiple universes, a heart-rending search for identity and what is ultimately a very human and powerful resolution.

A story that takes in the whole of creation and history and yet takes place in an instant. This is one of the best and most original novels I've read in some considerable time.

THE SPECULATIVE ECONOMIST'S SCRAPBOOK

Richard Freeman   **Paul Krugman**

"What set me up to choose economics was Isaac Asimov's Foundation series of science fiction books. The 1st volume of the series laid out the key proposition that, Hari Seldon be praised, it was possible to construct a science of history. Equations based on verified knowledge could predict the flow of history - at least up to the point where uncertainty allowed the heroes of the series to gain better outcomes for humanity through their brave deeds. The 2nd volume of the series taught the reader that economics dominated military power in determining history. The Foundation expanded through its trading practices. Free trade helped it survive the efforts of the mighty Empire to crush it."

"Practitioner of the Dismal Science? Who, Me? Couldn't Be!!" (2008)
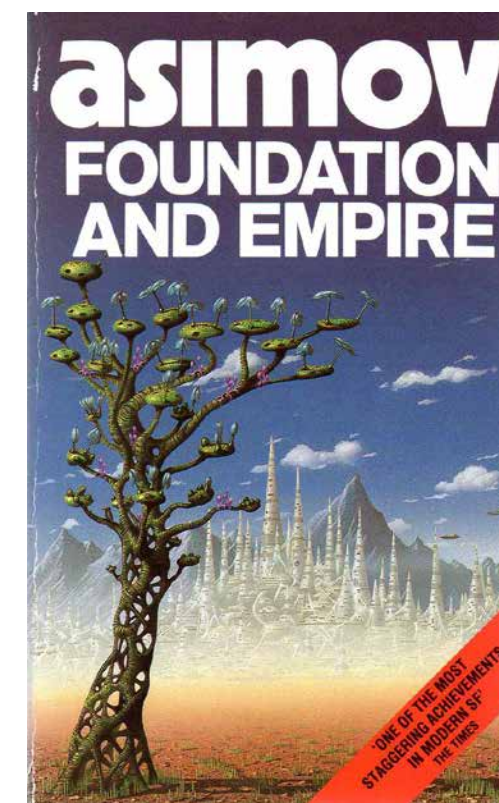
"There are certain novels that can shape a teenage boy's life. For some, it's Ayn Rand's Atlas Shrugged; for others it's Tolkien's The Lord of the Rings. As a widely quoted internet meme says, the unrealistic fantasy world portrayed in one of those books can warp a young man's character forever; the other book is about orcs. But for me, of course, it was neither. My Book – the one that has stayed with me for four-and-a-half decades – is Isaac Asimov's Foundation Trilogy, written when Asimov was barely out of his teens himself. I didn't grow up wanting to be a square-jawed individualist or join a heroic quest; I grew up wanting to be Hari Seldon, using my understanding of the mathematics of human behaviour to save civilisation. [...] OK, economics is a pretty poor substitute; I don't expect to be making recorded appearances in the Time Vault a century or two from now. But I tried."

The "B" in "BSFA Awards"

Clare Boothby

With my Award Administrator hat on, two notable things happened during last year's BSFA Awards. The first is that in December I went into Heffers bookshop in Cambridge and bought a copy of *An Unkindness of Ghosts* by Rivers Solomon. It was prominently displayed because Rivers lives in Cambridge too. It's a really fantastic book and has completely revitalised the generation ship sub-genre of SF for me. But... although it's written by a local author and is readily available in the UK, it's published by a US press, and so isn't eligible for the BSFA best novel award.

The other notable thing was a week-long argument on the committee list about whether Anne Charnock's *Dreams Before the Start of Time* was eligible. We eventually decided yes, it was, because we think the publisher has an office in London these days. Whether or not the publisher does is completely irrelevant to whether BSFA members had read the book (they clearly had, because several people nominated it) or liked it (they do! it made it onto the shortlist). It seems very strange to be deciding eligibility based on the publisher's exact business model, not to mention that facts like this will only become harder to divine in future as publishing moves to less traditional, more international models.

Part of the point of the BSFA Awards has always been to get people reading and discussing SF. If the awards are to properly reflect British fannish conversation, the works which are eligible for the Awards need to reflect the things that British fans can easily get hold of. Back when the BSFA Awards were instituted in 1970, short stories made it across to us from the US pretty quickly, but novels might not get a UK release for several years. These days, it's so much easier to get hold of books from US publishers that some books never see a formal UK release. Many of them are from British authors or authors living and working in Britain. Disproportionately they're from authors who are disadvantaged by traditional publishing. (In two years of administrating the awards, not a single book I've had to disqualify on grounds of publishing location has been by a white male author.)

I feel strongly that the BSFA ought not to be excluding good, readily available fiction from consideration for the Awards just because its author could not get find a publisher with an office in the UK. That means it's time for the novel publishing location rule to go.

We'll keep the ability for the Awards Administrator to rule books in on a case-by-case basis, to deal with books which had a hard-to-get US edition followed by a widely available UK edition in a later year. But in general the rule has had its time, and it is standing in the way of BSFA members nominating and voting for books they like, rather than helping us all stay on the same page.

CLARE IS A SCIENTIST, ARTIST, CRAFTER, AND CON-RUNNER, AND HAS BEEN THE BSFA AWARDS ADMINISTRATOR SINCE 2015.

Kincaid in Short

Paul Kincaid

An Infinite Summer

Christopher Priest tells two different stories about the origins of "An Infinite Summer." In *The Book on the Edge of Forever,* his forensic analysis of the non-appearance of *The Last Dangerous Visions*, he records that Harlan Ellison pestered him for a story even while at the same time proclaiming that the anthology was already closed. Eventually, "In August 1974 I reluctantly broke off from the novel I was writing, wrote a short story called 'An Infinite Summer,' and sent it to Mr Ellison" (Forever, p.13).

In his introduction to the collection *An Infinite Summer* he tells a rather different story. During 1974, he had made several visits to Richmond in order to get the feel of the place for his novel, *The Space Machine*, though little if any of the research went into the novel. But "somewhere in Chapter 13, to be precise" the research gave birth to the story "An Infinite Summer," which "was written because there was one strong feeling that would not fit in the novel" (*Infinite*, p.9).

The two origin stories are not totally incompatible, but the differences between them are instructive. By linking "An Infinite Summer" to *The Last Dangerous Visions,* Priest's impatience with that project and with Ellison's behaviour is transferred to the story, which is presented as an unwelcome interruption in the progress of the novel. In the introduction to the collection *An Infinite Summer,* however, there is a more organic and positive feel, the story emerging out of the research for the novel with a strong impetus of its own. Because I believe that "An Infinite Summer" marks an important transition in Priest's career, I tend to be more comfortable with this more positive version.

Although "An Infinite Summer" was submitted to *The Last Dangerous Visions,* Priest heard nothing further from Ellison. "After four months without any reaction at all from Mr Ellison, I instructed my agent to get the story back from him" (Forever, p.13). "An Infinite Summer" therefore has the distinction of being the first story withdrawn from *The Last Dangerous Visions,* though it was never formally accepted for that anthology. It eventually appeared in *Andromeda 1* edited by Peter Weston in 1976.

That there was a change in Priest's work at some point during the mid-1970s is undeniable. At the beginning of the decade, with works such as *Fugue for a Darkening Island* and the BSFA Award winner *Inverted World,* he was recognized as one of the rising stars at the heart of British genre fiction. By the end of the decade, with the publication in particular of *The Affirmation*, a novel which had poor sales and little recognition at the time, he was perceived as moving away from science fiction and was conceived as occupying some curious, ill-defined hinterland somewhere between science fiction and the mainstream. In fact, Priest had embarked upon a much richer and more mature stage in his writing,
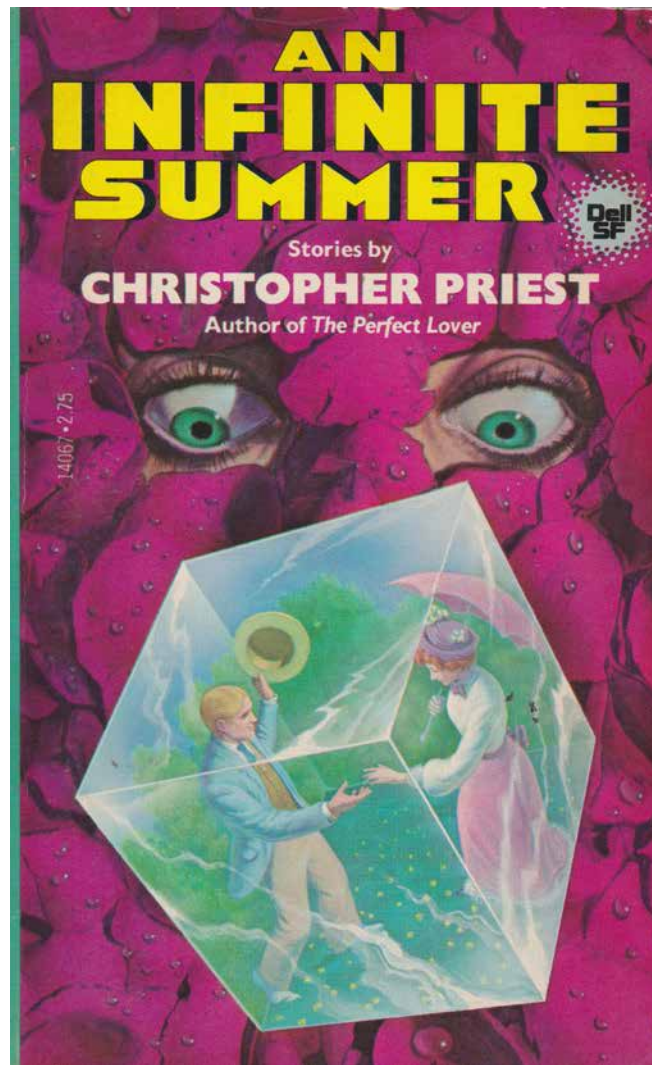
but where exactly that transition lies is a subject of debate.

Priest himself has identified *Inverted World*, a novel "driven along its tracks by a small, hidden engine of autobiography" ("IT" *Came from Outer Space*, p.8), as the point of transition; other commentators, such as Brian Aldiss, identify the change with *The Affirmation*, a novel whose "viewpoint [is] too distanced to win a reader's sympathies" (*Trillion Year Spree*, p.478). But for me "An Infinite Summer" is the first tentative expression of the new aesthetic, the new voice and approach, that Priest's prose was to adopt.

At the time he was writing "An Infinite Summer," *Inverted World* had just come out and was a tremendous success: hugely favourable reviews and his first award. But it was a dead end; the notion of a planet shaped like a hyperbola was one of those eye-catching one-off ideas that appear periodically in science fiction, but

it could not be revisited without repetition, and such unique ideas tend not to come twice in a career. It was perhaps in recognition that this was a dead end that Priest's next novel, *The Space Machine*, was a radical change of pace, a pastiche of H.G. Wells that conflated *The Time Machine* with *The War of the Worlds*. But this, again, was a dead end; there is only so much Wellsian pastiche that one career can sustain. Priest may have perceived something in *Inverted World* that opened up possibilities rather than closing them down, but to pursue such possibilities would involve a move away from the straightforwardly science fictional.

To consider why I identify "An Infinite Summer" as the turning point, it is worth going back to that moment of origin "somewhere in Chapter 13" of *The Space Machine*. Chapter 13 is one of the cruder chapters in that novel, a scene of battle between the Martians full of brutality, action, horror, and derring-do from our human protagonist. "An Infinite Summer," which emerged in the midst of this blood and thunder, is altogether different, a story of quietness, regret, and stasis in a time of war. The way that war is transformed from an excuse for colourful adventure into a backdrop for something more introspective is probably the most overt expression of the change taking place in his writing.

A more subtle but telling difference is in the language and characterization. "An Infinite Summer" is set partially in Richmond in 1903, that is, in the setting and at the time of *The Space Machine*. It reflects, therefore, the late-Victorian reserve of that novel, both in terms of the language and the characterization. But the central character, Thomas James Lloyd, shifts to 1935 and 1940, cutting him loose from his particular milieu. Lloyd then remains of his time and yet detached from time, but always acutely conscious of the space he occupies. This is largely because that place is, to him, treacherous: he has been frozen in 1903, and unfrozen in 1935, all the social and cultural and political changes have taken place without his awareness of them. The fact that he is still, physically at least, a young man in 1940 in the early months of the Second World War, is an

irrelevance to him: "There was a war on, but it made no difference to Thomas James Lloyd. The war was an inconvenience and it restricted his freedom [...] Misfortune had brought him to this violent age, and its crises did not concern him" (*Infinite*, p.13). And again we learn: "Lloyd neither cared for the present nor shared it with its people" (*Infinite*, p.34). This sense of detachment, expressed in a coolly precise quasi-Victorian prose style is the affect that would become familiar in Priest's subsequent work.

Lloyd is an unquestioning product of his time. He "attended church with his father and mother and sister, sitting in the pew that was reserved traditionally for the Lloyds of Richmond" (*Infinite*, pp.14-15) It is a wealthy family, and "Thomas James Lloyd lived in the knowledge that one day the substance would be his by inheritance" (*Infinite*, p.15). The emphasis is on continuity, certainty, assurance that the world has always been this way and always would be this way. Even his future bride is part of the same surety: "That one day he would marry one of the two sisters had been an inevitability long acknowledged by both families" (p.15). This is a world without change, but for Lloyd it is about to change radically as a result of a different form of stasis. At the moment in June 1903, when he had proposed to the younger sister, Sarah Carrington, and been accepted, visitors from the future froze the scene using a device "shaped rather like a modern portable camera [...] but it was much larger than a camera and was approximately cubical in shape" (Infinite, p.21). In that moment, "Happiness shone in her eyes. She stepped towards him extending her left hand, and Thomas, his straw hat still held high, reached forward with his right hand to take hers" (*Infinite*, p.25). Thus posed, they present a tableau that is both dramatic and romantic. And the tableaux that these future visitors preserve seem to be just such poses: a horse-drawn carriage at the point of crashing, a woman being kissed by one man while flirting with another, and so forth. The primary impulse would appear to be artistic, although there is at least one occasion when a freezer had been deployed "to prevent a traffic-accident: a man stepping carelessly into the path of a car had been frozen in mid-stride" (*Infinite*, p.33).

Those frozen in such tableaux effectively disappear from the world; they are invisible and intangible, as we discover when an Air Raid Warden approaches one such tableau: "he showed no sign of awareness, and in a moment had passed right through them" (*Infinite*, p.19). But the tableaux decay, though at different and unpredictable rates: "Some tableaux lasted for several years, others only a day or two" (*Infinite*, p.18). So Thomas is released in January 1935, from his perspective translated in an instant from a hot summer day to a night in which "snow lay thickly on the meadows beside the Thames" (*Infinite*, p.29), but "Sarah was still locked in frozen time" (*Infinite*, p.30).

After unfreezing, he is taken to a hospital to be treated for pneumonia and for amnesia "that seemed the only explanation for his condition" (*Infinite*, p.31). What he learns about this new world is, of course, disorienting: "he had moved from a world of stability, peace and prosperity to one where dynamic and violent ambitions threatened the whole of Europe. In that same short moment of time, he himself has lost the security of his assured future, and become a pauper" (*Infinite*, p.30). He discovers that it was assumed that he and Sarah had absconded, as a result he was disinherited, and following the death of his parents, the family home was sold and demolished. But while he has been dramatically severed from the life he knew, the life whose certainties he felt safe in anticipating, he cannot become part of the modern world. "The part-time work Lloyd had been doing in Richmond paid barely enough for food and lodgings, and what little spare there was usually went on drink; he was still wearing the same clothes as he had five years ago" (*Infinite*, p.18).

However, as a result of having been frozen, Thomas is able to see the freezers, and their tableaux, with the effect that he was "moving through a half-world, one where past, present and future co-existed uneasily" (*Infinite*, p.33). He spends his time visiting the various tableaux he has discovered, noting when they erode, though he does not appear to have made contact with any of those who have been frozen. The freezers, in turn, are clearly aware of him, but do not make contact; sometimes they watch

him, more often they turn away. Everything he tells us about the freezers, that they are visitors from the future for instance, is guesswork, completely unsubstantiated. In truth, neither he nor we know anything about them: who they are, what they are doing, why they are doing it. The questions one would normally expect to be answered in a science fiction story here remain conspicuously unanswered. Thus another of the key ways in which this story marks a change in Priest's work is that it is made up of clearly and confidently described experiences, but without any explanation. As would become a common trait in his later fiction, the world is both solid and uncertain. We are left with doubts, but without answers.

As the story draws to an end, war begins to intrude on timeless Richmond. A German plane is shot down overhead; the pilot bails out. As the pilot floats down on his parachute, one of the freezers, apparently acting against the recommendations of his fellows, freezes the pilot moments before he hits the Thames, a tableau that was "at once amusing and poignant" (*Infinite*, p.32), only for the scene to erode in seconds. But this brief tableau has distracted from the more significant consequence, the "exploding bomber had scattered fragments of itself across the meadows" (*Infinite*, p.35) near where Sarah stands. For Thomas, this was normally a place where "past and present fused," but today "the present had intruded violently" (*Infinite*, p.35). Sarah is surrounded by smoke and fire. While frozen, out of time, she is of course impervious to the fire, but at this moment the spell weakens, she wakens, fire takes hold of her skirt, Thomas takes hold of her; and the scene is frozen once more. "Past and future became one, the present faded, life stilled, life forever" (*Infinite*, p.38).

It is an ending that, of course, leaves more unresolved than resolved. What sort of life forever could this be? What sort of story ends in stillness rather than action? But it is a story dependent on atmosphere rather than incident, a story that shows the world to be uncertain, a story in which the imagination counts for more than the reality. As such, it is a story that paves the way for *A Dream of Wessex* and the early

Dream Archipelago stories; a story that points the direction that Priest's fiction would follow from that moment on.

Works Cited

Trillion Year Spree by Brian Aldiss with David Wingrove. London; Paladin, 1988.

"An Infinite Summer" by Christopher Priest in *An Infinite Summer*. London; Faber & Faber, 1979; pp13-38.

"Introduction" by Christopher Priest in *An Infinite Summer*. London; Faber & Faber, 1979; pp9-11.

The Book on the Edge of Forever by Christopher Priest. Seattle; Fantagraphics Books, 1994.

"IT" Came From Outer Space by Christopher Priest. Hastings; GrimGrin Studio, 2008.

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Foundation Favourites

Andy Sawyer

The Annotated Sandman and the Peter Weston SF Convention archive

This will be my last column in the "Foundation's Favourites" series as, from the end of September, I will be unqualified for the task on the grounds of not actually *being* the Librarian of the Science Fiction Foundation Collection. After twenty-five years in the post, I am retiring. I will, of course be continuing to read, think about, and write about science fiction. (Or, as a close family member would put it, after turning my hobby into my job, I will be turning it back into my hobby again). But, probably, time for some reflection.
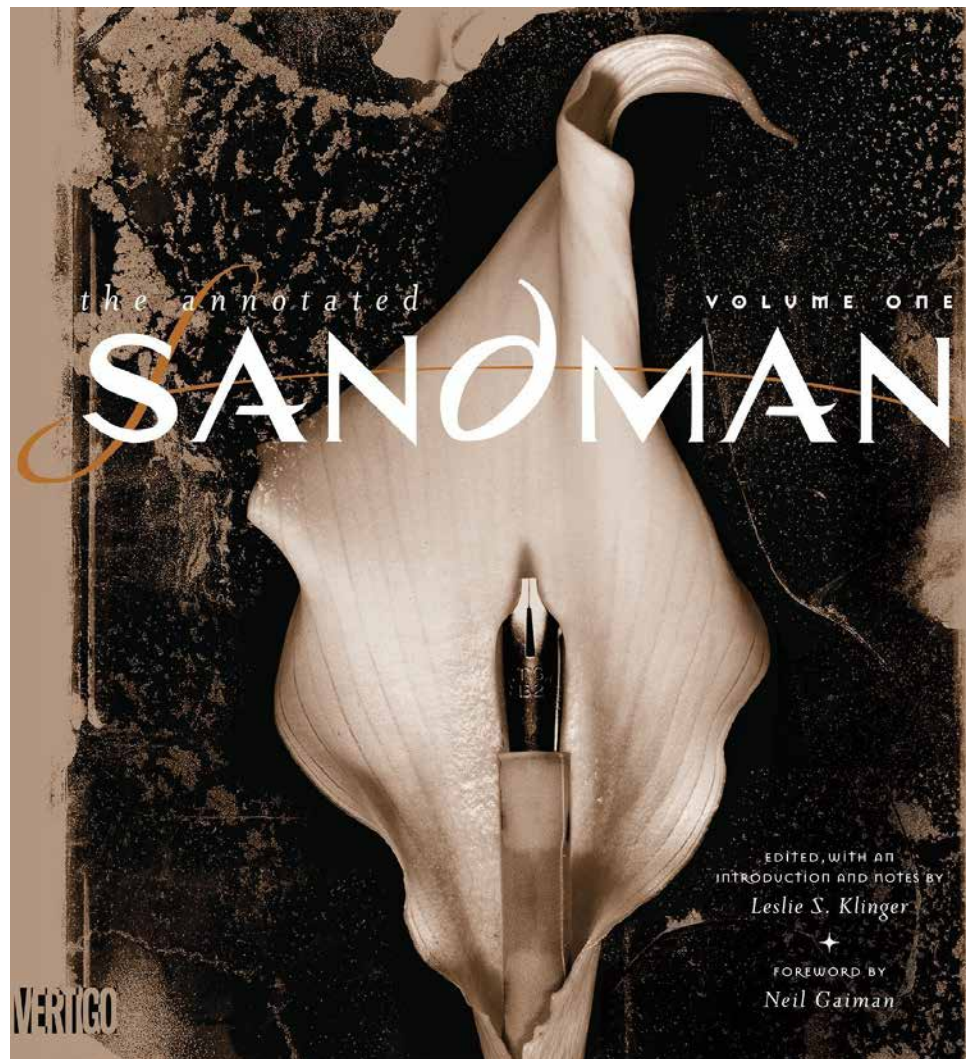
The purpose of the column was, at the beginning, to take an (extremely personal) look at some of the items in the SFF Collection that I found interesting; from the bizarrely obscure (the column began with Russell Braddon's *The Year of the Angry Rabbit* (1964), which many people have chuckled over but which few, apparently, have actually read) to the overlooked pioneers (Jane Webb Loudon's *The Mummy!: A Tale of the Twenty-second Century* (1827), in which *another* young woman not yet out of her teens theorises science fiction), to the source of bitter envy (Mary Gentle's *Scholars and Soldiers* (1989), in which a supporting character in a novel I was writing appeared to-the-life-as-drawn-from-the-same-sources on the page far, far, more inventively than I ever could have hoped to achieve). Naturally, "Favourites" have been biased towards a bit

of publicity: so several columns have been somewhat hastily written around items donated to us or acquired via donations: thus, we would not have acquired our copy of the scarce first edition of Edwin Lester Arnold's *Lt. Gullivar Jones: His Vacation on Mars* (1905) without a substantial bequest from the bookseller and fan Ken Slater, whose "Operation Fantast" did more than anything else to pick British sf fandom up after the War.

So it is probably right that I end with more "donations" and here I will go right to the top. Almost literally, in fact because I am talking about one of the SF Foundation's patrons, Neil Gaiman, and about one of the most valuable records of British sf.

Some years ago, Neil donated copies of almost everything in printed-book form to the SFF Collection (excluding, of course, the voluminous numbers of comic-books and spin-offs and ephemeral journalism, because that way madness lies). Recently, I asked for more. And another large box appeared . . .

Out of this box, *The Annotated Sandman* stood out. Partly because it is a huge, four-volume compilation that can do serious injury if picked up in the wrong way, but mostly because there are few comic books which have ever lent themselves to the critical position of being "annotated" in the first place. As it happens, we did have a complete run of individual issues of *Sandman* (donated by a comics collector who was downsizing), so the annotated volumes add immensely to the resources available in the library. Each page reproduces (in monochrome)

hanging in the final panel of *Sandman* 72 is Giorgione's *The Tempest*, painted around 1507. Gaiman's own words about his creation, culled from interviews and his scripts for the series, are extensively cited. Appendices include a chronology of the series, and a list of characters and their first appearances. There is probably much not covered by the annotations—listing every allusion and nuance probably ventures into the territory of the obsessive—and the strength of something like *Sandman* is, in reality, the way many of the allusions pass through you, half-understood, only to surface much later when you come across the original. , but this is a fine set to be browsed by the reader who wants to explore this major work in greater depth.

a single page of the comic book, to which notes are added by the volumes' editor Leslie S. Klinger. Not every panel (perhaps fortunately!) is annotated, but Klinger draws our attention to, for instance, the context in which characters and plot-lines appear, or the way in which Gaiman draws upon comic-book history and the wider "cauldron of story" for references we might well miss. In the first page of *Sandman* 2, in which the recurrent figures of Cain and Abel appear, we are told that Cain first appeared as a host in DC's *House of Mystery* #175 (July 1968) while Abel appeared in *DC Special #4* (May 22 1969), then reminded of the original Biblical story. Few, even in these degenerate days, would lack some sense of whom Cain and Abel *are*, but I certainly did not know that "Gregory" the gargoyle on page three harks back to the cover of that issue of *House of Mystery*. We learn also that the line "Happily ever after . . . in hell" (*Sandman* 28 p.23) is from a song cut from Stephen Sondheim's musical *Company* (1971) and that the painting

As said, a welcome addition to the library. Thank you, Mr Gaiman and your assistants!

As was a set of folders containing more about sf conventions than many people would ever want to know.

Peter Weston (for those who did not know him—and many did) was a Birmingham fan whose *Speculation* fanzine in the 60s and early 70s has become the essential source of material for first-hand reflections upon the British New Wave. He was also involved in sf conventions and his later fanzine *Relapse* is a mine of information for anyone interested in the history and personalities of British sf fandom (which included, of course, most of the major writers of the time). Before he died in 2017, Peter gave the SF Foundation an archive he had build up of British sf convention material from the very first gathering of sf fans in 1937 (programme books, progress reports, fanzine reports, ephemera such as name badges, and occasional correspondence) which is probably the most complete first-hand record of an important period in British sf. This is being catalogued and added to our already voluminous collection of convention material donated by Howard Rosenblum, the son of one of the founders of British fandom, J. Michael Rosenblum, and the authors John Brunner and Ramsey Campbell (frequent convention Guests of Honour).

Why was I so delighted when I received this? Partly because Peter was a friend of whom I have memories of that staple of conventions, sitting in the bar and putting the sf world to rights. Partly because the history of science fiction *IS* that history of the way sf fans and readers and writers (very often all three in the same bodies) got together to talk about sf. In these days of massive gatherings, it took a long time before attendance at even a Worldcon surged over more than the low hundreds, but in those sometimes amateurishly-produced "Souvenir Books" you will find material about writers whom you will barely find mention of in more conventional literary histories. In their speeches to early sf conventions, we find writers *defining* the genre, arguing about what it is and what it means. Like fanzines, SF convention material is a major primary resource of what people read when, and what they thought about it.

So thank you (the donors) for giving this wonderful resource. And thank you (the readers) for reading me . . . this is not exactly a goodbye, I hope, sort of "farewell for now." And I leave you with two thoughts. If you are a sf reader/fan, please support the SF Foundation (financial support is welcome). If you are a published writer whose books *ought* to be part of what is in effect the national library of science fiction, then please follow the example of the SFF's patron and donate copies. Posterity will thank you!

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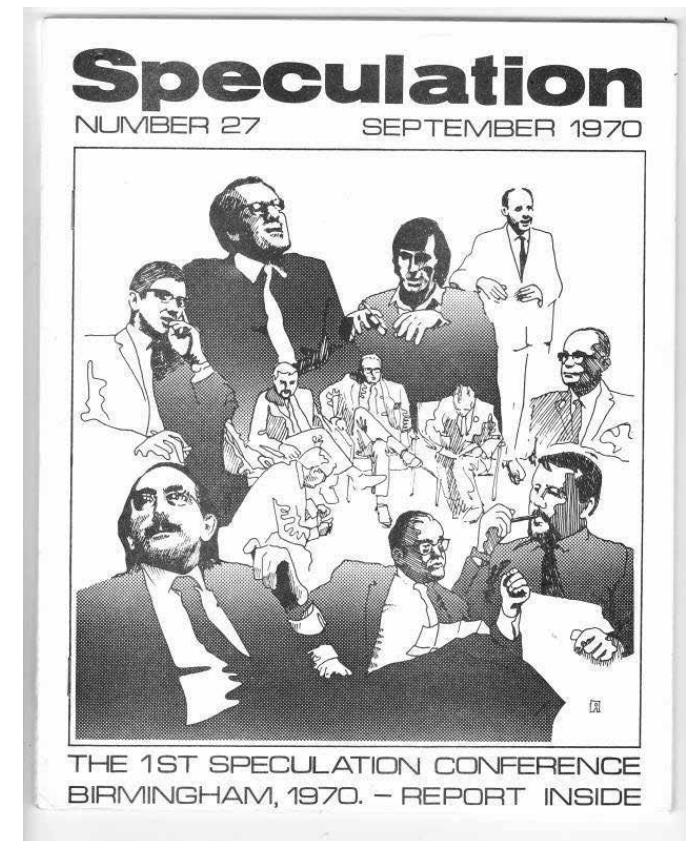
RESONANCES

STEPHEN BAXTER

Through a benevolent bit of serendipity, I recently came across a book called *How We Will Reach the Stars* by a Scottish writer called John Macvey. Originally published in 1965 under the title *Journey to Alpha Centauri,* it was reprinted under the later title in 1969 (Collier Books, page numbers from this edition). What intrigued me about the book was that while it is essentially popular-science non-fiction about the challenges of interstellar travel, its 243 pages include a sixty-page novella on a journey to our sun's nearest neighbour – authentic SF, and technically quite prescient too - even though you won't find Macvey mentioned in such sources as the online SF Encyclopaedia.

I like to think that one function of the BSFA is to be a kind of centre of gravity for SF culture in Britain. By 'discovering' Macvey and mentioning him in these pages, perhaps we have drawn him, and his readers, a little close to that centre.

Not that he needs discovering; Macvey is certainly not forgotten by those readers. I came across his work in a comment by one such reader on a post I made, with two colleagues, on the *Centauri Dreams* website. This is a discussion forum on all things interstellar, both technical and occasionally fictional. Our post concerned Kim Stanley Robinson's *Aurora* (Orbit, 2015), which kicked up something of a controversy in the space-cadet community. *Aurora* is a very technically detailed depiction of a generation-starship mission which ultimately fails. Stan's didactic purpose seems to have been to demonstrate, in his words, that 'no starship voyage will work' (chapter 7) – at least if crewed

by humans. Our critique pointed up a number of fatal technical flaws in the starship's depicted engineering, in the planet's posited biology, and in the sociology. Maybe human starflight is impossible; Stan doesn't seem to have proven the case.

Anyhow, in the course of the discussion, one correspondent asked about a comparison with another generation-starship study, Macvey's fifty-year-old depiction. Having never heard of this writer, I felt compelled to look him up.

John Wishart Macvey was born in Kelso in 1923. By profession he was a research chemist, working for ICI in Ayrshire. But he was an enthusiastic amateur astronomer, with his own observatory, and space buff, having been a council member of the Scottish branch of the BIS (British Interplanetary Society) and involved with a group called ASTRA, the Association in Scotland for Research into Astronautics. At one point he prompted the investigation of a novel SETI scenario. The Search for Extraterrestrial Intelligence is mostly carried out by radio astronomers seeking signals from civilisations at other stars, but Macvey suggested exploring the possibility of the detection of echoes of our own radio transmissions, much delayed and re-transmitted by an alien spacecraft in our solar system.

And in addition, Macvey wrote several popular science books, on such matters as colonizing other worlds, space warfare, time travel – and interstellar flight.

How We Will Reach the Stars is essentially a pretty comprehensive survey of the prospects for

starflight as seen in the 1960s – the first version being written, remember, before America had even begun to fly its two-man Gemini spacecraft. There are chapters on star types, planetary formation, and the possibility of alien life.

We get a rather sketchy review on interstellar flight in SF. Clarke's story 'The Songs of Distant Earth' (1959) (the seed for the later novel) is generously covered, with Clarke, another contemporary space enthusiast, praised for his prescience in pointing out that a high-speed starship would need a shield to protect it from the thin gases and dust of the interstellar medium. (Macvey doesn't cover any of the generation-starship fictions already written, such as Heinlein's 'Universe' (1941), or Aldiss's *Non-stop* (1958), which is perhaps surprising given this is the subject of his own fictional speculation later.)

Macvey is however pretty dismissive of the less technical SF of the pulps, with their '"space-warps" and "hyper-drives"' (p95), and as for the more ambitious material then emerging from the New Wave and elsewhere, he believes that more lurid 'tales of sex, sadism and violence' would have been better left unwritten (p97).

The most intriguing material in the book, of course, is on starship technology as anticipated then. Interstellar propulsion possibilities are covered, including nuclear fission and fusion drives, and ion drives (p40, 42). The fusion drives he describes have a similar performance to the design used by Robinson for his starship in *Aurora* fifty years later.

As for the journey itself, and leaving aside faster-than-light travel, Macvey distinguishes between high-speed travel – that is close to lightspeed – and travel at much slower speeds. High-speed travel is more challenging technically, but there are engaging chapters (with equations) on time dilation, and optical effects: what you would see from the bridge of a near-lightspeed starship overtaking the very starlight. As for low-speed travel, by means of which even the closest stars are centuries away, the technical possibilities explored are generation starships, or suspended animation: 'the long sleep' (chapter 5). Of these the generation starship is seen as a
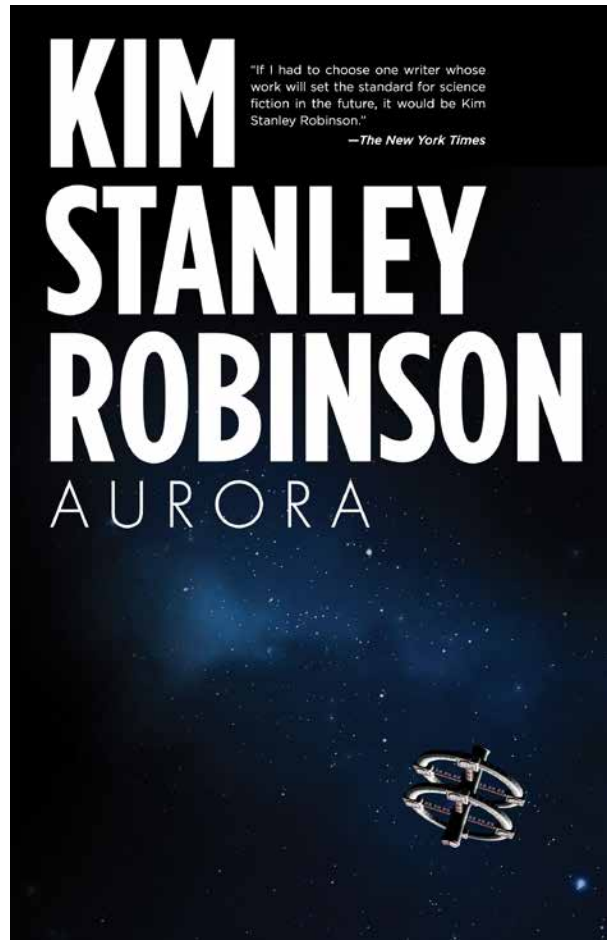
more practical proposition for the relatively near future.

And it is a generation-starship mission, just as in Robinson's *Aurora*, that Macvey describes in his novella.

The story is presented in the form of first-person journal entries by crew members aboard the *Columbus* and the *Drake*, two mighty starships launched from their construction base in Earth orbit on January 12, 2500, each carrying 3000 crew (p182). After brief acceleration periods the ships cruise to Alpha Centauri at 2% of lightspeed, taking 215 years, or eight generations, to reach the target (p181). Macvey doesn't describe his ships in detail in the fiction, but in the non-fiction sections (p48) he says a likely form for a starship would be a sphere, rotating for spin gravity at the equator, and with thrust applied by engines along the rotation axis.

Macvey is good on the sociology of his generation ships, which he also covers in his non-fiction sections (chapter 6). He argues that 6000 crew ought to be enough for a genetically diverse founding population on a colony world - and as for the journey itself, he carefully thinks through some surprising consequences. There would have to be tight controls on reproduction, not only upper limits but minimal required replacement rates too: you don't want over-population, but you don't want your crew dying out either. So women are expected to have married by the age of 30 – all births, at the beginning of the journey at least, being under wedlock. Later, after sickness (caused by unanticipated radiation) devastates the crew's numbers, there is a sex imbalance, and *compulsory* artificial insemination is used to impregnate unmarried women. Such measures seem unacceptable to us, of course, but they illustrate the fact that life in a long-duration space habitat such as a starship will impose constraints on liberty of all kinds.

And the crew is aware of this. While the first generation come to terms with spending the rest of their lives in their mobile prison, they muse on the ethics of condemning generations to come to the same fate: 'We had a choice. They have none' (p194). Macvey hopes, perhaps a little wistfully, that the grandeur of the outside

reach the stars, says his title – but the 'how' will be extraordinarily difficult, imposing both technological and sociological challenges.

In later life Macvey retired early though ill-health, but continued as a writer, amateur astronomer and ham radio enthusiast, and even studied for a degree in geology. At the time of his death in 1990 he was working on a book on the San Andreas Fault. I never met Macvey, and I suppose his work is dated now. But personally I'm grateful to that reader of my blog entry for introducing me to Macvey's enthusiasm and expertise, all these years later. As Macvey says in his preface to *How We Will Reach the Stars* (p ix), 'Is it wrong to dream?'

universe and an awareness of the significance of the mission will help the later generations maintain an 'esprit de corp' (p69).

The two ships limp on to Alpha Centauri, where the crews are lucky enough to find a habitable planet (chapter 17) – and luck is the word. Macvey did not anticipate the ability to examine exoplanets and their atmospheres from the solar system, an ability we are developing now; he imagined his colonists would have to be sent into the unknown. But he did speculate on the possibility of extraterrestrial life inimical to humans (p157) – just as befell Robinson's explorers in *Aurora*.

In all the book is a pleasant and engaging read, the science and the sociology still pretty much standing up, the SF respectable if a little didactic, and the sociological exploration in particular a thought-provoking exploration of difficult issues. It is an interesting comparison to Robinson's novel, anticipating much of the ground Stan covers. But Macvey's conclusion is different. Unlike Stan he does not believe interstellar travel is impossible – we 'will'

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VECTOR
Future Economics

ILLUSTRATIONS AND DESIGN

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COVER DRAWING BY IAN LONG, INSPIRED BY SAMUEL R. DELANY'S DHALGREN

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Polina Levontin and Jo Lindsay Walton, with assistance from Seonaid MacKay.

THE SPECULATIVE ECONOMIST'S SCRAPBOOK

"Having said that SF writers would benefit from having better knowledge of economics, I would hasten to add that the main beneficiaries from the interaction would be economists. From the beginning SF has been a very powerful way for us to imagine alternative realities in which very different technologies have changed our institutions and thereby individuals, forcing us to rethink the assumptions about institutions and individuals that economists take for granted in analysing the economy."
Ha-Joon Chang, "Economics, Science Fiction, History, and Comparative Studies" (2018)

"Everybody's saying it: we need a new economic story, a narrative of our shared economic future that is fit for the twenty-first century."
Kate Raworth, *Doughnut Economics* (2017)

"To write science fictions about the economy is to insist on the possibility that the imagination can intrude into economic life in an uninvited way that is not computable or accountable."
Will Davies, *Economic Science Fictions* (2018)

"If markets indeed validate truth, then the cadre that gets to construct the markets gets the final say on the nature of truth."
Philip Mirowski and Edward Nik-Khah, *The Knowledge We Have Lost in Information* (2017)

"The early practitioners of sf, figures such as H.G. Wells, Olaf Stapledon, M.P. Shiel and Edward Bellamy [...] were interested in economics and the intersection between politics, society and science. They were influenced by a strand of ecology known as energy economics, a branch of applied economics that has now been incorporated into the broad domain of sustainability science. Its theoretical basis is grounded on ecological notions of entropic processes and the recognition of Earth's finite resources. Wells and Shiel were especially interested in the socialist underpinning of Henry George's (1879) Progress and Poverty, illustrating that an interest in ecologically motivated economics and socialism has been a longstanding feature of sf."
Chris Pak, "'The goal of Martian economics is not "sustainable development" but a sustainable prosperity for its entire biosphere': science fiction and the sustainability debate" (2015)