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Mapping the technologies of spatial (in)justice in the Anthropocene

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The production of space is dependent on a variety of social practices and physical conditions, meaning the experience of space and time varies between particular individuals, groups and cultures: 'Castles, palaces, cathedrals, fortresses, all speak in their various ways of the greatness and the strength of the people who built them and against whom they were built' [H Lefebvre, *Critique of Everyday Life* (Verso, London 1991) 232]. Just as social models and relationships are contingent upon and shaped by large-scale policies and organising mechanisms such as almanacs, calendars and maps; cultural norms and economic prospects are also influenced by temporal and spatial structures. The spatial turn provides a material grounding from which to address the erosion of jurisdiction in a world of algorithms, globalisation and advanced capitalism. By reconsidering the means by which the physical infrastructure is allocated and appropriated by citizens across the socioeconomic spectrum, it moves towards an understanding of how social justice expresses itself in the technologically mediated urban environment. The spatial concept of the Anthropocene provides a further opportunity to explore the ontological distinction between humanity and nature, as the pace of technological advancement continues to outstrip our potential to control these new sites of opportunity and exclusion.

Keywords: Anthropocene; technology; spatial justice; globalisation; law's spatial turn

1. Introduction

Having progressed from savagery and barbarism to modern civilisation, the sociocultural evolution of humankind is organically connected with technological advancement. In *The Question Concerning Technology*, originally presented as the second of four lectures in 1949, Martin Heidegger refers to technology as 'no mere means, it is a way of revealing … The revealing reveals to itself its own manifoldly interlocking paths, through regulating their course'.[1] The consequent development of more efficient methods of working and production, along with the commercialisation of private life and the leisure industry has expedited the growth of capitalism; whilst the manufacture of knowledge and information systems is in the process of transforming all human relations. In the early days of the Internet, this disembodied space promised pluralism, diversity, individuality and the formation of new virtual communities, and importantly possessed a humane orientation; however, it is now pertinent to question what technologies contribute and what they take away from

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[1]M Heidegger, 'The Question Concerning Technology' in W Lovitt (trans), *The Question Concerning Technology and Other Essays* (Harper and Row, New York 1977) 3–35, 12, 16.

human life and human culture. The concept of the Anthropocene provides an opportunity to reassess the ontological distinction between human culture and nature, along with the impact of technologies on lived experience. The beginning of the Anthropocene is supposed, by some, to have begun at the dawn of agriculture, when the planting and cultivation of crops and the ploughing of fields was considered to have disrupted and changed the Earth's natural ecosystems. Others state it started 2000 years ago in the mid-Roman period, with the expansion of large cities governed by regional empires which extended their reach across the globe; and more often, the Industrial Revolution is acknowledged as the commencement of the 'Human Age'.

Just as agriculture is now synonymous with the mechanised food industry, for Heidegger the rising demand for coal and expansion of mining in the late 1700s and early 1800s meant 'a tract of land is challenged into the putting out of coal and ore. The earth now reveals itself as [merely] a coal mining district, the soil as a mineral deposit'.[2] This ontological process of *gestell* or 'enframing' – an amalgam of techné, poiesis, and episteme – reimagines the Earth instrumentally, as merely an energy resource along with the sky as particles and gases, and the complicated surface of Pluto will become whatever those with influence desire it to be. In this way, enframing 'banishes man into that kind of revealing which is an ordering. Where this ordering holds sway, it drives out every other possibility of revealing'; namely, when we gaze upon Pluto with the intention of technologically enframing it, the possibility of disclosing alternative forms of revelation is diminished.[3] The distorting and reality-bending effects of new technologies produced an ontological and social crisis which, even some 65 years ago, necessitated a questioning of the purpose and intentions of technology along with its methods of ordering the natural world.

Although there is some disagreement over the official onset of the Anthropocene, the concept has created a paradigm shift which extends beyond the natural sciences; towards influencing important developments within politics, philosophy and law. Human behaviour has become a global geophysical force, responsible for producing a transformation of the Earth's biophysical systems; for example atmospheric CO_2 concentration has increased from 310 to 380 ppm since 1950 with 50% of this increase occurring in the last 30 years. The post-war population boom and sharp rise in pollution, consumption and technological innovation marks the most recent stage of the Anthropocene; often referred to as the 'Great Acceleration'. The extraordinary impact of human activities on every ecosystem suggests new qualitative and quantitative possibilities for governance, scientific and socio-economic research and the generation of critical knowledge about the future of the planet and its people. All of which, animals, things, people and places, are irrevocably changed by the transformative effects of modern technology; '(t)he field that the peasant formerly cultivated and set in order appears differently than it did when to set in order still meant to take care of and to maintain'.[4] 'We have passed from the production of things in space to the production of space itself':[5] As Lefebvre suggests, space is not merely 'out there' as a 'space like any other space', rather it signifies the process, product and by-product of all social relations and, as such, is grounded in public institutions, legal and governmental

[2]M Heidegger, *The Question Concerning Technology and Other Essays*, W Lovitt (trans) (Harper & Row, New York 1977) 14.
[3]ibid 27.
[4]ibid 15.
[5]H Lefebvre, 'Space, Social Product and Use Value' in N Brenner and S Elden (eds), *State, Space, World: Selected Essays* (University of Minnesota Press, Minneapolis 2009) 186.

authority and social practices. How we describe and conceptualise public space is inextricably linked with what it means to be human in a particular society, and the extent to which the prevailing culture either perpetuates or strives to mitigate spatial injustice.

It is incumbent upon public agencies across a wide range of fields, therefore, to adopt a critical stance about their own roles in creating commonalities across difference in areas as diverse as environmental activism, urban planning to the accessibility of essential technologies. For instance, 'Broadband and mobile coverage have become essential utilities, like water or power. Without coverage it is like living in the old world without a post box or hot water.'[6] Edward Soja has discussed the imperative of spatialising political debate and social struggle, in order to ensure a more equal distribution of access, resources and services as a basic human right. This requires

> focusing in on specific examples of where and how (in)justice takes place [which] helps to ground the search for spatial justice in socially produced contexts rather than letting it float in idealized abstractions and too easily deflected calls for universal human rights or radical revolution.[7]

Spatial justice is not merely an abstract concept; its utility lies in its capacity to elucidate the complex set of relations between capital, technology, governance and space. It also has the ability to extend the shared responsibility for producing debate and addressing injustice, to all engaged agencies (such as law-givers, economists, geographers, politicians, scientists and technologists) located within the very socio-spatial systems they inhabit. This article proposes to critically address the spatial nature of social interaction and the injustices that are (re)produced through spatial relationships, by exposing the complex interdependencies between cultural, juridical, technological and political questions.

2. From centrifugal to centripetal: man and machines in the Anthropocene

The Anthropocene provides a spatial framework for explicating the societal impact of technology as a transformative force, within the context of globalisation. The origins of the term 'Anthropocene' are complex; etymologically it is a compound word from the Greek *anthropos*, meaning 'human' and *kainos* meaning 'new'; and mimics more traditional geological terms such as Pleistocene, 'the most new'. The Anthropocene has been defined as the period from when *homo sapiens* began to alter the geological record across the globe.[8] Man is leaving many such records; chemical changes increased pollution, traces of anthropogenic global warming or alterations in the biological record of lake sediments, as natural vegetation is replaced by agriculture. Wolfe and others discerned two such anthropogenic shifts in the geology of North American and Arctic lake sediments, at around 1950–1970 and again after 1980. Cities are now 'the essential habitat of mankind';[9] urban centres and the farmland necessary to feed them are leaving ever more indelible marks in the geological record. Cities are also inextricably linked with the concept of

[6]Baroness Neville-Rolfe, HL Debate, 13 May 2014, col 1749.
[7]EW Soja, *Seeking Spatial Justice* (University of Minnesota Press, Minneapolis 2010) 31.
[8]AP Wolfe and others, 'Stratigraphic Expressions of the Holocene-Anthropocene Transition Revealed in Sediments from Remote Lakes' (2013) Earth Sci Rev (116), 17–34.
[9]R Wittig and others, 'What Should an Ideal City Look Like from an Ecological View? – Ecological Demands on the Future City' in LM Marzluff (ed), *Urban Ecology* (Springer, New York, 2008).

globalisation,[10] having functioned since the beginning of civilisation as the centres of technology and innovation, and the pace of technological advancement speeded up from 1950. The 1950s signalled the beginning of the 'Great Acceleration',[11] when a wide range of global socioeconomic and demographic indicators (from total population to energy use, from rivers dammed to fertiliser consumption, from tourist numbers to cars and telephones in use) increased markedly. Alternative dates for the commencement of the Anthropocene include the Industrial Revolution, in Britain in the late 1700s, or the year 1610,[12] when European colonisation of the Americas caused a fall in atmospheric CO_2 as European diseases killed many indigenous Americans and native farms were abandoned to forest regrowth. Other bioclimatic pivot dates have been proposed such as the expansion of the Roman Empire from 600 BC, linked to changes in agriculture and forest cover across large regions of the globe. Although the starting point for the Anthropocene is contested, each proposed year is closely linked to a key stage in the internationalisation of the world economy.

The exact time when internationalisation developed into globalisation is as disputed as the commencement of the Anthropocene. It is a step change from the transcontinental trade between Rome and China[13] or the Triangular Trade of European colonisation,[14] which still integrated economies across four continents. Nevertheless, all definitions of globalisation incorporate a concept of technologically enhanced and speeded-up communications, just as proposed dates for the Anthropocene are linked to key techno-social changes. Giddens defined globalisation as '(T)he intensification of worldwide social relations which link distant localities in such a way that local happenings are shaped by events occurring many miles away and vice versa.'[15] Ohmae speaks of the 'borderless world' of globalisation and Robertson wrote of 'the compression of time and space'. Instant messages have facilitated this space–time compression with rapid growth in, first electric, and then the electronic communications of the Great Acceleration. The global landline telephone population rose from zero in the 1870s to 1270 million in 2008, but in the wake of wireless communications, this means of communication has become outmoded and begun to fall in many countries; as the world's mobile phone population has soared to 5300 million in 2010, and the global number of Internet users has rocketed to 2400 million in 2010. Africa, the world's poorest continent, has almost leapfrogged landline phone technology altogether, as its mobile phone numbers rose from 16.5 million in 2000 to 650 million just 12 years later.

The paradox is that our ultraconnected world remains intensely divided, socially and spatially. These divisions are in fact deepening and the boundaries of affluence shrinking back, even as the Great Acceleration broadens out Western capitalism and culture to new territories. A root cause of this paradox is, *who owns*, and *who benefits from*, the new silicon technologies that have typified the Great Acceleration. African fishermen on Lake Victoria, for example, use their mobile phones to ascertain which port has fewest fish for sale, and hence a higher price.[16] The welfare of both fishermen and consumers rises in

[10] S Dalby, 'Anthropocene Geopolitics: Globalisation, Empire, Environment and Critique' (2007) Geogr Compass 1(1), 103–18.
[11] W Steffen, PJ Crutzen and JR McNeill, 'The Anthropocene: Are Humans Now Overwhelming the Great Forces of Nature?' (2007) Ambio 36(8), 614–21.
[12] SL Lewis and MA Maslin, 'Defining the Anthropocene' (2015) Nature (519), 171–80.
[13] Roman emperors wore silk garments, then only obtainable from China.
[14] P Dicken, *Global Shift: The Internationalization of Economic Activity* (Guildford Press, London 1992) 1.
[15] A Giddens, *The Consequences of Modernity* (Polity Press, Cambridge 1990) 64.
[16] V Vasagar, 'Talk Is Cheap, and Getting Cheaper' *The Guardian* (2005) 25.

this example of the centrifugal nature of capitalism; always seeking out new locations where better returns are available. However, the per capita ownership of mobile phones in Africa, and across the developing world, remains low. In 2011 the 1.2 billion people of the developed world possessed 1.4 mobile phones per head; the 5.7 billion in the developing world had 0.6 per capita. The divide is even wider for computers; the wealthy 1.2billion had 0.6 PCs per head, against 0.1 for the poorest 5.7 billion.[17] The demography of cyberspace has not changed much since Aurigi and Graham described it as 'remarkably white, middle class and well educated'.[18]

The centrifugal tendencies of capital investment are frequently overwhelmed by the centripetal tendencies of the rewards from those investments. China is poorly rewarded for being the world's workshop; of the US$299 paid by an American consumer for an iPod assembled in China in 2007, just US$4 stayed in the Chinese economy, whereas US$160 went to the US companies that designed, transported and retailed the iPod.[19] These two opposite trends of capital flows, centrifugal for the cheap low-wage assembly workers and centripetal for the profits from those workers, are mirrored in the two opposite forms of globalisation described by De Souza Santos; localised globalism for the peripheral countries and globalised localism for the core regions.[20] The periphery or Global South has had foisted upon it the localised globalisms of deforestation for agribusiness plantations, touristification of sacred sites, free trade assembly enclaves and natural resource depletion at discounted prices. The core regions enjoy the rewards from globalised localisms such as the ubiquity of McDonalds, US-enforced trade agreements or copyright laws, the universality of Western/US cultural signifiers, from music and dress to forms of urban structure and the use of (American) English as a *lingua franca*.

Just as communication technologies facilitated the economic efficiency of those fishermen on Lake Victoria, they have also created this connected-yet-divided world whose divisions have intensified since the technologies of the Great Acceleration further advanced both globalised localisms and localised globalisms. These technologies, from the European ships of 1610 and the railways of the Industrial Revolution to the jet aircraft and computers of the twentieth century, are more than simply communicative; they change our very culture. Shipping helped institute Greenwich as the world's universal time meridian, and railways imposed a universal time across countries where time was once set at local noon. Jet aircraft have brought over 90% of the world's population within a day's travel of each other, and IT has given us instant communication, instant knowledge, instant control over distant people and enterprises. IT-facilitated automation – where humans communicate with machines as much as with fellow humans, from ATMs and automated switchboards to robotic carers for Japanese pensioners – is having an even deeper effect on our culture. In the epoch of the Anthropocene, the centripetal nature of the rewards from technological innovation threatens to metamorphose the global core towards an infinite height, miniscule size and perhaps infinite instability.

[17]Slideshare.net (2015) <http://www.slideshare.net/jonhoehler/insights-into-mobile-telecoms-in-africa-by-jonhoehler-andrewmchenry> accessed 7 August 2015.

[18]A Aurigi and S Graham, 'Virtual Cities, Social Polarisation and the Crisis in Urban Public Space' (1997) J Urb Tech 4(1), 19–52.

[19]DS Hamilton and JP Quinlan, *Globalization and Europe: Prospering in the New Whirled Order* (Center for Transatlantic Relations, Washington, DC 2008).

[20]B de Sousa Santos, *Towards a New Common Sense* (Routledge, London 1995).

3. The late modern malaise of the centripetal city

The economics of the nineteenth century enshrined first Britain then a handful of other countries such as Germany and the USA, as the global 'core'. Many cities and regions of Great Britain prospered and the Corn Laws ensured prosperity for many rural landowners too, until these Laws became an encumbrance to industrial growth in the 1840s and were repealed. Some regions were bypassed and became what Howe termed 'internal colonies', such as Ireland, a part of the UK until 1922.[21] The centripetality of the twenty-first century has produced a set of much smaller outstanding cores; the global cities of the new millennium, for example London, Los Angeles, New York, and perhaps aspirant cities such as Manchester. Flanders, Economics Editor for the BBC, seriously considered whether London should be, or even still was, a part of the UK.[22] London is a wealthy professional IT and banking services city whose wealthiest 10 boroughs were worth more in property values than the whole of Scotland, Wales and Northern Ireland put together; without London, the rest of the UK would be a middle-ranking manufacturing nation. A poll by Censuswide found 20% of respondents (nearly half of respondents aged 25–34) would support the actual secession of London from the UK. Transport links such as HS2 and Crossrail, funded by Government, reinforce London's dominance over the Midlands and other regions. HS2 is still being contested by opposers who believe its UK £50 billion costs could be better spent elsewhere, with higher social equity. Meanwhile Soja has analysed the case of Los Angeles where less-affluent bus users successfully diverted funds from a rail project that would have benefitted wealthier commuters.[23] This (temporary) triumph of spatial justice in the transport sector is rare. More often transport links favour the wealthy in a self-reinforcing circularity of free market housing prices (social housing has eroded to a rump leaving private rental or purchase as the only options) being bid up where new rail links are built, or even planned and on the remote horizon. UK house prices have already risen in 2015 in districts where Crossrail stations will open in 2019. The affluent then replace the poor, international finance supplants local industry, and the politics of money ensures further improved links.

There is a socio-spatial dialectic whereby the geography of infrastructure, of built technology, does not merely reflect the underlying socioeconomic hierarchy but itself produces that hierarchical order of access to and usage of technology; politics produces space and space produces politics.[24] When the London 'Docklands', from Tower Bridge six miles east to Beckton, actually was docks and industry, it was poorly served by public transport. The shiny new Jubilee Line, Docklands Light Railway and Overground cross-Thames line (replacing the shabby East London Line) only materialised under the Thatcherite transformation of 'Docklands' into an eastern extension of The City, centred on the celestial towers of Canary Wharf. That name is now faintly ironic, having its origins in the docks trade in fruit imported from the Canary Islands. The power to name is the power to control;[25] the power to control is the power to dissemble, reimagine and exclude. In this way, the European colonisers of North America took over the territory and excluded its original Amerindian

[21] S Howe, *Empire: A Very Short Introduction* (Oxford University Press, New York 2002) 20.
[22] S Flanders, 'Should Britain Let Go of London?' BBC (2013), <http://www.bbc.co.uk/news/business-21934564> accessed 7 August 2015.
[23] EW Soja, *Postmetropolis: Critical Studies of Cities and Regions* (Blackwell, Oxford 2000) 352.
[24] EW Soja, 'Thirdspace: Expanding the Scope of the Geographical Imagination' in Doreen B Massey, John Allen and Phil Sarre (eds), *Human Geography Today* (1999) 260–78.
[25] C Pursell, *White Heat* (BBC Books, London 1994) 121.

inhabitants by both imposing European names upon the landscape and by appropriating Amerindian names for European usage.[26] Pontiac became an automobile brand, and Ossining became a prison town; both concepts alien to the Amerindians. In similar manner the poor are excluded from privileged regions of the city; this exclusion reinforced physically by the security guards that prowl the upmarket shopping malls in the bowels of London's Canary Wharf, weeding out those who do not look like upmarket consumers. The financial exclusion of the poor was typified by the sale, in August 2015, of a former council flat in a gentrified part of London's Covent Garden for £1.2 million, or 67 years' worth of the London Living wage. The buyer was untroubled by the flat's social housing 'council property' provenance as 'there is a whole generation of people now who don't even know what a council house was'.[27] The flat was bought in 1990 under Right to Buy legislation for £130,000; the actual tenant may not have possessed this money but wealthy agents will do a deal to stump up the necessary resources. The occupier gets a windfall in cash but it is a Faustian Bargain; they lose the right to any more social housing forever. Urban spatial inequalities rise as the poor are tempted out; or forced out, as older social housing is condemned, not refurbished, and replaced by private executive flats. Not only the poor but even their memories are being expunged from the locales of the chosen few, to the point where Mitchell asks, 'have we reached the end of public space?',[28] as even shopping malls become socially policed areas; the mall itself being a privatised replacement for the public theatre of the traditional High Street.

Twenty-first century core regions, then, do not even include the entire city. Bauman wrote of 'cities of little fortresses', protected from poorer fellow urbanites by an array of IT-based defensive, offensive and surveillance technologies.[29] Note the reference above to London's 'wealthiest ten boroughs', whilst the other 22 contain neighbourhoods of severe deprivation, especially in the north-east of the city. The commodification of open space and enclosed accommodation leads to a 'rising sense of fear, mistrust and fortification within cities' in a self-perpetuating vicious circle of further enclosure, commodification and exclusion.[30] Meanwhile the poor also cage themselves up at night against the 'zombified city',[31] fearing each other rather than the distant affluent who may ultimately bear more blame for their feelings of unease.

The rewards of the Great Acceleration have gone increasingly towards the wealthiest 1% or fewer; much fewer in fact. Across many developed countries, the share of total income taken by the wealthiest 1% has evolved according to politics rather than cyclical busts and booms. The top 1% share tended to fall across a range of countries including France, Germany, the Netherlands, Sweden, the UK and USA, from 1900 to the 1950s, then rose with a vengeance from the 1980s[32] and is now as high, or higher, than it was in the 1920s. There is little trace of the 1930s recession or the two World Wars, but politics

[26]E Relph, *Place and Placelessness* (Pion, London 1986) 17.
[27]The Economist, *Cleaning up* (1 August 2015) 21–2.
[28]D Mitchell, 'The End of Public Space? People's Park, Definitions of the Public and Democracy' (1995), Annals Association American Geographers 85(1), 108–33.
[29]Z Bauman, *Collateral Damage* (Polity Press, Cambridge, UK 2011) 63.
[30]A Aurigi and S Graham, 'Virtual Cities, Social Polarisation and the Crisis in Urban Public Space' (1997) J Urb Tech 4(1), 19–52.
[31]M Davis, *Beyond Blade Runner: Urban Control – The Ecology of Fear* (Open Magazine Pamphlet Series, Westfield 1992) 7.
[32]D Dorling, 'Division Grows as Inequality Multiplies' *Times Higher Education* (25 September 2014), 35–41.

is significant. Most post-war Western democracies adopted redistributive Keynesian economic policies through to the mid-1970s, following the principle of equality of access for the least-advantaged.[33] However, by the 1970s this egalitarian Fordist accumulation model of capitalism had produced powerful unionised often militant workforces whose mass power was sufficient to provoke economic disruption leading to the novel economic problem of 'stagflation'; there were also political crises in the USA such as Vietnam and student protests. The election of neoliberal politicians such as Reagan and Thatcher was a reaction to this debacle, and from the 1980s ushered in the current era of 'flexible capitalism', whose world reach has been greatly facilitated by the global silicon technologies.[34] In the US the top 1% now appropriate almost 20% of total income whilst globally the top 0.7% possess 44.0% of total wealth.[35] Over time, more socialist developed countries such as France and Sweden exhibit consistently lower shares for their top 1% than do the UK or US. There is also a close correlation between (1) the share of US GDP taken by the top 1% and (2) the % of global foreign investment assets as a proportion of total developed-country GDP, 1900–2012.[36] (1) is a measure of inequality and (2) is a measure of globalisation, telling us where the rewards of globalisation are largely going.

The Great Divergence has seen a concentration of wealth within the US top 1% so that from 1980 to 2014 the inflation-adjusted average income of the top 0.1% US households rose from US$2 million to 7 million; the top 0.01% saw their average incomes rise from US$4 million to 31 million.[37] This shrinking but rising core of wealth is even mirrored in the physical skyline of our cities. Eighteenth- and nineteenth-century iconic landmark buildings tended to be communal or government oriented, grand places of worship, palaces or administrative edifices such as St Paul's Cathedral or the White House; they were block-shaped and seldom any higher than they were wide. Even the Eiffel Tower, opened in 1889, has a height to base ratio of under 2.6. Today's iconic buildings, from the Empire State Building to the Petronas Towers and the Burj Khalifa, have height to base ratios of nearer 10 and reach almost a kilometre skywards. These modern icons are oriented more towards private usage as offices, upmarket flats and luxury hotel and restaurant space. The Great Acceleration of technology that has facilitated the construction of such skyscrapers and indeed created the demand for them has also produced the ever more unjust distribution of wealth of the early twenty-first century. The wealthy have amassed more wealth not just because global communications technologies have given them access to more of it, but because such technologies have depressed the wealth of the bottom 99%; widening out the base of the lowest earners and shrinking the numbers of middle earners.

4. The perfect crime: machines that stole the middle

The *Washington Post* noted the growing inequality across America, with 'superzips', ultra-affluent postcodes, where 'it's possible to … rarely encounter others without college

[33]A Bromberg, GD Morrow and D Pfeiffer, 'Editorial Note: Why Spatial Justice?' (2007) Critical Planning: UCLA Journal of Urban Planning 14 (Summer).
[34]C Fuchs, 'Transnational Space and the 'Network Society'', 21st Century Society (2007) 2(1), 57.
[35]The Economist, *Economic and Financial Indicators* (18 October 2014) 97.
[36]The Economist, *The Gated Globe* (Special Report, 12 October 2013).
[37]A Lowrey, 'Even among the Richest of the Rich, Fortunes Diverge' *New York Times* (10 February 2014) <http://www.nytimes.com/2014/02/11/your-money/even-among-the-richest-of-the-rich-fortunes-diverge.html> accessed 14 August 2015.

degrees or professional jobs', whilst 'middle-income neighborhoods have been fading away as more people live in areas that are either poor or affluent', and 'the working class and the poor become confined to communities where no one has a college education and no one has connections to the world'.[38] Growing spatial inequalities in healthcare, access to healthy food and education play a major role in diminishing the middle. Poor areas are abandoned by the best doctors and the greenest food retailers, reducing life chances and healthy life years for the least affluent, especially in countries where such services are privatised. Harrison[39] noted this 'inverse-care law' in Hackney, east London; this is the antithesis of the 'just city' proposed by Young,[40] where no groups are excluded through unequal space or access to technology. In America the best instructors get employed by the best schools and universities, always located in the leafiest 'superzips'. The high fees to access these establishments debar the poor even if they could physically reach these educators of the elite; without the certificates from these places, more valuable than a share certificate from a blue-chip firm, the poor stay in poor jobs and their children stay poor. The 'superzips' do create entire hierarchies of jobs, some well-paid, many not. A largely Hispanic workforce cleans, gardens and maintains these superhouses, and pampers their billionaire residents; Castillo, a masseuse for the Hamptons oligarchs, says she makes US$650 a week with tips but 'without tips I can do nothing'.[41] Spatial inequality is also inequality over time, uncertainty of income from one week to the next, job insecurity and the lack of accountability associated with casual remuneration by socially and physically remote employers; Hamptons oligarchs can afford to spend only 16 summer weekends a year in these US$60 million mansions.[42] Social processes interact with physical space to produce what Soja terms the 'socio-spatial dialectic';[43] social and economic processes produce spatial inequalities that themselves delineate and reinforce social inequalities, through the ownership and operations of technology and technological processes.

It is the impact of technology on the middle jobs, however, that may explain the widening socio-spatial inequalities in the USA and other developed countries. *The Economist* notes how numbers employed have changed, 2002–2010, categorised by income decile.[44] Deciles 1 and 2 (the lowest) have grown by 2% each, and deciles 8 and 10 have increased by 1% each. All other deciles have fallen, with deciles 5, 6 and 7 down the most at 2% each; a true hollowing out of the middle. During the 1980s, the industrial jobs, with their skilled-manual work, moved to the Pacific NICs; the ICT revolution automated away many semi-skilled manual jobs, whilst skilled IT personnel prospered. In the twenty-first century, machines are replacing far more than human car assemblers. Bank tellers, shop checkouts and call handlers, are amongst the lower paid jobs to go. Search engines like Google replace librarians; computers can search for and even analyse

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[38]Washington Post, 'A World Apart' (9 November 2011) <http://www.washingtonpost.com/sf/local/2013/11/09/washington-a-world-apart/> accessed 14 August 2015.
[39]P Harrison, *Inside the Inner City* (Penguin, London 1983).
[40]MI Young, *Justice and the Politics of Difference* (Princeton University Press, New York 1990).
[41]R Neate, 'The Other Hamptons, Where Life Is Hard All Year Long' *The Guardian* (15 August 2015) 21.
[42]G Lovink, *The Principle of Networking. Concepts in Critical Internet Culture* (Hoge-School van Amsterdam, Amsterdam 2015).
[43]EW Soja, 'In Different Spaces: Interpreting the Spatial Organization of Societies' (Proceedings 3rd International Space Syntax Symposium, Atlanta 2001) <http://undertow.arch.gatech.edu/homepages/3sss/papers_pdf/s1_Soja.pdf> accessed 14 August 2015.
[44]The Guardian (2015) <http://www.theguardian.com/money/2015/aug/13/ex-council-flat-in-central-london-sold-for-record-12m> accessed 13 August 2015.

information, putting at risk many regular middle-wage jobs. These include routine medical examinations, simple design work (CAD) and mundane legal tasks such as form filling and information retrieval. Computers might even decide routine legal cases such as speeding infringements and general road traffic offences. University lecturers, once middle to high status, present a case study of a whole range of the limiting, stultifying and ossifying effects of technology; from machine marking of essays (semantic recognition programs) to PowerPoint-based instruction to the restrictive effects on flexible use of teaching space when students use fixed-position terminals in the classroom.[45] Those who lose middle rank jobs will seek similar or higher level posts; few will succeed because there are few such vacancies available, so many will join the ranks of lower status workers, putting downwards pressure on the remuneration for these jobs.

Technology also makes us do our own work; we become our own supermarket checkout operators, travel agents, accountants, typists and educators, and we make time for these extra tasks by outsourcing household tasks such as cooking, entertaining, cleaning, perhaps soon even driving, to machines not people. The declining price of technology is a major factor in this replacement of humans; the cost of investment goods relative to consumption goods has fallen by 25% since 1980,[46] inducing firms to shed workers for machines and software. Top-level decision makers and creatives are safe (for now) from machine-induced redundancy; humans are still required to analyse the increasingly sophisticated data provided by the machines. We still need the 'human touch' in our politicians; a robot President, kissing children in order to get elected, is unlikely. We want a human judge to decide complex cases where human motives, distinguishing the *mens rea*, for example, are in question. Financial traders, who must combine human intuition and quick thinking with machine-like speed of reaction, will be safe from a computer-generated redundancy notice. It is no coincidence that, of those earners in the top 1%, financiers and practising lawyers increased their share over the period 1979–2005 whilst managers and medical personnel lost ground.[47]

Automation is also unlikely to touch the lowest-paid jobs. Robotic carers for Japanese care homes may not become widespread for the same reason it is uneconomic to replace a Minimum Wage toilet cleaner with an iRobot Roomba because the machine would cost more to buy and maintain. The 'human touch' predominates in the lowest-paid jobs as well as the highest; it is more economic to employ the human version of primary school teachers, parking wardens and nurses. Many low-status jobs suffer from the blight of 'transferable skills'; 'suffer', because this means they can be done by anyone from any place, often even with limited command of the local language. Low paid jobs can be casualised by technology even if a human still does the job; retailers have sophisticated IT programs to predict demand and have staff on zero-hours contracts to call in or not as required, and the vision of security guards can be extended by CCTV, perhaps linked to artificial neural networks that can distinguish nefarious activity from normal human actions. Geolocation technology facilitates worker tracking, tracking means performance monitoring, and that facilitates squeezing greater productivity from them. Governments collude with this squeeze on the poorest by technological monitoring of job-seeking activity by the

[45]MG Meeks (2004) 'Wireless Laptop Classrooms: Sketching Social and Material Spaces' *Kairos* 9 <http://english.ttu.edu/kairos/9.1/binder2.html?coverweb/meeks/index.html> accessed 14 August 2015.

[46]L Karabarbounis and B Neiman, *The Global Decline of the Labor Share* (National Bureau of Economic Research Working Paper No. 19136, 2013).

[47]The Economist, *The Age of Mammon* (21 January 2012) 41.

unemployed, by Social Welfare cuts and sanctions which are increasingly being applied in the UK and US. Public welfare is cut because the uber-wealthy, having become self-centred and disconnected,

> see no point in paying for public services they can no longer use; many of them have ceased to think of themselves as Americans in any important sense, implicated in America's destiny for better or worse. Their ties to an international culture of work and leisure – business, entertainment, information, and information retrieval – make many members of the elite deeply indifferent to the prospect of national decline.[48]

5. From the Anthropocene to the 'Adikocene'

The Anthropocene has been linked to key stages in human economic development, but if the economy is increasingly dominated by machines and technology, benefitting just a tiny fraction of humankind, the question arises as to whether or not we are still in the *Anthropo*-cene era. We are not (yet) in the 'Machinocene', where machines, independent of human desires, shape the planet and its geological record. However, the excesses of technology-induced inequality are beginning to create traces around the world, especially at the poorer end. The Hamptons palaces and their manicured lawns may not leave detectable marks a million years from now but geologists will find the fossilised refuse, the bottles, wrappers, and human waste from the thrill-seeking climbers of Mount Everest, who spend 25× the annual per capita GDP of the average Nepali to replicate what Edmund Hillary and Norgay Tenzing already achieved. These geologists may see the effects on the Nigerian coastline from the vast offshore slums of Lagos and they might trace the chemical pollution on the poor of Bangladesh, China and India, where heavy metals contaminate the environment; from e-waste such as mobile phones used for just two years by consumers thousands of miles away and then discarded. These geological traces will mark out extreme inequality or unfairness (*adikos*), so the increasing physical impacts of an ever more unfair distribution of wealth on our planet might be termed the *Adikocene*;[49] perhaps starting around 1980 as the time when global inequality began to soar.

This is inarguably a critical juncture in human history and accelerated technological innovation will inevitably shape the future. A variety of economists, sociologists, geographers, philosophers and theoretical physicist Stephen Hawking anticipate that intelligent self-replicating robots might indeed supplant humanity, enslaving or annihilating us; the true Machinocene. However, whilst humans are still in charge, the vast deprived majority may rebel, organising themselves with the very tools of globalisation provided by the Great Acceleration; the Internet, mobile phones, blogs, social media. It has already happened locally, in Tottenham, in Tunisia, in Cairo. As Tsar Alexander II of nineteenth-century Russia warned us, 'It is better to abolish serfdom from above than to await the day when it will begin to abolish itself from below.' Alternatively neoliberalism may continue to prevail in much of the world, albeit perhaps not universally as Fukiyama anticipated in *The End of History*: This might require ever more stringent controls and monitoring of the non-elite, both socioeconomic and technological, so as to permit continued concentration of wealth amongst the top 1%, 0.1%, 0.01%. Shifting socioeconomic structures,

[48] C Lasch 'The Revolt of the Elites: Have They Cancelled Their Allegiance to America?' (*Harper's*, Nov 1994), 39–49.
[49] HJ Shaw, *The Consuming Geographies of Food* (Routledge, London 2014) 121.

further concentration of capital and the proliferation of artificial intelligence networks continue to produce a set of fractured identities which impact on the relationships of people to each other, the planet and the State. All or any of these may present complex governance challenges and create the potential for an unprecedented wave of social and political disruption; which call for both economic equality but to realise a broader appeal to the concept of justice.

6. Mapping the terrain of spatial (in)justice

Communications technologies constitute a variety of novel and evolving spheres of activity determined by their own distinct rationality and dynamic, and many of the early spatial metaphors used to describe them derived from science fiction and imagistic political rhetoric. Since William Gibson's description of cyberspace as the 'consensual hallucination' created by millions of connected computers in his 1982 short story *Burning Chrome*, the term has been used to define the Internet, computer networks and a range of virtual domains. The etymology of cyberspace alludes to its nebulous nature; 'cyber' originating from the ancient Greek *kybernetes* or helmsman, itself derived from *kybernan* meaning to steer or govern, and 'space' denoting a unit of time, time lapse, physical expanse or infinite continuum void of matter'. Alluding to the idea of control and unboundedness, materiality and void, the term expresses something of the polarity of this parallel virtual reality; in that despite being produced by a disembodied, unfettered, anarchic electronic network of connections mediating human life and abstract space, ICTs are still dependent on spatial fixity such as bandwidth and access points. Whilst both symbolic and tangible forms of exchange co-exist and suggest an unfathomable horizon of potentialities, there are a growing number of exceptions. For example, cash transactions and the digital cryptocurrency 'Bitcoin' are valid in cyberspace; only the latter (using the public distributed ledger 'blockchain' method of recording coin-as-data transfers verified by participating network nodes) removes the need for eventual physical manifestation or, significantly, an intermediary. As a purely voluntary peer-to-peer method of transaction, with no central repository or administration, the Bitcoin may also represent an emotional desire to be liberated from the capricious and unconscionable behaviour of unaccountable financial institutions; as it is based on a form of distributed trust rather than on constitutional law provisions or the law of contract.

Early cyberpunk, graphic novels and science fiction provided a vividly imagined allegory of the unfolding future by envisaging the first stirrings of technological rebellion in the wake of the rise of corporate power, vast globalised disparities of wealth and the intensification of information gathering and data sharing. The imagistic spatial metaphors which characterise the genre offer a more accessible, if perhaps oversimplified, explanation of the complexity of this burgeoning parallel universe than low-level abstractions of machine code. Although easily repelled by a range of fictional futureworld superheroes, the new panoptic technologies of power – which are too often competitive with, rather than complimentary to, the existing norms of the real world – are not readily subject to legal or moral censure. Nevertheless, techno-utopian revolutionaries expected to be able to shape their own counterculture and social norms within newly emergent self-regulated virtual communities, beyond the authority and control of powerful governments or repressive oligarchies. However, cyberspace has not replaced urban space and as Heidegger and Marcuse have warned, technology and technologically imagined spaces can also serve as, respectively, the apparatus and locus of domination; 'The facts directing man's thought and action are … those of the machine process, which itself appears as the embodiment of

rationality and expediency … Mechanized mass production is filling the empty spaces in which individuality could assert itself'.[50]

The phenomenon of technological advancement has moved humans further from having control over their lifeworld or physical environment; for example the car, on which many people rely for their livelihood and social life, is now dependent on sophisticated automotive technology such as electronic circuitry, fuel injection systems and adaptive cruise control. The driverless cars anticipated in 2017 manufactured by Tesla and Audi, are likely to be powered by two Nvidia Tegra X1 superchip processors (each at 1 teraflop performance level) which control everything. When the hardware and software fails, the mechanic cannot simply pop the hood and use his mechanical acumen to make a repair, as non-functioning or malfunctioning parts can only be replaced. All that can be done is remove the failed component, of which the mechanic understands nothing, and order a new one. The same logic can be applied to many other objects in domestic use; televisions are another example. When the unit fails, even if a repair were possible by changing a motherboard or replacing the LED panel, it is often uneconomic and exceeds the cost of a replacement television; by which time television technology has already moved into a new phase. The constantly evolving relationship between nature, people and objects, mediated by ever-mutating and mutable technologies, has reshaped social life to the point where human endeavour and ability is on the cusp of being eclipsed. Ray Kurzweil predicts the moment of absolute techno-transcendence, or 'singularity' – the point at which human intelligence will be eclipsed by artificial intelligence – as 2045.[51] He recently speculated that all humans will become man-machine hybrids by the 2030s; any resistance to this innovation would be futile as the renegade humans would be unable to meaningfully participate with the majority who have been assimilated. The common feature between this dystopian view of the future and the present is the growing inability of individuals to model their own identity and long-term prospects outside the possible contexts of various technological mediums. Patterns of work and social life are expressed and facilitated via a variety of technological media and a lack of proficiency or access to these forms of communication equates to being ostracised on the wrong side of the digital divide.

This disparity was never the intention of the early 'ubiquitous computing' developers; Mark Weiser, Chief Technologist at Xerox in 1988, envisaged a new age of 'calm technologies' in which computers blended into the backdrop of human life. Their purported role was to infer the informational and practical needs of humans and perform repetitive routine chores on our behalf, freeing up time we might put to better use on other, perhaps more worthy, tasks. However, the pressures of contemporary life provide less time to pursue benevolent objectives such as voluntary community work and projects relating to social justice, which are only possible via human consciousness and endeavour. Rather, a series of microprocessors hidden inside everyday objects such as cars, networked home appliances, mobile phones and other programmable consumer goods (comprising the Internet of Things) transmit data from smart homes and smart cities to a range of information gathering agencies. The capacity to process vast quantities of information has become the aim of a series of clandestine technological processes and this type of knowledge is privileged over the human ability to make decisions based on either a large or small

[50]H Marcuse, 'Some Social Implications of Modern Technology' in A Arato and E Gebhardt (eds), *The Essential Frankfurt School Reader* (Continuum, New York 1988) 143, 158.

[51]R Kurzweil, *The Age of Spiritual Machines When Computers Exceed Human Intelligence* (Penguin, New York and London 1999).

amount of information; comprising 'the obsolescence of the concept of human subjectivity in our sciences and our philosophy, the reduction of subjectivity to cybernetic circuitry, and the reduction of human initiative to the power to precipitate nuclear extinction'.[52]

7. Law, language and the spatial imaginary

The figuration of space and its elaborations are no less significant than the spectacle or event. Understood as a form of *writing*, the organisation of power is able to be *read* by those encountering it; technologies of surveillance, policing strategies, areas of separation in the built environment express regimes of order and control which, in turn, describe the nature of a society. For Lefebvre, 'Constructed space – a transparency of metal and glass – tells aloud of the will to power and all its trickery. It is hardly necessary to add that the "habitat" too shares in this spatial distribution of domination.'[53] Spatial metaphors constitute an imagistic way of thinking which transfers one idea or concept to another; this cross-domain mapping can usefully represent the abstract in terms of the concrete. More than a simply a literary device, our ordinary conceptual system is quintessentially metaphoric in nature, and the metaphor forms a significant role in how we think and communicate. As Albert Camus wrote in his *Notebooks* of 1935–1942, 'Feelings and images multiply a philosophy by ten. … People can only think in images. If you want to be a philosopher, write novels'.[54] Franz Kafka's *The Metamorphosis*, George Orwell's *Animal Farm* and *Nineteen Eighty Four* famously illustrate the skilled use of extended metaphor to satirise, respectively, the fragile nature of identity and human relationships; Stalinist Russia and the rise of totalitarianism; and a dystopian society where totalitarianism had taken over. Metaphor is cognitively significant; it allows us to draw comparisons and amplify a certain aspect of a particular thing, and 'brings something before the eyes'.[55] Cleverly coded information hidden within metaphoric imagery can also be used to obfuscate and provide a distraction from acknowledging and challenging a crisis in space or spatial injustice. In this case, the metaphors which already infuse legal discourse with meaning and embed its authority must not be allowed to keep law from being able to 'exceed its boundaries and connect with the radical opportunities of space'.[56]

In order to elaborate a coherent discourse of spatiality, the definition and meaning of space is important and a variety of complex and contradictory concepts have been proposed. From a static receptacle of all human life defined in absolute and mechanistic terms by Cartesian coordinates to Michel de Certeau's claim that a place becomes a space when transformed or activated by people and Edward Soja's socially produced material spatiality; the physical and social organisation of space is always open to interpretation. For Henri Lefebvre, space is both a material property and a process which enables social interrelationships, not simply a container or frame to be filled with content. Social space is 'not a thing among other things, not a product among other products; rather, it subsumes things produced, and encompasses their interrelationships in their coexistence and

[52]A Lingis, *Deathbound Subjectivity* (Indiana University Press, Bloomington and Indianapolis 1989) 1.
[53]H Lefebvre, *The Survival of Capitalism* (Allison & Busby, London 1976) 88.
[54]A Camus, *Notebooks 1935–1951*, P Thody (trans) (Marlowe & Company, New York 1998) 10, 210.
[55]Aristotle, *On Rhetoric* 3.10.6.
[56]A Philippopoulos-Mihalopoulos, *Spatial Justice: Body, Lawscape, Atmosphere* (Routledge, Abingdon, Oxon 2015) 25.

simultaneously – their (relative) order and/or (relative) disorder'.[57] This conceptualisation justifies intervening or intruding on space to ensure its more equal distribution. The association of space with discourse, as 'rhetorical territories', depends on familiarity and understanding because an individual knows about and can speak of what is familiar about the place they occupy;'[t]he character is at home when he is at ease in the rhetoric of the people with whom he shares life'.[58] Whilst avoiding a purely idealised or institutionalised conception, the fluidity of the spatial metaphor as structure and function has both practical and political significance.

Most formulations concede that place is a spatial locality within which meaning is formulated through the shared experiences, attachments and cultural practices of the individuals who inhabit that space. Even so, place-making (as the planning, design and configuration of public places) has largely been an imperial undertaking since the beginning of modern colonialism; only authoritative agencies had the power of naming, the ability to give meaning to a particular place. Yet in order to grasp such abstractions, for instance, to discern what properties would render a place meaningful in the widest sense or to discover the truth of things, it is necessary to withdraw from the everyday world of objective realities. In Gustave Flaubert's final unfinished satiric novel *Bouvard and Pécuchet* the protagonists, two middle-aged scriveners, meet on a stifling summer afternoon and become fast friends. When Bouvard inherits money from his father, they buy a house with farmland and retire to the Norman countryside to take up gardening. Bolstered by their success at cultivating a kitchen garden they decide to become farmers; taking over the running of the farm from the previous tenant farmer. To understand farming, however, they realise it is necessary to acquire some knowledge of agriculture which depends on a basic comprehension of chemistry in relation to insecticides and fertilisers. In learning about soil fertility, they further encounter molecular biology, agrophysics and a range of other related disciplines until, Flaubert concludes, 'what amazed them more than anything was that the earth, as an element, does not exist'.[59] The pair go on to implement a raft of poor decisions based on the random parts of too many theories from which they were obliged, without prior knowledge and experience, to ascertain which would be the best. To say the farm was unsuccessful would be an understatement and Flaubert's novel exemplifies the problem with letting abstractions obscure the reality of an object or proposition by extending their reach far beyond the matter in hand. When authorities search for the essential meaning of things, for example to understand what is nature and how to best protect the planet and its people, like Bouvard and Pécuchet starting from having little or no prior knowledge, they adopt a technical mindset and seek to reduce the subject under consideration to other constitutive elements. Here lies the problem with a technical construction of reality; namely, everything is left to the free choice of those who know nothing, who have a tendency to dilute the elemental properties of lived experience into an ineffective, arbitrary and disorganised order of diminished realities.

Just as the two Parisian copy clerks struggled to make sense of farm management with no experience of the rudiments of farming, lawyers often struggle to grasp the ambiguities and complications of social life and impose value judgments upon actions and events which

[57]H Lefebvre, *The Production of Space*, D Nicholson-Smith (trans) (Blackwell, Oxford 1994) 73.
[58]M Augé, *Non-places: Introduction to an Anthropology of Supermodernity*, J Howe (trans) (Verso, New York 1995) 108.
[59]G Flaubert, *Bouvard and Pécuchet*, AJ Krailsheimer (trans) (Penguin Books, Harmondsworth 1976) 69.

are not within their own realm of experience, nor part of their lifeworld. Yet, the institution of law, itself the product of a particular socio-spatial context, produces space by naming, assembling, controlling and legitimating spaces, places and limits. The language of legal authority articulates a purely technical world which is constructed on method and system, within which the paradigms founded in judicial precedent, statutory provisions and legal principles often distance individuals from their life worlds. The technical mindset subsumes all realities and lived experience to an abstract system of specialised language, expertise and classifications. This problem with modern authority and their discourses of power was exemplified in the background material for *Bouvard and Pécuchet*; which is often appended to the end of the mock-encyclopaedic novel as the *Dictionary of Accepted Ideas* and draft outline of the *Catalogue of Fashionable Ideas*, translated into English for the first time in 1954. In a letter to a confidante, George Sand, Flaubert justified his collection of clichés, platitudes and axioms which sought to expose the social deceits and inanities imposed by culture and conventions of 'right thinking', stating 'to dissect is a form of revenge'. According to translator Jacques Barzun, the nineteenth-century mass production of jargon, new words and phrases were taken by Flaubert to comprise 'philosophic clues from which he inferred the transformation of the human being under machine capitalism': He interpreted the deliberate degradation of language and meaning as a personal insult; so in representing the Mind, he battled senseless dogmatism and 'the encroachment of matter and mechanism into the empty places that should have been minds'.[60]

Although our hope for the future rests on language, as a means of articulating a common understanding and realising human flourishing, for Orwell language was susceptible to misuse and degradation. The decadent use of cliché and metaphor lead to the endless repetition of words, as empty signifiers which themselves alluded to concepts which had become, if not were always, detached from cultural life and reality. If these words and phrases had contained any original meaning, they had been lost through misuse; and consequently, this decayed language rendered any communication of human experience in real life meaningless. For Saussure, language describes merely a structural relation where words signify only their position within a system of signification or in relation to other words; 'the linguistic sign unites, not a thing and a name, but a concept and an acoustic image' in which the expression of the concept or idea is the signified, and the acoustic image or word-pattern describing it is the signifier.[61] Although together they comprise the sign, the signifier assumes no necessary relationship to the signified and since the referent is omitted, it relies merely on social convention. Consequently, the sign is arbitrary as the relationship is based only upon the signifier's dissimilarity from other signifiers and it attains meaning only from the system within which it occurs.

Language, like politics, is an area of considerable concern because it offers the illusion of common understanding when in fact communicating nothing at all; as words no longer indicate humans and objects, rather they elucidate only the system of words which exist for themselves. Since, by privileging specific normative propositions, legal code supported by specialised language exerts considerable influence on social interactions; the appeal of a spatial construction lies in its ability to more fully represent the competing and often antagonistic perspectives of wider physical, economic, political and social life. The spatial

[60]J Barzun, 'Introduction' in G Flaubert (ed), *The Dictionary of Accepted Ideas* (Penguin Books, Toronto, Canada 1968) 5.

[61]F de Saussure, *Course in General Linguistics*, W Baskin (trans) (Philosophical Library, New York 1959) 66.

metaphor facilitates a broader conception of law as justice; one which not only acknowledges the dialectical relationship between the economic and social conditions of diverse groups, but can also articulate the geographies of injustice, namely how the production of space impacts social groups and their life chances.

8. The significance of law's spatial turn

The transdisciplinary language and spatial frames of reference force law to confront the inappropriateness of its dogged adherence to certainty and predictability, and the futility of fixing immutable boundaries within an evolving social and physical environment. This is not to say that either the linguistic or spatial turn provide a complete set of alternative settled parameters, rather the relevance of spatiality to law lies in its ability to disclose the wider political and strategic implications of a metaphorical and material utilisation of space. Spatial indeterminacies and multiplicities not only compel an attitude of openness to competing discourses, they pose a challenge to law's disciplinary closure. Spatial materiality renders law, at once, visible and accountable in its creation of boundaries, bodies and meaningful places. Rather than simply 'being' – as something constant and *a priori* – law is revealed to be, of necessity, always in the process of reinventing and 'becoming' something other than itself; a multiplicity of somethings or something extra, having a fundamentally contingent character. Law's capacity for reinvention as an instrument of politics, finance, commerce or technology for example, is exposed by its proximity to spatial schisms and ambiguities; and, importantly, justice is required at the instant law engages in the allocation and reinterpretation of space, so as to interrogate the legitimacy and efficiency of existing legal configurations.

Andreas Philippopoulos-Mihalopoulos refers to the preconscious and posthuman *lawscape*, as 'the way the ontological tautology between law and space unfolds as difference'. The lawscape has no outside; everything is within its contemplation as a matter of 'spatial positioning'; and the question of spatial justice arises when unequal bodies desire to occupy the same space at the same time.[62] Justice is spatially circumscribed; just as law is in conflict with and within its own territories which may be exceeded at any moment by extrinsic territorial claims. It discovers its space in the movement of retreat, by withdrawing from judgment, from one's own justice, from justice itself, and away from the space of the other's claim. In this way, spatial justice is never more visible that in the movement of taking leave, when the force of law retreats before the claim of the other; 'Law is the necessary precondition of spatial justice … it regulates the way to justice in a constant oscillation that dictates the withdrawal of law before justice and equally the withdrawal of justice before law'.[63] It is within the context of competing claims and hierarchies of (re)interpretation and control, in relation to evolving natural, artificial and technological spaces, that socio-legal and critical scholarship seeks to determine a new conception of spatial law and justice.

9. Conclusion

The concept of space provides an invaluable transdisciplinary lens with which to view the outermost reaches of law as justice. Spatial justice is neither an attribute nor adjunct to

[62] A Philippopoulos-Mihalopoulos, *Spatial Justice: Body, Lawscape, Atmosphere* (Routledge, Abingdon, Oxon 2015) 4, 175.
[63] ibid 207.

social justice; rather, the law is revealed to be already spatial and material in character and presents a challenge to existing notions of social justice. Technological and transnational socioeconomic systems become ever more connected as a result of globalisation, advanced capitalism and embedded technologies such as the Internet of Things. People as technologically mediated individuals and communities have become disconnected from each other and estranged from the natural world, whilst simultaneously increasing their dependency on authoritative systems and technologies of control. Moreover, ICTs and the forces of global capitalism have become the implicit criteria against which countries, regions and cities are classified. In this case, the Anthropocene thesis has the ability to provoke a series of novel constructions that have the capacity to reimagine existing schools of thought by developing affinities and collaborations through multi-disciplinary and multi-centred approaches to the changing lawscape.

As the gap between rich and poor continues to expand, the spatial consequences of increasing isolation, division and exclusion demand not only a critical explication of the grounds for such categories of exclusion, but also the investigation of potential sites of resistance and transformation. This would necessitate addressing conflicting attitudes relating to the individual and collective experience of the imposition of new social practices, directly and indirectly shaped by technological innovation. The increasing incursion of mass surveillance and bulk storage of personal data, transformative employment patterns and leisure habits in our urban spaces and cities, for example, continue to transform both work and social life and, as such, are highly contested areas. A key feature of the Anthropocene is an impending human-technology exacerbated extinction event; brought on by disease, devastation of natural habitats, social disorder, food insecurity and climate change. Such a crisis demands law's spatial turn offers more than simply an opportunity for a novel mode of representation. Rather its innate spatiality and situatedness discloses an ethical and political imperative to pragmatically engage with real issues experienced by all who inhabit the shared lifeworld. Consequently, since there can be no aspatial social relations there is an imperative for law to intervene on space to ensure its more equitable distribution.

Disclosure statement

No potential conflict of interest was reported by the authors.