



Article

The Architectural Logic of Climate Catastrophe

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Abstract

This paper attempts to explore the relationship between climate catastrophe and the globalised economy of late-capitalism and the implication that the architectural profession has been complicit with the environmental failures of this system.

The essay identifies a number of key authors who argue that late-capitalism is not only a significant factor in climate catastrophe but is also responsible for a fatalistic position of 'no alternative' which have weakened effective opposition and the creation of other possible futures. It is suggested that many of these critical positions fail to convince as they cannot effectively communicate what an alternative future might look like, and suggests that architects, using speculative techniques familiar to Science Fiction, could be uniquely situated to try and represent what these forms of otherness might be and authors can map out future possibilities. But, if this is to happen it requires a rethinking of what architecture is and what architects do and how architectural education needs to change to facilitate these transformations

Keywords

Climate, late-capitalism, science fiction, architecture, capitalist realism, Junkspace, social justice,

"Architecture is, however, of all the arts closest constitutively to the economic, with which, in the form of commissions and land values, it has a virtually un-mediated relationship."

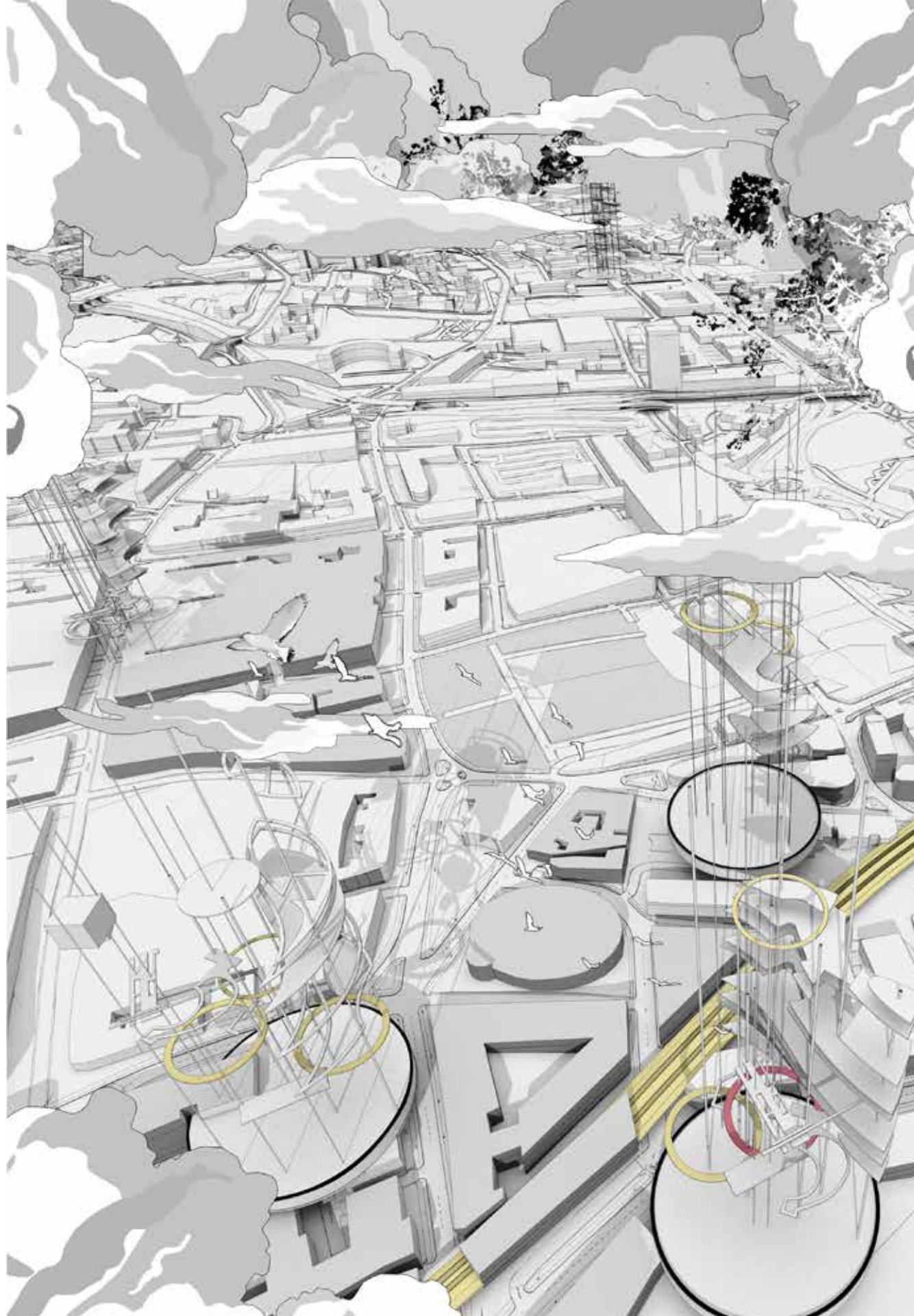
Frederic Jameson (1982, p56).

Frederic Jameson, in his seminal essay 'Postmodernism: The Cultural Logic of Late-Capitalism' (Jameson 1982), made one of the most explicit articulations of the relationship between the corporate architectural complex and global finance, suggesting that contemporary architecture is not only an integral part of late-capitalism,

but has brought about a new form of space, 'postmodern hyperspace', and made spatial practices dedicated to consumerism the dominant way of experiencing the city. Jameson's definition of 'postmodernism' as the 'cultural logic' of the third phase of capitalism, late-capitalism¹, is very different from Charles Jencks' description of architectural Post-Modernism as an eclectic historical style (Jencks, 1977). Jameson's conception is much broader, and it encompasses Jencks' position in many ways.

1 - I have tended to use the term late-capitalism over the other common term neo-liberalism as the latter can be seen as a subset of the former.

Figure 1. Viktoria Dimitrova, 'New Living', unitffteen, University of Huddersfield, 2019



Following Ernest Mandel (Mandel, 1977), Jameson describes how transformations in technology have initiated new forms of capitalist organisation, which in turn characterise how new cultural models are developed. Architecture, in particular, is intimately bound to the new forms of 'economic' organisation, not just through the value of land and commissions as stated above but also through the processes of urbanisation, industrial manufacture, and commodification. The 'cultural logic' of late-capitalism and the narrative of the market has, as Jameson predicted, permeated into every aspect of our lives, resulting in increased social divisions and financial inequalities, all facilitated by digital technologies and networks, nowhere more so than in commercial architecture where buildings have become the physical embodiment of these ideas.

In the forty years since Jameson's essay was published, the expansion of the globalised economy has had a significant impact on the levels of greenhouse gases in the atmosphere, the destruction of ecological diversity as well as seeing a widening of the gap between rich and poor. As discussed below, for many, a market-based economy based on capitalist ideals is incompatible with environmental strategies that seek to limit global temperature rises to 1 – 1.5 degrees Celsius. The architectural profession is intimately bound to the system of late-capitalism and by extension with climate catastrophe and the wider inequalities of contemporary society.

In this essay, I will suggest, following the ideas of several contemporary authors, that if we wish to address the issues of climate change alongside social justice, then we will have to rethink the relationship of architecture and the built environment to the capitalist economy and more importantly the role of architecture and the architect in designing alternative progressive futures. Architecture is currently complicit with an economic system inherently responsible for climate catastrophe and repressive social conditions. I will also suggest how the adoption of speculative narratives, as exemplified in recent Science Fiction (SF), can provide a mode of thinking for an architecture where we are able to ask complex 'what-if' questions and use progressive future narratives as a means to explore possible alternatives, and in the face of a seemingly impossible task, try and represent

how those futures might work and what those futures might look like.

For most of its history, the architectural profession has been creating monuments for wealthy elites in the service of power: imperial, colonial, state, and industrial power. For the last 250 years, this has seen western architecture almost exclusively in the service of *laissez-faire* capitalism, an issue rarely discussed in mainstream architectural discourse and especially in architectural education. Business as usual is not an option; the reality is that we are facing a number of immediate concerns regarding Planetary survival, particularly how we deal with the global impacts of climate catastrophe, environmental degradation, and the legacy that we leave for future generations. Moreover, it needs to be remembered that we still live under the very real threat of Weapons of Mass Destruction through the stockpiles of nuclear, chemical, and biological weapons made more pressing by the escalations in global tensions, regional conflicts, and extreme forms of nationalism. Additionally, there is an urgent need to address Social Justice, race, ethnicity, gender, sexuality, class and caste, and the multiple forms that hate and discrimination take in the contemporary world, which, as some would suggest, are also linked to the current political and economic system.

The implementation of new technologies will be central to how a future architecture might be enacted to create a progressive future, although as I have argued elsewhere (Clear, 2009), the most important technological transformations in recent architectural production are not the shape making CAD software or the advances in new materials and new energy systems, but the technologies of finance and procurement that have reduced nearly all architecture to a commodity, and it is these forces that have been shaping architecture and architectural production. How architecture will contend with the increased automation of its processes both in terms of design and information production will set the terms for what an architecture of the future looks like. The importance of AI in developing the cities of the future in quantitative terms will be enormous; how architects help set the agenda in qualitative terms through the development of progressive narratives will be equally vital.

Critique

"The relationship between capitalism and eco-disaster is neither coincidental nor accidental: capital's 'need of a constantly expanding market', its 'growth fetish', mean that capitalism is by its very nature opposed to any notion of sustainability."

Mark Fisher (2009, p 18)

There have been a number of influential authors who, like Fisher, have alerted us to the explicit links between late-capitalism, climate emergency, and the need for social justice; often suggesting radically new ways of organising or developing collective strategies.

In 'Staying with the Trouble: Making Kin in the Chthulucene' (Haraway, 2016), Donna Haraway argues that we must become interdisciplinary activists, forming coalitions and collaborations beyond our own immediate groups, and develop forms of 'sympoiesis', that is 'making with' rather than autopoiesis, or 'self-making'. Haraway, whose work has always involved the intersection of biological sciences, political activism and speculative practice, suggests that a number of terms such as Capitolocene, Plantationocene and Chthulucene alongside the Anthropocene would be a more appropriate designation for our existing geological time period (Haraway, 2016) and the future for humanity is to be found through forging alliances with others rather than focusing on replicating our own genetic pool, 'making kin, not babies'. Throughout the book, Haraway openly invokes science fiction along with a number of other SF's, 'speculative fabulations, string figures, speculative feminism, science fact, so far' (Haraway, 2016). The final chapter of the book, 'The Camille Stories: Children of Compost', takes the form of a piece of speculative fiction that Haraway describes as 'gestated in SF writing practices' and tracks the story of 'the five Camille's over a 400-year span as the humans develop symbiotic relationships with non-human species, which in Camille's case is the Monarch butterfly. Haraway presents a model for enframing collaborations between artists, scientists and activists and for developing action outside the current capitalist and patriarchal systems. Such a radical approach, if applied to the built environment, would have profound consequences for the role of the architect, the practice of the architecture

and the way we educate future generations of architects.

In her seminal 2014 book 'This Changes Everything: Capitalism vs The Climate' (Klein, 2014), Naomi Klein presents a compelling argument for capitalism's role in accelerating the environmental degradation of earlier industrial periods and promoting a culture of climate scepticism. Klein's conclusion is that we need to completely change the entire economic system to mitigate the long-term effects of our profligate economy. The problem is not simply what humans do, but what certain humans do, knowing full-well the consequences of their actions. Klein also makes it clear that those who run our political systems are, due to vested interests, either unable or un-willing to affect such a change and that 'only mass social movements can save us now' (Klein, 2014, p450). Klein's book is rich with information and evidence, perhaps too much so.

Timothy Morton argues that one of the difficulties in communicating the apocalyptic message that often goes along with climate discourse relies on 'data-dumps' and other tropes that do not engage with ordinary people (Morton, 2018). One of the central issues is effectively communicating the scale of the problem in that it suggests something beyond the comprehension of most individual subjects. Morton argues that some concepts are so 'massively distributed' that they surpass our ability to fully comprehend and represent them; that they are 'real yet inaccessible' (Morton, 2013), he has labelled these phenomena 'hyperobjects' (Morton, 2013). Hyperobjects can be unimaginably vast such as black holes, quite mundane yet enduring, Styrofoam which takes 500 years to degrade, or they can be hugely significant such as global warming (Morton, 2015). A useful way of understanding hyperobjects is to think of the relationship of the weather to climate; the weather is localised, it is what you see out of your window, but the climate is the interconnectedness of all the different weather situations everywhere over time. Weather is graspable, but the climate is not, and this is what makes climate such a difficult concept to discuss.

According to Morton, we are already in the era of sixth mass extinction (Morton, 2018), but they do not suggest that we give in, though accepting where we are might be



Figure 2. Tom Phillips, 'The HY-RAD Tower', unitfifteen, University of Greenwich, 2015

a relief, rather Morton suggests we stop talking about ecology and start 'being ecological', and it is our failure to embody the issues around climate in a sustained and coherent manner that is one of the biggest problems. One important aspect of Morton's assertion is that there is no such thing as 'sustainable capitalism'; they are mutually exclusive.

If, as Morton suggests, scale presents one difficulty when discussing climate, environmental issues, technological transformations and social justice, another is the tendency to resort to 'the data', which itself raises two further problems. First, understanding information necessitates a particular skillset to interpret the data, consider alternative interpretations of that data, and draw reasoned conclusions. Secondly, this type of approach abstracts the issues into information that does not relate to our personal experiences. What does a three-degree rise in temp mean to most people? Perhaps more importantly, how would a green economy based on real zero carbon and 100% renewables work on a day to day basis and what this world might look like.

Data science is never neutral, but it claims to be objective, and this is where many problems emerge because our relationship to the world around us is profoundly subjective, so to try and integrate a set of ideas that do not situate the subject in an understanding of what is happening will bypass the concerns of many, and if a more convenient narrative is offered, it will often dominate. Change often seems more intimidating, and we are frequently told that the current system is inevitable; perhaps that is why doing nothing and hoping for the best is winning.

Junkspace

"Someone once said that it is easier to imagine the end of the world than to imagine the end of capitalism."

Frederic Jameson (2003, p76)

This well-known quote, often used without attribution, is for authors such as Mark Fisher one of the defining statements of contemporary cultural production, something he described as 'Capitalist Realism' (Fisher, 2009),

in that it captures the existential crisis brought on by the perception that there is 'no alternative' to our current societal model. However, its explicit connection to architecture largely unappreciated.

In fact, the quote first appeared in an essay by Jameson in the New Left Review under the title 'Future City' (Jameson, 2005)². 'Future City' is a review of two books, 'The Great Leap Forward' and 'The Harvard Design School Guide to Shopping', both edited by Dutch architect and CEO of the Office for Metropolitan Architecture (OMA), Rem Koolhaas. The two books were produced by Koolhaas as part of his role as a Professor at the Harvard GSD, and they bring together research from colleagues and research students that map the shifts in global architecture, particularly the rise of Asia as the dominant centre for emerging architecture due to the rapid expansion of economic activity in the region and the profound global economic shift that this has entailed. While the Great Leap Forward is a relatively conventional analysis of the 'prodigious' urban transformations that have taken place in China and the Pearl River delta, in particular, the Guide to Shopping presents a more unconventional approach to its subject in both style and structure.

Throughout his essay, Jameson reflects on the ambivalence shown to the subjects discussed and the remarkable indifference demonstrated from an architectural perspective. Much of the focus centres around Koolhaas's own contribution to the 'Guide to Shopping', an essay entitled 'Junkspace' (Koolhaas, 2001), which constitutes a startling reflection on contemporary architecture. As Jameson states:

"Junkspace is an extraordinary piece of writing", that is both a postmodern artefact in its own right, and—a whole new aesthetic perhaps? unless it is a whole new vision of history." (Jameson, 2003, p73)

Junkspace is a part polemical rant, seemingly part stream of consciousness, and overall an excoriating indictment of the mediocrity of contemporary architecture despite its apparent excesses. Disregarding nearly all academic

2 - The quote has also been attributed to Slavoj Žižek (Žižek & Fiennes, 2006)

conventions, it is written as one long paragraph, with no section headings, no references or footnotes, just a relentless attack on the ubiquity of contemporary commercial architecture. Junkspace bears more similarities to a type of frenzied Science fiction short story written by Philip K Dick, Jameson likens Junkspace to Dick's 'kipple' (Jameson 2003, p76), or it could be compared to an updated version of one of William S Burroughs routines from the Naked Lunch.

The essay attacks mediocre planning, poor use of materials, poor ideas, the infantilisation of the public, and the banalisation of public space. However, most of all, it addresses the alienation of users, workers and even the designers of Junkspace, and in ways that chime closely with the ideas of the critics of late-capitalism. It is a deliberate and provocative challenge to his formalist contemporaries in that it sets out an argument against a system where ideas and values have been turned upside down.

There is no doubt that Koolhaas is one of the most important contemporary architects, and OMA is one of the most formally innovative and successful architectural practices that produce iconic and provocative building designs. It is significant that Koolhaas does not seek to exclude OMA's output from the focus of his ire in Junkspace but seemingly understands that he is as complicit in the production of Junkspace as everyone else. The fact that one of the most critically regarded architects makes this kind of statement demonstrates the ethical vacuum at the heart of contemporary architecture where most architecture is Junkspace whether or not its practitioners realise it. At a critical level, the text exposes, as bankrupt, the wider idea that a market dominated system promotes greater quality, innovation and competition. Rather it perpetuates the mundane monopolies of global finance, a world order that would be responsible for the economic disaster of 2008 and the resultant misery of millions of ordinary lives.

While neither 'Future City', nor 'Junkspace' address climate explicitly, it is clear that the nature of the system that creates Junkspace has little concern for the environment; indeed, the implication is that it is completely apathetic to anything resembling the ethical use of resources, as "In the end, there will be little else for us to

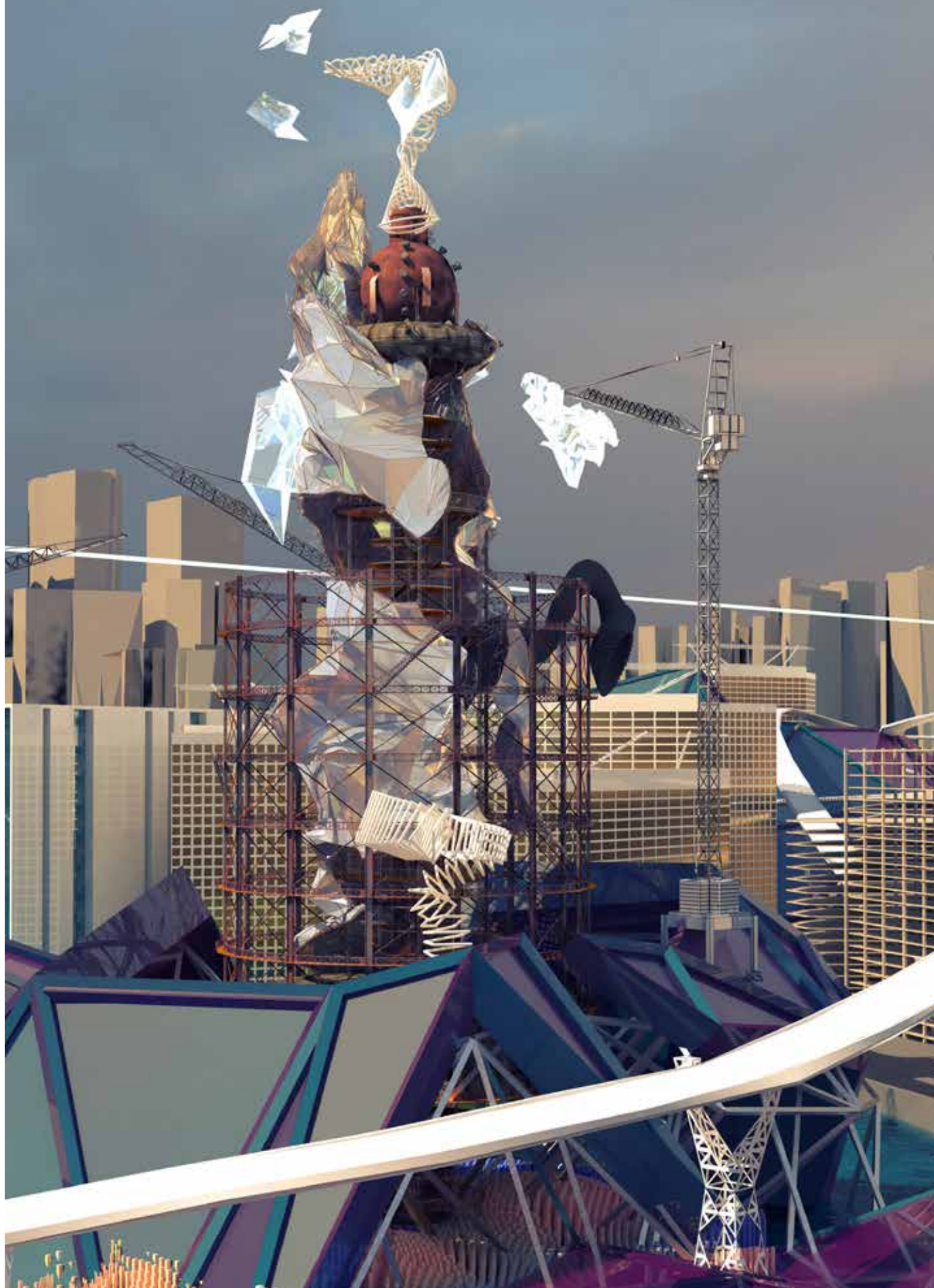
do but shop" (Jameson, 2000, p79). For all their critique, Jameson nor Koolhaas never suggest an alternative to the system that produces 'Junkspace', and one is left with the feeling that Junkspace is an inevitable part of a system that is heading toward Armageddon?

However, in a more recent work 'An American Utopia: Dual Power and the Universal Army' (Jameson, 2015), Jameson does try to imagine an alternative to capitalism, using the novel 'Looking Backwards, 2000 - 1887' from the 19th century American SF author Edward Bellamy as a guide to describing a way in which a post-capitalist, environmentally conscious America could emerge through a form of national service. 'An American Utopia' is an interesting publication, as well as the main essay written by Jameson; the book contains a number of additional contributions, including an essay from Slavoj Zizek, who Edited the book, and a short story from Kim Stanley Robinson, whose work will be discussed later. However, once again, the shapes, colours, and textures of what everyday life might be like in this new world are absent; while the concepts might be compelling, though controversial, they lack animation, they need to be visualised.

The structure and tone of 'An American Utopia' bear a striking similarity to David Harvey's appendix to his book 'Spaces of Hope', titled 'Edilia, or 'Make of it what you will'" (Harvey 2000). This text, set out in the form of a short fictional narrative, explores what alternatives might be possible following the collapse of the financial system and also owes much to Bellamy's 'Looking Backwards'. The story, set 20 years into the future, starts by predicting a global financial meltdown in 2013 (he was only five years out); and the aftermath of this following a military coup, there is a further 'revolution' where the population led by scientists, doctors, intellectuals and artists free the world from the tyrannies of previous regimes, echoes of which could be found in the Occupy movement.

"By 2020, much of the world was disarmed. Military and religious authority had slowly asphyxiated in a deadly embrace. All those interests that would prevent the realization of the possible were subdued. People could think about, discuss, and communicate their alternative visions." (Harvey, 2000, p263)

Figure 3. Tim Evans, 'Posthuman Fun Palace', unitffteen, University of Greenwich, 2017



Like the hero in Bellamy's 'Looking Backwards', Harvey wakes up in a cold sweat still in his hometown of 'Baltimore' but finishes the book with a final positive note.

"And when that Golden Age arrives, we may finally hope to say good-bye to fear, tension, anxiety, overwork, and sleepless nights." (Harvey, 2000, p279)

Following Jameson and Harvey, who both use Bellamy's speculative fiction as a guide to the way we might think of alternatives to the current system, Architecture might also adopt the use of narratives that allow us to ask 'what-if' questions. Furthermore, if we want to suggest viable solutions that can be implemented, then we will have to be able to convincingly communicate those possible futures to a wide audience and give them compelling narratives, not just what we do not want, but what we do want, what it looks like and how it works.

Speculation

"Whenever I come across such intractable problems, my impulse is always to turn to science fiction. Perhaps we will be able to imagine what we are unable to know. . .

(SF) is a kind of thought experiment, a way of entertaining odd ideas, and of asking off-the-wall what if? Questions. But instead of approaching its issues abstractly, as philosophy does, or breaking them down into empirically testable propositions, as physical science does, science fiction embodies these issues in characters and narratives. By telling stories, it asks questions about all sorts of things: consciousness and cognition, the future, extreme possibilities, nonhuman otherness, and especially the deep consequences — the powers and limitations — of both our ideologies and our technologies."

Steven Shaviro (2016, p8)

The type of strategies that we will need to implement to create the cities of the future in order to achieve a zero-carbon and socially just future could be developed if there is a willingness to use the model of SF and ask 'off-the-wall what-if? questions'. Questions allow us to embody issues and create narratives that can be deployed

to bring about necessary transformations and communicate viable alternatives.

It is not the assertion here that architects should simply follow SF and invent fantastical solutions, although much SF is based on an extrapolation of existing scientific research. However, suppose architects are serious about the need to adopt more radical visions about possible futures. In that case, they need to 'embody' those ideas in speculative architectural projects and like SF describe in detail coherent imagined worlds within which alternatives can take place.

Current depictions of the future in SF film and television tend to play on the apocalyptic possibilities of what is to come, though this may be due to the proliferation of computer-generated imagery that has made the representation of these disaster scenarios more realistic. Certainly, dystopian futures often present a more thrilling context for dramatic storylines, though it needs to be emphasised that many of these dystopian scenarios are clearly metaphors for current fears around existing uncertainties and antagonisms, including climate catastrophe and the need for social justice.

Architecture is not subject to the same need to simply entertain, and an architecture that takes its cue from literary SF with its 'world-building' culture with the accompanying architectural representations and project management and logistical understanding. Given that architectural designers have access to the same c.g.i technologies as film and television to create and bring to life positive models for what a future may be like rather than utilising them to create images that perpetuate 'pacification by cappuccino' capitalism, described by Sharon Zukin in 'The Culture of Cities' (Zukin, 1995). Contrary to Jameson's epithet, it could be just as easy to imagine something different, though we would have to imagine not just what the different types of space might be, but, as David Harvey states, what type of people we want to be.

"the question of what kind of city we want cannot be divorced from the question of what kind of people we want to be, what kinds of social relations we seek, what relations to nature we cherish, what style of life



Figure 4. Yu Min Teoh, 'New Life, Neo Hull', unitfifteen, University of Huddersfield, 2021

we desire, what aesthetic values we hold." (Harvey, 2015, p4)

Architectural production needs to look at the changes that may occur at a quantitative level but also in qualitative terms and ask what we need to do to achieve the necessary transformations that have to occur to illicit a meaningful response to climate catastrophe, both political transformation and the shifts in our approach to agency and identity.

I would like to briefly discuss a number of recent novels where the themes of climate and social justice have been addressed with great urgency and clarity. These stories represent the implications of a failure to act in a more effective than may be seen in theoretical texts, and more importantly, they are more effective in communicating these ideas to a wide audience. I have chosen to identify novels over film and television representations simply because they offer the greatest depth in their analysis

and world-building.

At the outset of the recent novel 'Ministry of the Future' (Robinson 2020), the author Kim Stanley-Robinson graphically illustrates the potentially tragic consequences of climate catastrophe when a rise in wet-bulb temperature to 35 degrees kills over 20 million people in the Indian state of Uttar Pradesh.³ The graphic nature of this event is to deliberately shock the reader into understanding the reality of such abstract but very possible weather events. However, the book also consists of storylines around two central protagonists, one of whom is a survivor of the catastrophic weather event and the other the leader of the titular ministry of the title; their lives are entangled as one tries to overcome PTSD and the other deals with political intransigence of those who resist change.

3 - Wet bulb temperature is a measure that relates both heat and humidity.



Figure 5. Yu Min Teoh, 'New Life, Neo Hull', unitfifteen, University of Huddersfield, 2021

The book is formed of 106 chapters of varying length and complexity that feature a range of other storylines and ideas, many taken from environmental science, and feature a range of characters and positions that outline positive strategies to deal with the effects of climate catastrophe, alongside the tales of individuals. Most powerfully, it foregrounds our responsibility to future generations and those who will have to inherit the mess caused by previous generations. Like Klein's conclusions, this will require a fundamental re-evaluation of the current financial and organisational infrastructures.

In terms of structure and narrative, the book powerfully conveys the message that there is no single route that will lead us out of the difficulties caused by climate catastrophe, and the scales of action vary tremendously from the individual to large scale geo-engineering of the Antarctic ice-sheets and cloud-seeding. However,

underneath is the message that without political change and cooperation and a drastic realignment of the economy, we will not be able to address any of these problems in any meaningful way.

Similarly, in the novel 'New York 2140' (Robinson, 2017), Robinson sets the story in a flooded New York following a dramatic global sea-rise that sees most of downtown Manhattan under 50 feet of water. The multiple storylines show that while many of the power structures of late-capitalism still exist, their impact is not as ubiquitous, and in the worst affected areas, systems have evolved to accommodate more progressive approaches to negotiating the city. These changes result in new relationships and forms of collective ownership within an ecological and socially just framework. Robinson uses the stories of a wide range of characters to convey the range of lived experiences and shows how these lives intersect, so even if there is one class that is seemingly

untouched by the severity of the changes, the fact that they are reliant on many others is an important lesson of the connectedness of populations.

As has already been mentioned, discussions around climate are often closely linked with concerns for social justice, and these issues have also been a powerful theme of much SF, especially since the social revolutions of the 1960s. Themes questioning ideas of gender and identity, which formed the backdrop to the works of Ursula Le Guinn, Joanne Russ, and Marge Piercy⁴ are also found in current trends of queer and trans-SF that use the speculative nature of SF to describe radically different forms of identity and agency. Recent works by Charlie Jane Anders, Arkady Martine, and Ann Leckie blur gender roles and identities, reflecting non-binary debates using the speculative opportunities of SF to expand conventional attitudes.

In questions of race and ethnicity, the rise of Afrofuturism has had an important impact on SF. These issues become a central feature of its discourse. This tendency has its roots in the critical analysis of the work of Samuel L Delaney and Octavia Butler in particular (Dery, 1993), and the themes often overlap with other ideas of identity, as can be clearly seen in the success of writers such as NK Jemison, Rivers Solomon, and Nalo Hopkinson. They use complex conceptions of alterity as a starting point for narratives that engage with a discourse of progressive values about the nature of inclusion and exclusion.

British-Nigerian author Tade Thomson's Rosewater trilogy (2018 – 2019) presents an intriguing perspective on the theme of 'otherness' in the way it presents an alien invasion as a corollary to the threats of a pandemic, climate change and capitalism. The novel, set largely within Nigeria, focuses on the otherness of an alien species that is the novel's main antagonist, reproduces itself through viral infection both physically and through a virtual network connecting consciousness. The story offers a complex web of narratives and timelines, but it is in the everyday descriptions of the main protagonists and, in particular, the extensive use of vernacular Yaruban references and terminology without explication; Thompson

is of Yaruban heritage, that makes many non Yaruban readers equally feel 'alien'. This othering of the reader reminds us that, depending on the context, we are all 'aliens' and 'natives'. Indeed, one of the principle themes of much contemporary SF is questioning conceptions of inclusivity and difference; in the face of external existential threats, our local differences start to seem quite petty.

By engaging with the narratives around alterity and social justice and the ability to 'embody' their progressive ideas in compelling narratives and characters, architects presented with the possibility to speculate on what these worlds might look like has never been more prescient nor achievable.

If the progressive ambitions voiced by many architects and their professional bodies are to be incorporated into future architectural strategies, then it will necessitate a radically expanded concept of architecture in all its manifestations, starting with architectural education.

Education

"The results of this increasing polarization in the distribution of wealth and power are indelibly etched into the spatial forms of our cities."

David Harvey (2015, p15)

Architecture is an integral part of the industrial world and has a symbiotic relationship with its development, including contributions to the production of carbon emissions. The formation of the architectural profession and the rise of formal architectural education were contemporaneous with the emergence of the industrial revolution, driven by the need for the implementation of standardised methods of construction and production and properly skilled professionals to oversee their implementation.

The dominant model of Architectural Education, which emerged in the late 18th century, continued throughout the 19th and 20th centuries, is the system developed in post-revolutionary France with the foundation of the École Polytechnique in 1794 and the re-introduction of École des Beaux-Arts in 1817. The role of the École des

4 - See Dariana Nistor's essay in this issue

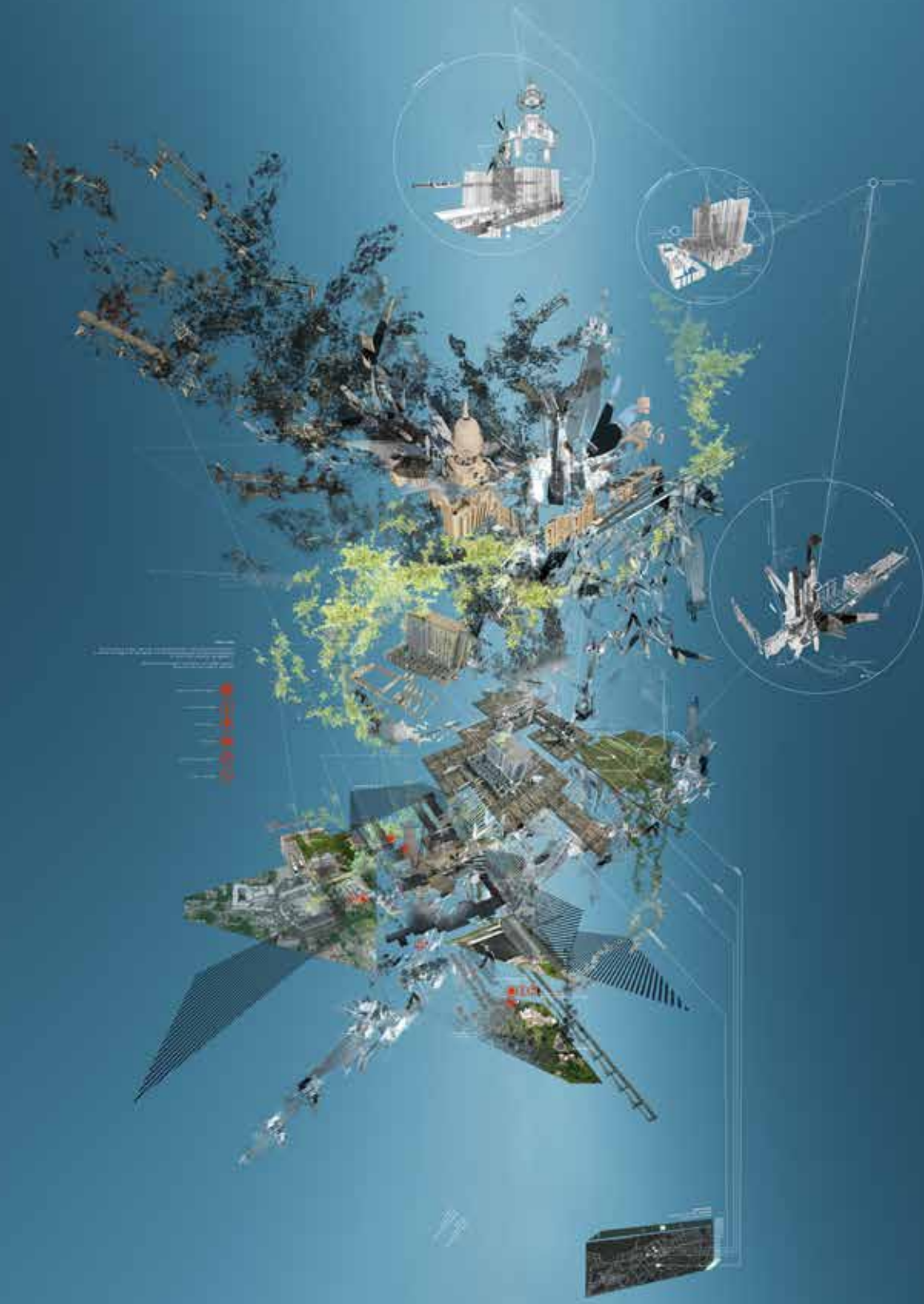


Figure 6. Vipin Dhunnoo, 'Games Space', pre-production chronogram, unitffteen, University of Greenwich, 2013

Beaux-Arts has been particularly influential in the formulation of a hierarchical type of architectural education. Its model of design-based teaching is still followed as an archetype of the profession based on the stylistic predilections of the 'great architect' and developed through the implementation of the atelier system led by the professors at the École - something that persists in many of the variations of the Unit system to this day. For this reason, architectural education is often concerned with backwards-looking formalist strategies, learning from the past and not seeking to communicate outside narrow disciplinary boundaries. For the most part, the stratification of master – pupil in architectural education signals a division of labour that is perpetuated within the wider discourse of architectural practice. There are those experts who run the architectural profession and set the terms of architectural practice while serving the interests of wealthy clients, and there are those who produce, deliver and consume architecture often passively.

Toward the end of the 19th and throughout 20th-century architecture did start to address social concerns, initially under the remit of a philanthropic paternalism where reforms were put in place to appease the threat of social unrest and then as part of the modernist tradition of moving away from the hierarchies of the Ancien Régime toward a more collective model before those utopian aspirations were co-opted by the newer forms of industrial and financial power.

Consequently, the last century saw many changes to the practice of architecture as a discipline, a profession and as an academic subject. In architectural education particularly, there have been major changes in the constituency of those studying architecture and becoming architects, although the UK profession is still dominated by a white, male, middle-class majority. The ultimate goals of the profession reflect, with few exceptions, to perpetuate the status quo and, in particular, the financial and contractual norms of late-capitalism.

However, over the last 40 years, as part of late-capitalism, we have seen the incremental monetisation of everything, particularly property, healthcare, education, and especially Higher Education. With the introduction of fees and loans, debt-based education has shifted to

being a service industry where Universities are conceived of as businesses competing with one another and students are consumers. Competition has not improved the quality of education. It has created a market that skews its results, and while the introduction of new modes of delivery can be seen as opening up alternative routes through education that address the financial burden of the contemporary academic system, they can also be seen as a move to try and 'privatise' education even further.

From a progressive perspective, education has always been at the core of social justice, and one of the great aspects of social welfarism was making education more available. While architectural education is more engaged with social issues, it is still subservient to the profession and follows the criteria of the professional bodies. Architectural education may claim to be part of a liberal arts education at every stage. The structure and teaching outcomes are guided by professional criteria that intrinsically perpetuate the existing status quo.

Current architecture students will reach maturity as architects around 2040 - 2050, and hopefully, they will be designing for a world with limited rises in global temperatures to 1.5degrees, but 3 – 4 degrees is more likely. In either case, the world in which they will be designing for will be very different; just how different will also depend on whether we have managed to ensure that a system of social justice has triumphed over the extremism that we see embedded in the current system. For these future architects, climate catastrophe, technological convergence, and social justice will not be abstract concepts; they will be ingrained in the way they live their everyday lives.

For over twenty years as a teacher, I have been using the moving image to help students develop narratives that communicate ideas of the future. Running alongside these representational skills, I have also been themes and tropes taken from SF, both literary and cinematic, along with a critique of the economic and political structures of contemporary life. Part of my use of the moving image is a direct critique on the use of traditional architectural representation to describe architectural spaces and the ability of stakeholders from a wide constituency



Figure 7. Charlie Barnard, 'Floating Utopia', pre-production chronogram, unitfifteen, University of Greenwich, 2013

to understand complex time-based narratives more easily than the abstractions of orthographic representation. Throughout this essay, I have used examples of student projects to illustrate the potential of speculative projects to imagine alternative futures.

Conclusion

"We have two choices. We can be pessimistic, give up, and help ensure that the worst will happen. Or we can be optimistic, grasp the opportunities that surely exist, and maybe help make the world a better place. Not much of a choice."

Noam Chomsky (2015, p196)

At the early part of the 20th-century, architects, artists, and designers took inspiration from speculative fiction to imagine what a new world might be like, though this has not been properly acknowledged (Clear, 2014), many such as Le Corbusier and Frank Lloyd Wright, were directly influenced by authors such as Bellamy, Wells and Verne, others were inspired more political forms of SF such as Bogdanov's 'Red Star' (1908), and even the Futurist Marinetti wrote two works of SF 'Poupees Electronique' (1909) and 'Marfarka il Futurista' (1910). The desire for speculation and the ability to imagine a better future needs to be reclaimed if we are going to set out architectural ideas that address climate catastrophe and social injustice, and it needs to start in architectural education. Learning from SF and thinking like an SF author may help give them tools to ask 'what-if' questions and imagine alternatives.

At a time when we should be changing our behaviours, we see resistance to those changes because the uncertainty of what that future might look like is too unsettling, and we already see those uncertainties manifest themselves in wider political and social upheavals.

As a global community, we have to dramatically alter our behaviour or suffer the consequences of a global temperature rise of 3 – 4 degrees. Tomorrow will not be business as usual, but we have to inspire hope and 'embrace the possibilities' and not give in to despair, or even worse, do nothing. Architects are in a unique position to provide visual and spatial interpretations to the ideas

being advanced by theorists and speculative authors; as architects, we have to make a zero-carbon socially progressive future into something tangible. Architectural education needs to work with the generation of emerging architects to imagine alternative futures and alternative architectures. We have to imagine a better world, not only as an alternative to the current crisis but because there are so many possible worlds to imagine.

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