



PAPERSPACE

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**20XX**

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There is a Chinese curse which says: "May they live in interesting times." Is it applicable to where we are right now, as individuals, as humanity, as a planet? Probably. Do we live in the time of change? I sincerely hope so. Does every generation feel they live in the time of change? Ask the oldest person you know.

We have the honour to share with you the lucky 13th issue of Paperspace, under the theme of 20XX. Marking the start of a new decade, it reflects on how the past has influenced the current condition of our immediate situation in the global context. It speculates about what is to come, drawing on what we hear, read, tweet, like and share. It imagines a future which we will be able to design for.

This issue is very much ingrained in the realm of the climate crisis, its consequences and solutions which we believe have the capacity to alleviate them. We were present at and engaged in the **Climate Emergency Forums** held here at the University of Bath, but we also went as far as the **Paradise Lost**, which is a heartbreakingly report from the Maldives.

In **20XX** we explore the ongoing changes in education, our profession and the industry from different perspectives. **Is the Future Female?** Should we start **Designing for the Fourth Dimension?** Or become **Modern Polymaths?** **Structural Engineering of the Future** interrogates the prospects and possibilities of technological advancement in architecture and construction from a civil engineer's point of view. **A Certain Uncertainty** reflects on the dilemmas of architecture students from the perspective of a much more seasoned sailor, not only in terms of his own experience, but also the struggles of many students who have come through his doors in 4ES 5.01.

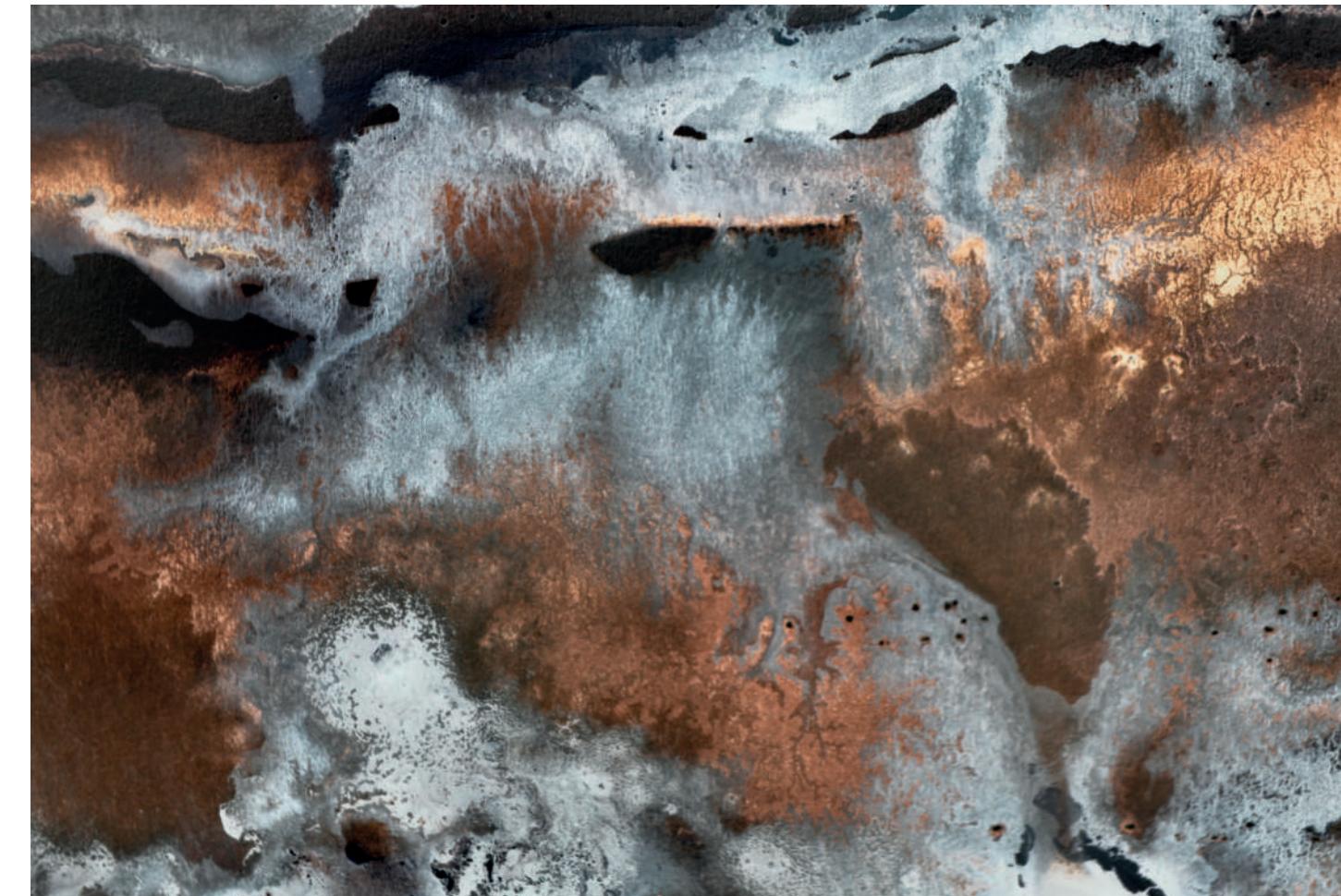
We speculate about the future of ethics and ethics of the future, housing, information and technology. The interesting times we live in invite us not only to take a stand, but to take action too, both as individuals and professionals.

The research we have done, the things we have learned and the articles we have written as a consequence have helped us formulate open-ended opinions – those which have not had the time to stagnate yet, which are evolving with our rapidly changing reality. Having an opinion is crucial to making things happen, but not allowing this opinion to shift and fluctuate with time is what stops us from growing.

We hope 20XX will engage you in new conversations, open your ears to new voices and encourage you to question the opinions you have read, heard, or made.

Julia Korpacka

*Editor in Chief of PaperspACE*



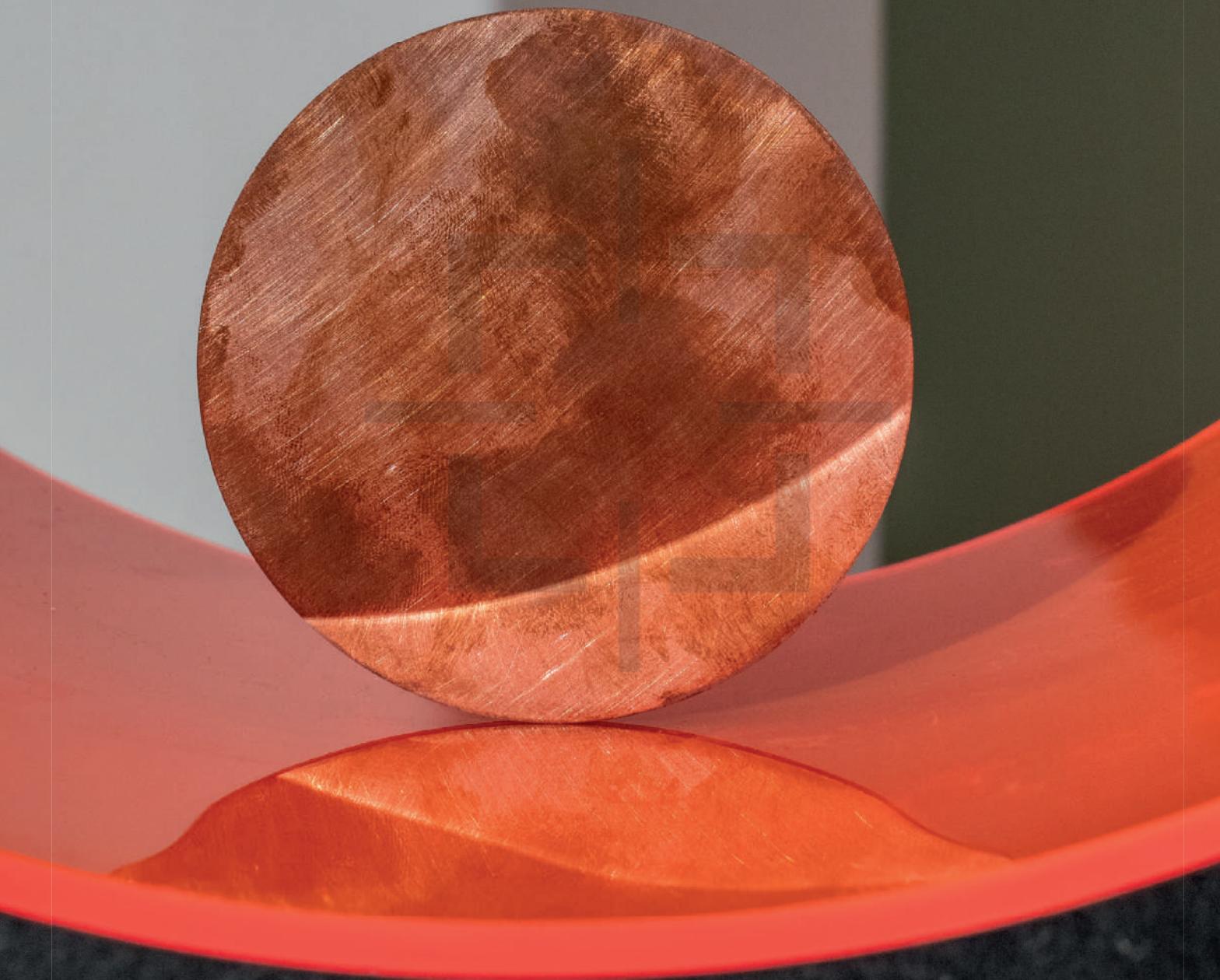
## In the Depths of the Unknown

By **Maddi Gomez-Iradi** (2019) fluid acrylics and salt on paper



As founding members of Architects Declare, Feilden Clegg Bradley Studios are happy to be able to support Bath University School of Architecture students in their recognition of the global climate emergency.

[fcbstudios.com/climate](http://fcbstudios.com/climate)



# FeildenCleggBradleyStudios

## Architectural and urban design practice

Image: FCBStudios' Carbon Counts exhibition about material matters. Exhibition running in our London office until end of March 2020.

*This issue would not be possible without the donations that have been supporting the magazine this year. They help us continue providing PaperspACE as a platform to express our opinions and views, allowing our voices to reach further.*

Hence, the entire PaperspACE team would like to express gratitude to **Prof. Peter Clegg** and **FCB Studios, Jestico + Whiles, DKA and Yangou Architects**.

**Thank you!**



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Cavendish Laboratory, University of Cambridge

**jestico + whiles**

An architectural rendering of a modern school building complex. The complex consists of several interconnected wings with large glass windows and doors. The building is set against a backdrop of rolling green hills and a clear sky. The rendering includes a cross-section of the building, showing various rooms and spaces. The overall design is clean and modern, emphasizing light and space.

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# map of our influences



# A City Grown on Trees

By Catelyn Liao (2019) pencil on cardboard

If a human manipulates the roots of a Banyan tree, they can form structures and keep growing for years. Inspired by a Banyan tree bridge made of living tree roots that have stayed for over 100 years in my hometown, I could not help thinking that even a city could be built on a tree that keeps growing. Thus, the city would develop and spread out together with the vertical growth of the tree trunk and the horizontal growth of the branches.

An interesting issue this image brings up is the right of enjoying the sunlight. Given the city itself is made of layers of neighbourhoods on top of one another, the higher level you live on, the closer you are to the sun. Does this 'Right of Enjoying the Sunlight' affect the demography of this city?



# Climate Emergency Forum

## Summary Notes



**Words by Joe Watton**  
**Images by Matt Dodd**

### 16/10/19: Forum 1 – Gathering ideas

The first climate emergency forum in mid-October brought staff and students together from across the department to discuss what we can do to reduce our carbon footprint as individuals, as a department and as a university. The event was well attended, with ideas being contributed by students from all year groups as well as tutors and the heads of year. It was interesting to observe how these suggestions were often reflective of the contributor's particular stage of education.

Among the first and second year students there was a focus on changes relating to the syllabus. These included the suggestion of a retrofit project in design studio, as well as a potential lecture series from environmentally driven architects. The upper years leaned more towards ideas based upon the acquisition of specific knowledge, proposing a best practice guide for low carbon building materials and technologies, and questioning whether postgraduate research projects could be integrated into design studio work. Staff generally had a more holistic overview of what may be effective, asking whether a department manifesto could be created to encourage a collective culture of environmental awareness that would feed into both the lifestyles and the design work of members of the department.

### 04/12/19: Forum 2 – Action points

During the second forum the ideas generated in the first session were scrutinized in further detail. The likely impact and feasibility of each suggestion was discussed by the group as a means of deciding which would be most worth pursuing. We now have a list of thirteen refined action points ready to be broached with the relevant parties and eventually put into action.

# ACTION POINTS

## Teaching

### 1. Manifesto

Create a department manifesto promoting an approach which considers the broader effects of our work on the environment.

### 2. Retrofit Site

Assess the viability of offering a retrofit site as an option in one of the design studio modules.

### 3. Lecture Series

Organise a lecture series from leading sustainable architects, offering practical advice on low carbon design.

## Lifestyle

### 4. Biodiversity

Conduct a feasibility study into what can be done to enhance biodiversity on campus.

### 5. Transport

Evaluate the lowest carbon method of transport for the third year study trip.

### 6. Meat-Free Events

Look into the feasibility of serving only vegetarian/plant based foods at open days and other department events.

## Resources

### 7. Building Study

Research the operational carbon footprint of 4ES and consider how it might be reduced (turning the heating off at night, etc.)

### 8. Paper

Look into whether it would be feasible to switch to 100% recycled paper in 4ES.

### 9. Recycling

Design a more effective layout for the studio recycling system, find out if food waste and glass recycling would be possible.

## Research

### 10. Research

Find a way of linking PhD academics with undergraduate students so that research can be learned from and tested out in design studio projects.

### 11. Moodle Page

Design a new moodle page with best practice guides on different aspects of sustainable design, such as embodied carbon and thermal performance.

## Wider Context

### 12. Design Competition

Open design competition to reduce the carbon footprint of the University, whether it be how students get to campus or how the bins are collected.

### 13. Transferable Model

Harnessing the presentational skills of architecture students to demonstrate how actions taken within ACE may be repeated by other departments.





image source: Trotman, A. (2017) Why don't European girls like science or technology? Microsoft News Centre Europe [online]

Conventional gender roles are still prominent in our society, where we raise men and women differently, and young girls not being very exposed to science or engineering outside of school hours.

to be encouraged from a young age if we expect them to take up a career in STEM in the future. It has been shown in a study that teenagers felt that they would fit in better if they studied subjects with more people of their own gender.

*Is STEM just easier for boys?*

Questions I am sure you have asked yourself on this topic is: maybe boys are just smarter than girls? Maybe they are more capable with STEM subjects? A meta-analysis of the differences in gender in mathematics tested over three million people. It found that girls outperform boys overall in primary school, but there is no difference between them in secondary school. In another study based on maths performances, girls' maths scores were 10.5 points lower than the boys' average, but this varied depending on the country. It also found that in countries with better gender equality, these differences disappeared. In countries such as Sweden, there was no gap between boys and girls, and in Iceland girls actually outperform boys by 14.5 points<sup>3</sup>.

There seems to be a lack of confidence in girls during testing, with those over the age of six being more likely to think that brilliance occurs more in boys. Also with the idea of social belonging, we tend to approach areas where we feel we would succeed in. If there is no confidence in that subject, there is less of a chance of pursuing it in the future. We also tend to gravitate towards people of our own gender, even when it comes to studying subjects with people from similar backgrounds.

If there is a lack of representation or role models to identify with, it is no surprise that you would feel discouraged to join that field (and we have all seen that man with a yellow hat holding up blueprints on Google Images, have we not?).

This made me wonder what are the young girls in this country interested in today, so I went to see for myself whilst volunteering for outreach programmes in 2019.

I spoke to hundreds of girls and boys, proudly wearing a badge that said Civil Engineering. What I found was shocking - nobody knew what civil engineering actually was! In fact, very few of the children I spoke to (ages 11-17) knew what engineering actually entailed. At one event, where I spoke to about 100 girls around the age of 13, the question I got asked the most was 'is it difficult?' with concerned looks on their faces. They did not seem to have any knowledge about the many ways in which engineering exists in our everyday lives.

In fact, even speaking to 17 year olds made me realise they had little knowledge about what engineering was. The second most popular question was "what grades did you get at school". Every person who asked that had this pre-existing assumption that you have to be in the top 5% of the country to even consider engineering, or that you have to go to university, which is not possible for everyone. Nobody had spoken to them about apprenticeships, the traditional way of training civil engineers.

From this experience, it is clear

# Is the Future Female?

## Women in STEM

By Yolanda Plunkett

I recently went to an event hosted by Women Engineering Society, where they had a group of women from STEM speak about their personal experiences and how we can "change the world". During the panel discussion at the end, a student asked "how do you balance your career in STEM and having a family?"

It made me wonder if family life was something that affected women's involvement in STEM? Was it a problem that also male engineers were asked about? And how bad the gap between male and female engineers actually was?

It may not come as a large surprise to you all reading this, but there is a massive gender equality gap in the STEM industry. STEM, short for Science, Technology, Engineering and Maths, encompasses some of the largest sectors in the UK and the world. £1.5 billion in the STEM

industry is wasted in the UK every year due to the lack of potential employees, where 89% of STEM businesses are finding it difficult to hire people with the right sets of skills. Employing more women in STEM could potentially lead to the increase of the UK's labour value by £2 billion<sup>1</sup>.

It is clear that there is a severe shortage of people in STEM, but it becomes even more distressing to find that only 11% of the engineering workforce are female, and only 5% are chartered engineers or technicians. Shockingly enough, this is also the lowest in Europe<sup>2</sup>. In this day and age, the gender gap can no longer be justified - it is obvious that there needs to be more encouragement for females to join the STEM industry. But why is there such a large gap in engineering? If we take a look at the past, it may provide us with solutions for the future.

These kinds of gender roles are still prominent in our society, where we raise men and women differently, and young girls are not being sufficiently exposed to science or engineering outside of school hours. It has been shown that a deeper interest in the STEM industry starts from childhood, which means that children need





Myself talking to young girls at the event

to me where the problems lie; lack of education in the field; lack of confidence in women to take up challenging subjects; pre-existing gender roles and lack of representation. This does not mean or imply in any way that women who do not work or decide to be housewives should be condemned, but development and prosperity in this country will only occur with increased application of STEM, in which both males and females should be involved.

I will not let this piece leave a sour taste in your mouth, I have one more anecdote. I went to a workshop hosted by Engineers Without Borders, where we spoke to children who were about 8 years old. At the end of our workshop we asked them if they knew any engineers in their families and we had many responses: "my grandad was an

engineer in the navy" "my dad is an engineer" "I think my uncle does" - I may be paraphrasing, but I kid you not, nobody mentioned a female engineer in their family. It was a little sad but expected. We then asked them who is interested in doing engineering in the future, and every single girl shot their hand up. There is an interest and excitement in STEM at a very young age, it is a fire that we have to make sure does not get put out as they navigate themselves through the world.

There is one thing that we can clearly see; the amount of females that are going to university to study engineering is slowly increasing. Eventually there will be more female civil engineers who will break the glass ceiling, and there will be a whole generation of children who will be there to see it. Maybe feeling represented in this field will inspire them to partake in

it - that is at least what happened to me, and I hope it happens to many others. ☺

#### Notes

<sup>1</sup> STEM (2018) Skills shortage costing STEM sector £1.5bn. [online] <https://www.stem.org.uk/news-and-views/news/skills-shortage-costing-stem-sector-15bn>

<sup>2</sup> WES Statistics (2018) *Statistics on Women in Engineering*. Stevenage: Women in Engineering Society.

<sup>3</sup> Guiso, Luigi et al. (2008). *Diversity, Culture, gender, and math*. Science (New York, N.Y.), 320, 1164-5. 10.1126/science.1154094.

# THE MODERN POLYMATH

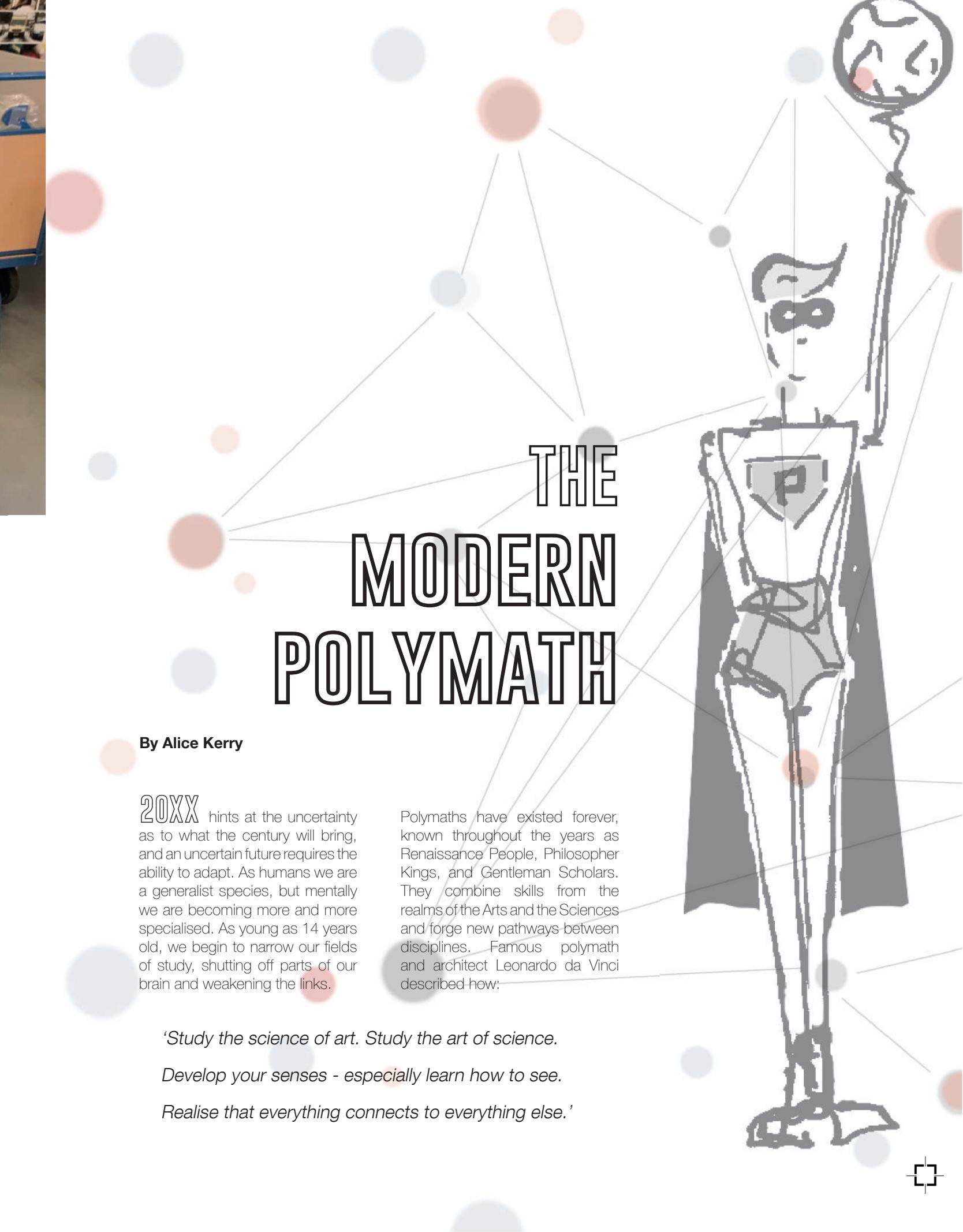
By Alice Kerry

**20XX** hints at the uncertainty as to what the century will bring, and an uncertain future requires the ability to adapt. As humans we are a generalist species, but mentally we are becoming more and more specialised. As young as 14 years old, we begin to narrow our fields of study, shutting off parts of our brain and weakening the links.

*'Study the science of art. Study the art of science.'*

*'Develop your senses - especially learn how to see.'*

*'Realise that everything connects to everything else.'*



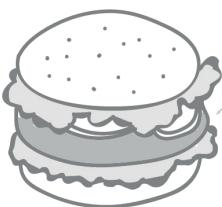
## VEJA

The creators of the sustainable *veja* trainers made from recycled plastic bottles and wild rubber studied Business and Philosophy, then moved into the world of sustainable fashion. The brand has a lab that creates and tests new and environmentally friendly materials.



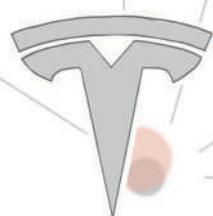
## BEYOND A BURGER

*With many experts advising that a plant-based diet is the best way to reduce our impact on the environment, more and more meat alternatives are appearing on our shelves.* ‘*Beyond Meat*’, one of the leading meat alternative brands, has a ‘*Future of Protein*’ lab researching the use of peas and fava beans in their products, and a colour lab to make the burgers look more ‘realistic’.



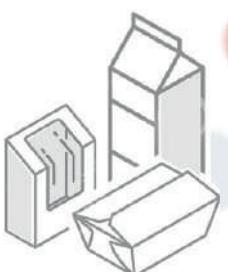
## TESLA

*With four multi-billion pound companies under his belt, ranging from software to aerospace, Tesla’s creator, Elon Musk is an avid polymath. He regularly puts hours each week into learning and self-teaching new topics. His secret to his wide range of successes is said to be the understanding the principles that connect the different fields.*



## THE SHELLWORKS

*Almost everything we buy is packaged, and packaging design has become an art form in itself.* A team comprised of architects and designers (alumni of the IDE course) have come together to design sustainable packaging that uses chitin from waste lobster shells to make biodegradable plastic containers.



Our century is the century of the Polymaths. Already, people who fall into this category have considerably changed the face of the world we have come to know. Steve Jobs, Elon Musk, and Jeff Bezos (the founder of Amazon) have all combined tech skills with design and boundary-pushing ideas that define a generation, and that many of us cannot imagine life without.

There is one important thing about modern polymaths that becomes evident when looking at the products designed by them. They are critically important when it comes to saving the planet. Teslas, *Véja* sneakers, the *Beyond Meat* burger – each of these products has been designed by people considered to be polymaths, and they all have two things in common: they are sustainable and they are flying off the shelves. Polymaths manage to combine ground-breaking scientific ideas with pleasing aesthetics and ergonomics to design new, exciting, and most importantly desirable products. As a society, we cannot stop consuming, but brands like these are changing the impact of our consumerism.

Looking at the polymaths that are making waves in society and looking into their education, a common trend is an American university experience. In the UK we begin to specialise at a very young age, and by 19 many of us have defined our paths, closing our minds to the possibility of learning new languages or creating art, things that at one time we did at school. Polymaths are not born polymaths, they are made. At one time in all of our lives, our weeks were filled with learning about every subject that was available. Why is it now normal to cut half of these out of our lives?

Some universities are beginning to catch on to the new types of graduates that are so desired in modern day society. In London, Ed Fidoe and Chris Persson

have founded the London Interdisciplinary School, accepting their first cohort in 2021. The difference between the new ‘breed’ of polymaths that they intend to produce and traditional polymaths or the ‘Renaissance People’, is that these polymaths will not be lone ‘Gentlemen scholars’. The men and women who graduate from these courses will have been taught ‘soft skills’ to make them excellent and effective collaborators. Leonardo da Vinci was known as a ‘jack of all trades’, but with so much knowledge at our fingertips, our slowly fragmenting global and political environment will benefit immensely from the teamwork of people willing to work together and understanding each other’s specialisms.

Also in London, the Royal College of Art and Imperial College London have teamed up to create the MA/MSc course in Innovation Design Engineering (IDE). This course has been running for around 30 years, yet is still almost one-of-a-kind in the UK. Their students have studied a wide range of subjects before coming here, with a large proportion coming from architecture or design backgrounds. Their students learn the art of ‘disruptive thinking’ and design things that really make a difference to the way we live, from biodegradable packaging to cockroach farms.

In the 21st century, we are facing challenges that are new and exciting, but which need solutions terrifyingly soon. The need for holistic designers and thinkers who can realise connections and innovate has never been greater. If we cast our academic nets further, learning more about subjects outside of our field, we could all be polymaths. ☀





# Instagrammable Galleries?

**By Ankie Ng**

With Greta Thunberg being named Person of the Year 2019 by TIME Magazine, it is undeniable that the new decade is the time to properly address the issues of climate change and the environment. The Tate Modern wrapped up the decade with a blockbuster exhibition by the Danish-Icelandic artist, Olafur Eliasson: *In real life*. The striking play of shadows and reflections has successfully created a powerful sense of space in each of the large-scale installations. It was the perfect break on a Friday evening during my time in London, just to be impressed by the art itself and to contemplate. I was pretty sure that everyone was impressed by the spectacle – at least judging from the time most visitors spent on taking snapshots of the exhibition.

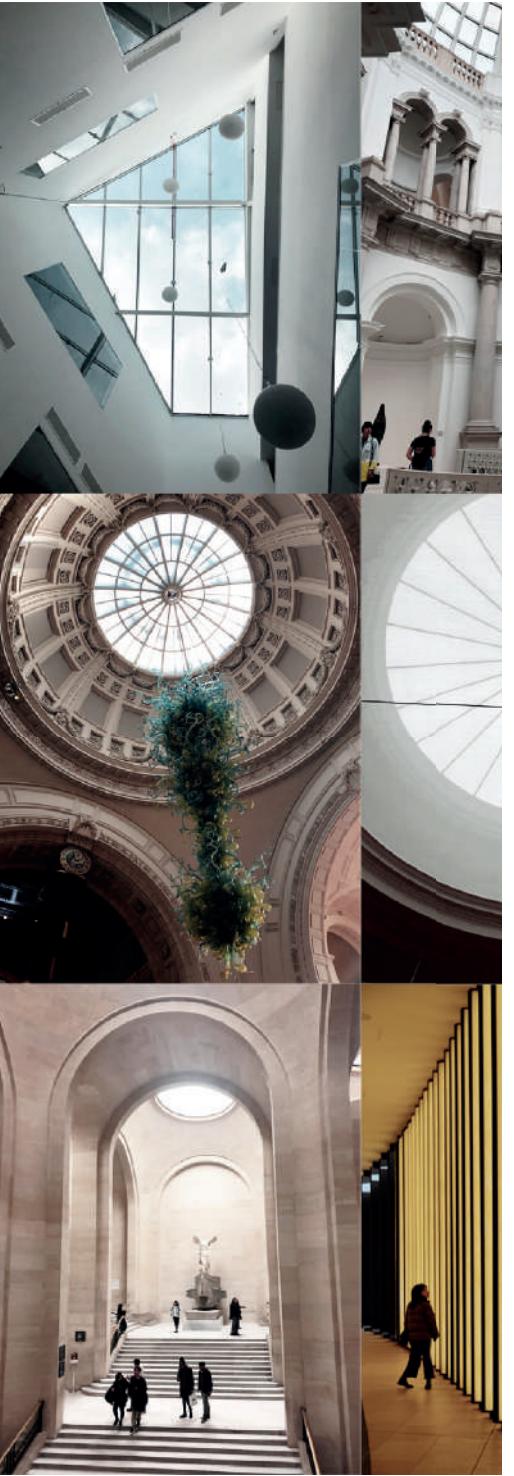
*"In Eliasson's captivating installations you become aware of your senses, people around you and the world beyond."*

But to what extent will one be self-aware, if not of the surroundings and the world beyond, when taking 'Instagrammable' pictures has

become a priority in the appreciation of art? At least, speaking from personal experience, it is rather questionable that the pictures taken would be appreciated later on, as the stories disappear after 24 hours.

*"In just nine years, Instagram has risen from a fun photo-sharing app to a central element of contemporary culture."*

Firms like BIG and Heatherwick Studio are creating buildings that are iconic on the skyline but also on the grids of any Instagram account. The number of architecture or interior design accounts with pictures of similar aesthetics regardless of their actual context is just uncountable. A picture of some art in the middle of a gallery, or a picture of a fancy brunch in a restaurant with good decor is presumed to be of value in the world of self-promotion through the social currency of 'likes' received on a virtual, but present social media. It is still not a crime to do so, yet, considering how most of us are vulnerable to the expectations imposed by social media, further reinforced by our peers, perhaps it should?



private collections for the nobles and elites to view art outside of its usual daily settings. It is now part of our daily life, where parents take their kids for a stroll and people meet up with their friends after work for a cultural (and hopefully intellectual) break on Friday and the weekend, as most of them like to spend some time in a gallery café with nice coffee, cakes and views. In Michael D. Levin's book, *The Modern Museum: Temple or showroom* from 1983, modern galleries are defined by the following qualities:

#### **Multiplicity of function**

The art gallery is no longer limited to the preservation and collection of art. As Guggenheim's former director, Tomas Kren, described, it is "a theme park with four attractions: good architecture, a good permanent collection, prime and secondary temporary exhibition, and amenities such as shops and restaurants".

#### **Expansion and diversification of exhibited material**

Criticized as an industry for favouring white masculine artists (in 2017, 80% of the artists in New York galleries were white), galleries like the Tate are trying to expose its audience to a wider range of themes, e.g. feminism, LGBT, African and Asian Art.

#### **A New Approach to Light**

Natural lighting provides the sacredness in galleries as it varies with textures and time of the day, enhancing contemplation in galleries. The skylight, pioneered by Sir John Soane in the Dulwich Picture Gallery, was a common approach to gallery lighting until artificial lighting was found to be a better solution in terms of overheating, glaring and preservation of materials. However, to prevent museum fatigue, a balance between natural and artificial lighting should be reached.

#### **Conservation**

Modern technologies like sensor systems and more sustainable approaches are being introduced to provide the optimal environment (in terms of temperature, UV radiation, humidity) for the preservation of the archives.

#### **Flexibility**

For galleries with ever-changing exhibitions, the design should allow for flexibility of the arrangement of space with interchangeable partitions, display cases, lighting fixtures, and even floor plates. Galleries have started to consider how an exhibition would look like on Instagram, as the Space Shifters, an exhibition at the Hayward Gallery, was marketed as 'the most Instagrammable exhibition'. Inevitably, the idea of how a gallery would appear on pictures and Instagram stories, or how it would integrate with new forms of technology like VR, would inform some of its architectural decisions.

#### **Expressive form**

From the temple-like galleries of the 19<sup>th</sup> century and the white cubes in the 20<sup>th</sup> century, the new contemporary galleries have been more expressive in their form to embrace their identity as a showroom and institution of art.

There is a bloom of Instagram posts every New Year's Eve, where people suddenly become sentimental about their life and type up their New Year resolutions with 'new year new me' posts. Surely, the world has not become a better world simply because it entered a new decade – it will be if we all try to tackle and embrace the current social and environmental issues that we should address. Public spaces like galleries could be one of the first places to make a change. New decade, new us, hopefully. ☺

# **Placements**

## Brexit and beyond

only sporadic, we should be alright (fingers-crossed).

ii.

Exchange programmes and placements in the EU might become less accessible to UK students. It might mean that students will not seek exchange programmes and simply undertake placements in the UK. On the other hand, it could result in students being more open to the opportunities beyond the EU – both for placement and for exchange programmes (as is the case for a few other courses at our university).

iii.

No one knows exactly what the relationship between the UK and the EU will be like in the next few years. That said, no one – even the RIBA – has concrete guidance on how it might affect the architectural profession. So far, the immediate effect has been on our second year students who are unable to participate in the Erasmus programme this year. However, we can only speculate what might happen to the industry, to architectural education and to placements in a post-Brexit UK.

And that is only the political tea. Beyond the next few years, there is much more to consider in the way of broader themes such as technology and climate change.

So for now, here is my bit of speculation on the future of placements (Brexit and otherwise):

i.

The next couple of years might present challenges for students wanting to work at large firms which have great stakes in the EU, as Brexit-related policies are yet to be set. However, assuming that waves of political upheaval are

Technology is becoming increasingly important. Often, we are hired for placement based on our technical skill set (are you proficient with Rhino?). However, I do not think it is hard to imagine a future where our CAD monkey skills become obsolete. It feels like it could be a matter of time before drafting drawings on computers will be done with the simple press of a button, while an AI bot crunches the numbers. ☺



# DESIGNING FOR THE

**Words by Harry Wyatt**  
**Images by Michael Tsang**

Proponent of circular economy Michael Braungart, insists that the dominant philosophy of 'eco-efficiency' is inadequate because it only seeks to limit the environmental impact, but ultimately the impact is still there; we are simply slowing the rate of it. We need to go beyond the design of a building as a 3D object with a static performance calculation; we need to consider its entire lifetime including where it comes from and where it might end up.

Your building is located not just on a site in an urban and cultural context, but also a temporal one. The materials come from somewhere and have been something in the past. In a future beyond the life of the building they will go somewhere and become something else. All of this movement will impact someone's present. Think of a timber building; its skeleton was once a grove of trees and at the end of its life perhaps that same timber will go into another building, or into furniture or maybe it will rot down and return its nutrients to the earth. A plastic membrane will have likely come from crude oil and may end up inside sea-life if it is not handled responsibly at the end of its life. In a circular economy all waste should be managed as nutrients for something else; decaying trees are nutrition for the eco-system; scrap plastic is a nutrient for new plastic.

Designing for time was integrated into this year's Basil Spence brief, with the building changing use from a flagship building for a major development to a centre for advanced technology. The three groups winning the critics' choice awards all showed that they had considered time as a factor beyond the single change of use. The first prize project was designed to change to adapt to the growing community around it. With a little adaptation it could become a sports centre, a college or three residential blocks. One runner up scheme had a living façade which changed with the seasons to provide appropriate shading and had a life 2 programme that intended to support lifelong learning, so the people would keep coming back and making use of it. The other runner up leased rather than bought technically complicated materials from suppliers to ensure they would return to a place where they could be recycled at the end of life.

Already at Bath we are coming up with rich and exciting ideas for how time can be used as a design parameter. Despite the more limited scope of most architects' work in real life, modern technology is offering us a chance to bring the design of buildings from something quite static to something continuously operating. Increasingly rich sources of data allow us to make more informed decisions already about where the building and materials are coming from; grappling with the

unpredictability of what happens next is more of a challenge.

While we invariably design for performance as well as space, most buildings have a performance gap between the exciting environmental credentials promised by the architect and the actual reality. A better understanding of how the building will be used from earlier stages, the delivered building meeting the specifications and a clearer strategy for its use and servicing are all necessary. There are multiple reasons for this, from poor estimates of usage, construction to a lower specification, leaving out variable power load or using the systems inefficiently. Using BIM (building information modelling) to a high level of maturity promises to alleviate some of these issues.

We are living in the age of data so we must learn how to use this and apply it appropriately. Working more closely with consultants and the contractor with BIM is already allowing us to build closer to what is intended, as all the systems can be tested virtually before hitting the site. This can also save on material, energy and time. Used effectively, BIM can help us design the building for use and thus for time. At the usual handover from contractor to client a mature BIM model can be passed to end users of the building to allow them to more easily understand how it works. This can allow for better operation of the systems in place and makes servicing, upgrading or adapting them a far simpler

# FOURTH DIMENSION

task. Detailed analysis can be continuously made.

Media is moving into a subscription model; we pay a monthly amount to listen to music or watch movies rather than buying them to own. Perhaps the aftercare that a mature BIM model provides could see architects and contractors kept on subscription to ensure the building is performing well and thus being able to offer intervention if not, or if requirements change. The data can also help the building to be deconstructed and recycled responsibly at the end of its life, particularly if care has gone into design for deconstruction.

There are as many ways of approaching design for time as there are for the design for space. Certain factors might create a desire to build something to last millennia; other factors might suggest that a building designed for eventual demolition is best. Sometimes a building that can completely decompose might be desirable. A sustainable world is one that will continue into the future; sustainable buildings, or at least their materials, must do the same.

So let's step beyond asking the question of 'what is my building' to 'where did my building come from' and 'where is my building going'. ☺



2040



2050



2060

# A Certain Uncertainty

## Letter to a Young Architect

'I was just wondering if you could help me find my way'

Well, that depends on where you want to get to

Oh, it really doesn't matter, as long as...

Then it really doesn't matter which way you go.

So long as I get somewhere

Oh, you're sure to do that, if you only walk long enough.'

Alice to the Cheshire Cat from *Alice's Adventures in Wonderland*, Lewis Carroll.

20XX

**By Martin Gledhill**

In this short piece on uncertainty I will first look at our theme in general, then examine how it plays out in architectural education and finally offer some thoughts as to how we might address the matter.

My subtitle unashamedly refers to one of my favourite books - *Letters to a Young Poet*<sup>1</sup> (first published in 1929). The book collects together the correspondence between the poet Rainer Maria Rilke and a young officer cadet, Franz Xaver Kappus who hoped to be a poet himself. Spanning ten exchanges, the letters ostensibly explore love, solitude and other difficulties. They are infused with the relationship between certainty and uncertainty where in essence, Rilke appeals to us all to, *learn to love the questions*. I am not certain that the phrase, when expressed as such,

is actually to be found in the book, but since we are dealing with uncertainty I hope that the reader will set aside some certainty. The biographies of the correspondents themselves offer us an interesting insight with regard to our subject matter. In the early part of his life Rilke was effectively raised by his mother as a girl, or rather, a doll, as a compensatory device following the loss of his sister – an ambivalent beginning? Subsequently, his parents pressured him to enter a military academy until illness came to the rescue and liberated him to be a poet, a calling which he pursued with ascetic zeal. From an uncertain start Rilke finds his way. Kappus, although hesitant about his military career, continued to serve in the army whilst also writing prose and poetry, but as the letters reveal, he doubted both his military

career and his literary talent. In sharing his uncertainty with Rilke, Kappus inspired his confidant to compose some of the most beguiling treatises on the creative process that I know of. At least to my understanding, the military environment in which this drama plays out is one that is reliant upon discipline and obedience being forged (in both senses of the word) by devolving certainty and answers to those of higher rank. This is understandable perhaps in the face of catastrophic uncertainty – war, but are we always facing such a catastrophe? That outer certainty or 'authority' stands in contrast with the poet's inner voice which affords a kind of lonely lure to a place much less certain but profoundly intuited and which paradoxically, is certain in another way. Perhaps we all need to develop the capacity to assimilate both ways of being and to hold the tension between them; to be soldier and poet? E.F. Schumae<sup>2</sup>r puts this dilemma in another way with his concept of convergent and divergent thinking. In a result orientated world perhaps are we in danger of thinking only in a convergent way? A more balanced educational purpose, however, might also be a more divergent process, an encouragement to ask questions, to form questions and to interrogate those questions, to search rather than follow, to wander rather than march. Education then is not only about what we are, it is about Who we are. This is a dynamic process of becoming through both triumph and adversity, one where we are all more often lost than found and certainly uncertain. Here, if the reader will allow a brief excursion into quantum physics, I think that Heisenberg had it about right in his Uncertainty Principle (1927). In this enigmatic proposal he suggests (with a little attunement) that the more certain we are of the position of something (read oneself), the less certain we can be of its (read our) momentum. In a sense, this can be understood as a fluid relativity between

certainty and uncertainty that is more relational than oppositional in that both phenomena are no longer set as polar opposites. I think that we can draw parallels here with the product/process argument that sits within our contemporary educational climate. In short, do we 'learn to earn' or 'learn to discern'? I do not know, but I have witnessed over the years increasing levels of both individual and collective anxiety in education – a need for, and sometimes addiction to, certainty in an uncertain world, and that is certainly a problem. This issue can be especially exaggerated in architecture.

I recall one student from a few years back asserting that architectural education was in effect an elaborate pretence in being confident (read certain) – "fake it to make it!" As architects we all walk the tightrope of either committing to a design too early or too late, teetering as we do between Spectacle and Technical. On the one hand the search for the perfect solution often leads to a propensity not to commit which at its root, is probably a fear of certainty or endings. On the other hand, the race to commit in the service of deadlines could be a fear of uncertainty and beginnings. The principal theatre in which this tension is played out is the review. Most of us will have experienced the 'collapse of certainty' following a 'difficult crit'. This sense of disorientation and uncertainty is experienced as much an existential crisis as a pedagogical one, where self-belief (or lack of it) collides with another version of 'reality' and the promise of a degree certificate. In this space we all encounter something wonderfully and fearfully Other. This Other has many proxies or understudies, variously the tutor, the review panel or a critical friend, but really, involves us all in a confrontation with the uncertain and unknown aspects of ourselves. Jung would call this the *Undiscovered Self*<sup>3</sup>. We probably ought to give the

experience our own psychological term – PCS (post crit syndrome) whose symptoms range from anger, confusion, indignance, elation, clarity, ennui and hubris to name but a few, and all of which obscure the creative capacity of uncertainty. Personally, I both love and loathe reviews and the only way that I have found to navigate their “complexity and contradiction” is to sift through the discourse in three ways; Firstly, to establish comments which are very likely true and these might include instances where the laws of gravity and thermodynamics have been unwittingly transgressed. Secondly, to identify aspects which are worth looking into and exploring. And finally, to observe diagnoses which belong to another scheme altogether and which, more often than not, are an expression of at least two differing belief systems - architectural or otherwise, meeting (or not), head on. In my experience, the vast majority of comments occupy the second category, one which is essentially about the uncertainty. Regarding all categories I find it helpful to remember the maxim; – the only certainty is that; those who are certain they are right are certainly wrong. So how do we find our way?

In the corner of my office is a chair variously known as the ‘crying chair’ or more recently the ‘dream chair’. The Poäng was born of Scandinavian parents, IKEA and Alvar Aalto, a meeting of the prosaic and poetic. Interestingly, the advertising rhetoric for ‘our chair’ suggests that it is both strong and flexible, a nice trope for ‘both and’, rather than the more binary, ‘either or’ - a ‘certain uncertainty’. Over twenty or so years, hundreds, maybe thousands of people have sought a certain comfort within the arms of this innocent piece of furniture. All seemingly arrived with a disorientating sense of uncertainty framed as questions looking for definitive answers. These questions have ranged from the outright existential to more

everyday concerns around the precise location of vapour barriers. The most frequently asked can be broadly organised into three categories; Am I right? Are they right? and Is this right? The answer to all these quandaries invariably was I do not know but let us spend some quality time looking together – are you sitting uncomfortably? Some left the chair with more questions than they arrived with, setting off back to the studio with a cornucopia of possibilities and explorations. Others departed with bigger life questions and a few wondered why even have a vapour barrier in the first place? Many cried, others laughed and some left early, hurrying to a date with certainty maybe. It is my belief that we do our best work when we are out of our comfort zone and that takes time. The chair is not uncomfortable *per se*, but at least for the first ten minutes of any meaningful dialogue I have observed that it seems to constellate a healthy amount of uncertainty. A certain amount of bravery and fortitude is required to endure this conversational overture (tissues help as does humour). In that sense the chair might be better termed a couch. Did all its visitors seek certainty? I think not, they all sought a safe, supportive space in which to be present, but most of all for uncertainty to be held and heard. A place to be comfortable being uncomfortable and whilst the territory is uncertain at least we travel through it in mutual companionship. If there is any certainty at all it is contingent on a process of touching, albeit fleetingly, something which therapists term the ‘third in the room’, something that transcends the tension of knowing and not knowing, where uncertainty is ‘bracketed’ and certainty is provisional. I am not a therapist, but in psychological terms the task of the conversation I feel is to distinguish between an authentic need for certainty and another altogether neurotic type of need. The latter is one we all share, a kind of psychic Elastoplast to mitigate

and camouflage uncertainty out of fear of ourselves. A quick look at an etymological dictionary reveals that one root of the word ‘certain’ is *cernere* – ‘to separate’. In those terms we might configure uncertainty as ‘un-separating’ or a joining force between the known and the deliciously unknown. After all, architecture endeavours to make the intangible, somehow tangible whilst at the same time preserving a sense of nuance and mystery in doing so. Therein is the rub, I think that certainty is contingent, temporary and uncertain.

In conclusion and rather ironically, I find myself facing my own uncertainty as I write this piece at the turn of a new decade. Having spent twenty years at the front-line of design tutoring I am now advancing forward (excuse the military metaphors) to pursue my PhD on Jung and architecture. Stepping out into new territory is certainly not without considerable financial, intellectual and psychological uncertainty. Propelled by that uncertainty my study involves me going to Switzerland regularly (how we suffer for our work!). Whilst I can be fairly certain that the train will turn up on time I am less certain as to where it will take me. <sup>①</sup>



## Notes

<sup>1</sup> Rainer Maria Rilke (2011) *Letters to a Young Poet and Letter from the Young Worker*, trans & ed. C. Louth. London: Penguin Books, 2011.

<sup>2</sup> E.F. Schumacher (1995) *A Guide for the Perplexed*. London: Vintage

<sup>3</sup> C.G. Jung (1957) *The Undiscovered Self*. London & New York: Routledge, Kegan and Paul, 1958.

# Intrusion

*Who do we trust? Are we losing our sense of privacy?*

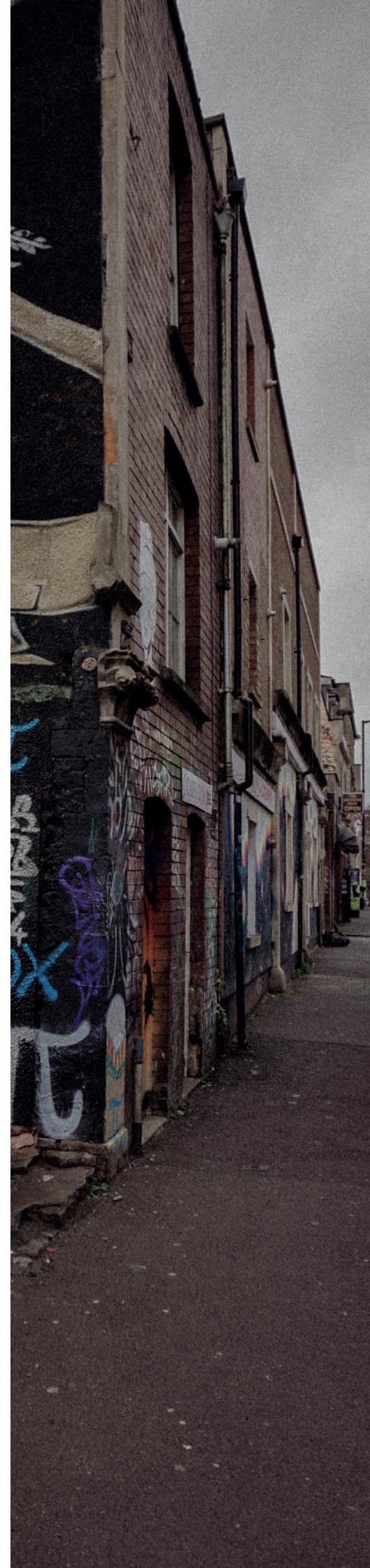
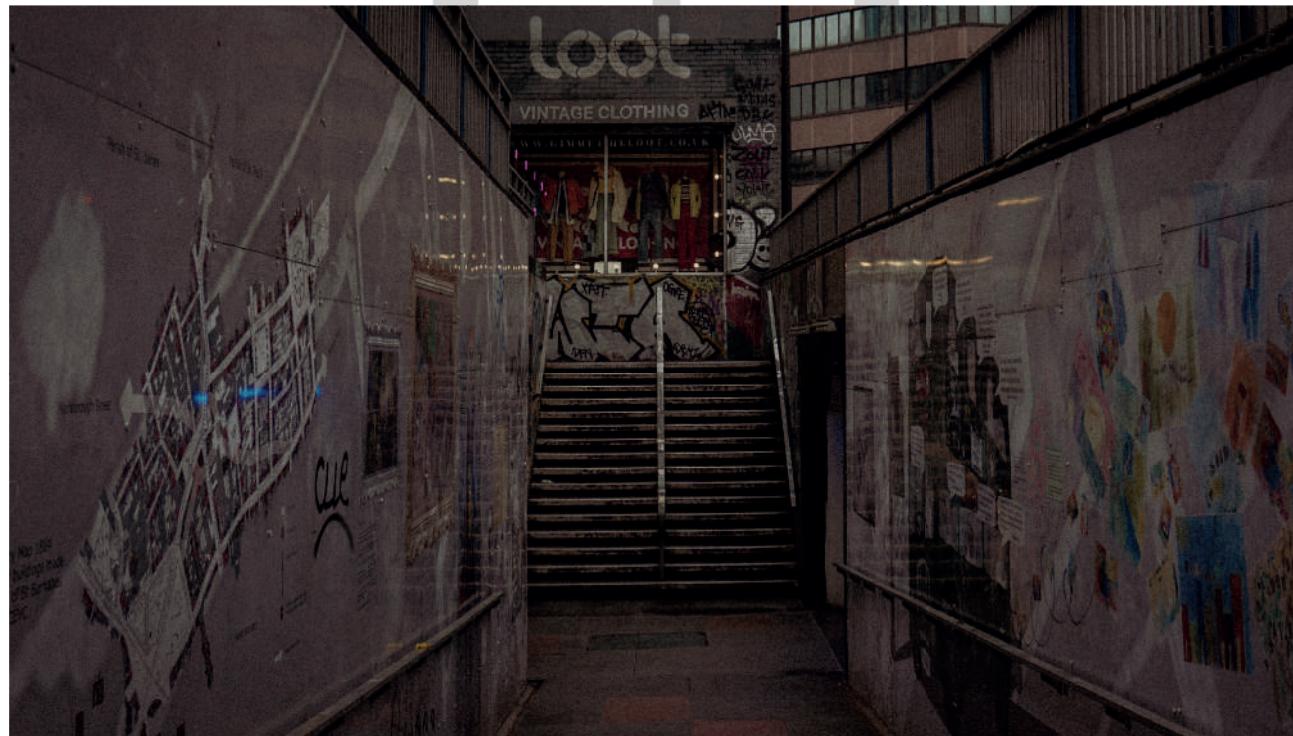
**By Meraaj Harun**

In 1854, when streetlamps were introduced to the streets of London, it was fiercely opposed by residents, as they were concerned by its invasion of privacy. During this conservative era, when many 'sins' were committed under the cover of darkness, the lamps became a tool to police the nights. The enrolment of illuminated streets continued, as safety benefits outweighed public opposition. Although formerly seen as a form of surveillance, today it is widely accepted as part of the street scene, with major upgrades

taking place to improve the quality and clarity of the light emitted.

Over the years, the information available to the government has increased by a series of Acts that allowed for more surveillance. In 1984 the introduction of the Telecommunications Act enabled the Secretary of State to impose any orders on Ofcom, the telecoms regulator, without disclosing the request to the public. When questioned on how these powers have been used, the government could '**neither confirm nor deny any issues**'.

As a born and bred Londoner, I have grown up with the knowledge that most of my actions will be known. I felt comfort knowing that CCTV surveillance can deter criminals and can keep me safe. Recently, I was startled by what is actually a rather well-known fact that London is the most watched city in the Western world. Since then, I have been more conscious of the numerous cameras following me and yet I feel that my actions and movement remain private. The stark contrast between how much information the state has had on the people in the 19th century and today indicates how much



we have grown accustomed to sharing our data.

The democratic state is, however, held accountable to the people, whereas corporations are only interested in increasing their own wealth. This creates a new set of challenges for privacy, where technology - a means of obtaining intel - is developing much faster than laws can regulate. I personally welcome the advent of the GDPR - albeit rather tedious most times - as it informs us of the types of cookies that are stored and their purposes, and in doing so gives us the option to reject them. This was, however, an incredibly slow reaction to cookies, which have been around for over 20 years!

Facebook, Google and Amazon have been in the news recently regarding how they retain and sell data on individuals. With Facebook tracking your location, Google retaining every search and using ads to profit from it, and Amazon using Ring and Alexa to put eyes and ears into millions of homes, it seems impossible to live in the modern world without losing the sense of privacy. The curious thing is that people, myself included, still use these companies because they provide us with services that we value and appreciate, and over time have become convenient, and perhaps a necessity. We voluntarily share our most private information with those companies, such as photos of ourselves but also of those closest to us.

**Sidewalk Labs**

Are we willing to sell our privacy for the convenience these companies bring? Apparently so. Sidewalk Labs is an avant-garde project, which announced it will develop the Toronto Quayside to provide a sustainable, accessible and inclusive district that reduces carbon emissions per capita by 'up to 89%'. It is to become a petri dish for new technology to be implemented that will change the way we live; by monitoring public transportation patterns to provide frequent, reliable services when we require them, water and electricity usage to optimise their availability, and to reduce strain on power plants by storing energy in the off-peak for electric vehicle charging, and even the weather to estimate travel patterns and heating demands.

The project is seen to tackle the social and climate issues that face us. By encouraging the use of public transport, using predominantly Glulam and CLT construction materials to reduce embodied carbon, and creating green spaces that everyone can use, it is difficult to find fault in its ambition. Although this initiative has also been criticised by many, including Jason Pomeroy, an architect and television producer; the project fails to consider how technology is advancing exponentially, and so the features of this design will become outdated within a decade of its completion.



Notwithstanding, if this is financially lucrative, then retrofitting the site with newer technologies as they are introduced will likely be the course of action.

Designed by Thomas Heatherwick and backed by multiple companies ranging from Google to BT and Primesight, it could be the future of housing... the future of living. The concern is that it is funded by corporations who intend to gather data on residents (which will be anonymised, to comply with Canada's regulations) and track their movements throughout the day for the use of advertising and technology companies.

Where do I stand on this? Sidewalk Labs is proposing to build a utopia that I have only imagined and has not been done anywhere else in the world. As I have mentioned, it is realistic about the problems society faces, and is proactively trying to eliminate them. Perhaps there is an element of dystopia in the future, a compromise where we give a part of ourselves to create the best environment for everyone. I would imagine given the opportunity, I would live there and accept that my actions would be data on a file, because, if it truly removes barriers for people and creates an environmentally friendly way of living, then the individual is less important than the collective.

### China

Being cautious of one's digital privacy is not an unfounded concern. In China, mass surveillance spans internet usage to facial recognition, under the pretext of social management. It combines intel with Big Data Analysis to monitor individuals, to create a detailed database of all 1.35 billion citizens by the end of this year. The system, labelled Social Credits, will be used to determine the social reputation of an individual, claiming to improve quality of life and a person's morals.

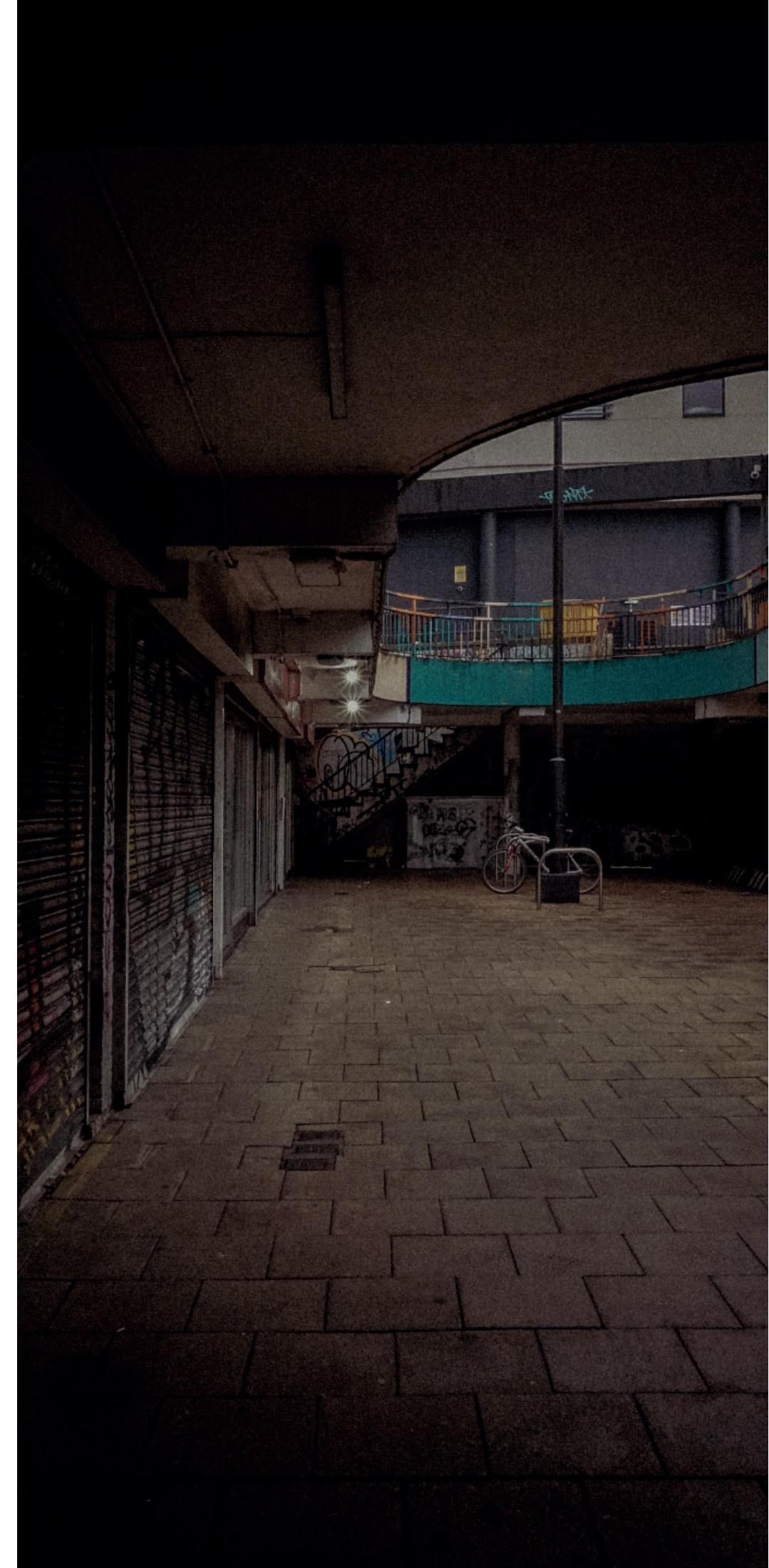
The system has already prevented some students being allowed to study privately or attend university due to their parents' social score and has created a priority ranking in hospitals, so those with higher scores receive better healthcare. The Credit system will determine the futures of children and the incomes of adults, where scores are not only calculated from your own actions but of those around you.

I think one should have the option of sharing or withholding data; it has the potential to create a better world but also the ability to restrict it. For decades, if not centuries, people have been striving for equality, to allow each person to receive equal opportunity and access to healthcare, regardless of social class or upbringing, yet the advent of Big Data could revert this progression, and plunge us back into a world where status controls all. For some, this is the present, enabled by a controlling state and data intrusion. 

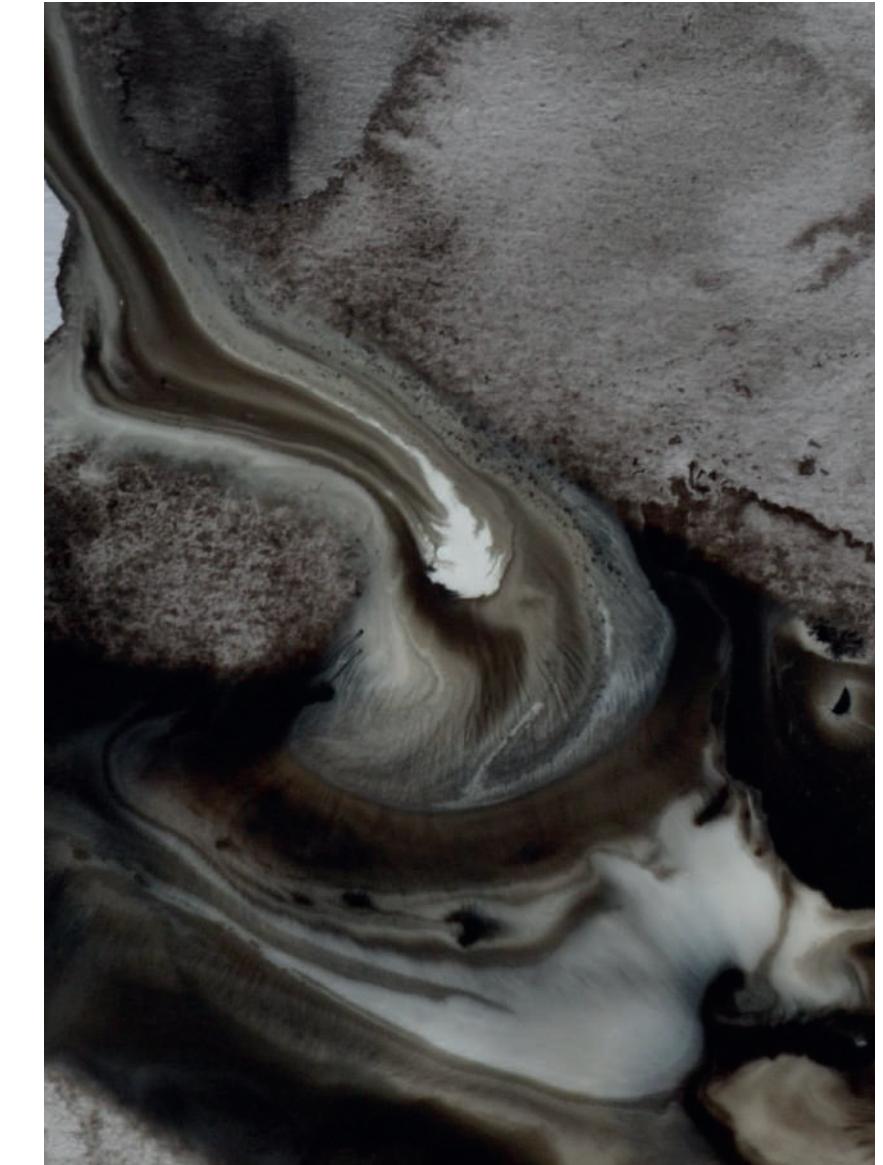
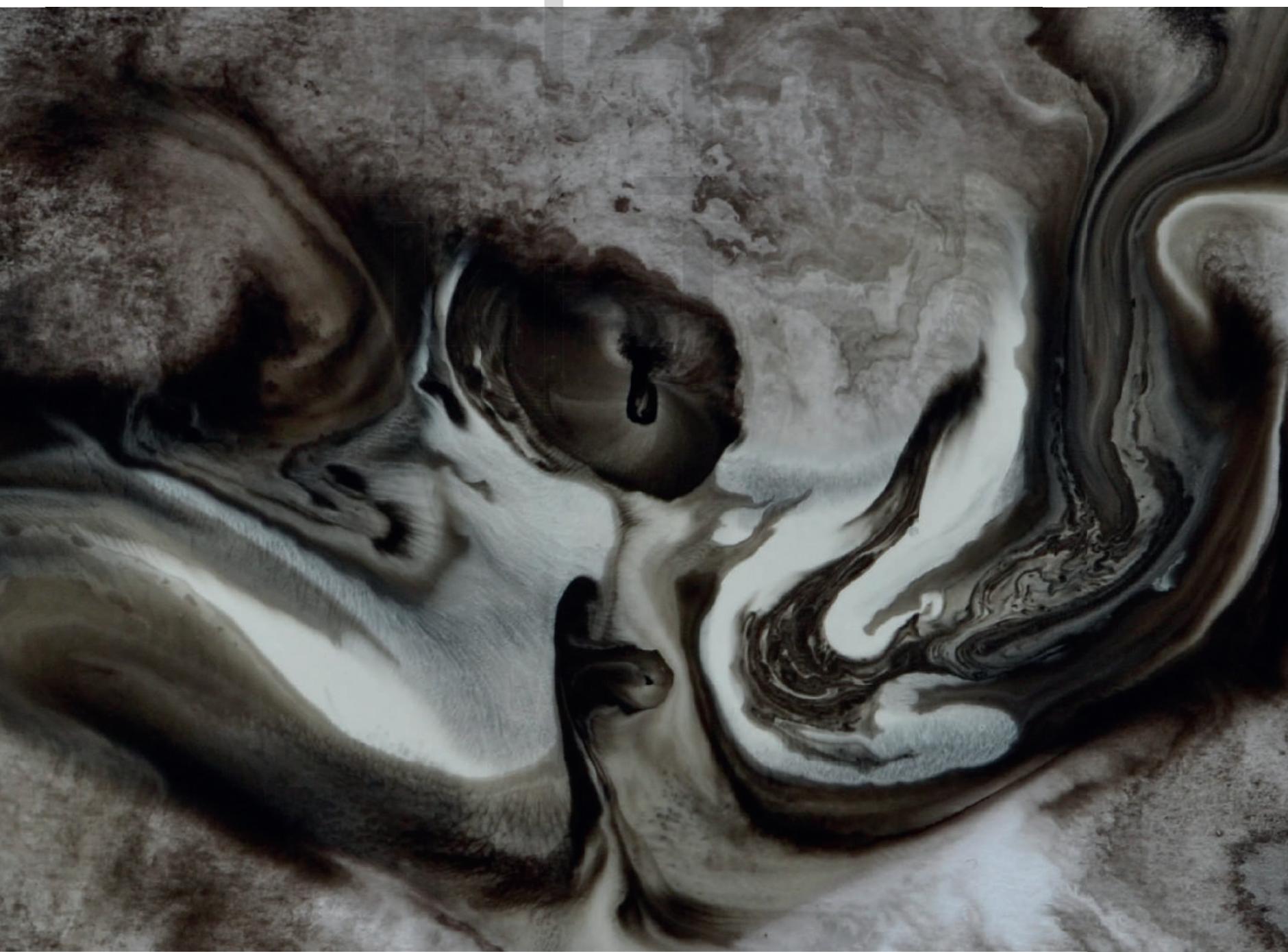
### Notes

<sup>1</sup> Evening Standard (2014) *BT refuses to deny data handover* [Online]. Evening Standard. Available from: <https://www.standard.co.uk/panewsfeeds/bt-refuses-to-deny-data-handover-9200475.html> [Accessed 5 January 2020].

<sup>2</sup> Dezeen (2019) *Sidewalk Labs reveals masterplan for Sidewalk Toronto neighbourhood*. Dezeen. Available from: <https://www.dezeen.com/2019/06/28/toronto-tomorrow-sidewalk-labs-toronto/> [Accessed 5 January 2020]



# In the Depths

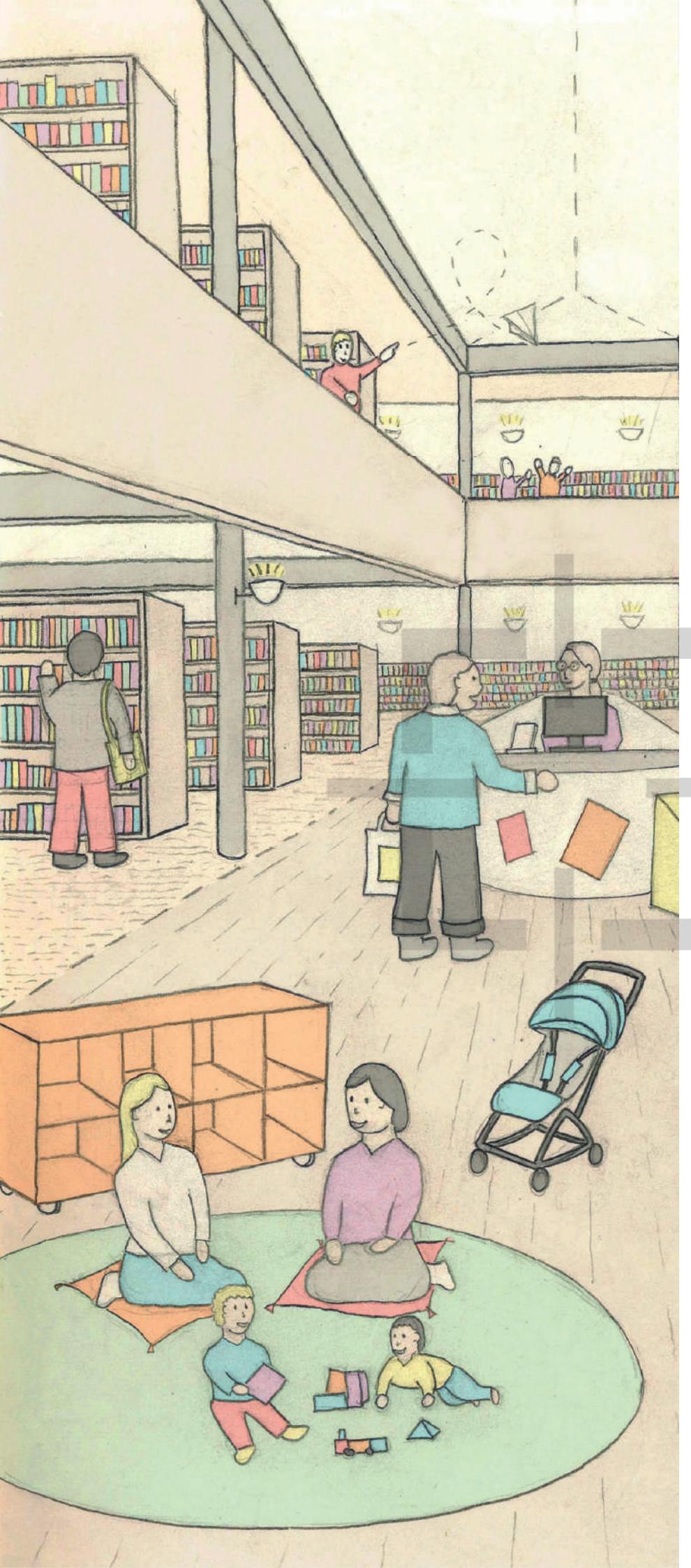


# of the Unknown

By Maddi Gomez-Iradi (2019) fluid acrylics on paper

*Individual lines of thought entering the vast sea gradually lose momentum and are engulfed in a placid current that silently awaits their arrival.*





# Before We Lift the Next Shovel

*'... we should know what we want to improve, what we need to protect, and, more important, what kind of society we want to create.'*<sup>1</sup>

By Michael Tsang

Aside from his work as a Professor of Sociology at New York University, Eric Klinenberg's involvement in architecture includes his role as Research Director for Rebuild by Design, a design competition ran in response to the damages of Hurricane Sandy, now led by BIG, in addition to his more recent role as a jury member for the Berkeley Essay Prize 2020, an annual essay competition for undergraduate architecture students concerned with 'the social art of architecture'. His most recent book 'Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life' has received praise from the likes of starchitect Renzo Piano to potential 2020 US Democratic Presidential nominee Pete Buttigieg, and was written 'in a kind of fury' following the 2016 US Presidential Election. In it he makes a case for what he describes as 'social infrastructure', by which he refers to any manner of public space that facilitates the

formation of the social ties that define a community.

The importance of Klinenberg's writing lies in his argument for the quality in public space. Social infrastructure, if designed poorly or left derelict, may stifle social activity, leaving residents vulnerable to the threat of isolation. Yet on the other hand, if designed well and robustly, it may foster relationships between friends and neighbours. Linking back to his days as a graduate student, the first case study that Klinenberg recalls is the 1995 Heat Wave of Chicago - his home city - raising the question of how two demographically similar neighbourhoods, both poor and primarily black, could emerge so differently in the face of such extreme circumstances, one with a fatality rate ten times worse than its neighbour. Klinenberg attributes this to the quality of social infrastructure in these neighbourhoods - the more vulnerable neighbourhood had been largely left abandoned and derelict in the previous decades, and thus its residents lacked the public amenities to frequent whereby they could form the social ties and acts - those as simple as knocking on the door of an elderly neighbour - that were essential during this disaster. The more resilient neighbourhood was the opposite with occupied public spaces in which neighbours got to know and could rely upon one another in such circumstances. Upon further observation Klinenberg noted that this was not unique to the Heat Wave, but had always been the case - for example five-years prior the aforementioned resilient neighbourhood had also exhibited a life expectancy more than five-years greater than the vulnerable neighbourhood.

Following this first case study, the remainder of the book primarily reads as a series of similarly enlightening case studies, highlighting the importance of

social considerations in design. Klinenberg's writing is not so dissimilar to that of Jane Jacobs in 'The Death and Life of Great American Cities', in its anecdotal style, and discussion of ideas such as Jacob's 'informal surveillance' through 'eyes on the street'. Where 'Palaces for the People' most interestingly expands on Jacob's writing, however, is in the discussion of the influence of the 'new information economy' on our cities in the 21st century. Klinenberg, though not doubting his good intentions with respect to philanthropic work, is critical of Mark Zuckerberg's disingenuous claims of Facebook 'developing the social infrastructure for community... for civic engagement, and for inclusion of all', highlighting Facebook's Frank Gehry designed Menlo Campus in the San Francisco Bay Area. Though remarkable in its provision of social and leisure facilities for tech-employees, no doubt in order to maximise productivity, Facebook's so-called social infrastructure fundamentally lacks inclusivity - it is a private social infrastructure. This has not gone unnoticed by the working and middle-class residents of the area, for whom the effects of gentrification are unbearable. Further aggravating the issue is the worsening conditions of traffic caused by tech employees commuting to work which has prompted the plans for Facebook's residential-led 'village' expansion to its campus, designed by none other than Rem Koolhaas' OMA, whilst many of the city's schools and parks remain dilapidated.

Klinenberg acknowledges that no individual, such as Zuckerberg, can be solely blamed for the rise of such poor social infrastructure, but dwells on the importance of philanthropy in building spaces that create opportunities for everyone. By this he refers to Andrew Carnegie who at the turn of the 20th century opened

thousands of public libraries in the US, UK and other English-speaking countries, dubbing them 'palaces for the people'. It is no doubt the public library that drove Eric Klinenberg to write this book, for he repeatedly emphasises its significance as the exemplar piece of social infrastructure - a place where teenagers may go after school to play games, where former inmates may seek a public computer to complete a job application, where seniors may convene for social clubs.

This anecdotal style makes Klinenberg's writing accessible to a general audience, yet for one looking for more critical analysis, they will be disappointed. The book makes no attempts to formally provide some hypothetical structure to explain what makes good social infrastructure, most likely as this varies according to context. Klinenberg also attempts to remain unbiased, consequently omitting much political discussion that would strengthen his argument - most notably in discussing inequality he never acknowledges where this comes from, no doubt as he wishes to appeal to as wide an audience as possible in the extremely polarised political climate of today.

As architects of the future, facing amongst many challenges, the climate crisis, political polarisation and inequality, the importance of social infrastructure cannot be forgotten. Any alteration to the built environment must be measured against this idea of social infrastructure with regards to quality and inclusivity, and it is the role of the architect amongst the many voices within the construction industry to ensure this agenda is met. ●

## Notes

<sup>1</sup> Klinenberg, E. (2018). *Palaces for the People*. New York: Broadway Books. p. 232

# Structural Engineering of the Future

By Marcin Karczewski

The future has and always will be full of imprecise ideas about what might happen, and the only way to check whether we are right or wrong is simply to wait. 50 years ago people were thinking of the upcoming decades being transformed by the introduction of flying cars. Nobody would have guessed the digital revolution and how the Internet would reshape society. Even though in this case the scope is more narrowed

down to the topic of construction, engineering and architecture, the trial of predicting upcoming trends seems equally uncertain.

There will be a push in the industry to reuse existing infrastructure and give a second life rather than building from scratch. That is due to the growing environmental awareness as well as a stagnating rate of new investments. Conservation engineering along with gentrification will be inseparable key fields of knowledge

used in upcoming projects. There are only few multimillion pound projects currently happening in the UK, perhaps due to Brexit and halted economical decisions, and the biggest one is a redevelopment scheme – the Battersea power station.

The High Line in New York is a perfect example of how reusing an existing structure can lead to a significant improvement of life quality in the society. Hopefully, this trend will become even more



mainstream over the upcoming years and we will be able to see older buildings and public spaces reshaped to integrate the new demands of modern lifestyle.

*"We should be looking at concrete and steel like we look at petrol and diesel" – Andrew Waugh from Waugh Thistleton Architects*

Certainly a set of new materials will become dominant in construction. Only recently CLT, Glulam and other engineered timber types became mainstream. As of the end of 2019, the tallest timber building is in Norway at 85 metres. This is about to change in the

upcoming decades as more proposals arise, like the Barbican tower by PLP architects. Thus, timber hybrid structure aims to significantly reduce the CO<sub>2</sub> emission as timber would absorb the surrounding carbon.

According to public perception, timber is still associated with rather unpleasant thoughts connected with great fires like in London in 1666 or Chicago in 1871. Nowadays, timber is engineered for increased fire resistance using fireproof glue in the case of cross laminated timber. Eliminating that issue will lead to cleaner and healthier building systems.

Only recently, the first timber stadium was designed by Zaha Hadid Architects and the new stadium for Tokyo 2020 Olympics will have a green timber outer structure. Other materials like hemp, straw bale, or local masonry will reflect on the climate

emergency whilst enhancing the final design performance. There is a certain pressure in testing new, unobvious materials that could become the future of the industry.

One of the concerns while thinking about the upcoming years is the expanding automatization process putting many jobs at risk. Are civil engineering and architecture professions going to be affected by that issue? I am trying to be optimistic in that case and I believe that any advanced software will serve as an improved, precise tool that allows for even more complex design. There are always some creative elements that AI will be lacking - with technological advancements, there will be opportunities for humans to discover new branches of engineering necessary for more developed, complete and ingenious final outcomes.

Environmental aspects will be





highlighted due to decreased quality of air in urban zones. Nowadays, one can see the pollution levels achieved in Beijing and wonder whether it could get worse. This challenges future designers to not only reduce the emission of CO<sub>2</sub> but also to consume and redistribute it as a renewable source of energy. The major cause of that is rapid population growth and constant migration to cities.

A possible solution would be to decrease the rate of this migration by fixing the income gap between the marginal ends of the economical spectrum of present society. All goods would be redistributed to society regardless of economic background. As the main reason for migration is economic, fostering the demographics and alleviation of poverty would result in a halted rate of migration and therefore curbed urban sprawl.

Pollution distinguishable in vast metropolis is associated with transportation – this is also prone to change over the upcoming years. By 2040, France is going to switch to creating only fully electric cars. This means that we are possibly the last generation to own petrol/diesel cars. Other countries will follow this example and hopefully in the next years, some great cities will be transformed by a sudden change in the carbon emission from vehicles. Electric cars will replace the traditional ones, while new lines of public transport will be created to satisfy increasing demand over the next decades. Moreover, self-driving cars with an integrated system that would minimise traffic would be introduced over the next decade.

With such major changes in the focus of a structural engineer – one that will particularly stand out is slenderness. In New York City, the upcoming high rise residential towers are redefining what a slim skyscraper is. The latest addition – 111 West 57th Street - is 435m tall with only a 20m width at the base.

That is a ratio of 1:24 – previously unachieved by any skyscraper. Such a level of slenderness can be only accomplished when the demand for land is reaching unprecedented levels. Due to economic demands, it may result in schemes being developed for extremely slim skyscrapers with new damping systems preventing excessive sway at the top floors.

With new parametric software like Grasshopper focused on optimization, or Revit - part of BIM, the future seems bright and exciting for the collaboration of architects and engineers. There will be more materials to choose from whilst redesigning the built environment of the past. There is a huge room for error in my predictions - who knows, maybe everything will be built using 3D printing drones and supervised by an omniscient mega computer... No one knows, we can just be patient whilst time will show the answer. ☺

#### Images

New London Development (2020) Battersea Power Station. [online] Available at: [http://newlondondevelopment.com/nld/project/battersea\\_power\\_station](http://newlondondevelopment.com/nld/project/battersea_power_station)

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111 West 57th Street, New York. Rendering by Hayes Davidson [fragment] Available at: [https://www.archdaily.com/915742/shop-architects-111-west-57th-street-celebrates-topping-out-near-central-park?ad\\_medium=gallery](https://www.archdaily.com/915742/shop-architects-111-west-57th-street-celebrates-topping-out-near-central-park?ad_medium=gallery)

# D i s c r e t e

**By Julian Wong**

The world as we know it has undergone significant changes throughout the past few decades. Barring the effects of climate change, perhaps the most significant is the rapid digitization of the way we live, work and play. Many sectors across the global economy have utilised this new technology, increasing productivity and efficiency within their workflow. Unfortunately, the same cannot be said for the construction industry. In a study conducted by the consulting firm McKinsey and Company in 2016, three key issues in the construction industry were highlighted.

Firstly, it was revealed that productivity per worker in the construction industry has remained stagnant for over 20 years, while in comparison, other industries have seen significant growth. Furthermore, another study, the Industry Digitization Index, which ranks industries based on their level of digitization, found the construction industry to be ranked second to last, only surpassing the agricultural and hunting industries. Lastly, it was found that delays and cost overruns plague the construction industry. The study states that large projects typically take 20 percent longer to finish than scheduled and are up to 80 percent over budget.

During this period of rapid digitization, with new technologies ranging from online marketplaces to machine learning developed, the disconnect between disappearing productivity growth and rapid technological change could not be more pronounced.

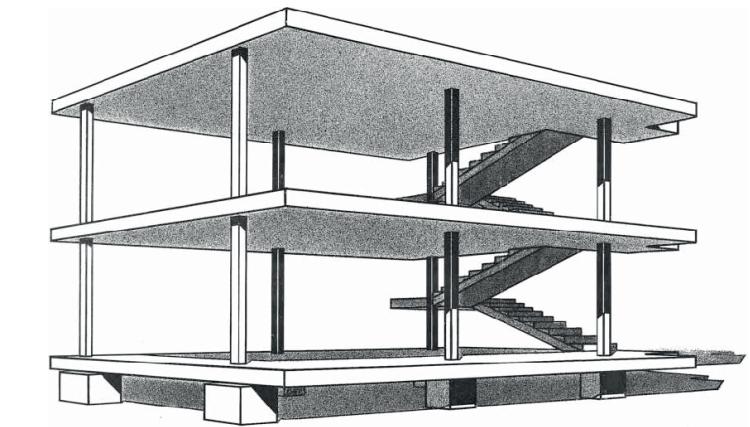


Figure 1: Maison Dom-Ino, Le Corbusier, 1914

McKinsey predicts that, if the productivity of the construction industry manages to catch up to the rest of the global economy, the value added will be \$1.6 trillion USD (equalling to a 2% increase in the global economy), and that the world will need to spend \$57 trillion USD on infrastructure by 2030 to keep up with global GDP growth. Such impressive figures are a huge incentive to strive for better productivity in construction and architecture.

However, looking into the structural systems of current digital architecture, whether it is modernist, deconstructivist or parametric, the underlying construction methodology remains the same. The basic system of Le Corbusier's Maison Domino, the slab, column and stair, is still the standard construction system in use today. While in the 20th century this system was undoubtedly revolutionary, somehow this system is still the industry standard over 100

years into the future, despite the relentless change and advances in technology that has occurred in the world.

This poses a problem with the current trend of digital architecture. The promise of infinite variability of parametricism, along with the ability of computer programs allows architects the capability to design limitless permutations of forms and massing, organic or otherwise. While during the design process this allows architects the greatest flexibility and the desired form to be achieved, the process of construction and the labour needed increases exponentially. These designs require many components of the building to be bespoke, resulting in an architecture of an assemblage of countless unique pieces. Instead of creating architecture which is more efficient and sustainable to build, architects are designing structures that are increasingly difficult to construct. Despite the new ways in which forms



can be produced, the realities of construction have yet to change.

There is an extreme dichotomy between the methods in which we design architecture and the way in which we build, where architects are utilising new technologies in design and becoming increasingly disconnected with the realisation of the construction of the building. This digital architecture form-making has resulted in an architecture with a whole-to-part methodology, where the constituent parts are not considered during the design process. As a result, post-rationalisation is required to realise these designs; the design intent and the required construction method is disconnected

There is a severe conservatism in architecture where innovation is often simply concerned with form-making. This notion is preventing the profession from truly embracing technology which can significantly innovate and revolutionise architecture. It is this conservatism which has caused this stagnation in the industry. The



Heydar Aliyev Center Construction, Zaha Hadid Architects, 2013

question is, how does architecture move forward?

It is these systematic problems within the architecture and construction industries that the concepts of discrete architecture aim to resolve. Its ideas were published in a special edition of *Architectural Design* magazine, titled "Discrete: Reappraising the Digital in Architecture". The guest editor, Gilles Retsin, is an architect and architectural theorist who, along with others, conducts research on discrete architecture. Discrete architecture rethinks the built environment for our current times, but also speculates on the automated architecture of a post-work future, and how technology can accelerate us towards the post-capitalist prospects. The term "discrete" is used to refer to discrete data, which is data that consists of a finite number of individual counts.

In a rejection of the infinite variability and mass-customization nature of current digital architecture, discrete architecture is envisioned as a collection of discrete parts,

combined with new technologies in order to facilitate the eventual full automation of the construction industry. This simplification of architecture to discrete blocks could be understood as a response to the whole-to-part thinking of parametric architecture. Discrete architecture aims to reverse this relationship, resulting in a part-to-whole thinking, where the discrete parts which make the architectural whole take precedence and are considered first.

Retsin describes that the key aspect of the block is that it pre-exists any design. By aligning what is the digital representation of the block with what is the actual block used for construction, the dichotomy between digital design and constructed architecture decreases dramatically. Automating the existing, analogue syntax of buildings does not make much sense, as a building consists on average of more than 7,000 different parts, therefore any attempt to automate these many different processes is futile. Reflecting upon these current complexities of the construction industry, discrete architecture imagines a reality where all architecture can be represented and built using a repetitive discrete building block.

The adaptability and scalability of this element allows for many possible outcomes and designs which comprise of the same discrete parts. This customizability is focused on the needs of the end user, as opposed to the aesthetic desired.

In theory, the simplification of the constituent parts of architecture, resulting in the use of discrete elements, can enable a streamlined process in the design, manufacturing and assembly of these blocks. This results in an increase of productivity in both the design workflow and the construction sequence.

Manifestations of discrete architecture currently only exist within theoretical projects. Architect Gilles Retsin's project 200M Housing Block utilises a standardised modular cuboid cross-laminated timber element as the discrete part. It is used for the floor slab and wall structures, and customization and variability are not achieved through the differentiation of the parts, but from how the parts are arranged.

The current process of construction, especially in the age of design and build contracts, results in an extensive chain of contractors and sub-contractors. As a response, discrete architecture aims to achieve efficiency in the production and construction of architecture, through utilising technologies of automation. By simplifying the components and processes of constructing our built environment, and automating the construction of these discrete parts, productivity in the construction industry can improve, the dependence of on-site labour can decrease, and issues of asymmetric information can be removed. The result is a more productive industry, with the democratization of the elements of architecture resulting in a more equitable future for the design and ownership of our built environment.

Architects have a responsibility to be aware of the economic, social and ecological consequences of the stagnation of the industry. The role of the architect is essential to innovate the industry beyond form-making, but towards technologies and practices that can address the issues of productivity and digitization, to prevent a further disconnection of the industry. There is immense potential for a new digital architecture to innovate and change the way we build and experience our built environment, but action is required from architects before this future can be realised. ☀



200M Housing Block, Gilles Retsin, 2017

## Notes

<sup>1</sup> McKinsey Global Institute. (2016, June). *Imagining construction's digital future*. Available at: McKinsey Global Institute: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/imagining-constructions-digital-future>

<sup>2</sup> McKinsey Global Institute. (2016, June). *Imagining construction's digital future*. Available at: McKinsey Global Institute: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/imagining-constructions-digital-future>

<sup>3</sup> McKinsey Global Institute. (2017, February). Reinventing construction through a productivity revolution. Available at: McKinsey Global Institute: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/reinventing-construction-through-a-productivity-revolution>

**By Lee Zu En**

i.

Have you ever experienced a moment where you were moved by a space you were in? A space that did not seem any special at all, yet leaving you confused and unable to come up with any reason as to 'why?'. I experienced this once, in a little museum on the outskirts of Copenhagen. ARKEN, a Museum of Contemporary Art sat like a giant sculpture on Køge Bay, Ishøj. Approaching the building, it was impressive. A huge imposing concrete wall protrudes upwards and outwards, seemingly splitting the building in half. Then I went in, making my way through large open rooms to small closed rooms, admiring works by Van Gogh, J.F. Willumsen, Candice Breitz and more, and then I stumbled upon 'the space', a transition zone between galleries, an empty quiet space, littered with a few chairs and tables and a view out to the surroundings. Standing in that room, I was moved, given a chance to pause and reflect, experiencing first-hand, how an empty room with nothing could evoke such emotions in me. Since then, I began to wonder: What makes us want to stop and enjoy a space? Architecturally, what moves us? Why do we not stop more often in our daily lives?



# Respite

A pause or rest from something difficult or unpleasant.

ii.

Perhaps it is because the modern man is undeniably disconnected from the built environment. 'How long does it take?', a question which I am guilty of asking too often. It has to do with how we travel, we are no longer bounded by travelling on foot. Today, we have cars, buses, trains and planes. We seek efficiency and result; 'time' is so precious to us that we are unwilling to sacrifice an extra minute doing anything that inhibits us from our goals. In my opinion, this change in mindset and shift in modes of transportation has had a great implication on how we as a civilisation experience a journey. As Tim Ingold puts it:

*'Wayfaring is replaced by destination-oriented transport, mapping, where the drawn sketch is replaced by the route-plan, and textuality, where storytelling is replaced by the pre-composed plot.' (Ingold, 2016. p. 77)*

Looking at a map, what we see are locations indicated as points, and the lines which connect these points as mere routes to bring us from one point to another. We downplay the line, we wish to spend time in places, not between them, no longer caring about the journey.

We might put the blame of this detachment on the advancement of technology (Pallasmaa, 2005), or even on the design and structure of the built environment itself; how it is not built in a way where we are regularly prompted to pause. But what is scary is the undeniable fact that we, our mental wellbeing, are inevitably affected by the built fabric that surrounds us. Countless studies have proven this: A meta-analysis from 2010 found that people living in cities were 21% more likely to experience an anxiety disorder and 39% more likely to have mood disorders (Peen, 2010). When

scanning the brains of over 50 healthy participants who lived in a range of locations from rural areas to cities, while engaging in difficult mental arithmetic tasks, results showed that the amygdala and the cingulate cortex of participants living in cities were over-active during stressful situations. The amygdala is the danger-sensor, whilst the cingulate cortex is important for control of emotions and dealing with environmental adversity (Lederbogen, 2011. p. 498) The fact that the current intimidating nature of the built environment could have such adverse effects also shows us the potential for good urban design and architecture to improve our wellbeing.

Architecture could serve as a means for us to find a sense of oneself. According to Juhani Pallasmaa, architecture has a task to accommodate and integrate, strengthening our sense of reality and self, 'direct(ing) our consciousness back to the world and towards our own sense and being. ... making us experience ourselves as complete embodied and spiritual beings.' (Pallasmaa, 2005. p. 11). The need for a place of reflection is not at all new, even in 1882, Friedrich Nietzsche said:

*'An insight is need (and that probably very soon) as to what is specially lacking in our great cities – namely, quiet, spacious, and widely extended places for reflection, places with long, lofty colonnades for bad weather, or for too sunny days, where no noise of wagons or of shouters would penetrate ... : buildings and situations which as a whole would express the sublimity of self-communion and seclusion from the world.' (Aben and de Wit, 1990. p. 11)*

And yet we are still so deprived of such spaces. So, what does it

mean to experience architecture, and what is it about it that moves us, makes us pause and reflect?

iii.

Of course, what moves me may not necessarily move you too, so bear with me as I share another experience where architecture has evoked emotions in me. Let me bring you to Seville, Spain, more specifically the Sala de la Justicia (Hall of Justice) of the Real Alcázar. Built by King Alfonso XI in the 1340s, it is said that it was in this room where he disported with his mistresses. The hall has two portals, connecting Patio del León with Patio del Yeso, part of the walls were covered in beautiful Mudéjar plasterwork, a ceiling of intricately designed interlacing timber beams covered the space, a few benches were set against the walls and right in the middle of it all was a little water fountain, filling the space with the constant murmur of flowing water.

I was enchanted, rooted to the ground, I ended up staying in the hall for a good half an hour, spending my time observing other visitors who came through. Some like me decided to stay while others came and left soon after, but the one thing everyone had in common was as soon as they entered the hall, we all started speaking in hushed voices, as if we were afraid to break the serenity of the hall.

According to Zumthor, the greatest secret of architecture is how it collects different things (materials) and combines it to form a space, creating what he describes as a 'bodily mass', a membrane or fabric that envelopes us (Zumthor, 2018. p. 23) Like a piece of clothing, a T-shirt would no longer be called a 'T-shirt' if you ripped its sleeves out, it would be an entirely different object, a tank top maybe?



Likewise with architecture, great spaces only turn out to be great spaces when all of its details are combined in perfect harmony, as Steen Eiler Rasmussen explains: 'But details tell nothing essential about architecture, simple because the object of all good architecture is to create integrated wholes'. (Rasmussen, 1964. p. 33) Furthermore, both Alain de Botton and Juhani Pallasmaa argue that the ultimate goal of architecture is to remind us of who we are, to reflect, materialise and eternalize our transient and timid inclinations, a self-identity. Essentially, it means that we find things beautiful because we see something in them that we do not possess.

Maybe it was because the space was a perfect combination of details, the walls and ceiling of the hall protected me from the outside world, shutting out noise, wind, fierce sun and the stench of exhaust fumes, while the emptiness of the space intensified the murmur of water and footsteps of visitors, a connection to nature. In Sala de la Justicia, I was free from the obligations and regulations imposed by my life, and it could be that I subconsciously resonated with the need for tranquillity, to detach myself from the hustle and bustle, and to reconnect with nature.

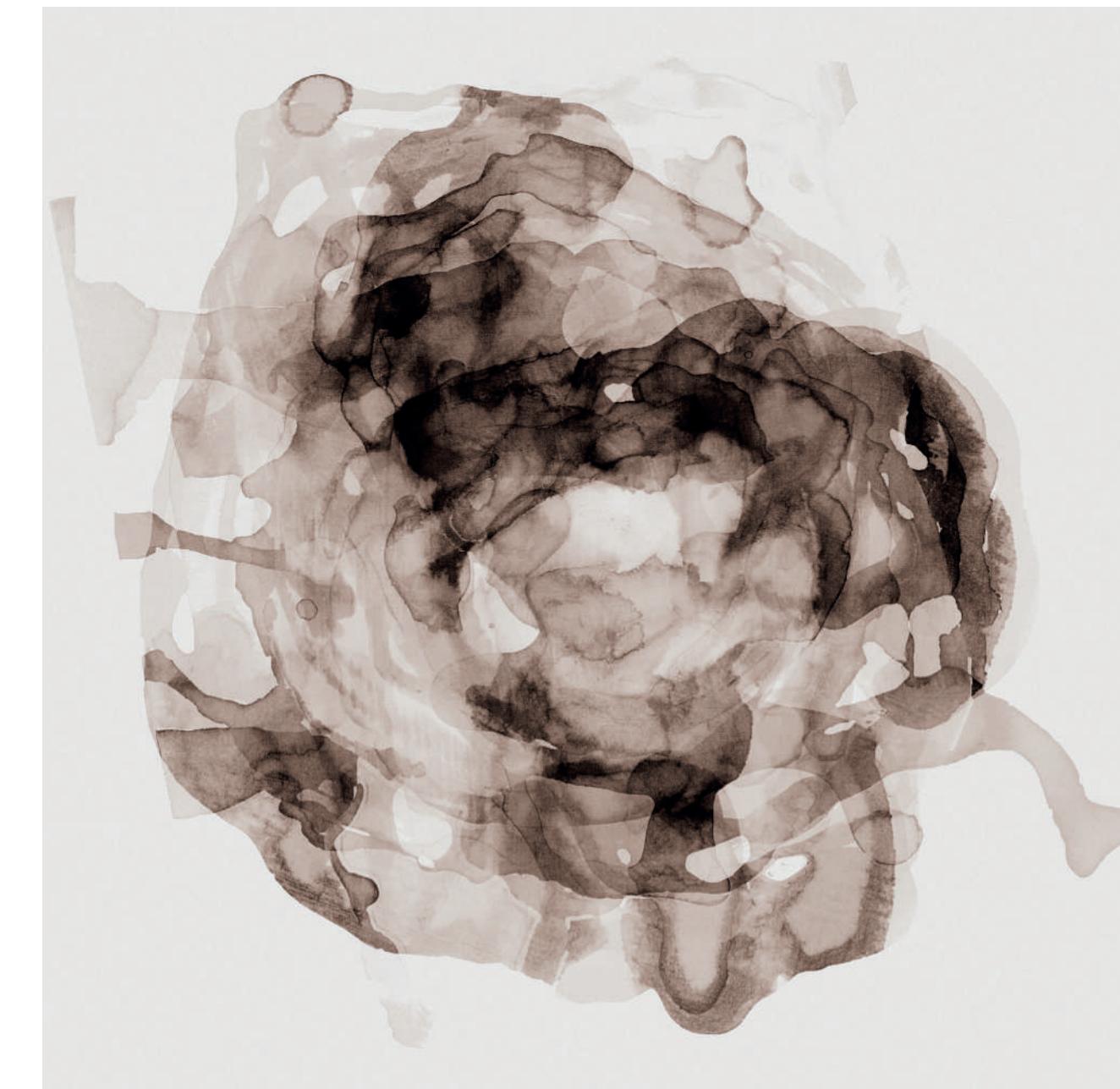
#### iv.

I am not sure if you have noticed, but both encounters that I have described were from my travels. As questioned by Irénée Scalbert, how often do we scrutinise architecture the same way we do of an artwork in an art gallery? (Scalbert, 2013) I also had a revelation recently on my way to Holburne Museum in Bath. I realised that maybe it was not the built environment that was at fault, having continuously complained about how there just were not enough places for us to contemplate in within the urban



#### Notes

- fabric, maybe I was the problem. The journey to a space to reflect was merely 15 minutes away from home, I could have realized this sooner, had I made more effort and paid more attention to my surroundings. I was seeing but not looking. This led to a conversation I had with a friend, when asked about her thoughts on the matter, she told me that she too often has the urge to pause, but even if she does stumble upon such places, she would usually refrain herself from doing so, in fear of burdening and wasting the time of those in her company. Are we too blinded by the notion of 'time'?
- As discussed before, architecture and the built environment could affect our mental wellbeing. Hence, it would be wise to start promoting conversations on this matter, we should not be afraid to discuss what we want from our buildings and cities. With that in mind, I will try to stop neglecting the full potential of my sensory experience in the built environment, and I hope that after this, you too would be encouraged to pay more attention in the future. to your physical surroundings. [①](#)
- Aben and de Wit (1990) *The Enclosed Garden*. Rotterdam: 010 Publishers.
- Zumthor, P. (2018) *Atmospheres* Basel: Birkhäuser.
- Rasmussen, S. (1964) *Experiencing Architecture* Cambridge: The MIT Press.
- Scalbert, I (2013) *Never Modern*. Zurich: Park Books



## In the Depths of the Unknown

**By Maddi Gomez-Iradi** (2019) fluid ink on paper

*The lines that define the boundaries of reality dissolve and disappear into an imaginary domain as the mind delves into uncharted waters.*



# Exploring the Cognitive Challenges of the Built Environment

By Ella Thorns

From the beginning of humankind, humans have been wired to seek shelter and warmth - a mammal instinct at its basis. It is within our prerogative to find comfort in private, quiet spaces, yet our society has become so far detached from this; meccas of bright lights, overfilled spaces and amalgamations of noises fill our everyday lives. It is no wonder that many of us mentally struggle on a daily basis, and we can find architecture as the root cause.

Human contentment is an emotion transposed from a feeling in space. Often described as a

"warm, fuzzy feeling", it evokes the ancestral burrow that we seek to recapture throughout life: in how we wear clothes and sleep under blankets. Our mammalian roots lead us to emanate this, seen in the early primitive dwellings, their function was just that – refuge, differing only in aesthetics from the habitats' of our four legged friends.

Society has led to most of these instinctive comforts being compromised for progressive ideals as Western architecture has become detached from the emotive reaction it imparts on the user. Many of us spend our days in open, loud and crowded offices,

or schools that are too concerned with surveillance that student freedom is inhibited. When the time comes to give birth, mammals find themselves warm, dark and private spaces to bring their young into the world. For humans, we veer far from the natural process, finding ourselves under the bright hospital lights with a small crowd forming at the end of the bed.

For a neurotypical person, they can blank out much of the overbearing sensory information in order to function and concentrate at the task in hand. However, when we begin to look at the proportion of the population that

*Photography by Timothy Archibald, documenting the unique habits of his autistic son*

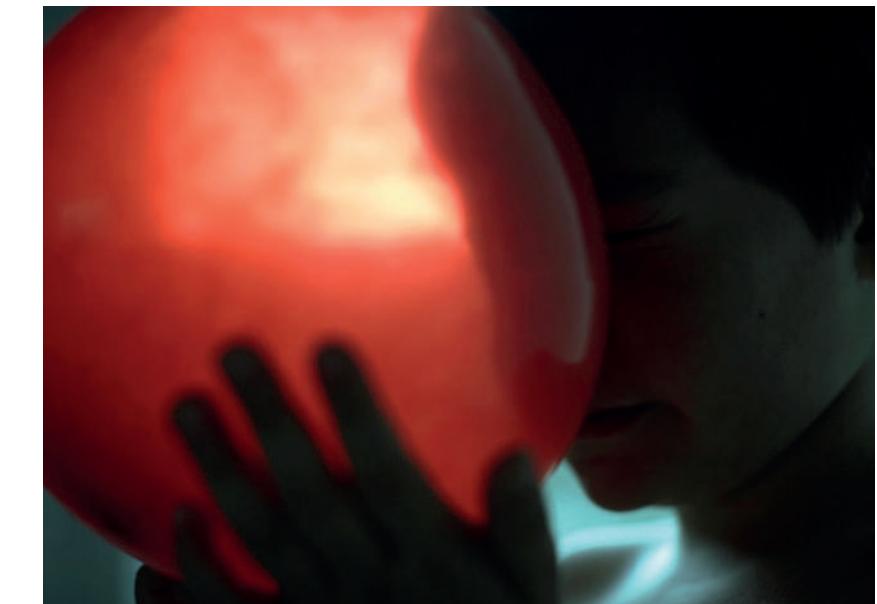


*Photography by Timothy Archibald, documenting the unique habits of his autistic son*

deal with cognitive challenges, the built environment becomes alienating. Such individuals often have Autism Spectrum Disorder (ASD) and struggle to filter through sensory data, confronted by a world of disorientation.

Fluorescent lights. A wall covered in bright post-it notes. Footsteps along polished concrete. A mumbling of voices behind you. Seemingly everyday occurrences at places of education and work, but what if the footsteps sounded like a round of applause next to your ear? Or if the fluorescent lights seemed to be vibrating and emitting an acutely loud hum? Or if the bright post-it notes seemed to be piercing your vision, like staring at a swirling optical illusion?

This could be how individuals with ASD perceive our built environment. What a neurotypical person would consider just a mere distraction, could become the centre of focus for someone experiencing



cognitive challenges. Why is it then that a disorder so steeply based on the sensory issues, it is ignored in architecture? This is not just an issue for the autistic user, it is an issue for everyone. Understanding a human's basic needs is fundamental in creating architecture that supports progression and learning. If a building strives to minimise the arduous, overbearing sensory information and improve upon the comfort of the user in the space, it has the opportunity to benefit the general population – maximising their potential.

As the number of diagnosis of ASD increases, it is becoming more of a national health concern and research indicating the effect of architecture to either enable or disable a person's experience of space continues to grow. Without necessarily realising it, we are surrounded by people on the spectrum who experience this everyday – some suggest even the

great Le Corbusier was autistic. His buildings were broken down into logical geometric spaces and shapes, obsessed with the neurobiological nullification of the built environment to offer a rest for the constantly avid ASD minds.

The individualism of a person's spatial interpretation requires the architect to distinguish the many ways the human-mind, in its various forms, makes sense of the environment. Not least with autism, the sensory profile is exaggerated from the basic human interpretation, taking in far larger amounts of sensory data. If we are being responsible designers, we should design inclusive buildings that are not limited to physical impairments; creating an adaptive solution that is empathetic in its possibilities. In the future if this is considered in the design of schools, could more students cope in education and the general wellbeing of the population improve? 



Rational and rigid modernist planning has successfully influenced urban design up to this day. Nowadays, however, in the light of the growing environmental crisis and resulting uncertainty, the re-emergence of anthropocentric and post-humanist trends in architecture and urbanism is observed. Today's and tomorrow's cities have to respond not only to the needs of the people, regardless of their wealth or their origin, but also to the needs of our planet and its ecosystems.

# Supramuros

urban ethics and the need for reconnection



By Julia Korpacka

## Towards a new urban dialogue

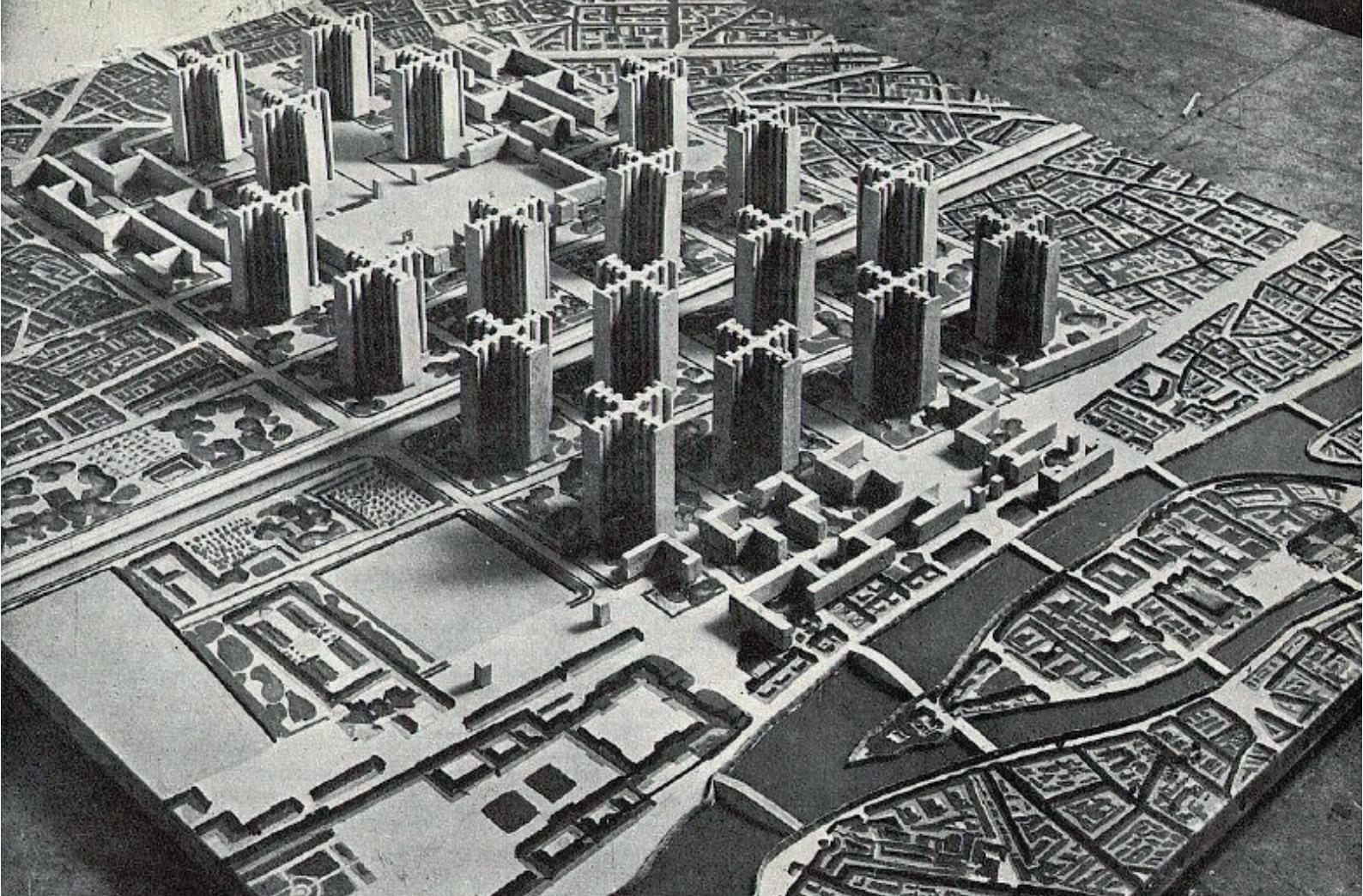
For centuries, cities have outlived governments and survived wars and catastrophes, thanks to their exceptional ability to grow, adapt and evolve, resulting from their density, mixity and the capacity to embrace the unexpected. Nowadays the over-specification of form and function, favouring destruction over adaptability, prevents growth and creates what Richard Sennett calls *Brittle Cities*<sup>1</sup>; those prone to decay and fragile in their inflexibility. Zoning and widespread privatisation of urban space have limited the communal right to the city, separating uses and introducing homogeneity, unfamiliar to the incarnate diversity of urban settlements. The UN-Habitat's most recent reports highlight that urban inequality and

segregation are again on the rise<sup>2</sup>. Cities worldwide, regardless of their age, location and size, are facing the same questions – who are they for? Whose interests should be prioritised?

In response to the unprecedented demographic, environmental, economic, social and spatial challenges faced by the cities worldwide, in 1978 the United Nations created a programme called UN-Habitat. Its third supranational conference was held in 2016 in Quito, where member states signed the New Urban Agenda, setting global standards of achievement in sustainable urban development<sup>3</sup>. In parallel to this document, the United Nations published *The Quito Papers* – a collection of research, essays and articles exploring and discussing

the contemporary questions of urbanisation, sustainability and the right to the city, evoked during the conference<sup>4</sup>. The scope of the works interrogates the ethics of urban living and the needs of not only the inhabitants of cities, but also of the planet and its ecosystems, in terms of urban ecological footprint, inequalities, segregation and the resulting stagnancy in urban development. Moreover, it is a remarkable critique of the Charter of Athens, whose many recommendations have over the years contributed to the aforementioned issues.

The research published in *The Quito Papers* suggests that the issues of informal settlements, pejoratively referred to as slums, favelas or barrios, should especially be addressed. These



Model of Le Corbusier's Plan Voisin for Paris, near Île de la Cité. From *Urbanisme* (Paris, 1922)

dense, mixed neighbourhoods are frequently the most sustainable ones, yet also most vulnerable. They very often fail to provide for the most basic human needs such as access to clean drinking water or sanitation, moreover they are frequently located in areas prone to the effects of climate change. Taking into account Peter Singer's famous analogy of the *Drowning Child*, one may question whether it is ethical, in such a globalised and unequal world, to concentrate on fulfilling the increasing needs of the developed countries rather than ameliorate the precarious living conditions of the resource-deprived majority of our population. The post-humanist sustainability theories encourage to go one step further and ask: what about the needs of the planet? Nowadays it has become humanity's most

vulnerable and most irreplaceable asset, ironically requiring no significant financial input, but something more demanding – a change of our habits.

## Liberty, equality, sustainability

Does it mean that the only truly ethical solution to global inequalities would be to completely shift our intelligence and resources towards the needs of the most precarious inhabitants of our planet and the Earth itself? The answer is not as simple. It is, above all, the most affluent countries and metropoles that contribute the most to the climate change. Targeting the root cause rather than symptoms and effects seems to be a logical approach. The reason for the environmental crisis is not merely the increase in global population,





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The border of the water-deprived Paraisópolis favela and a luxurious apartment complex Morumbi in São Paulo, Brazil. Credits: Tuca Vieira

but the way we live and consume the available resources. Significant research proves that the solution to managing urban development sustainably is to encourage greater equality in cities, ameliorating the quality of life of the ones in need and rendering consumer society more sustainable at the same time. However, cities have never been fully egalitarian and giving everyone an equal amount of resources and provisions is neither possible nor sustainable. Yet, they have also never been as vast, populated and polluting. The indetermination, the common, the porosity and the mixity are key elements of both an egalitarian and a sustainable city – one that has the capacity to fulfil the needs of all its inhabitants, adapt and evolve. While we cannot give everyone equal decisive power,

Cities today consume 60% of global energy and contribute to 75% of global CO<sub>2</sub> emissions<sup>5</sup>. As the urban population is predicted to exceed 75% of the global population by 2050, the environmental and economic impact of cities already extends beyond their administrative boundaries, and is only predicted to grow uncontrollably. It is indisputable that the sustainability of cities is no longer a local, but a global issue.

paperspace

we can create invitations to greater urban equality. Urbanists, architects and policy-makers can become catalysts for the changes that result from the unplanned and the unexpected.

#### **Leaning from coincidence**

This means re-thinking almost a century of urban planning. The times we live in call for limiting the influence of the modernist ideology of the Charter of Athens and the lobbies of corporate interest on contemporary urbanisation. Venturi's *Complexity and Contradiction in Architecture* encourages to seek to "embody the difficult unity of inclusion rather than the easy unity of exclusion."<sup>6</sup> Providing social housing door-to-door with luxury penthouses. Giving away a certain degree of control over the design to its prospective users. Bringing together the public, the private and the common. Building infrastructural and social networks that run through the rich and the poor neighbourhoods. Promoting inclusion among the most excluded. Thinking about evolution, change, adaptability. About appropriation. Allowing the unplanned, coincidental and unexpected to desacralize grids, uses, zones and forms. Learning from Las Vegas, learning from Rio, learning from Delhi. The United Nations and *The Quito Papers* have started this discussion, providing data, numbers, testimonies and arguments towards new ways of thinking about urbanism, politics and architecture.

#### **Global urbanism**

We can no longer be excused from looking away from the situation of the most vulnerable. Following the logic of Peter Singer's analogy the difference between a child drowning in a nearby pond and one dying of hunger or poor sanitation in a slum in Delhi is no longer valid in a world where information and money travels in milliseconds. Considering ourselves "a global

village" while claiming that the most basic needs, the safety and the dignity of our species and ecosystems is not "our business" is completely unethical. Perhaps what many of the unconvinced need in order to understand and reconnect to the common goal of sustainability, is for the boundaries, both physical and immaterial, between the neighbourhoods to fall down, like those photographed by Tuca Vieira. The image depicts the border of the water-deprived Paraisópolis favela and a luxurious apartment complex Morumbi in São Paulo. The egalitarian city does not mean it is equal for everyone. The egalitarian city ensures dignity and rights to it to everyone who inhabits it or is influenced by it. There is great potential in what may result from tearing down walls, porosity and diversity. Without a doubt, the most fundamental transformations relate to changes in the system. The first step is to stop considering it an impermeable obstacle and start thinking about it as a collective opportunity.<sup>6</sup>

#### Notes

<sup>1</sup> Sennett, R. (2018) The Open City. In: *The Quito Papers and the new urban agenda*. New York: Routledge. p. 90-95

<sup>2</sup> Burdett, R. (2018) Contemporary Urbanism. In: *The Quito Papers and the new urban agenda*. New York: Routledge. p.140-149

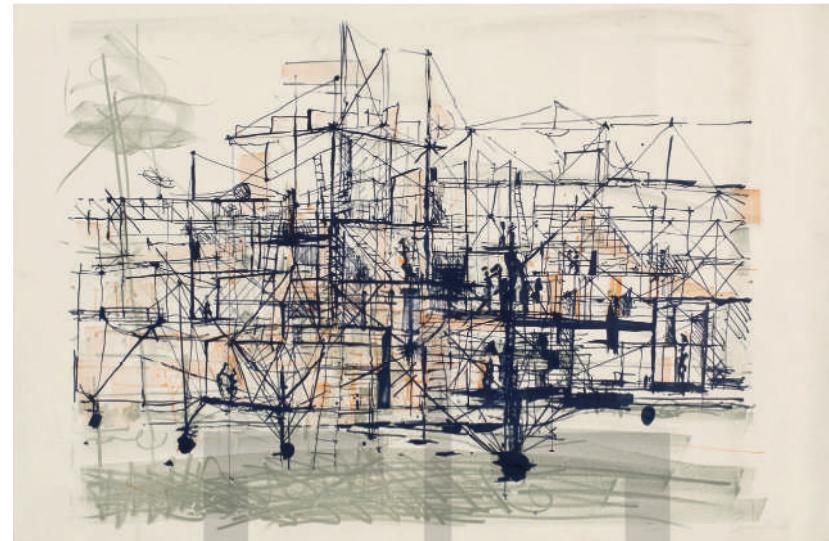
<sup>3</sup> UN-Habitat (2019) *UN-Habitat at a glance*. [online] <https://unhabitat.org/un-habitat-at-a-glance/> [Accessed 19 May 2019]

<sup>4</sup> United Nations Human Settlements Programme. (2018) *The Quito Papers and the new urban agenda*. New York: Routledge.

<sup>5</sup> Burdett, R. (2018) *op.cit.*

<sup>6</sup> Venturi, R. (1966) *Complexity and Contradiction in Architecture*. New York: The Museum of Modern Art. p.29

# the house of the future



Constant Nieuwenhuys' sketch of 'The New Babylon'

20XX

## By Amy Young

Architecture has many complexities but one of the greatest is perhaps that architects have to design buildings that will be standing significantly beyond their lifetime. In the time of a climate crisis and political unrest, we really have to take a position to design for a positive future – thinking smartly about the changes we can expect, and how to accommodate them within the architecture we design.

As part of my Erasmus exchange in TU Delft I opted to study the module 'House of the Future' to learn about designing for what is often so unpredictable and unstable. The study is based around reimagining the house in the year 2100, removing all perceptions of what a house should be and envisioning a new

normal, responding to changes in lifestyle, climate, politics and culture. To try and understand how to design for the future we began with analysing examples of 20th century architecture that were designed for a future, often utopian and with extreme predictions of how life would be.

In 1956 Alison and Peter Smithson designed their 'House of the Future' for the Daily Mail Ideal Home Exhibition. It was intended to be for the year 1981 and for a childless couple living in a dense urban area. The scheme focused on new building materials, a reorganisation of the programme and new methods of communication within the home. For example, there were speakers and microphones around the space that would present telephone messages and music. The sink was formed from

reinforced plastic and the bed sank into the floor with a nylon sheet on top. The house was by a 9x15 rectangle which allows each unit to be joined together in a highly dense grid structure. The interior walls are not made up of straight lines but rather fluid partitions which sweep across the plan, directing a specific movement through the space. All windows are focused onto the courtyard, creating maximum privacy from the outside world. The Smithsons were really focusing on the idea that in the future there would be new methods of communication in the home, new materials and a fascination with plastic. All these changes were clearly integrated into their architecture.

Another example of a house for the future is the project by influential Dutch artist, Constant

*"Every limitation of movement, of the creation of mood and atmosphere should be inhibited. Everything should remain possible, everything should be able to happen."*

Constant Nieuwenhuys, 1959.

Nieuwenhuys, the 'New Babylon'. The project was designed in 1959 as a response to a future in which people are liberated from human labour and could instead fully dedicate themselves to creative thinking. He wanted to imagine a world far from the destructive and turbulent time of the WW2, reinventing cities and social structures. As Nieuwenhuys described the project:

*"The New Babylon offers only minimal conditions for a behaviour that should remain as free as possible. Every limitation of movement, of the creation of mood and atmosphere should be inhibited. Everything should remain possible, everything should be able to happen. The environment is created by the activities of life not the other way around."*

The project was definitely a complete Utopia, a future that probably would never exist, but his project helped to provoke ideas on the way housing could be reinvented in the most radical way. The project includes floating and raised structures, that then support transformable interior environments which have a combination of dwelling units, services and public spaces. Nieuwenhuys focused a lot on integrating the more technical elements of the scheme into the

architecture itself, so they would become "powerful, ambience-creating resources in the psychogeographical game played in the social space."

The next example of a house designed for the future was House Sonneveld by an architecture firm Brinkman and Van der Vlugt for the owner of the Van de Nelle Factory in Rotterdam. The house is based around Dutch functionalism and at the time of construction in 1933 it was a very radical and unique home in the neighbourhood.

Much like the Smithson's 'House of the Future' the main house had phone and speakers in each room, a revolutionary way of communicating in the home in the 30s. House Sonneveld also used modern techniques and materials like concrete and steel, which produced an efficient and hygienic design. The house was supposed to support a healthy lifestyle, large windows and constant ventilation produced a fresh and airy environment to live in. The architects really tried to reimagine modern living and the design was 'Shaped by ideas about a healthy lifestyle and outdoor activities: the balconies, roof terrace, veranda and garden allowed for intensive use of outdoor spaces for fresh air, sun, games and relaxation.'

The lessons taken from these

20th century examples are that we have to reimagine people's daily lives, investigate how habits and routine are going to change and thus, how architecture should support that. Throughout my studies at TU Delft we analysed the main drivers that will change daily life for people, primarily in Western Europe. These include climate change, an increasing population and automation/AI. Each driver is predicted to change life dramatically, much like the mobile phone or the internet did twenty years ago.

So, the question arises; how do we actually build architecture to support these changes?

We can already see architects tackling the problem of climate change, it is slowly becoming a priority in design and regulations set in place. Even this year's Stirling Prize winner was a sustainable project - Goldsmith Street by Mikhail Riches. A push for increased application of Passivhaus, intelligent building materials and solar design will be expected. Arguably, to prevent the increased warming of the Earth significantly more is going to need to be done within the construction industry.

Increased population could potentially lead to entirely new



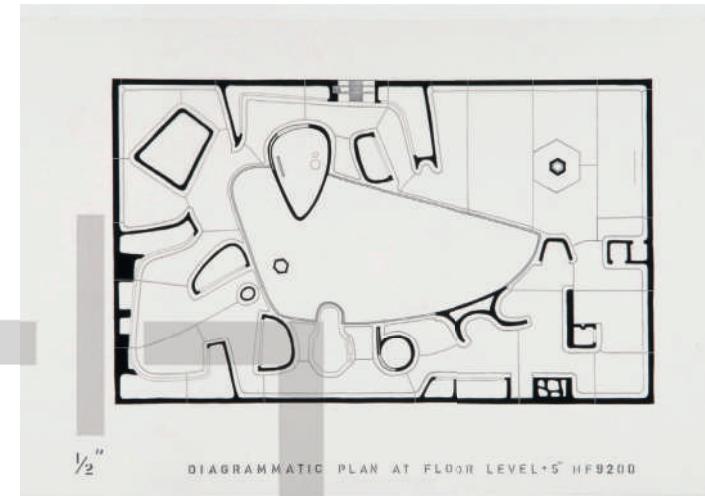
*"A house designed like a car is at some disadvantage, for the appliances would be so closely integrated into the structure, that to change the refrigerator would be like getting a larger glove compartment in a 'Volkswagen' d" ashboard—it would be simpler to get a new car."*

Allison Smithson - 1956

housing models with co-housing and cooperative housing becoming more common, in order to maximise space. But given that our societies seem to be increasingly divided in views and political opinion, the idea of co-living is probably just another utopian fantasy.

Automation is likely to result in more 'flat-pack' architecture, simple designs that can be made in factories, shipped to site and assembled within a day. The role of the architect is likely to ensure these are efficient and beautiful, rather than boring and uninspiring. AI is a little trickier to predict given that it is not fully present in our day to day lives as of yet. Most likely the idea of a 'smart home' will become more common, the house will work in conjunction with its residents in order to make daily life a little bit smoother. Imagine a house which sets your alarm for you, makes you coffee in the morning and matches the temperature and humidity to your perfect environment.

Housing is due an overhaul; especially given the unprecedented changes we can expect over the next one hundred years. By looking at past examples like the Smithsons, Constant Nieuwenhuys and Brinkman & Van der Vlugt, architects need to design radically, and with future-proofing at the forefront of the design. New homes have to be able to cope with the incoming problems and changes, predicting issues before they even arise. ☀



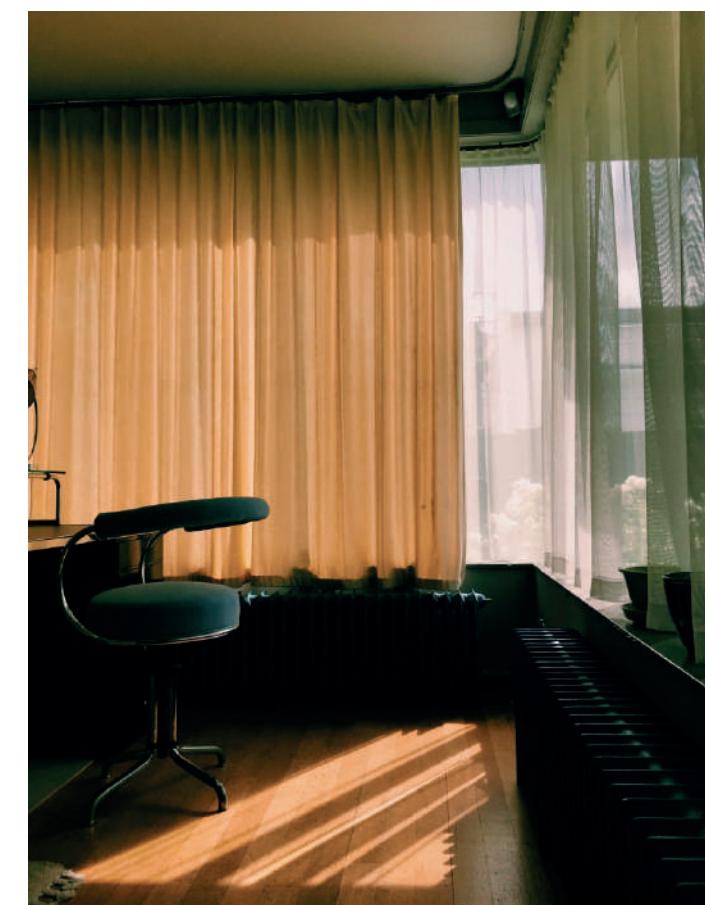
Smithson House of the Future Plan



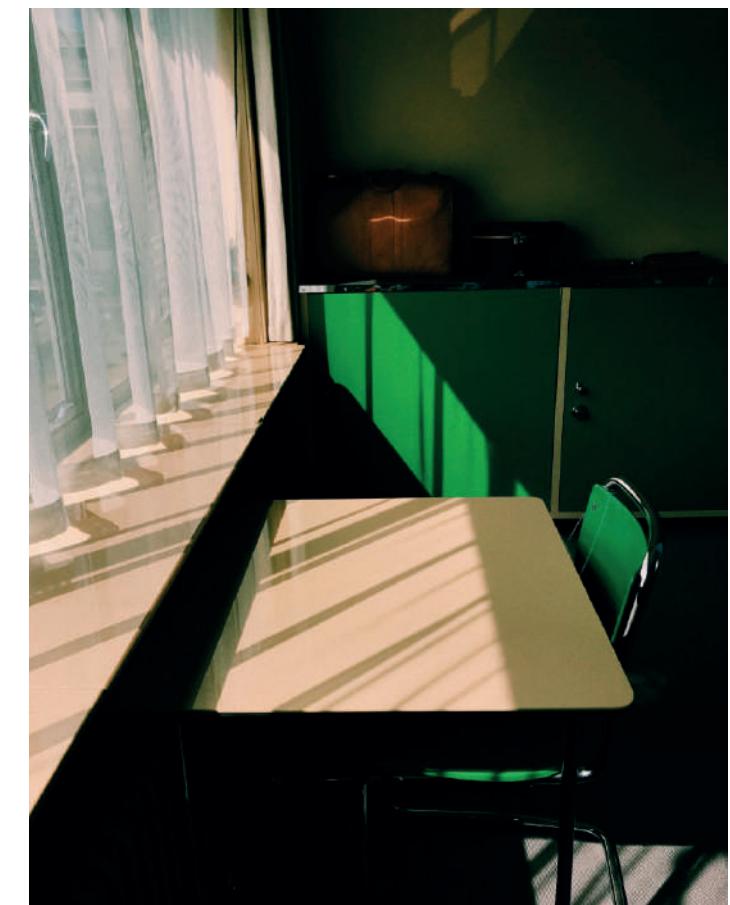
Mikhail Riches - Goldsmith Street

*" Sonneveld House has a steel skeletal structure and concrete floors, enabling it to dispense with loadbearing walls, thus allowing the spaces to be divided with greater freedom. Walls were used only to separate spaces. To create optimal openness and flexibility, on this floor the architects opted to divide the spaces with sliding panels and curtains rather than fixed walls."*

An extract from the House Sonneveld website



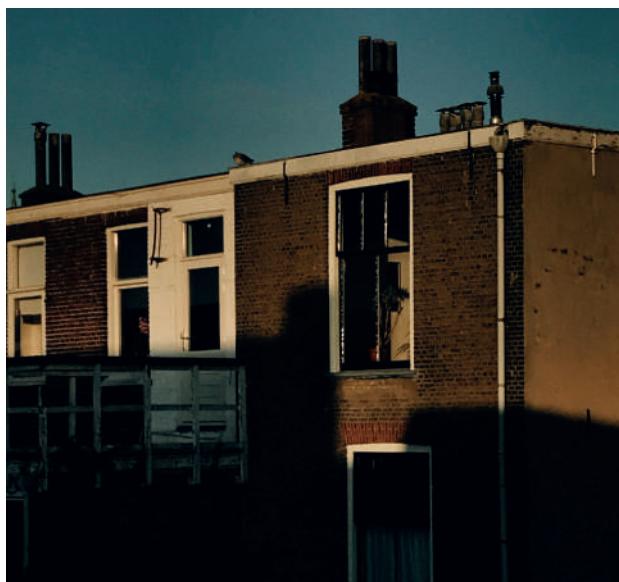
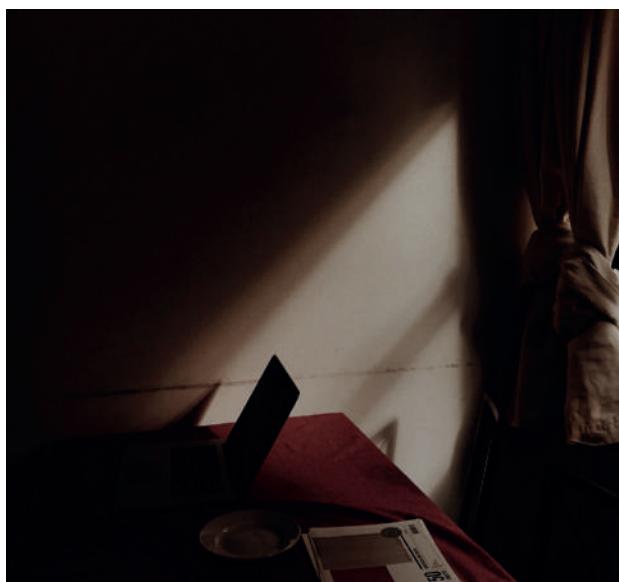
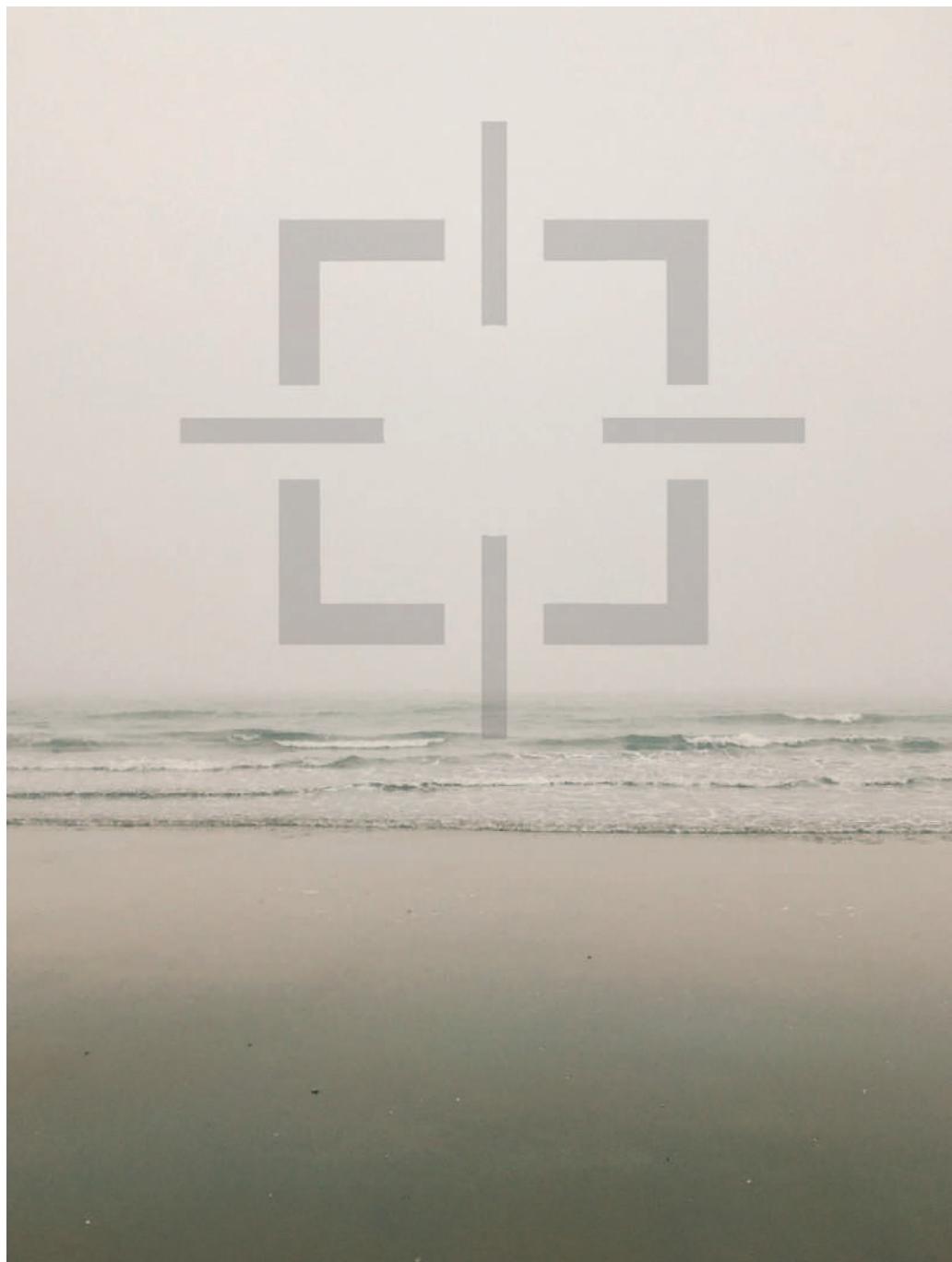
House Sonneveld - Rotterdam



# a room in delft

by Amy Young

*Delft, my home for the past six months. Often grey and miserable, but when the sun peeks through the clouds, the play of light is glorious.*



*there is no time left*

vaguthu nethey vaguthu nethey

وَكُمْ سَرِّمْ وَكُمْ سَرِّمْ

# Paradise Lost

By Ema Fathimath

White sandy beaches, clear blue waters and a feeling of permanent warmth from the bright sun shining in the sky. It is considered to be a "paradise" by the thousands of tourists who visit. But for the inhabitants of this "paradise", their home is in treacherous and troubled waters. Extreme weather changes, rising sea levels and the destruction of marine biodiversity - all of which can be attributed to climate change - threaten to destruct the way of life of the 400,000 people who call the Maldives their home.

Although their contribution to global emissions is dwarfed by those of countries such as the US or China, these extremely low-lying islands are amongst those that will be impacted by climate change the most. Their lack of geopolitical power also means that they are unable to significantly alter global climate decisions, leaving them helpless and vulnerable in the face of climate change. This is why active environmental organisations and the Maldivian government now favour climate adaptation strategies.

The harsh reality we must face today is that stopping climate change is no longer an available option. We must fight to limit it and we must learn to adapt to it. The "Gap Report 2019" published by the Intergovernmental Panel for Climate Change (IPCC) tells us that we still have the opportunity to curtail the rise in global temperatures to 1.5°C. Although this is far from an ideal situation, it is a feasible and possible objective we can achieve to ensure the least detrimental effects.

*Of Paradise by might of Waves be moovd  
Out of his place, pushd by the horned flou*

John Milton, *Paradise Lost* (1667)

## *Land loss and erosion*

Being surrounded by water, it comes as no surprise that over half of the country's human settlements and 70% of critical infrastructure are within 100m of the shoreline. People's homes, airports and hospitals are all left extremely vulnerable to climate change-induced flooding and sea-level rise. Destruction of such infrastructure would take an unprecedented toll on the country economically, as these assets are valued at almost 30% of the GDP (\$200 million). Furthermore, the booming tourism industry of the country is also at risk. For Maldivians, tourism is their economic lifeline, accounting for over 30% of their GDP (this figure rises to 90% once indirect relationships are considered). With over 90% of resort infrastructure within 100m of the shoreline, the industry is greatly threatened as well. Moreover, the unique geography of small, low-lying and flat islands means that retreating inwards or to higher land is not an option during such an emergency. Sea swells and flooding inundate a large number of inhabited islands annually. Loss of land due to severe erosion is a constant danger, and scientists estimate that by 2100, over 85% of these islands could be completely submerged. Although this may seem very far into the future, climate change is a terribly present and real threat to the very existence of these islands. The necessary steps need to be taken now, in order to ensure that these effects are limited and such small island nations are protected. For these islanders, there is no plan B.

Water and food security

Climate change is disrupting the water and food security for islanders in the Maldives, especially those residing in rural areas. Most islanders used to drink water from a naturally formed freshwater lens in the groundwater. However, rapid urbanisation, natural disasters and sea-level rise have either destroyed this lens or left it unsuitable for drinking. The locals then turned to rainwater but without the necessary resources to collect, purify and store it, this too proved to be difficult. Climate change causes longer and hotter dry seasons which contribute to this struggle, as water is unavailable when needed the most. Due to the scattered geography of the Maldives, sending emergency relief through bottled water shipments is no easy feat. The government in partnership with the UNDP have already started adapting potential solutions in some areas. For instance, in Laamu Atoll some large communal water storage units have been built. Such additional steps need to be taken across the country, especially in the South where rainfall has decreased drastically, and severe droughts affect the livelihood of thousands of residents.

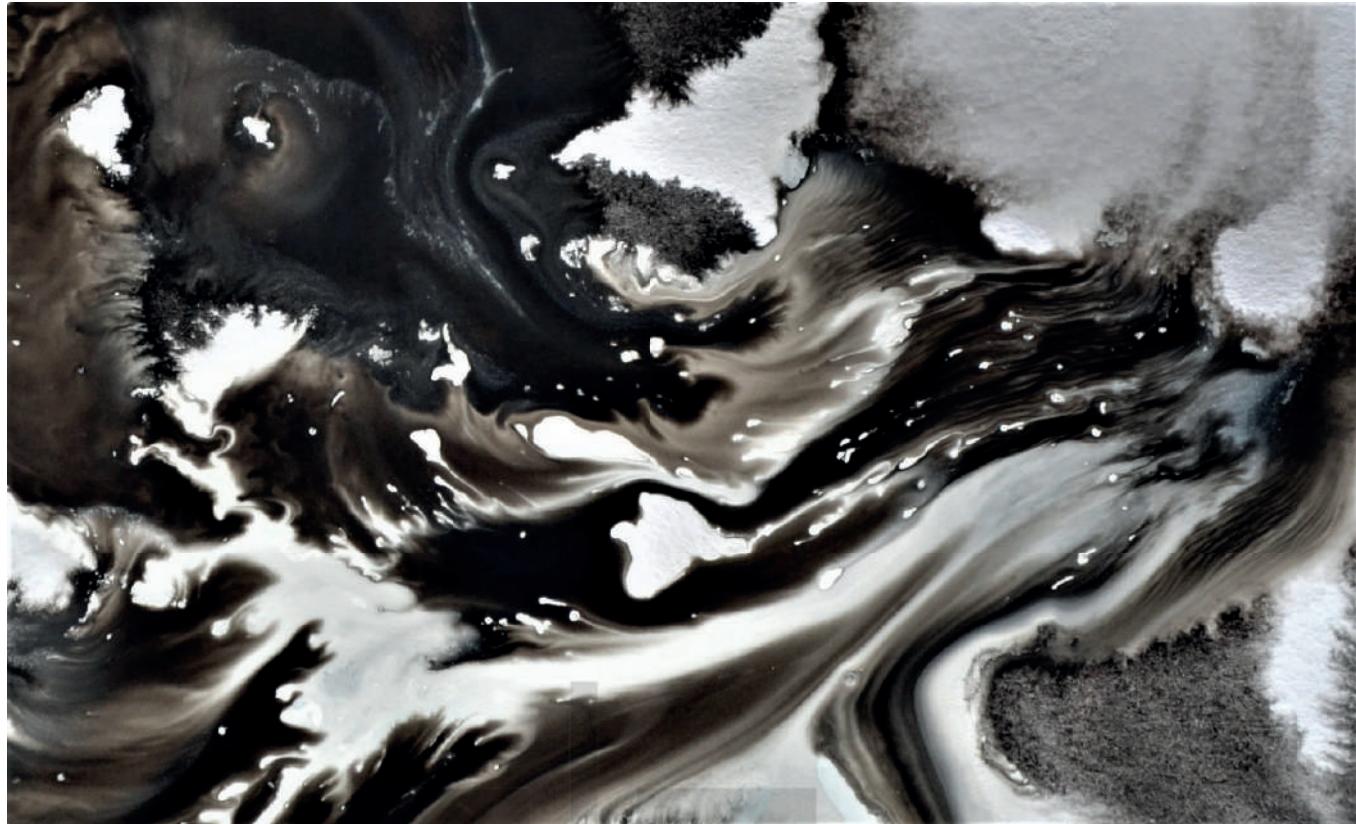
Marine biodiversity

Marine life is extremely sensitive to changes occurring in the sea temperature, so even the slightest increase could throw the whole system off balance. Maldivians have always had a special connection with the

ocean. From the sea we get our sustenance; food, money, water, it all comes from the deep blue. One-fifth of the population in Maldives depends on fisheries for food and livelihood. Changing ocean temperatures can shift the migration patterns of significant species of fish such as tuna, and bait fishing has decreased. Routines established by fishermen over several generations no longer work because the environmental patterns are becoming distorted. Additionally, Maldives is home to the seventh-largest coral reef system in the world. Coral bleaching can occur with even the slightest temperature increases and there have already been over 7 "severe" coral bleaching events in the region over the past 30 years. The IPCC estimates that even with our current best-case scenario of a rise of 1.5 degrees Celsius, over 70% of the global coral reefs will perish. Although this sounds dire, should the number grow to 2 degrees Celsius, virtually all of these lively rich underwater systems will die.

These islands are nothing but mere dots on the world map, but to me they are my home. For me, the idea of potentially losing this battle to climate change is incomprehensible. The white sandy beaches, clear blue waters and the bright sun; measures need to be taken on a national, regional and global level to adapt to the current and potential future situation, prevent the worst from happening, and save all the countries at the frontline of this clash against the climate crisis. 





## In the Depths of the Unknown

By Maddi Gomez-Iradi (2019) fluid acrylics on paper



Interesting times we live in indeed

And with this issue we hope to have planted a seed

Food for thought, topics for discussion

And most of all, **points for action**

From climate change to **digital intrusion**

Amongst these challenges we must diffuse confusion

Face them with understanding and learning

Only then can the tables be turning

But all hope is not yet lost

For in the future we must trust

In empathy, diversity, awareness and care

The consequences we all will share

The **depths of the unknown** we have but dipped in our toes

Yet with these words we must close

Though we may be drawing the curtain

The future is **certainly uncertain**

Michael Tsang

*Editor in Chief of PaperspACE*



THE UNIVERSITY OF BATH  
DEPARTMENT OF  
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