

ISSUE 4 SPRING 2020 HOARELEA.COM

Exploare

The future belongs to the curious.

A magazine from Hoare Lea



The future belongs to the curious.

**“The difficulty lies not
in defining the new
ideas, but in escaping
from the old ones.”**

John Maynard Keynes, economist

Places.

People.

Possibilities.

Liz Bonnin / 26

Life through the lens

Robert Llewellyn / 8

TV comedian turned
electric-future enthusiast

Surviving to thriving / 42

Building strong communities in
the face of poverty and disaster

Samsung KX / 14

The 'not a store' experience

Wapping Wharf / 24

Bristol's harbourside destination

Old Admiralty Building / 34

English heritage meets
workplace future

Shaping my city / 36

London

Spark or stifle / 16

The story of science, cities,
and a sector in flux

X files / 40

Indoor vs outdoor air quality

Fresh perspectives / 6

No more hot air

FOREWORD

Designing the built environment puts us at a unique intersection. We span technology, economics, local and global regulation, environmentalism, and the health and wellbeing of society. We craft the stage where lives – billions of them – play out every day.

The privilege, magnitude, complexity, and responsibility of this role can sometimes feel daunting. With every innovation, every development in how we work, and each impactful project, the need for more, better, newer seems to follow. The world feels fast, vast, and often out of control. Despite the pioneering developments they may feature, when projects take years to come to fruition, it can feel as though there's always more that could be done.

So how do we combat that overwhelming feeling? How do we even begin to make changes that keep pace?

We explore.

Exploration requires boldness. The kind of boldness most of us had before adult life beat it out of us. Bold discovery is thrilling – a chance to test boundaries and flirt with uncertainty.

Remember the joy and freedom you felt when you roamed the neighbourhood as a child, or last stepped out into an unknown city as an adult. There was a little fear of course. There was uncertainty... You probably slipped up at some stage, or questioned your confidence.

But you persisted. The thrill was too irresistible.

The brain's reward system means excitement can overcome concern. It can galvanise action.

2020 is the first year in what will be *the* decade of change: we have less than 10 years to preserve our planet, to reverse global warming, and secure a positive future for generations to come.

For some, it's a bleak, demotivating truth. So, let's get excited about it instead! It's our chance to change reality, to be the best ancestors we can be. When we're enthusiastic, when we see opportunity rather than obstacle, we become the engineers of change: confident in what that future could – and *will* – be.

The trend report.

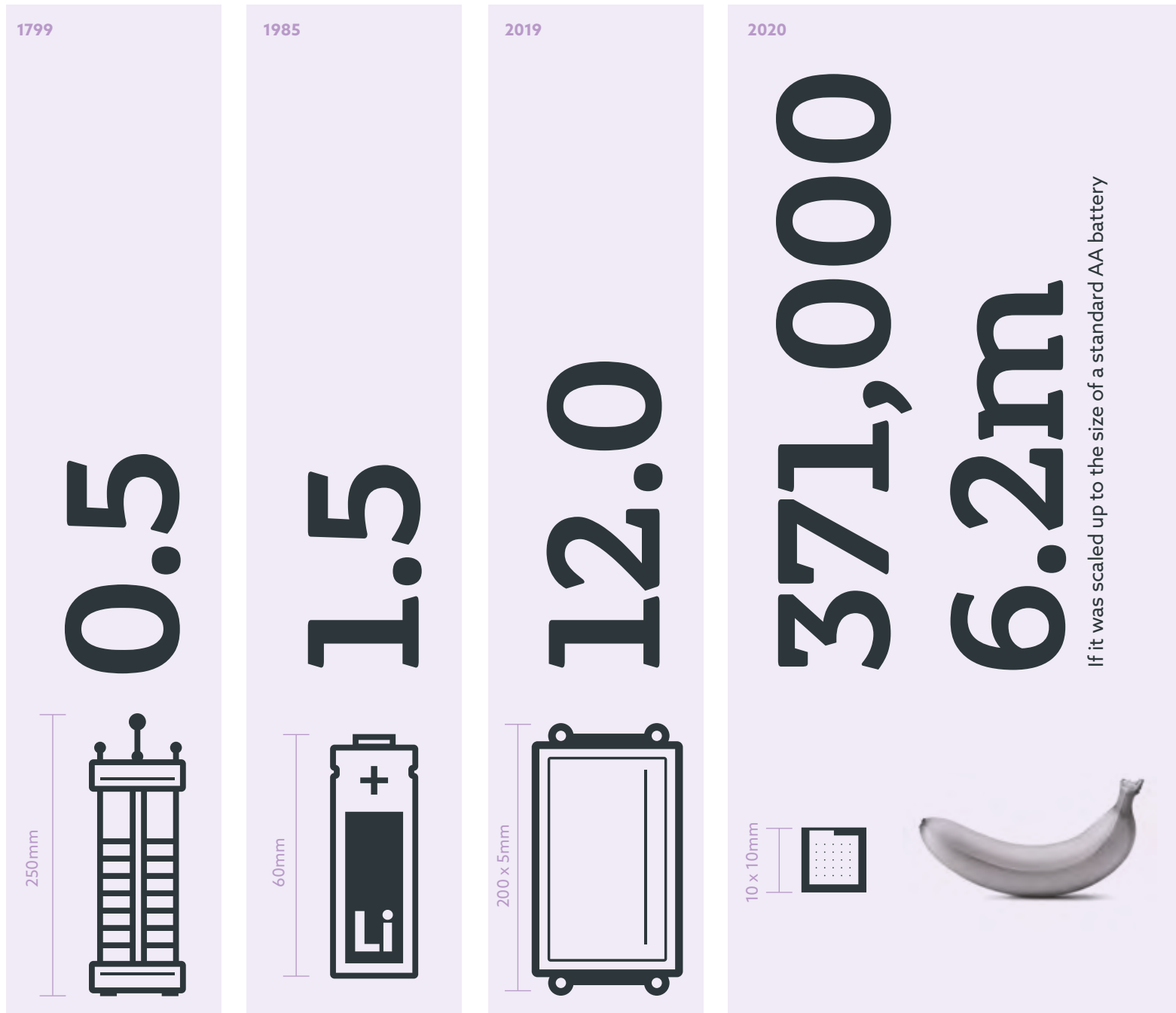
The future of battery power.

VISUALISING ENERGY DENSITIES OF HISTORIC AND FUTURE BATTERIES

From 1700s to 2020



WHAT? A comparison of the energy density of historic and new battery technologies against that of a standard AA battery.



Voltaic cell.

Invented by Alessandro Volta in 1799, and announced to the scientific community in 1800, this was the first recognised electric battery.

Lithium battery.

This is a technology that's still changing our world now, and is being refined to become more sustainable and robust.

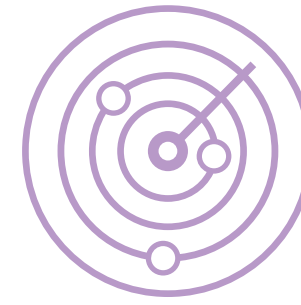
Aluminium air.

Developed by British engineer Trevor Jackson, this can power an electric car for up to 1,500 miles before being re-energised.

Diamond battery.

Invented at the University of Bristol, this will use waste nuclear material processed to be no more radioactive than a banana and last 5,000 years.

On the radar.



1.

UK'S BIGGEST ZERO CARBON DEVELOPMENT

The largest carbon neutral development in the UK is being built outside Tonyrefail, Wales. The 225 new homes have received £7 million of funding by the Welsh Government. Let's talk - RobinGriffiths@hoarelea.com

2.

VISIT EUROPE'S LARGEST GARDEN PROJECT

The Royal Horticultural Society Garden Bridgewater featured on *The Guardian's* 'Alternative Hotlist' for where to go on holiday in 2020. The +£30 million site in Salford is due to open this summer. Let's talk - MarkHagger@hoarelea.com

3.

RESPONSIBLE STEEL STANDARD

The Responsible Steel Standard, the world's first international, multi-stakeholder standard for responsible steel making and processing, is inviting applications for certification bodies. Visit - responsiblesteel.org/certification

4.

THE RETAIL (R)EVOLUTION

Warehouse space of more than 18 million square foot is needed to meet demand for online parcel logistics, which has soared in order to deliver an efficient retail experience. Let's talk - PhilGrew@hoarelea.com

Conversation kickstarter.

“Who or what is the barrier to change? Perhaps we should look closer to home...”

Hannah Vickers, CEO, ACE Consultancy

“New homes should not be holding us back in the fight against climate change. There is no sense in putting off until tomorrow what we should have done yesterday.”

Philip Box, UKGBC

Join the discussion at hoarelea.com/insights

Kaizen corner.

改善

“Change for better: one-time or continuous, large or small.”

A major inefficiency in building design and construction lies in transferring data between disparate disciplines and design software. What if we could communicate seamlessly using a single data model? A connected cloud service can make this possible.

Hoare Lea is...



Thinking about.

Lessons from the lives of trees.

According to new research, trees of the same species in a forest exist not in isolation but in a community. They operate using a form of intelligent resource sharing that could provide learnings for future smart cities. If they can feed off information from their buildings, huge opportunities can open up for energy and resource optimisation on a city-wide scale. Let's talk - AndrewBullmore@hoarelea.com



Talking about.

Our new Net Zero Carbon service.

Governments, local authorities and businesses increasingly understand the importance of achieving net zero targets within the next 10 years. After working with the UKGBC to develop a framework for net zero carbon in buildings, we now offer this vital service for new and existing developments. Let's talk - AshleyBateson@hoarelea.com



Caring about.

Advancing alternative fuels.

UCL's Advanced Propulsion Laboratory will provide a world-leading alternative fuel and vehicle propulsion facility. No UK facility currently offers independent testing for both technologies at this scale, making it a critical resource for academia and industry that will support the UK as leaders in this field. Let's talk - JohnSteele@hoarelea.com

Fresh perspectives
 New voices of the built environment
 Oliver Lockhart



No more hot air.

Let's banish gas boilers.

LET'S TALK
 OliverLockhart@hoarelea.com



The mantra used to be: what's good for business is good for society. It's now the other way around: what's good for society is good for business.

If our industry is serious about tackling the climate emergency, gas boilers have got to go.

2019 was a remarkable year – often not for the right reasons. Temperature records were broken in 29 European countries and the Arctic sea ice reached its second lowest point on record. Yet we also saw (and are still seeing) a surge of public outcry, with record levels of participation in climate crisis rallies and high-profile announcements from business leaders.

The built environment is responsible for 40 percent of the UK's carbon footprint, so what we all collectively do – as developers, architects, engineers and contractors – has a real influence on the impact to our planet.

Action over words

Most of us know the urgency: that, to fulfil the goals of the Paris Climate Agreement, all buildings must operate at net zero carbon by 2050 and all new buildings should target zero emissions by 2030.

The industry has never wanted change and impactful action as much as it does today. Sustainability is no longer the tick box exercise that it was often viewed as in the past.

As engineers, we need to consider the impact on our environment in every step of our designs and, with that in mind, there is no space for gas boilers. Natural gas is never going to get greener. The carbon emitted by burning gas hasn't changed since it was first used in homes in the early 1960s. Electricity, on the other hand, has been getting greener for years and the

latest projections by the National Grid suggest it's only going to get better. For 2020, the National Grid has forecast that the average carbon intensity of electricity will be 136g CO₂/kWh. This means that using a heat pump will reduce CO₂ emissions by more than 80 percent compared to a gas boiler. There would even be a 3 percent saving in energy costs, assuming a gas boiler is 80 percent efficient (which is generous – we've checked!).

Fast forward to 2030 and it's a 90 percent carbon saving.

The scenario

So let's say we decided to banish the gas boiler. What happens? Well, it's a nuanced situation, with a lot to weigh up.

For example, there's the emergence of hydrogen boilers and the capacity of existing electrical infrastructure to consider. Bigger energy users are more subject to changes in electricity costs (of course, if managed well, this can result in significant savings).

Also, the availability of green electricity ebbs and flows, varying the grid's carbon intensity and therefore how 'green' it is at that point in time; a volatility that offers cost and carbon advantages, as long as building intelligence is in place. These are all complex considerations, but they're nothing a bunch of problem-solvers can't easily work through.

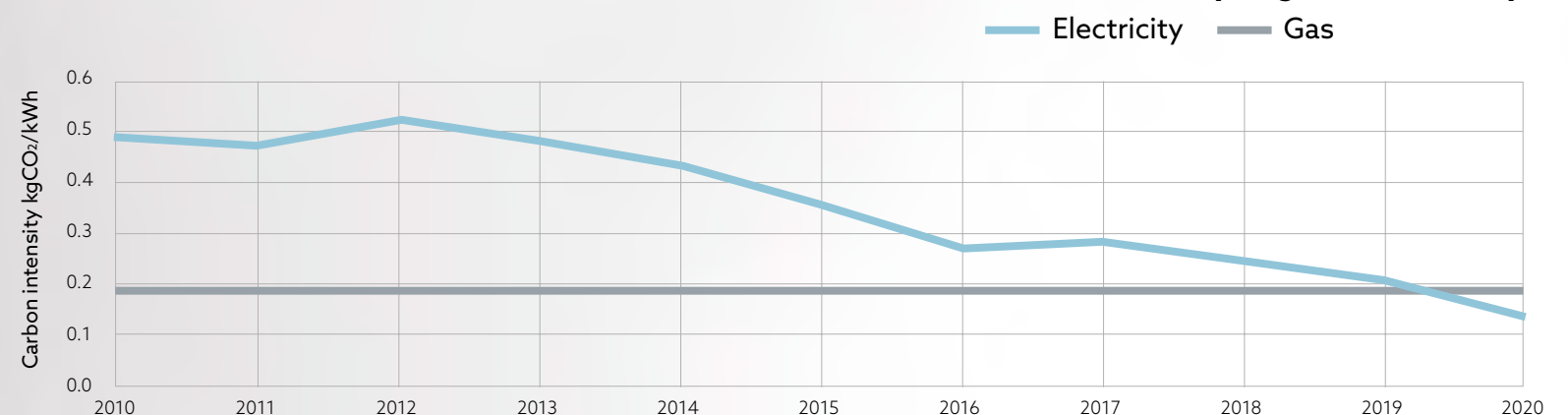
There are also some clear perks on top of the climate motivation. For example, there would be no need to provide a gas pipelines and cities would have significantly better air quality thanks to less gas being burned.

It's history

We are in the midst of the climate crisis and it's business-as-usual that has allowed society to end up here. Now is the time for decisive, positive action – for putting our climate impact at the heart of every design discussion and decision. For me as an engineer, the first step should be consigning gas boilers to the history books.

The mantra used to be: what's good for business is good for society. It's now the other way around: what's good for society is good for business. □

Carbon intensity of gas vs electricity





PEOPLE

Fully charged.

How do you go from playing a much-loved mechanoid in one of the BBC's most successful sitcoms to full-blown electric-future fanatic? **Robert Llewellyn** talks us through 30 years of TV, technological change, and nail-biting moments of British engineering glory.

Photos by James Cheadle @ The Royal Institution



Q In terms of public perception, you've moved from actor to innovation enthusiast – how did that transformation take place?

RL Well, once you've been on the telly acting, people decide that you're an actor. Yet, I would say I'm definitely not! I accidentally 'leant on the backdoor' of show business and it turns out they hadn't locked it. I can honestly say that at no point in my life have I had a desire to be an actor... or even to be on television. It took me 20 years to realise the reason people who work in the industry want me for jobs is precisely because I don't want to be on television!

It sounds bonkers, but my agent had to trick me into seeing the *Red Dwarf* team by telling me it was a work meeting. She knew I wouldn't go to an audition. I wrote comedy for other people, I never thought I'd be a performer. That feeling of exposure is not something I enjoy. But then when I did eventually end up getting roped into performing, people laughed and of course that was a curse!

Simultaneously, I have always been interested in science, engineering, technology... how things work etc - and not just how an individual machine functions, but how whole systems do. Why did we build the world we built? The history of engineering was something I was fascinated by as a child. My mum took me to all the museums and interactive exhibitions because I was obsessed with that kind of thing.

So, in a sense when I got the *Scrapheap Challenge* presenting job, it was this incredible merging of an area I was interested in with something I was good at. I loved that the show had teams asking things like: "How are we going to make a hydraulic digger out of old bed frames and bits of rusty Morris Minor?"

It was an amazing job and I was involved way before it came on screen. My intention was to be someone in the background but, again, I got talked into presenting... and, it was just as well, as my 'genius background ideas' were quite terrible as it turned out!



Q It always seemed as though the teams that gelled together the most did the best, would you agree?

RL Yep, it was all about the team. Almost every group would start out with an idea, which would then go hideously wrong for reasons that no one would have ever predicted... and it was fascinating to watch because success was absolutely down to how the team operated together to solve the issue. The organic human level to it, meant that often the programme wasn't about the physical manifestation of the machine a team was building, it was actually driven by how those people talked to one another and got on. There was a lot of emotional pain on set. You had to be able to deal with everything just grinding to a halt and people in despair asking "how the heck are we going to make this? It just doesn't work!"

Teams of people who had been to art college together and hadn't built anything before could be just as amazing as a team of engineers from Jaguar! When we first started I saw it as a 'how do you turn a lawnmower engine into something that moves stuff up in the air' programme, but I soon realised it wasn't. Ultimately, it was about communication and how people help each other rather than criticise. >>

With co-presenter Lisa Rogers on *Scrapheap Challenge*
Photo: Peter Dadds / Channel 4 Television



Often the programme wasn't about the physical manifestation of the machine a team was building, it was actually driven by how those people talked to one another and got on.



Q Were there any standout moments from the *Scrapheap Challenge* series?
RL In 2003, we had a global special that saw British, French and American teams try to build an aeroplane. It was 100 years after the Wright brothers' first flight so there were a lot of historical references and the teams had to use tools from the period: no electric drills, or saws, just hand tools to build wooden planes. It was such a delight to be on the set. It smelt of wood chippings and you could actually hear for once because there wasn't any grinding or welding of metal.

We took their built planes out to the desert to fly. The French one bounced into the air to about 10 metres; you could say that it sort of flew... ish! The American one ploughed a furrow into salt flats so deep you could barely see it. It was a brilliant land-based machine but it never got anywhere close to the sky. The British one, however, went up so high it was mind boggling. We had permission to fly it up to 50 feet, which was hysterical as we didn't think we would get up to two feet! It's very hard to judge how high something is in the desert, but as I was looking at this little dot of a plane in the sky, the guy from the aviation authority who was stood next to me just said: "that is above 50 foot, Robert".

We later found out that it went up to 3,500 feet! The British test pilot, an experienced guy, just couldn't believe it flew. He'd been sitting in a child's deck chair tied with strong string to a tiny piece of wood; no safety belt, no parachute. During the course of the series, we'd seen boats that sank, cars that broke down - all great fun. But, to take this leap of faith and for it to be so glorious was just brilliant.



Q So, tell us about how your YouTube channel *Fully Charged* came about

RL While I was in America doing the *US Scrapheap Challenge*, I met some pretty clever people who told me that television was going to be on the internet. This was in 2001 when we had dial-up modems and, if you had an hour to spare, you could download a picture!

I also met engineers who were working on batteries, electric trains, software etc... all that really early electric car stuff. It meant nothing to me at the time, I always thought *why are they bothering with this? We have cars. I want a flying car!* It took a long time, but slowly I began to understand the reasoning for it. I was not an overnight eco warrior by any stretch of the imagination.

As I started to get interested in the electric future, YouTube was growing and I realised there was an opportunity for a presenter like me to not go down the traditional route. I didn't have to go through a broadcaster, I just uploaded content. I started *Fully Charged* because I knew something was going on. I had seen early electric cars and the charging systems that made them workable. It was my passion project though - the first aggregate one million views on my video took two years, now we hit that most weeks.

Q You must have seen such a drastic change in technologies - or at least their viability - in that timeframe?

RL Yep, the speed that technology is evolving is dizzying. Yet it's also the change in cost that has really excited me. Take solar panels - I put them on my house in 2011. At the time it was a pretty privileged middle-class thing to do. They were so expensive, you were never going to live long enough to reclaim that money. But now they cost less than a quarter of what

Robert founded and hosts Fully Charged, the world's number-one clean energy & electric vehicle channel.

they did. They're smaller and you need fewer of them to do the job. The same goes for wind; in 2010 the biggest wind turbine could produce roughly half a megawatt hour, and that was considered enormous! The ones being tested now produce 20 megawatts, so two will provide more electricity than Battersea Powerstation at its peak. That's incredible.

Q So, would you say you're optimistic about the future?

RL I think humanity is facing an existential crisis that we have the potential to overcome, definitely. Compare it to a meteor heading for us; we have barely any control over that... But this climate problem is something we *can* solve! That's definitely the source of the frustration we are witnessing in young people. They get it and most are already changing their behaviour significantly. I'm enjoying seeing this big movement grow. So, in short... yes, I'd say I'm a sceptical optimist! □

“
Some pretty clever people told me that television was going to be on the internet. This was in 2001 when we had dial-up modems and, if you had an hour to spare, you could download a picture!

Images: Kevin Luckhurst



Samsung KX: a flagship experience centre.	
The client	Samsung / KSS
The expertise	Acoustics, Audiovisual, Building Physics, ICT, Security, Sustainability
The challenge	Creating an interactive experience-led space for the iconic brand, where people can discover the latest technology, and the 'next generation of innovators' can gather, learn, and explore.
The sector	Retail

POSSIBILITIES

Spark or stifle.

The story of science, cities, and a sector in flux.



How can the UK create the world's most successful science clusters? Like scientific breakthroughs, it seems there's no hidden method. But, put together a group of smart insightful people, and we can get closer to the answer...



Science cluster creation: what we know.



At the centre:

- An evolving sector
- Commitment to collaboration
- The value of location

Formation:

- Private funding
- Conscious place-making
- Some public-sector initiation

Sparked by:

- Research-centric university
- Academic talent
- Professional services
- Cutting-edge facilities

Crucial elements:

- Transport links
- Networking opportunities
- Amenities
- Social spaces
- Housing

In 2013, experiencing a slump in profits and a weak pipeline, AstraZeneca moved its operations to Cambridge from Macclesfield in Cheshire. Its press release announced that the move would give it the key ingredients of an urban science cluster: "easy access to scientific talent and excellent collaboration opportunities through renowned academic research institutions, pre-eminent hospitals and leading-edge biotech companies."

Had it taken inspiration from Cambridge's namesake city across the pond? In Cambridge Massachusetts a mix of big firms, small companies, and start-ups had started to form. Today, more than 30 companies are clustered together, all close to Harvard University, MIT, and several top-tier hospitals. "It's been the epicentre of the biopharma industry for a number of years," says Gary S. Gray, Director of Technology and Innovation at Harvard Catalyst, the Harvard Clinical and Translational Science Center. "You're always running into someone you know, so you can start conversations."

When it comes to location, the questions of collaboration, quality of life, and community have become as vital to decision-making as technical ones.

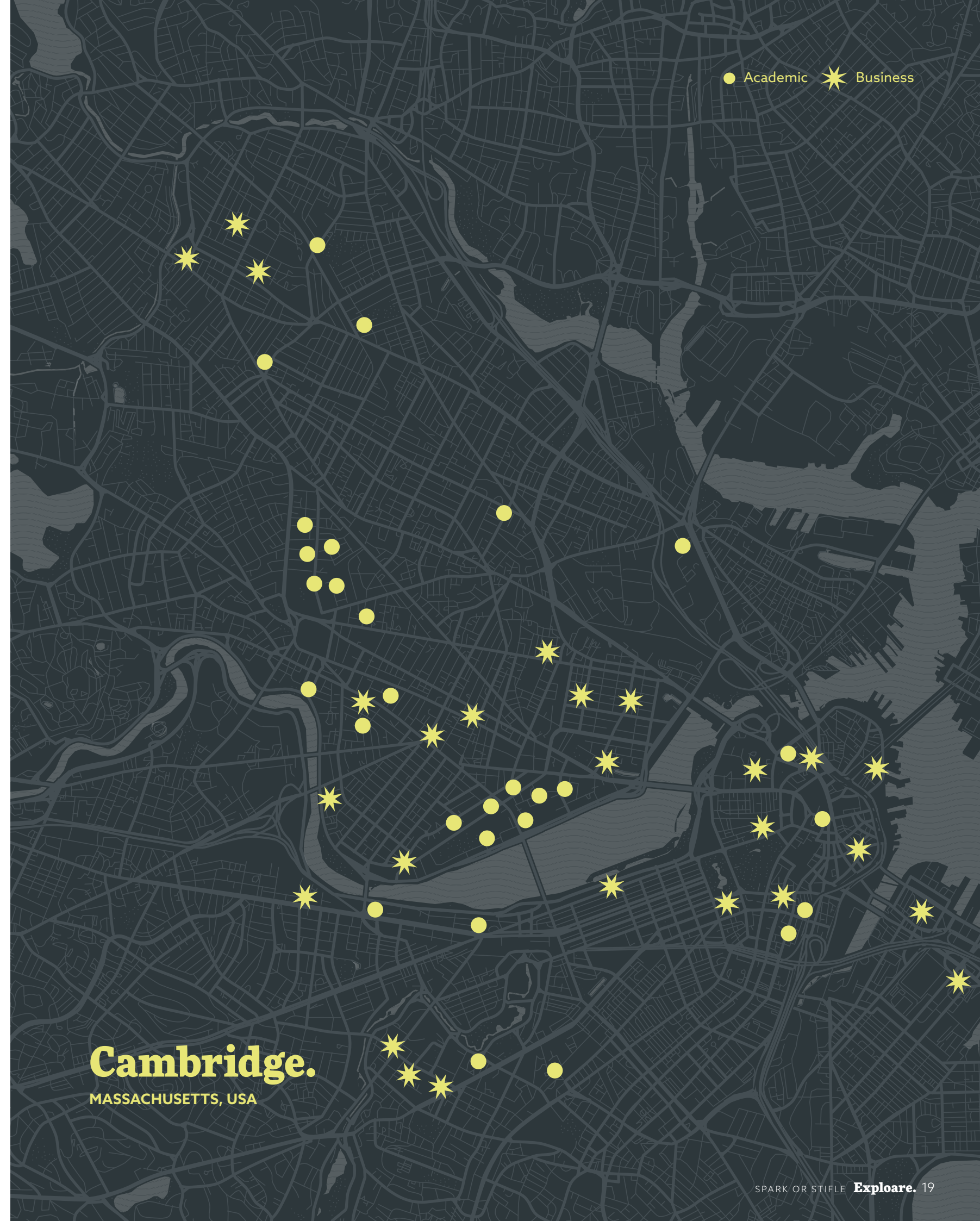
"Increasingly, people are looking for community," says Glenn Crocker, UK Head of Life Sciences, JLL. "They're looking to be part of something bigger, and not be isolated in a single building, or in a business park somewhere. You want to build communities of companies, as opposed to single entities."

Proximity, if executed well, promotes the breaking down of silos, which is another important way to enhance the commercial viability of a science and research cluster.

"People operate in their silos and they often don't really know how to work with people outside of them," says MedCity's Sarah Haywood. "Clustering needs to take place around big, capable, and expert institutions. They can either be industry based or academic based. The most successful clusters in city environments create the right spaces and mechanisms to allow people to interact effectively, engage with each other, and meet each other."

The built environment plays an important role in all of this, by developing physical spaces that foster professional collaboration and community. This relationship-building is perhaps the greatest asset of urban science clusters, facilitating encounters that spark exchange of knowledge and innovation. >>

● Academic ★ Business



● Academic ✨ Business

Cambridge.

UNITED KINGDOM



The most successful clusters — which may appear to have developed organically — represent intentional thinking on the part of their stakeholders.

Urban allure

City clustering also offers another compelling advantage: the opportunity for the location itself to act as a laboratory space. Dame Ann Dowling, Professor of Mechanical Engineering at the University of Cambridge, says that cities can provide the environment to test and demonstrate new technologies: “There are many examples where cities are using their own infrastructure to support innovation, helping to get new technologies from the laboratory into full-scale implementation.” Already we’re seeing how smart city infrastructure – underpinned by wearable connected devices such as Fitbits – can provide field research for wide-scale digital health developments.

The cluster conundrum

It’s no surprise that the more dynamic and connected a city is, the more it appeals. Once a cluster starts to form, momentum builds. It lures investors and companies. It spawns a gravitational force of its own. It creates a pull that’s hard to resist for the start-ups and early-stage companies that are so critical to development. By creating a virtuous circle of innovation and new infrastructure, cities become smarter and deepen their appeal.

Yet the accumulative nature of the most successful urban science clusters places significant demands on space. Cities’ very popularity can become their downfall. Infrastructure struggles to keep up with exponential population growth. Attractiveness drives up the price of private housing and commercial properties, which can threaten competitive advantage. Rising rents and the escalating cost of living drives out talent... and therein lies the conundrum to creating thriving urban science clusters.

Connection costs

“In London, there are real economic challenges in creating research spaces, where real estate costs are high,” says Sarah Haywood. Of course, while big firms can afford to pay high costs for real estate, start-ups and entrepreneurs struggle.

Despite this, a city location is still “the most desirable location” for large corporate companies to set up their R&D facilities. John Sommerville, Managing Partner at Creative Places, believes it’s about finding the right balance: “Real estate cost is often outweighed by the benefits a company or organisation gets from recruiting and retaining the best people, and the interactions they can have with others in urban locations.”

Proximity of private enterprise to research and development facilities can also support commercial success for clusters. In the early stages of companies, being close to the founding academics is incredibly important as they are heavily involved in setting the scientific agenda for the business.

Urban science clusters such as Silicon Valley, Boston, and the Golden Triangle have seen enormous success in building and attracting innovation, deriving their energy and dynamism from a combination of established and smaller players. Balanced clusters, home to both established companies and market entrants, enable smaller players to bring fresh ideas, and bigger firms to provide long-term financing and stability.

“In the UK, public sector bodies along with planning authorities, are recognising that you need to allocate space in districts,” says John Sommerville. “There is some work being done to drive density of development in city locations. A good example is White City, where Imperial College and Mitsui/Stanhope are each creating multi-level facilities that can accommodate innovative businesses.”

Funding flexibility

John also notes that the co-working model can partly address the parallel issue of rising costs. It allows small businesses to locate to key locations on a more flexible and cost-effective basis. A great example of this in action is SmartLabs, based in Cambridge Massachusetts, which touts its flexible lease terms and “on-demand, pharma-grade research environment”. Shared lab use and month-by-month leases are increasing, but are still highly limited... and the co-working operators seem reluctant to develop highly specialised lab space due to cost of delivery.

“We see a need for the public sector to continue to help gap-fund this type of real estate,” explains John. In some cases, property owners are responding to demand with new construction. But industry experts in the UK emphasise the financial obstacles. Landlords cite concerns about the viability of shorter leasing agreements and uncertainty about start-ups’ ability to pay. >>

"What is clear, is that the developer community doesn't currently have access to information about the size and nature of the demand for space from the science and research sector," says Andrew Somerville, Partner at Hoare Lea. "Creating common understanding between both sides of the supply/demand equation is vital."

When it comes to tackling this funding disconnect, can the scientific community learn from successful placemaking in other sectors? Andrew explains: "Our own London office is located in one of the first areas Argent regenerated at King's Cross. The building we're tenants in hasn't changed, but its value has because of the placemaking. Argent secured an 'anchor' (UCLA) to set the tone for the demographic they wanted to attract (influential, young and creative cross-discipline thinkers)... and then the other tenants followed. Placemaking attracts people and, in turn, allows for the highest yield when it comes to rent."

Government backing

Time is another key ingredient in the formation of successful clusters. Yet in countries like China and the United Arab Emirates we're seeing the usual timeframes (of multiple generations) contracting, allowing urban clusters – or even a series of clusters – to emerge within a single generation.

It's often down to interventionist state action and different socio-cultural contexts, which poses the question of whether UK science could rival such intense production and development. Through its industrial policy, the UK government has promised billions of pounds of public and private investment to science. But is this enough? Poor transport within and between cities in the UK, for example, is a recognised barrier to cluster growth. Although certain aspects of the Chinese approach are undesirable, others have potential lessons for the UK's policymakers.

What's clear is that leading cities like London, Oxford, and Cambridge cannot take anything for granted, as challenger cities are redoubling their efforts to become attractive. The next generation of global hubs are already fighting for talent, innovation, and direct investment, and if top-tier cities lose their momentum, these growing cities are more than ready to take their place.

There are also some major global trends at play that need to be considered in the context of all of this... if quantum computing is cracked, allowing researchers to model complicated chemical reactions or simulate molecules, how much lab space will be needed in the future? If the rise of AI drives a more knowledge-based economy, will clusters have to demonstrate the productivity or 'brain-friendliness' of a building? In the race for global talent, how can the UK define and differentiate itself from competitors?

Equally, a push in education towards STEAM (merging arts with STEM subjects) is likely to mean future scientists and researchers could naturally be more generalist. Will we have a generation of students who know how to work in a cross-collaborative manner and therefore will demand/drive the success of clusters?

A new lab landscape

Clusters where different disciplines collaborate to integrate diverse forms of expertise will require a mixture of spaces. "Already, we are moving from individual laboratories and models of self-sufficiency to higher levels of collaboration with shared laboratories and services," says Team and Technology Ltd's Michael Schuitevoerder. "We increasingly plan for shared labs, shared space, shared equipment, and shared support services."

Schuitevoerder cites another London lab that broke new ground when it opened, but he also warns against standing still. "London's Francis Crick Institute is still the current UK gold standard," he says. "However, when designing new labs, it is important to look forward and improve. Labs of tomorrow need to be highly adaptable to rapidly changing trends in scientific discovery."

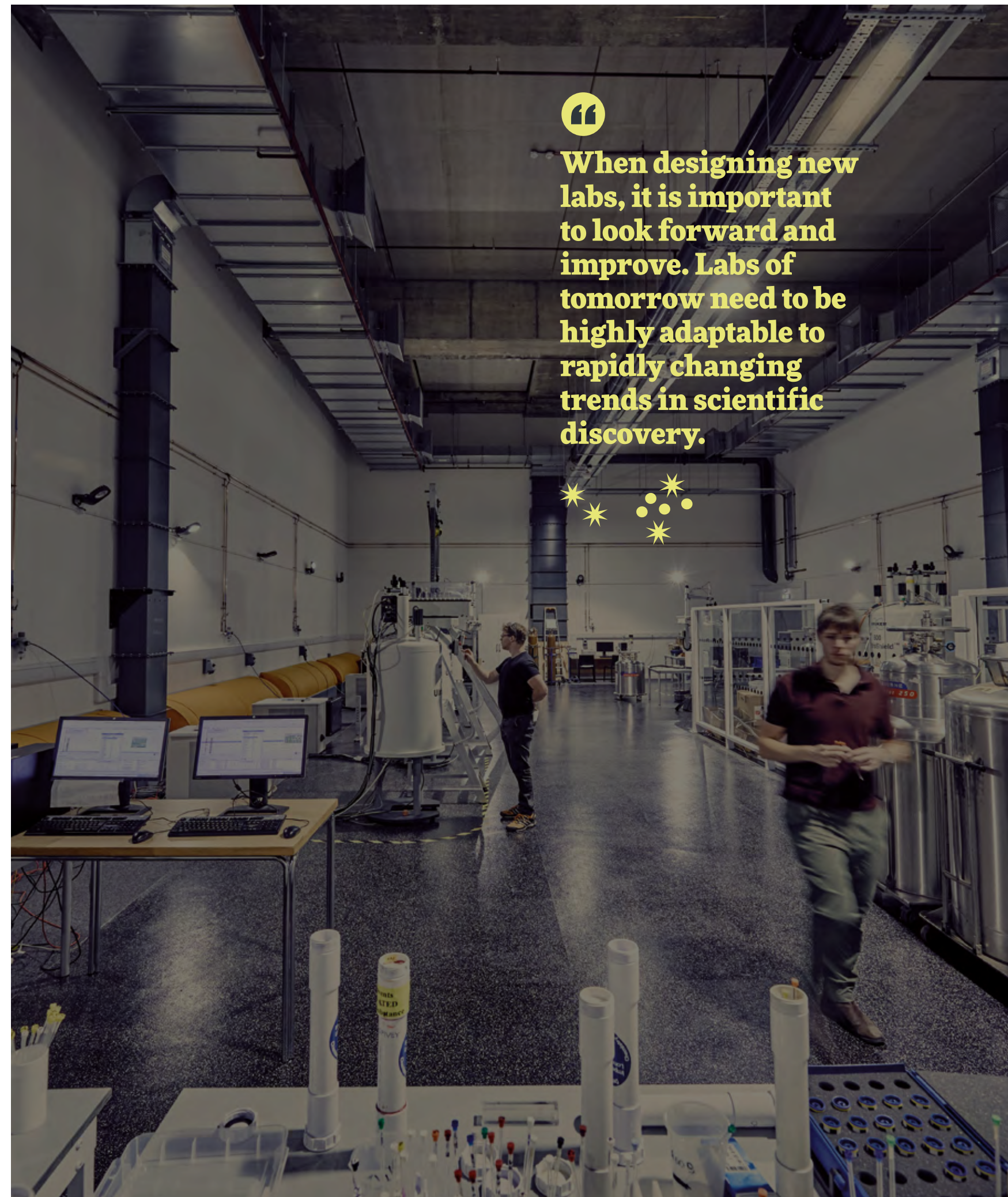
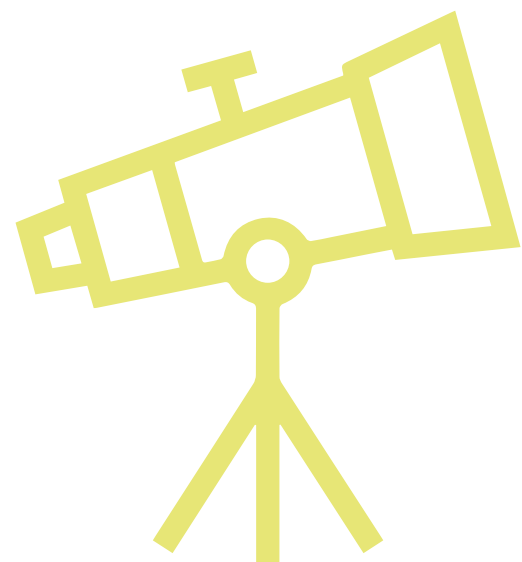
The pace of change is so rapid that it is difficult to anticipate what the lab of the future will look like, but as science develops and becomes more interdisciplinary, spaces that aid collaboration and can adjust to different needs will become increasingly widespread.

As science continues to advance, lab design may require new feats of engineering. Design teams will need to find better ways to communicate with scientists in order to answer increasingly sophisticated technical demands. Buildings will have to be flexible enough to accommodate changing space allocations and technical improvements that have yet to occur. Other developments, such as PropTech, will alter the fabric of buildings themselves by inserting technology into the relationship between spaces and their occupants.

Now is the time for the UK's scientific community – side by side with design teams, landlords, universities, businesses, funders, and developers – to break new ground. The best method? Thinking, sharing, and acting in the most holistic way possible. □

LET'S TALK

AndrewSomerville@hoarelea.com



When designing new labs, it is important to look forward and improve. Labs of tomorrow need to be highly adaptable to rapidly changing trends in scientific discovery.



Photo: Jon Craig



Wapping Wharf.	
The client	Umberslade and Muse Developments
The architect	Alec French Architects
The expertise	Acoustics, Fire Engineering, Lighting Design, MEP, Performance, Sustainability
The challenge	Creating quality inner-city apartments with a sense of place, surrounded by a vibrant public realm that acts as a catalyst to attract tourists.
The sector	Residential-led mixed use



PEOPLE

Liz Bonnin

Life through a lens.

From a childhood playing outdoors in the South of France to pioneering work in the Galapagos, Liz Bonnin's love for wildlife and the natural world has shaped her story. The biochemist and renowned presenter's passion remains as voracious as ever... and, today, is fuelled by a new fire - the biodiversity crisis.

Images courtesy of Liz Bonnin. Photo: GOAT



"Nature worked its magic on me without me even realising," says Liz Bonnin, speaking of her childhood growing up in the mountainous region above Nice. Today, having presented more than 40 primetime programmes – from *Blue Planet Live* and *Galapagos* to *Horizon* and *Tomorrow's World* – it's clear Liz has found her sweet spot... combining her early love of nature with a thriving presenting career.

There are many different routes to falling in love with the planet, but a childhood spent outdoors is arguably the one that most often seals the deal. Lots of us will recognise the early memories Liz has: "I was just always outside. My sister and I were off on adventures, exploring a wood near to our house. I remember playing out there for hours on end with our two dogs. We would see hedgehogs, spiders, birds, and we were just obsessed with the detail of them."

Moving to Ireland at age nine further fuelled Liz's curiosity for how living things work, leading to a fascination with biology, and subsequently chemistry, at school. "I think I wanted to understand everything – right down to the chemical equations. They explained and answered so many questions!"

Igniting imaginations

Armed with a masters in Wild Animal Biology from the Royal Veterinary College and Zoological Society of London, Liz began to build a career in science presenting. After honing her craft in entertainment programming, it was her time on BBC One's much-lauded *Bang Goes the Theory* that made her into a household name – and that Liz credits as her most transformative job.

"I had a ball on that series. I still miss it every day. We were young, naive, excited, passionate! Our incredible editor just told us all to run with our stories. It was where I learnt the creative process of storytelling and, importantly, how to communicate science to a family audience. It's actually easier to present a science programme on BBC Four because your audience already knows quite a lot. But on BBC One you have to strip it back to basics. The natural world is beautifully

complex; people think it's the science that's complicated – actually, it's just our universe! Sometimes it was hard to explain how everything interlinked together, but that's what made it the most sublime training programme for science communication I could have ever dreamed of. It taught me how to be rigorous and fearless. Every time I talk about it, I pine for it. To go back and do it again would be a dream!"

The programme was often recognised for its work promoting science to the whole family, effectively 'democratising' it for all. Today, Liz is a passionate ambassador for initiatives that encourage children and, in particular girls, to pursue STEM careers.

"Schools, parents, and society as a whole have to find better ways to encourage girls to feel like STEM-related jobs are open to them. First and foremost, I feel fervently that children should be encouraged to do what they love, rather than what they think they should. It's a complex topic of course, and I do think both our education system and the scientific community hasn't paid enough attention to the biases at play when it comes to how children are encouraged – whether that's girls or children from low-income families. So, ultimately, I'm keen to show all children that there's a space for them in this brilliant industry – and encourage schools and employers to play their part."

It's clear that causes – in whatever form they take – have become a common thread weaving through Liz's more recent projects. It's work that hasn't gone unnoticed. In 2018, she was awarded Honorary Fellowship of the British Science Association for her 'outstanding contribution to engaging a broad range of audiences with science, conservation and the environment'. Probably the most high-profile example of this is the landmark BBC One documentary *Drowning in Plastic*, which saw Liz investigate the ocean plastic crisis across the globe. A slew of awards have recognised it as a game changer in highlighting how drastic the situation is. >>



Schools, parents, and society as a whole have to find better ways to encourage girls to feel like STEM-related jobs are open to them.

Photo (right): Andrew Crowley



"Gosh, you think you know about these things, but doing *Drowning in Plastic* showed me how much I wasn't aware of," she explains. "I had been working in nature-focused TV for a while, so I'd talked to plenty of scientists off camera, and thought I had a good awareness of how wildlife and biodiversity is being destroyed by the modern world. Yet, everything I saw and learnt during filming was shocking. It has changed me forever. I've always had a fire in my belly to help the natural world, but after that job, there's just no turning back for me."

Out of the comfort zone

So what has Liz found the hardest aspect of her newfound role as a champion for change? "I'm a scientist, so I don't know very much about economics. Yet you can't talk about environmental issues without talking about politics. I'm trying to inform myself in that area, but I won't lie - it's really giving me a headache! Thank goodness many of the world's economists are pushing for our economic model to become more circular. The idea of having an eco-system of resource-use between industries really gives me hope.

"Probably the toughest aspect though, is feeling like things aren't changing fast enough. There has been some amazing work done, but just not enough when you consider the scale of the issue. When we look at the plastic crisis, it's still business as usual for the chemical industry - production is on the increase. It's also important to remember that everything is connected: the industry is ultimately the fossil fuel industry, because 99 percent of our plastic is made from fossil fuels. So, plastic plays a much bigger role in the wider climate emergency than people might think."

It also doesn't stop there. Last year, Liz joined world-leading scientists and researchers at the first ever Plastic Health Summit in Amsterdam. Understanding how plastic might affect the human body is a relatively new area of science, but it's a particularly potent one.

"I was asked if I'd be happy to be part of a study to identify how many toxic plastics were in my body. I had four that were on the European Chemicals Agency's 'substances of very high concern' list. The whole situation - both the affect on our human health and the planet itself - gives me a lot of sleepless nights. Of course, it's important we continue to raise awareness of these issues, but I also want to do more programmes that inspire and provide hope. I know many of my friends have children who are becoming so anxious and overwhelmed about the situation so it's vital we start to focus on solutions. There's reason to have realistic, tangible hope." >>

Photo: Cody Burrige / Raw TV Ltd



It has changed me forever. I've always had a fire in my belly to help the natural world, but after that job, there's just no turning back for me.



Below left: Liz is set to host the Planet Earth II Live in Concert arena tour.
Photo: Herbert Schulze and David Willis

Photos (right): Alisdair Livingstone / Raw Factual Ltd

So what is it that keeps Liz optimistic in the face of all this? "Talking to people in the climate movement, it's clear that there's so much opportunity when we come together and work as a global community. An aspect of this that really pleases me is how scientists are acknowledging the value of indigenous and local knowledge. There's a fabulous Brazilian climate scientist called Antonia Nobre. He's worked for more than 30 years to understand how important the Amazon rainforest is, using computer models and other technology. He finally discovered that the trees are not just the lungs of the planet, but are also the circulatory system. Each and every tree draws up 1,000 litres a day in the form of mist, helping to regulate our climate and creating weather patterns the world over. Amazing stuff, right?"

"...Then, after all of this work, he speaks to an indigenous Amazonian tribe who tell him they call the mist a floating river and they've always known the trees do that! What a perfect example of how we haven't properly valued indigenous insight in the past - yet how invaluable it is considering the environmental crisis we're facing. I love that the scientific process is really rigorous. You know - a study might appear in a peer-reviewed paper, but it has to be really critiqued before it can be taken as a credible idea. It's a brilliant process and it makes sure we don't spout nonsense or get things wrong but it's also great to see this indigenous knowledge now being recognised as just as important as the investigative scientific way of understanding our planet."

Shared experience

It's heartening that Liz gets to balance her hard-hitting programmes with those that celebrate the wonder of the natural world. Later this year, she's taking on the role of host for the Planet Earth II Live in Concert arena tour. This kind of event format is a growing one, arguably catering to people's desire to step away from their TV sets and be part of a collective experience. The tour will take the BAFTA and Emmy award-winning series and turn it into a multi-sensory experience where audiences can relive selected scenes in ultra-high definition, accompanied by the music of Hans Zimmer and other composers.

"Planet Earth II is one of those landmark series that had a powerful influence on people," Liz notes. "It affected audiences on a deep level. The TV series included some absolutely breathtaking sequences - who can ever forget the marine iguana fighting for its life as it escaped those racer snakes? To be able to put the magic of the natural world on a giant screen alongside an 80-piece orchestra playing live will be immense. I'm actually a bit worried I'm going to be really emotional, as it's everything that I love coming together! For someone who's often presenting to a camera, the fact that I'll be in front of thousands of people and we'll get to celebrate the natural world together is thrilling. It's a rare opportunity, but all the more special for it - and, really, isn't that what life's about?" □

Planet Earth II Live in Concert is due to tour the UK & Ireland in 2020.
For more details: www.planeteearth2live.uk



It's great to see indigenous knowledge now being recognised as just as important as the investigative scientific way of understanding our planet.





Old Admiralty Building.

The client	Department for Education
The architect	BDP
The expertise	Acoustics, ICT, Façade Access, Fire Engineering, MEP, Sustainability, Vertical Transportation
The challenge	Transforming a Grade II listed building with unique spatial constraints into a modern, future-proofed office facility for UK government departments.
The sectors	Workplace, Heritage



Partner Clive Williamson shares some of the unique developments our London office teams have delivered across the city.

LET'S TALK
CliveWilliamson@hoarelea.com

West.

Opportunity calls.

The West London boroughs boast a combined £73 billion economy, making it the UK's second largest powerhouse after central London. This sub-region has immense potential. It's been wonderful to play a key part in a variety of projects for Imperial College London at its major new 23-acre campus. Strategically located in the heart of White City, the campus is helping to transform the site, which is one of London's most exciting, dynamic, and rapidly growing neighbourhoods.

We've also been privileged to work on a development that's the first of its kind in London... 245 Hammersmith Road is a unique new office and retail site that features garden, bars, and restaurants. Notably, it was the first scheme to use its positive Social Value

Impact in discussions with the local council. We were also able to meet our target of achieving 25 percent improvements on Part L energy targets and BREEAM Excellent.

In keeping with these sustainable ambitions, one of the key challenges we were presented with during the Heathrow Terminal 2A project was to ensure 20 percent of the predicted carbon emissions were generated from onsite renewable energy. As well as meeting this target, our negotiated energy strategy allows for upgrading to innovative new technologies as they become available, ensuring this vital international hub is as flexible as possible!



Central

Shaping my city.

London.



West

HOARE LEA & LONDON

Our London office opened more than 30 years ago, providing us with a hub from which to grow our work in the capital. As the largest office within our firm, it's a hive of activity, made up of more than 200 people spanning our specialist services who are passionate about projects that shape London for the better.

Central.

A hub with heart.

The centre of the city has always presented us with stimulating projects and continues to do so. London being a global hub for companies means many of the buildings we work on are world-class offices. Deloitte's HQ, 1 New Street Square, is certainly one of our proudest. After becoming the first workplace fit-out in the world to achieve both BREEAM Outstanding and WELL Certified Gold, it's gathered an enormous amount of awards in acknowledgment of its pioneering human-centred design.

In the shadows of The Old Bailey, we had the chance to fit out a 12,000-square-foot space for global investment management firm, Barings LLC. We worked to make it an energy-efficient building that gives the business the ability to migrate to an agile working environment over the coming years.

A special recent office project has been the Old Admiralty Building. At one time the headquarters of the British navy, we helped refurbish this Grade II listed site into a future-proofed office facility for UK government departments.

But it's not all workplaces in this part of London... the Floral Court and Carriage Hall project created 48 high-quality residential apartments located above a completely new retail area in the heart of Covent Garden. A big success was the site-wide energy strategy we developed for the scheme, which was approved by the planning authority without condition and now serves the buildings seamlessly.



North.

Total transformation.

North of the river has arguably seen some of the most wholesale change in the last few decades, none more so than where our own offices are located in King's Cross. It's been incredible to not only watch the area be regenerated in a stylish and socially conscious way, but to have played a vital part in making it possible. Gasholders is an engineering triumph: premium apartments and retail spaces sat in three Grade I listed gas cylinder frames... and Coal Drops Yard is a stunning clash of art, culture, and commerce; what a brilliant place to have on our doorstep. It's clear why

Google has chosen to locate its London HQ here.

Meanwhile, the Ferry Lane development is one of the first private rental sector developments for Legal & General, turning a rundown industrial estate into a vibrant new community.

Towards Camden way, we're involved in the unique Village Lock redevelopment that will create 170 homes, a new market retail destination, and incubator start-up offices. It's a highly sustainable scheme that will be integrated into the existing community in phases as the project progresses.



Shaping my city. London.

Illustration: James Oses, London



East.

Emerging era.

If there's one thing East London isn't fazed by, it's change. Successive centuries and even decades have ushered in new eras, cultures, and commercial opportunities. The Olympic Games was a turning point for this part of the city and the International Quarter London (IQL) in Stratford City is an important part of the Games' legacy. Our work on the scheme involved collaboration with the world-renowned Rogers Stirk Harbour + Partners architects to create prime office space with high sustainability standards.

The nearby Isle of Dogs is an emerging area and its Crossharbour development project is set to create a vibrant new district. Designed to support the community, it will feature more than 1,600 apartments, central superstore, early-years school, retail units, and some great community facilities.

Over the water in Canary Wharf, one of the most remarkable additions will soon be a towering 60-storey skyscraper. A residential-led development, it will provide a stunning focal point for the 97-acre estate that's fast becoming one of the most exciting areas of London.

South.

Sky high.

The Southbank is seeing some of the most striking buildings shooting up. With its 49-storey tower, One Blackfriars is impossible to miss. It's a special project for our firm as the hotel element was our 100th BREEAM Excellent scheme. Nearby, Southbank Tower and Southbank Place are future additions. The former is a transformation of the 1970s Kings Reach Tower into a flexible new workspace, while the latter is seven new buildings of affordable, assisted, and luxury apartments, office and retail.

There are also a number of our pipeline design projects dotted throughout this area: Lavington Street is a vast low-carbon development centred around public space, flexible workplaces, and healthy living, while 71 Victoria Street will be turned from office building to hotel.

Build-to-Rent schemes are also flourishing all over the city and we're helping Legal & General deliver its biggest one so far in Wandsworth. Exciting times.

TWO EXPERTS: ONE BELIEVER - ONE SCEPTIC

X files: Is outdoor air quality more important than indoor?



The believer.

KATHRYN WOOLLEY
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Outdoor air pollution has been linked to cancer, asthma, cardiovascular disease, diabetes, obesity, and dementia. With approximately 40,000 deaths estimated to be attributable to outdoor air pollution in the UK annually, it's a serious matter that can't be ignored.

So what's causing it? In urban areas, outdoor air pollutants are mainly emitted from on-road and off-road vehicles, but there are also contributions from power generation, incinerators, and industrial process, depending on the locations and prevailing winds. Emissions-wise, approximately 1.5 million homes use wood for fuel across the UK, and burning wood/coal in open fires and stoves makes up 38 percent. By comparison, 16 percent comes from industrial combustion, 12 percent from road transport, and 13 percent from the use of solvents and industrial processes. In fact, a wood burning stove emits more particles per hour than a diesel truck.

From outside to in

Improving outdoor air quality relies on national and societal change, led principally by the government. We're starting to see more Clean Air Zones being introduced across the UK; these are designed to cut pollution and encourage people to drive less polluting vehicles (i.e. electric and more modern petrol/diesels).

Our indoor air is supplied from outside: both actively through mechanical and natural ventilation, and passively via gaps or leaks in doors, walls, and windows. Only one of these three sources of outdoor air allow us to control the resultant internal air quality.

Ultimately, without improvements and controls to reduce external sources of emissions, the air we need for inside our buildings will only be further polluted.



The sceptic.

CHRIS RUSH
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As individuals we spend 90 percent of our time indoors, spread between home, work, socialising, our commute, and other places like the gym etc. Given that the impacts of poor air quality are linked to our exposure (the time spent in an area) it stands to reason that, to reap the most benefit, efforts should be focused towards the areas we spend the majority of our time in.

While the indoor environment is of course linked to the outdoor environment, we still very much have the ability to control and influence it, especially from indoor pollutant sources. The indoor space can also offer a vital refuge from poor outdoor air quality, which to a degree is out of the control of the individual.

Indoor opportunity

Most of us are able to manage our bodily intakes: we watch what we eat and drink. However, our intake of air is pretty much out of our control when we are outdoors, and is down to the government to address. By comparison, a building's ventilation strategy is something we, as air quality consultants, can actively design to protect people.

There is no safe limit in terms of exposure to air pollution. Of course, standard limits must be achieved, but I believe it's important to move beyond compliance and deliver further benefits to a building's users. Good indoor air quality can improve cognitive performance, result in fewer incidents of illness, and lead to better mental and physical wellbeing.

Simply put, the indoor environment provides us with a real opportunity for control to be given 'back to the people', so to speak. For example, an organisation can take action to manage the air quality of its working environment.

Given how large a proportion of an individual's exposure is in this environment, buildings can present significant opportunities to help manage people's 'daily intake' of air pollution as we all go about our lives. Using our buildings to create environments in which everyone can thrive is vital to our collective health and happiness.



Photo: Article 25 / Grant Smith

More than a building.

From surviving to thriving.

Infrastructure is a powerful tool to build flourishing communities in the face of poverty, natural disasters, and conflict. London-based charity Article 25 brings together professional architects, graduate volunteers, and engineers to transform communities through buildings. With more than 90 projects in 34 countries, it is the most far-reaching architectural NGO in the world.

Director of Projects, Bea Sennewald:

"Article 25 gets its name from the section of the United Nation's Universal Declaration of Human Rights that states everyone has the right to adequate and dignified shelter. Our mission is to use our industry's skillset for the benefit of worldwide communities. With a focus on schools, healthcare buildings, and housing, we liaise with other charities to identify where projects could have

most impact. This kind of collaboration means we can further the efforts of their work: whether that's by creating a clinic for Operation Smile to undertake reconstructive cleft palate surgery in Morocco, or a school in Tanzania for Able Child Africa to support children with disabilities.

"The engineering firms we work with second volunteers to our London design office - usually one day a week for three months. They gain invaluable insight into the design solutions needed in different parts of the world - it's problem-solving with a humanitarian purpose.

"The building is of course the starting point, but is certainly not where it ends. Initial design development is a way to bring the community together and find out not just what's 100 percent essential but also what will enhance their lives: maybe it's social gathering spaces, perhaps it's something that allows them to start future money-making

activities... small features can create big opportunities.

"Having visited every single one of our projects, I've seen first-hand the value of delivering a building that can leverage economic and social development. This not only means designing disaster-resistant structures, but using materials that are made or sourced locally. By employing local contractors and workers where possible, we can train people in new skills that give them the opportunity to earn more in the future. In turn, this increase in income means they can put their children through school and transform the prospects for their family in just one generation." □

LET'S TALK

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DISCOVER MORE

www.article-25.org

Engineers of human experiences

Hoare Lea is an award-winning engineering consultancy with a creative team of engineers, designers, and technical specialists. We provide innovative solutions to complex engineering and design challenges for buildings.

Irrespective of the scale or complexity of a project, we provide a full range of MEP, environmental, and sustainability services, bringing buildings to life and ensuring that they perform in operation as well as they look.

Locations

Abu Dhabi, Birmingham, Bournemouth, Bristol, Cambridge, Cardiff, Doha, Glasgow, Leeds, London, Manchester, Oxford, Plymouth, Madrid (associated office).

Expertise

Acoustics, Air Quality, Audiovisual, Digital Engineering, Expert Witness, Façade Access, Fire Engineering, ICT Services, Intelligent Buildings, Lighting Design, MEP, Net Zero Carbon, Operational Engineering, Performance, Planning Support, Property Services, Research & Development, Security, Sustainability, Utilities & Energy, Vertical Transportation, Vibration.

Sectors

Arts, Culture & Heritage, Courts, Data Centre & Mission Critical, Defence, Distribution, Healthcare, Higher Education, Hotels, Manufacturing & Process, Prisons, Residential, Retail, Schools, Science & Research, Sport, Transport, Workplace.

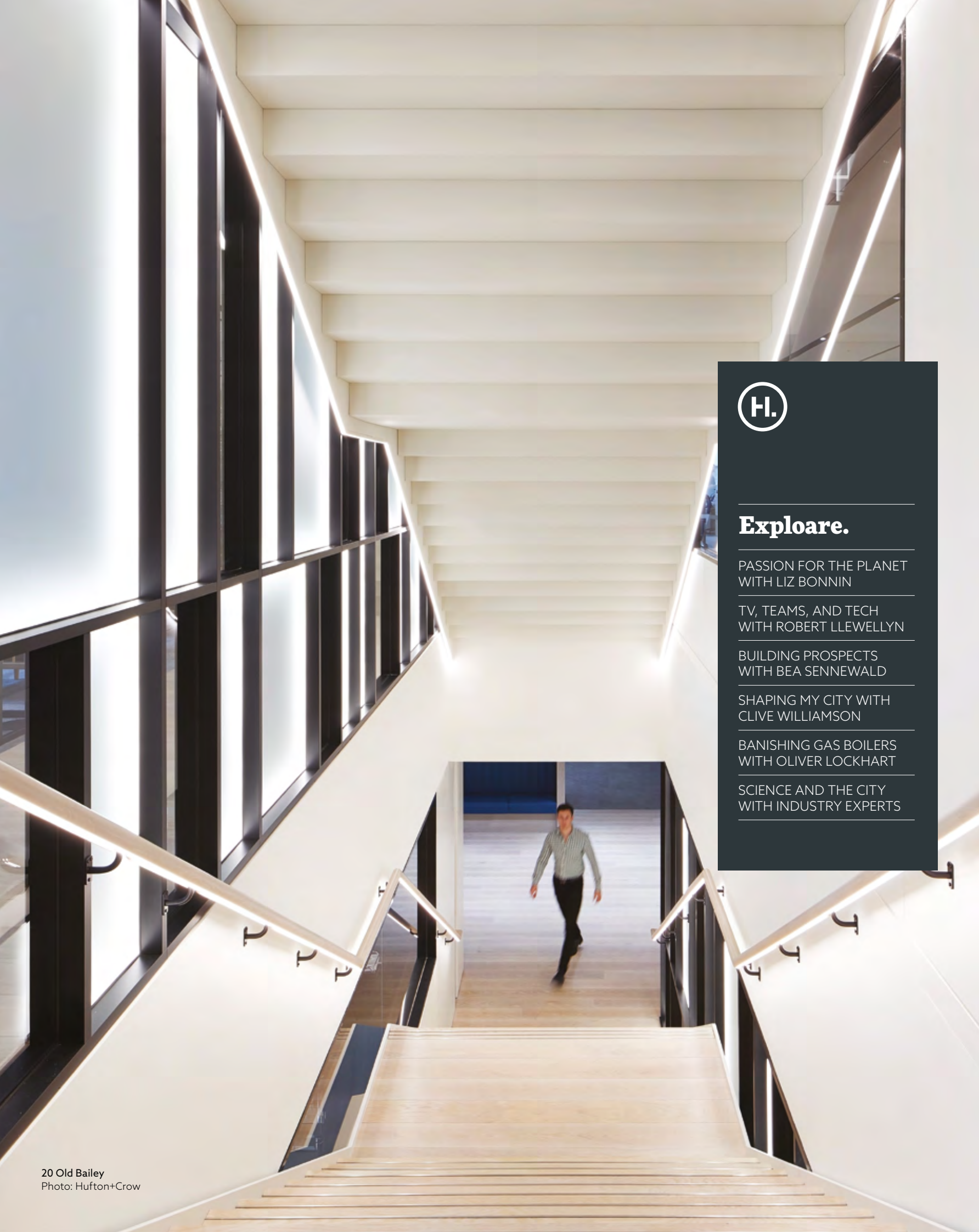
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Exploare.
The future belongs to the curious.
Challenge accepted.

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Exploare.

PASSION FOR THE PLANET
WITH LIZ BONNIN

TV, TEAMS, AND TECH
WITH ROBERT LLEWELLYN

BUILDING PROSPECTS
WITH BEA SENNEWALD

SHAPING MY CITY WITH
CLIVE WILLIAMSON

BANISHING GAS BOILERS
WITH OLIVER LOCKHART

SCIENCE AND THE CITY
WITH INDUSTRY EXPERTS
