

Design Researchers
in Residence 2022/2023
Future Observatory
the Design Museum

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Introduction

George Kafka

The image used to advertise the open call for the 2022/3 Design Researchers in Residence was 'Rising Sea Levels', a painting by Susan Wright spotted high on a wall at the Royal Academy's 2022 Summer Exhibition. The painting depicts the British Isles at an unspecified future moment when sea levels have risen to the point of altering the familiar national outline to something more scattered, fragmented. A thin strip from Leeds to Oxford forms a spinal mainland; parts of Kent seem to be floating isolated; Cornwall is divided into three land masses; Ireland appears fractured into dozens of islands.

The painting is a forewarning, an image of a dramatically altered future, but also serves to highlight the scattered nature of these islands as they are today. Over 6,000 islands make up the British Isles and 189 of those are permanently inhabited, including the islands of Ireland (population: 6.3 million), Skye (9,232), Foulness (212) and Rùm (22). Contrary to the national mythologies reinforced over decades and centuries, the United Kingdom is not one isolated island nation, but an archipelago of diverse places and identities.

It is at this point of tension between the insular 'island mentality' and more relational 'archipelagic thinking' that this year's residency theme of Islands finds itself. The open call was set with the intention of exploring Islands in topographical and metaphorical senses. While the island mentality describes a geographical state of isolation, as well as a psychological one, influential archipelagic thinkers such as Édouard Glissant and Epeli Hau'ofa look to Caribbean and Pacific islands as sites to understand relationality and interdependence. With these frames of reference in mind, how might they be productive for designers and design thinkers in the context of the climate emergency?

As Susan Wright's image reinforces, and as Lila Boschet's text in this publication describes, island nations are particularly vulnerable to the consequences of changing climates – most obviously rising sea levels – and designers have a responsibility to address these vulnerabilities. The move from an island mentality to archipelagic thinking also mirrors broader shifts in design thinking from the siloed discipline, practice or product to more interconnected ways of working and making. The design object – be that a building, garment, seat or otherwise – is no longer severed from the supply chains, material flows or labour practices that produced it. Indeed, as the work explored in this book and the accompanying exhibition by this year's group of residents shows us, the work of the critical design researcher today is to make those connections more visible, to build archipelagos of thought and highlight the interdependence of practitioners and the worlds they inhabit.

In **Extracts of the Abyss**, Rhiarna Dhaliwal spans a profound geographical and symbolic divide to connect environments both alien and everyday. Her research explores the live issue of deep-sea mining and its entanglement with technologies for sustainability, such as electric vehicle batteries and wind turbines. More than dredging metals from the

sea floor, Rhiarna's project is concerned with depictions of the deep sea from afar and considers how mapping and image-making can be tools to justify the exploitation of both human and non-human lives. Her chapter draws us through visual histories and contemporary debates around the next frontier in material extraction. By producing dynamic and beguiling new imagery of the deep sea – drawing on research into video games and ecological design thinking – Rhiarna refutes the idea of an inert space ripe for extraction and draws us closer to those lively marine depths.

'No man is an island, but every home is', wrote Marianna Janowicz in the opening to her residency application, reflecting on the compartmentalisation of domestic life into segregated units; a design choice, and not an inevitable one. Marianna's project zooms in on drying laundry and its relation to internal pollution and inadequate housing in London. Laundry is both a source of domestic moisture and the subject of landlord restrictions on account of aesthetics. Her research, titled **1001 Drying Rooms**, draws on hopeful archival materials as well as crowd-sourced laundry photography to argue against private solutions to public problems. In her chapter, we meet housing activist Kwajo Tweneboa and consider the washing line: a humble yet radical spatial device for post fossil-fuel domesticity.

Peripheral environmental knowledges are brought front and centre in the work of Isabel Lea, a graphic designer who explores the relationship between sociolinguistics and typography. Researching the cultural intricacies of Celtic languages spoken across the UK, her project **Eroded Expressions** focuses on terms relating to land, weather and care, considering the potential for reviving their usage amidst rapidly changing climates. Her work brings us words from Gaeilge (Irish), Gàidhlig (Scottish Gaelic), Gaelg (Manx), Cymraeg (Welsh) and Kernewek (Cornish). Here, the break between showers can be identified as a *slud* or a wave-smashed chasm in a cliff called a *zawn*. Through her chapter, Isabel develops climate lexicons alongside a new display typeface, showing how typographic tools can help foster renewed relationships between land and language, reinforcing the value of graphic design in design research.

In this publication's fourth chapter, James Peplow Powell makes a heartfelt case for caring about pigeons. James' research takes a deep dive into the intertwined and designed histories of humans and pigeons, spanning Chinese Aeolian flutes, Mary Poppins and Oscar Niemeyer to arrive at a piece of architecture for birds. He proposes a **Dovecote for London**, an infrastructural proposal for circular urban agriculture that makes an argument for multispecies co-existence in place of isolated, island-like reserves for "nature". James's chapter closes with a piece of short fiction by writer and curator Lev Bratishenko: the story of an ascent in an uncertain future.

Together, these projects form their own archipelago. They are distinct projects with currents, flows and tides that run between and amongst them. They show the value of design across species, citizens, languages and terrains, against islands of isolated thought and in favour of interconnected futures.

Redefining the Problems, Reframing the Questions

A conversation on design research with Cher Potter

Cher Potter Depending on who you ask, design is an aesthetic tool, a business strategy, a problem-solving technique, a cultural influencer, a critical mindset. If design itself is understood so broadly, how do you understand design *research*?

James Peplow Powell For me, design research is deliberately polyvalent. It synthesises lots of different concepts. As a group, we're focused on biodiversity and the climate and how these issues are interrelated and critical to our time. I use design research to unpick and analyse the structures we're using to think about these issues in more technical or systemic ways. Design research can synthesise ideas across disciplines and pose new questions.

Rhiarna Dhaliwal Design research can also help build a framework or a manifesto so that as a designer you can situate yourself within the context of existing ecological, social and political projects.

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You can't put forwards any kind of design proposition without understanding the context you're operating in, which is where research really plays a role. You immerse yourself in the work of other players, key stakeholders, their perspectives, pedagogies and knowledge systems to work out where, as a designer, your agency lies within this larger context.

Isabel Lea Your position as a designer adds something, you become a facilitator for cross-disciplinary thinking.

CP So on the one hand the design researcher builds cross-disciplinary frameworks for design practice; on the other hand, they support different groups to exchange ideas and generate shared ideas, using design methods of collaborating and innovating.

IL Yes, but you can also further the agendas of social research or environmental research by working with the visual, making visual tools. I think that visual tools created by designers are important when we are trying to navigate a really complex set of problems.

Marianna Janowicz Thinking about design research as the process but also the output is interesting, especially if you come from an academic background where your outcome might more commonly be a report or a written piece. If you make an object that is not a piece of commercial or "useful" design but a piece of speculative or critical design, people are able to use and interact directly with a concept.

CP So, speculative design is a method to imagine future scenarios that might develop from current societal problems and to design products or services for those scenarios. Critical design goes one step further and makes us question the role that products play in these future worlds. Both aim to spark debate about our potential futures.

MJ Yes, both the facilitation process and the design outcome open new avenues of research.

Sometimes I think as designers we are guilty of thinking that design can and must solve things, or at least that's my experience coming from an architecture background.

IL The purpose of speculative or critical design as a part of design research is not about solutions – designed objects or systems are used to prompt a conversation. This kind of design can nudge a person's view of something and through doing that, nudge public consciousness. Here, design is not just selling commercial things, but selling new ideas. I feel like that's really what our contemporary challenges need.

JPP There is also a slightly different take on this: design research as iterative solution-making. And this raises interesting questions, such as what exactly are you solving? I think it's a useful question to ask. If you try to propose a solution to the broken relations between humans and non-human species – being aware of all the problems inherent in trying to solve that problem – it forces you to formulate or define the problem in a different way. It's a cyclical process, oscillating between problem and solution, back to problem and back to solution. This can be incredibly productive. My work as part of this exhibition will be a kind of prototype that is not a final solution, but a part of this ongoing process of design inquiry.

Also, I've done projects with scientists or educators, and what they really appreciate from designers is how we generate a narrative as part of our work. Part of generating this narrative is about critically interrogating the context of the research: Why have I chose this inquiry? Why is it important? What does it mean to society? Who tends to fund this kind of research? What are their motives? What are the biases in this area of research?

05

CP Rhiarna, design research as critical storytelling is a central in your work.

RD Yes, the research that I'm doing for this residency is about understanding how different forms of narrative allow for different forms of representation; or how particular positions of representation depict different stories or political perspectives. And when I talk about narrative, I speak of forms of representation. A narrative doesn't have to be verbal or written, it could be images, drawings, mappings, your own or media footage. These narratives are formulated by the knowledges of communities of people, including Indigenous knowledges – the frameworks, the guidelines that a society has to adhere to, its histories and experiences, one's own life experiences as well.

In my work as part of this residency, I am trying to understand who dictates the narrative on the environmental impacts of deep-sea mining, how that narrative is being funded and how this defines the representation of the subject, and that is inherently a very political act. For me, design research is about becoming aware of the narrative that exists around a topic and then trying to propose of new narrative forms – or maybe it's not about formulating a new narrative or an output, but giving space to other less-dominant narratives that already exist.

CP And this bias and particularity of perspective that you mention characterises the story of design itself. When we talk about design and design research, the discipline has a partial and relatively limited set of histories that it uses as its resource. Is this something you address in your work?

MJ That is definitely an issue that resonates with me and with my project. When researching laundry in the urban setting, it is not necessarily included in architectural history. A large part of the recent history of laundry is placed in the realm of unpaid and reproductive labour, which is generally not documented or archived in a way that paid labour would be. So, my work is about identifying the gaps in documentation and looking at research material that is adjacent to design and architecture histories, such as GLC press releases or tenants associations' documentation or oral history projects; and then trying to understand these in terms of a history of domestic resource use.

IL My own practice of graphic design – versus disciplines like architecture, or even fashion design – has a shorter history of design research, so we lean much more on other disciplines, like social science. And a lot of these tools and frameworks have been co-opted by the commercial sphere to support activities like marketing. I'm interested in how you can take some of these frameworks and tools within graphic design and use them to do good. As well as reclaiming methodologies, my work is about learning from slightly under-explored climate knowledges and visualising these through design, making them more accessible. It's about giving an audience the words in particular languages that may not have been centred in conversations about climate. These words hold important meanings that help us to understand the world and climate we inhabit. I think that's one of the most powerful things about design – it can really communicate ideas to a broader audience.

RD Leading on from that, there's a question around what you can situate and understand as a knowledge. Even the academic institutions that we consider reputable sources of knowledge need to be questioned. Certain forms of media or popular culture, or maybe other forms of traditional knowledge that aren't considered "academic", are important sources in my work. I think what we consider as forms of knowledge and where we find those could be questioned and decolonised.

JPP When I founded my collective Feral Partnerships after graduating, one of the first activities that we did was to build up an alternative research archive that foregrounded different kinds of architectural histories that incorporate the non-human. I think when we talk about climate breakdown and biodiversity loss, we could look more at knowledges that exist outside of the recognised human realm – knowledges that aren't embedded in Western industrial and extractive processes. The word "knowledge" is maybe not quite the right word here, it's a kind of contested term. But certainly a kind of work, activity, agency and aliveness exists outside of what humans do. There are very material consequences to the lack of recognition of those kinds of knowledges.

When I say I'm looking at our relationship with the non-human, it's important to foreground Indigenous knowledges and Indigenous world views that have that kind of thinking already embedded within them and have established ways to think about these other worlds.

IL Yes, some of the solutions to climate breakdown and biodiversity probably already exist, but the dominant narratives are maybe not giving us access to these solutions, and that's why research projects like James's are so important.

JPP There is a kind of commonality across all our projects – we are looking at the hidden mechanisms or hidden worlds that are critical to supporting all of our lives

CP But as you disclose the weaknesses of the systems you are studying and operating within, you're faced with a daunting question: what agency does the designer or design researcher have to change these faulty, biased or outmoded systems, many of which underpin our current climate emergency? What impact do you hope your work will have?

MJ As a group, we've had conversations about the scope for impact in our projects. We all have varying perspectives on what we think we can achieve. But at this moment in our practices, where we are starting to identify the social, political and environmental systems we live in, the hope is that people who encounter our work will recognise that those systems are purposefully designed, rather than something that occurred naturally.

CP Yes, with the implication being that that they can be redesigned.

RD In my case I'm dealing with systems related to geopolitical ecological impact, and I don't have influence in the same way as a policy maker or a lawyer or an ecologist. As a design researcher you need to reckon with your own agency. But design researchers can produce research outputs that are more visual or aesthetic than language-based outputs. And visual output, especially when it is exhibited in a public arts institution like this, is a very influential, important and powerful form of research.

Having a background in spatial design and architecture, I am accustomed to questioning how we live and what spaces and places look like – and how these might change in the future. As designers, we have the potential to speculate on potential futures and to visualise them for others. Speculation itself could be seen as a potential output of design research.

IL Yes, it's important to use the Design Museum's platform to show people what a design output can be and what design can do, and to show the process of design research. Showing our research process to a Design Museum audience invites more people to understand the value of design research. This is an impact itself.

CP So in summary, design research does not necessarily propose solutions, but redefines the problem, reframes the questions or perhaps sets out a creative brief for new systems to come.

IL Design research is about re-imagining how we relate to the world, but also helping other people re-imagine how they relate to the world.

JPP I think there's a growing understanding that most of the answers to our environmental, social or political problems are probably not about making more things – we have a lot of designed things in the world already. It's about designing new ways of thinking.

The Vulnerability of Islands

Designing landscapes from the plantationocene to digital twins

Lila Boschet

In a world of rising tides and temperatures, the vulnerability of islands is plainly evident. Over the last two decades alone, natural disasters such as hurricanes Ian and Maria hitting Cuba (2022) and Dominica (2017) respectively, and the Haiti (2010) and the Sumatra–Andaman (2004) earthquakes, have been deemed some of the most devastating of all time. It is no surprise, then, that the UN's Intergovernmental Panel on Climate Change's (IPCC) 'Climate Change 2022: Impacts, Adaptation and Vulnerability' report identified that 'small islands present the most urgent need for investment in capacity building and adaptation strategies'.¹ But not all islands are affected equally.

08 The 'small islands' in the IPCC report are the archipelagos in the Pacific, Atlantic and Indian Oceans, and South China and Caribbean Seas, which face a particular set of social, economic and environmental challenges.² Although these archipelagos are scattered across the world, their experiences of climate change are similarly exacerbated because of the impact colonial histories have had in reshaping these islands. The relationship between these islands highlights that there is nothing "natural" about how islands live through the ramifications of climate change. As geographer Neil Smith explains, '[I]n every phase and aspect of a disaster – causes, vulnerability, preparedness, results and response, and reconstruction – the contours of disaster and the difference between who lives and who dies is to a greater or lesser extent a social calculus.'³

Mitigating the effects of climate change, and having the opportunity to do so, is therefore about infrastructure and resources. Historically, however, small island states, such as those in the Caribbean, were intentionally and systematically debilitated to bolster the prosperity of the colonising country. The

term Plantationocene emerged around 2014 as a nuanced counterpart to formulations of the Anthropocene. It engages explicitly with the racialised history of industrialisation, highlighting that the violent subjugation of colonised peoples and landscapes as a result of the proliferation of industrialisation and capitalism. Indeed, 'the rationale for investing in steam technology was geared to the opportunities provided by the constellation of a largely depopulated New World, Afro-American slavery'.⁴ The opportunity to set up a production line was possible because the plantation model, violently extractive as it was, assured the uneven growth of Empire. The legacy of this asymmetry is made evident today as paternal colonialist nations are now the world's overdeveloped nations: the nations best equipped to tackle climate change. In other words, the plantation provided what Katherine McKittrick identifies as 'the ugly blueprint for our contemporary spatial troubles'.⁵

But how does the plantation have an impact on how islands experience climate change today? As Anna Tsing explains, plantations are 'ecological simplifications in which living things are transformed into resources – future assets – by removing them from their life worlds'.⁶ The capture and enslavement of African peoples to substitute the murdered indigenous Carib and Arawak populations was part of the scalability logic of the plantation system. So too was the simplification of biodiversity (plants and non-human life alike) for the proliferation of monolithic crops like sugarcane or nutmeg. The depletion of natural defences, the pillaging of natural resources and the extinction of local cultural knowledges were intentional tactics systematically enforced by the colonial project to create a vulnerable and dependent island. Thus, when the IPCC warns of 'continued degradation of terrestrial and marine ecosystems of small islands'⁷ or that

'climate change is also affecting settlements and infrastructure, health and wellbeing, water and food security, and economies and culture'⁸, this is nothing new; it is so by design.

In recent years, the discourse around climate mitigation and adaptation has shifted to recognise that nations on the frontline of climate change have had the smallest role in advancing it. After decades of negotiations, COP27 in November 2022 saw 'governments t[ake] the ground-breaking decision to establish new funding arrangements, as well as a dedicated fund, to assist developing countries in responding to loss and damage'.⁹ This differs from typical climate financing, which has previously stipulated that over-developed countries must give money to help developing countries build clean-energy systems, reduce emissions and cope with the contemporary impacts of climate change.¹⁰ The Loss and Damage Fund goes further in acknowledging that leading fossil-fuel emitters have a duty to pay for the losses and permanent damage resulting from climate change, such as rebuilding homes and hospitals after a climate disaster. The Climate Council reports that this financing would include 'money needed to rebuild homes and hospitals after a disaster; or provide shelter, food and emergency cash transfers after a cyclone' as well as 'non-economic losses such as to cultural life, traditional knowledge, health and wellbeing'.¹¹

Although the Loss and Damage Fund is a significant step forwards in supporting small-island states, the details on how these finances would be raised and distributed remain unclear. Whilst financial support is essential to adapt and survive global warming induced devastation, vulnerable nations are also looking to advances in design technology to help mitigate loss and damages. In 2021, Grenada became the first country to digitally twin itself by collecting data to make a virtual model of the island that is designed to be its identical (digital) double. This technology has been embraced in the design world, particularly around developing smart cities. These are cities in which a suite of sensors (typically hundreds or thousands) is deployed to collect electronic data from and about people and infrastructure so as to improve efficiency and quality of life.¹² For this small Caribbean island, whose two primary economies are tourism

and agriculture, digital twinning can be used as a tool to simulate the ramifications of climate change. As Grenadian Minister for Agriculture Yolande Bain-Horsford remarked:

'[t]his data will provide the agriculture sector and by extension the entire state of Grenada with the relevant knowledge to be proactive in our mitigation efforts as we confront the reality of climate change. The availability of more accurate information augurs well for reliable planning, risk evaluation, maintenance of infrastructure, optimisation of land use and marine science study'.¹³

The Grenadian government can identify spots on the island most susceptible to landslides, produce flood susceptibility models and reveal where island residents are most vulnerable to the effects of weather related to climate change.¹⁴

Digital twins open up opportunities for infrastructure that responds to the needs of local peoples and spaces. When it comes to innovative technologies as solutions for climate change, it is crucial to remember that no technology is neutral or infallible. Place-making is not a data-driven process. And for islands like Grenada and its Caribbean neighbours, colonial histories mean that placemaking has been a violently fraught experience, where cultures and landscapes were desecrated to mirror the coloniser's home country. When it comes to climate adaptation, we 'have to grapple with the political and ethical implications of our methods and models, embedded in all acts of planning and design'.¹⁵ Otherwise, digital twins run the risk of replicating neo-colonial power dynamics through spatially enforced regulations on islands.

For island states experiencing the devastations of climate change on their shores today, a digital twin and the funding to develop those models could make a real difference. But only if this is a co-designed process from the outset; digital twins learning from their material twins.

09



The deep sea is a highly contested space. Understood as both a daunting abyss, a resource-rich terrain and an ecology teeming with non-human life, the deep sea has attracted the attention of mining companies, international organisations, governments, researchers and activists alike, each of whom is making their claim on whether the space is ours to impinge on or not.

In **Extracts of the Abyss**, Rhiarna Dhaliwal brings the deep sea close to home, as a space interconnected to our everyday lives rather than a distant, alien space. Beginning with debates around mining, the project uncovers the relationship between green technologies, such as electric vehicles, and the ecologically destructive potential of deep-sea mining. From here, Rhiarna considers how the visuals of video games might be used to counter dominant depictions of the subaquatic and, working with data from marine biologists, proposes a new visual language as dynamic yet beguiling as the deep seascapes themselves.

Extracts of

Rhiarna Dhaliwal is a British-Indian architectural designer, researcher and educator based in London. Her work investigates global environmental and political systems that affect the future of landscapes and ecosystems. Rhiarna currently co-leads the bachelors design studio, Studio Digital Native at the Design Academy Eindhoven, in the Netherlands and is the co-founder of the all-female design collective, Xcessive Aesthetics.

the Abyss

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The Uncharted Waters of Deep-Sea Mining

Louise Guillot

The seabed is full of critical raw materials, but scientists and green groups warn extracting them could cause irreversible damage.

Europe is preparing to ramp up local mining of critical raw materials, but some say it's overlooking a far richer source of minerals – the deep sea.

The bloc's climate transition will require vast supplies of minerals such as lithium and rare earths to produce green technology like electric car batteries and wind turbines – but most of these come from China, creating a dependency that the EU is now desperate to shake.

12 As part of that effort, Brussels is slated to unveil a package of measures this month that will make it easier to extract raw materials at home – a move that has already sparked local pushback over environmental concerns.

That's prompting calls from mining companies that the EU should be looking elsewhere; more specifically, the bottom of the ocean.

Several thousand meters below sea level, the deep-sea bed is scattered with millions of nodules, each roughly the size of a large potato, that contain key minerals like manganese, iron, nickel, copper and cobalt.

Extracting those resources from the seabed is less harmful to the environment than mining above ground, according to Oliver Gunasekara, CEO of the U.S.-based mining company Impossible Metals, which is working on a robot that uses artificial intelligence to harvest nodules without disturbing undersea life.

'We need massive quantities of metals as we move away from fossil fuels ... so the question is where should we get them that has the least impact,' said Gunasekara. 'I am convinced [the impact of deep-sea mining] is significantly less than the alternatives on land'.

The International Energy Agency has predicted that by 2040 the demand for copper and rare earth elements could rise by 40 percent, while demand for nickel and cobalt is set to increase by 60 percent and lithium by 90 percent.

But some scientists, environmental groups and politicians are slamming the brakes, warning that extraction activities risk damaging fragile marine ecosystems and contributing to climate change by releasing CO² stored in the seabed.

'It would be an absolute mistake to try to fight the climate crisis by worsening the biodiversity crisis. That doesn't make sense at all,' said Monica Verbeek, executive director of the ocean protection group Seas At Risk in Brussels.

The EU should explicitly rule out deep-sea mining in its new Critical Raw Materials Act, she argued, adding that it was "worrying" that it has not yet done so.

Risky Business

Most deep-sea reserves of critical raw materials are located in waters beyond national jurisdiction – known as the high seas – and they often overlap with vulnerable ecosystems.

The EU has a number of potential reserves in its own territorial waters, including off the coasts of Finland, Sweden, Greece, Italy and the Azores, and in the French overseas regions of Guadeloupe, La Réunion, New Caledonia and Polynesia.

France and Germany have lent support to domestic research institutes investigating the deep sea, while Belgium backs a project by the Global Sea Mineral Resources to explore mining in the Clarion-Clipperton fracture zone in the Pacific.

But even these countries have shied away from actively supporting the idea of deep-sea mining as a solution to the EU's scramble for critical raw materials.

In part, that's due to a successful campaign by environmental groups, which have been sounding alarm bells for years about how little is known about the deepest parts of the ocean and how difficult it would be to scrutinise companies' activities. On Monday, they protested in front of the European Parliament, calling on the bloc to ban deep-sea mining.

Among the potential risks is that industrial-scale mining could disrupt the ocean's carbon cycle, releasing CO² trapped in sea floor sediments, according to Verbeek.

Harvesting these nodules alters the sea floor and has "a permanent impact," including potential species extinction, said Patricia Esquete, a marine biologist at Portugal's University of Aveiro.

A paper published last month also found that noise pollution from mining activities could pose a major threat to marine mammals like whales and dolphins.

Some also fear that, rather than replace or reduce the need for mining on land, deep-sea mining could actually encourage more of it 'because you are adding a new form of competition,' said Pradeep Singh, a fellow at the Research Institute for Sustainability in Potsdam, Germany.

A great deal more scientific research needs to be carried out before countries can allow companies to launch into deep-sea mining, he added.

'Allowing mining to happen this year, next year? No, that's not feasible. I think it's very clear that we need a significant more time if we are going to take the environment seriously,' said Singh. 'The body of knowledge that we have [doesn't enable] us to make an informed decision on whether or not to allow mining activities to happen'.

Impossible Metals' Gunasekara rejected that argument, calling it "disinformation".

'These nodules were discovered 150 years ago, they have been researched since then... So, to say we have no data is actually completely false,' he insisted.

He added that international regulators currently require environmental impact assessment and baseline studies before they award exploration permits.

14

So far, Europe is erring on the side of caution. France is pushing for an international ban on deep-sea mining, a call echoed by the Greens in the European Parliament. Spain and Germany, meanwhile, have asked for a precautionary pause on any deep-sea mining activities until scientists can prove it's harmless.

The Council of the EU – which represents all member countries – has called on the International Seabed Authority to 'establish a sound regulatory regime' that would ensure any such activities 'would not cause harmful effects to the marine environment'.

That new regime has been under discussion for over a decade, and there's pressure to finalise the new rules at the ISA's next meeting in July.

14 'We cannot say: "We don't even look at what options there are," but at the same time, we cannot close our eyes to the potential dangers that deep-sea mining could have,' said Franziska Brantner, parliamentary state secretary at the German federal economy and climate ministry.

The Commission is also in favour of a moratorium until there is sufficient proof that deep-sea mining does 'no serious harm to the environment', and companies like carmakers and tech giants have committed to exclude minerals sourced in the deep ocean from their supply chains.

Environmentalists warn that, even with more research, deep-sea mining simply isn't worth the risk.

There are enough critical raw materials on land to satisfy growing demand, they argue. Green groups are also banking on the idea that demand for the materials will decrease as the EU's economy becomes more circular and recycling improves.

But these are long-term solutions, said Kestutis Sadauskas, deputy director general of the Commission's marine affairs department.

In the short term, 'do we source [cobalt] in Africa, in the worst human conditions possible? Do we go elsewhere looking for it? ... That's really the difficult question we have to pose'.

This article was first published on 9 March 2023 by POLITICO. It can be accessed at: www.politico.eu/article/the-unchartered-waters-of-deep-sea-mining

Untangling the Abyss

Visualising the interconnected narratives of deep-sea mining

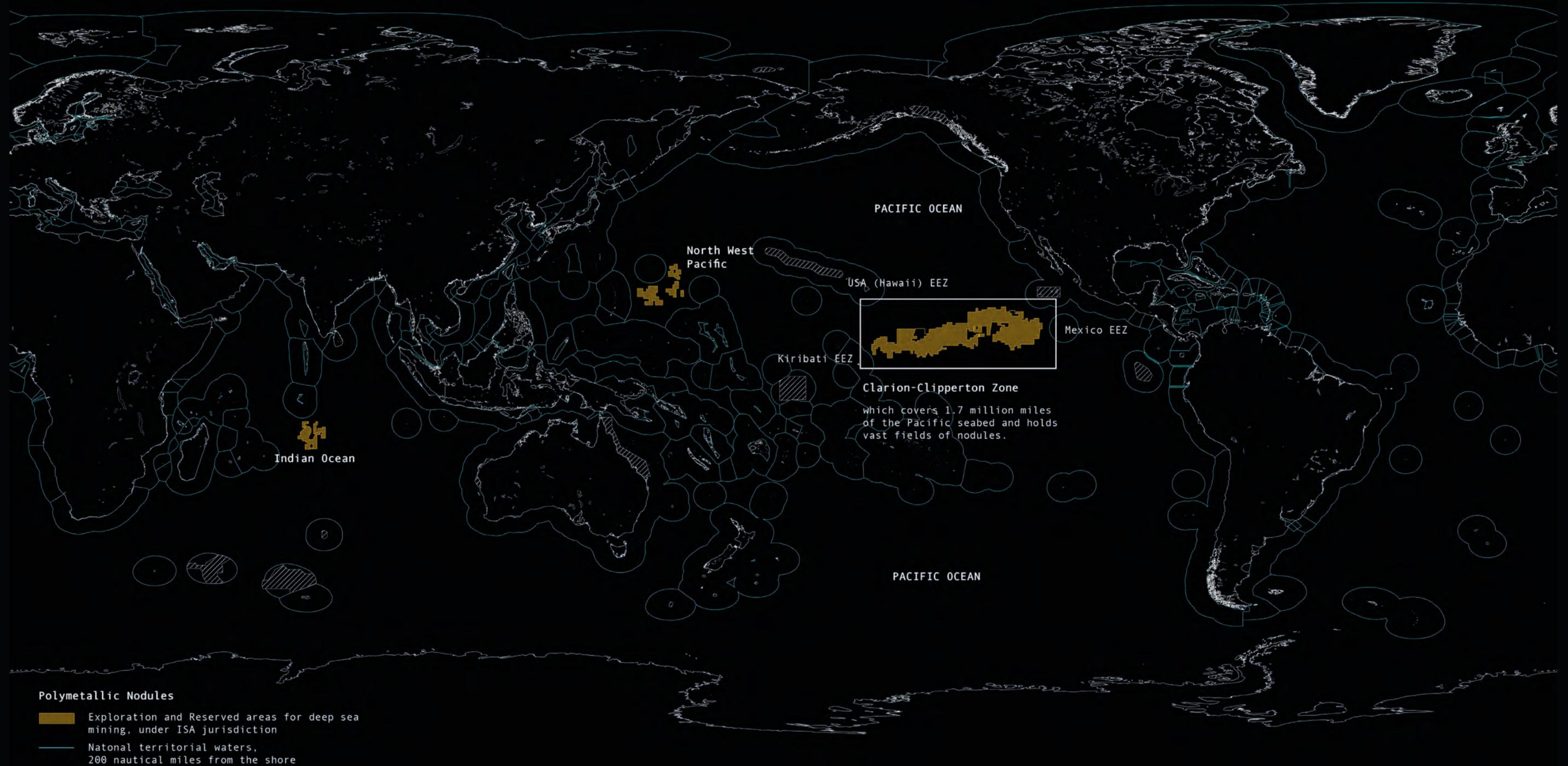
The abyssal plain that stretches across the earth's ocean floor is the new frontier for resource extraction.

With proposed exploration set to begin in July 2023, deep-sea mining will occur in areas abounding in mineral deposits known as polymetallic nodules. The mining will also take place in areas rich in marine life. Polymetallic nodules found on the seabed are rich in valuable metals such as manganese, nickel, copper, and cobalt, as well as rare-earth elements. These metals are used in a wide variety of modern technologies including home electronics, rechargeable batteries for electric vehicles and wind turbines. As a result, mining companies argue these metals are essential to the green energy transition. While only 0.0001 per cent of the deep-sea floor has been investigated, as doing so is considered technologically challenging and expensive, mining companies have set their sights on the seabed.

The prospects of this new, experimental form of mining are arguably re-actualising historic colonial and frontier mentalities and redefining extractivist global economies and processes for the modern day. This series of graphics depicts the relationship between the key stakeholders in this emerging political and ecological landscape, including metals, deep-sea terrains and everyday technologies.

Global Map of Polymetallic Nodule Exploration and Reserved Sites

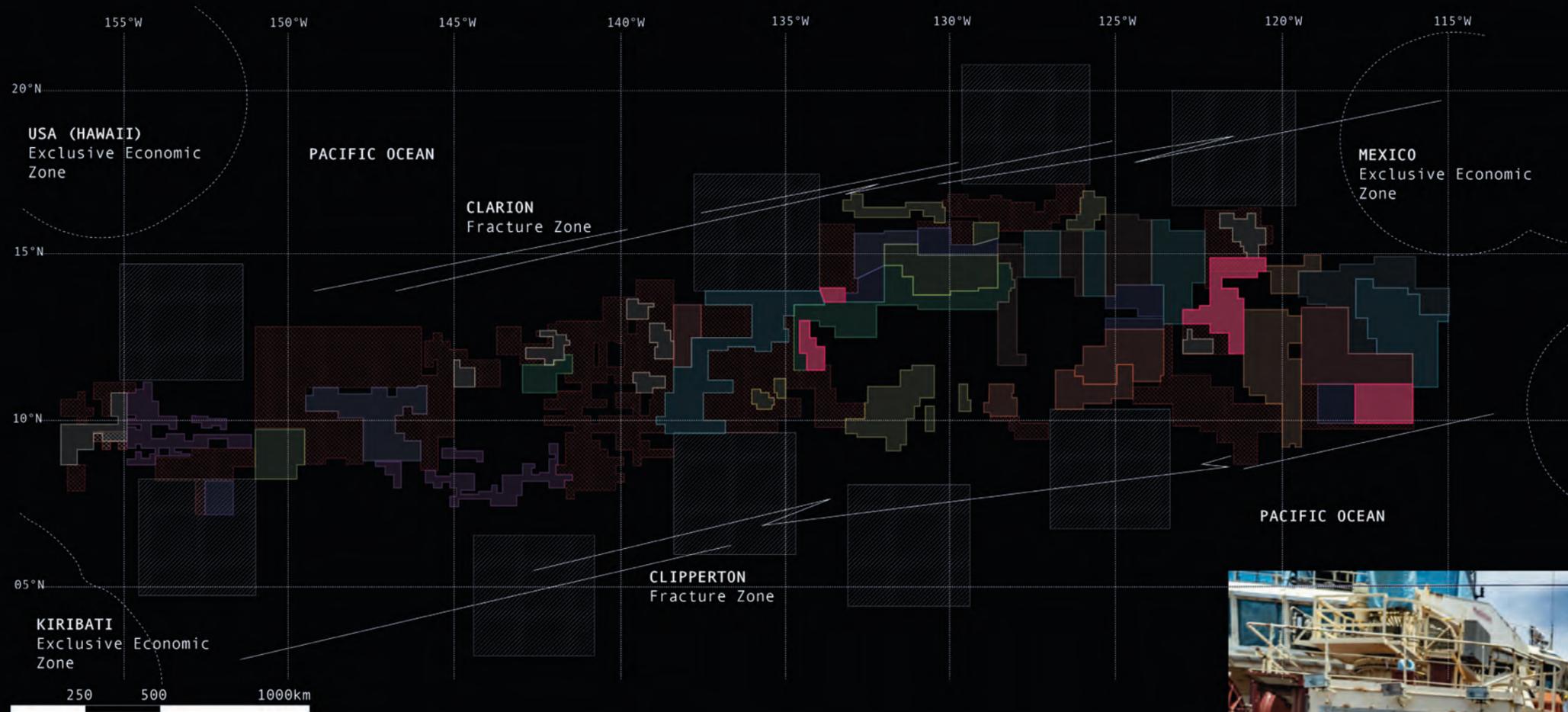
Source: International Seabed Authority



Almost two-thirds of the world's oceans lie outside of national boundaries and jurisdictions. These areas are known as the "high seas" or international waters. Fragmented and loosely enforced rules have meant a vast portion of the planet is deemed essentially lawless. As a result, the high seas are more susceptible to exploitation than coastal seas. The main sites targeted for future exploration are the Mid-Atlantic Ridge and the Clarion Clipperton Zone (Pacific Ocean) in international waters. The territorial seas of Papua New Guinea, Fiji, Tonga, New Zealand, Japan and the Azores archipelago, an autonomous region of Portugal, are also contested sites for potential exploration.

Clarion-Clipperton Zone Exploration Areas for Polymetallic Nodules

Reference: International Seabed Authority



- | | |
|---|--|
| Reserved Areas | Ocean Mineral Singapore Pte Ltd (OMS) |
| Areas of particular environmental interest (APEI) | Tonga Offshore Mining Ltd (TOML; Tonga) |
| Cook Islands Investment Corporation (CIIC, Cook Islands) | UK Seabed Resources Ltd (UKSRL; UK) |
| Deep Ocean Resources Development Company (DORD, Japan) | Yuzhmoregeologia (Russian Federation) |
| China Ocean Mineral Resources Research and Development Association (COMRA, China) | Government of the Republic of Korea |
| Bundesanstalt für Geowissenschaften und Rohstoffe (BGR; Germany) | Marawa Research and Exploration Ltd (Kiribati) |
| Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER; France) | Global Sea Mineral Resources NV (GSR; Belgium) |
| Interoceanmetal (IOM; Bulgaria, Cuba, Czech Republic, Poland, Russian Fed., Slovakia) | Nauru Ocean Resources Inc. (NOR; Nauru) |
| China Minmetals Corporation (China) | |

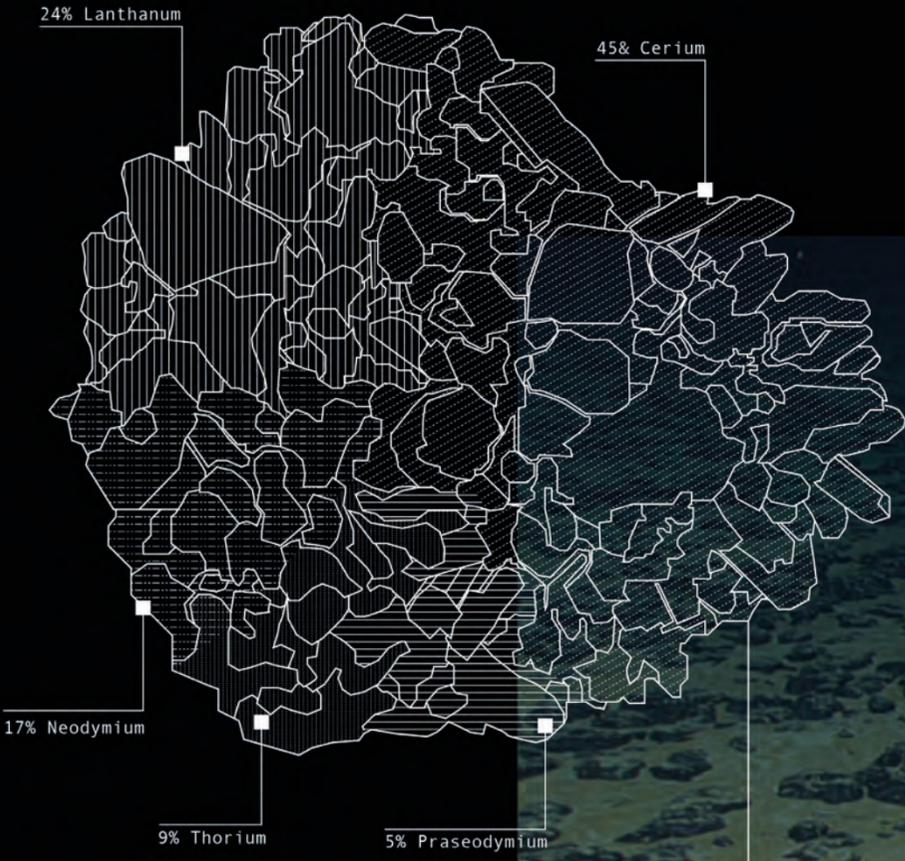
Engineers deploy a box core tool to assess the nodule resource and characterise the organisms living on the nodules and in the sediment as part of The Metals Company's environmental baseline studies
Courtesy of the Metals Company



The Clarion-Clipperton Zone (CCZ) is a large stretch of the sea floor spanning 1.7 million square miles between Mexico and Hawaii in international waters. It is monitored by the International Seabed Authority (ISA), a UN-affiliated organisation that also oversees deep-sea mining. The nodules in the CCZ between Hawaii and Mexico were first discovered by the crew of HMS Challenger in 1875, but only recently have developments in underwater robotics made large-scale mining of the metals possible. The ISA is currently drawing up regulations governing seabed mining in the high seas. Until global rules are in place, seabed mining is not allowed.

The Pacific island nation of Nauru, located in the CCZ, has made clear it plans to start deep-sea mining. They invoked an obscure clause of the United Nations Convention on the Law of the Sea in June 2021 that obliges the ISA to finalise and adopt rules and regulations for commercial deep-sea mining by July 2023. Nauru's action could open much of the high seas to deep-sea mining, permanently altering vast areas of the ocean.

The Implementation of Metals in Technological Devices

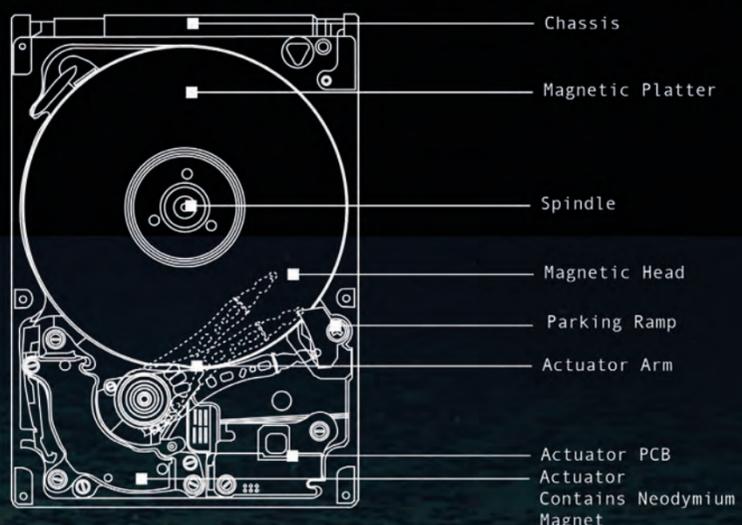


POLYMETALLIC NODULE

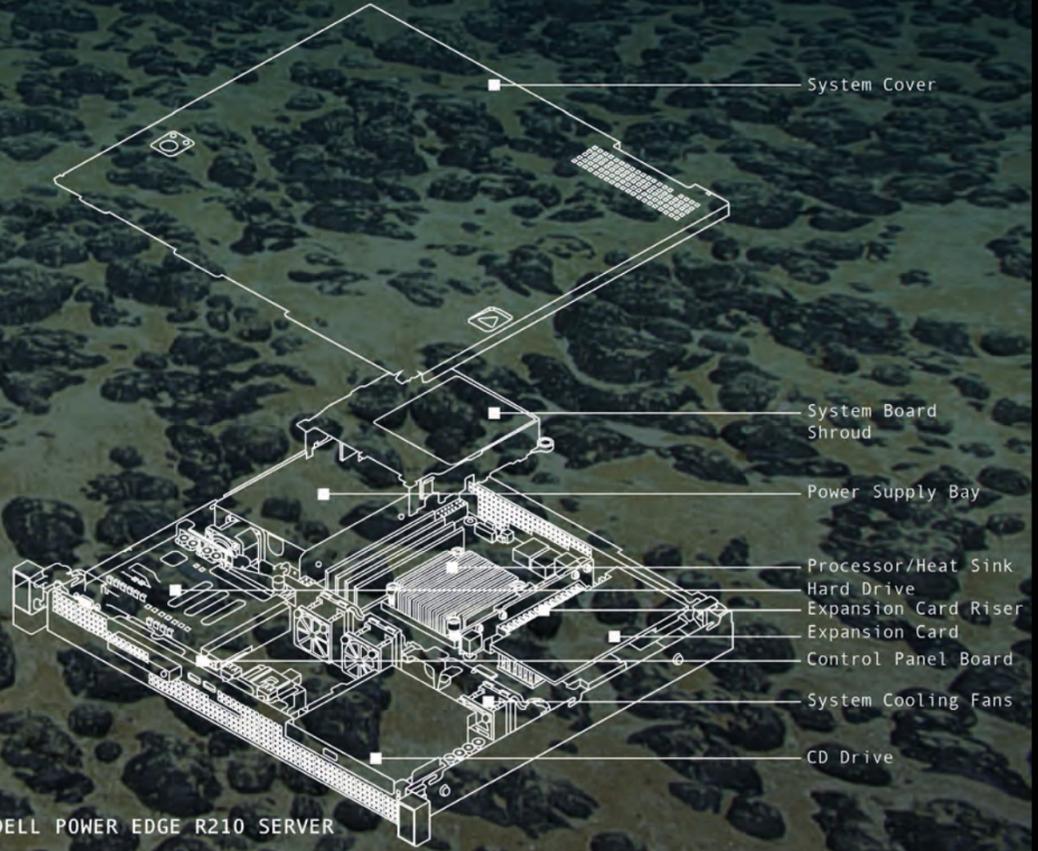
POLYMETALLIC NODULES FIELD IN THE CLATION-CLIPPERTON ZONE, PACIFIC OCEAN
Credit: 2019 Southeastern U.S. Deep-sea Exploration/Office of Ocean Exploration and Research/NOAA



SECTION CUT POLYMETALLIC NODULE



DELL500 GB 5400 RPM SERIAL ATA HARD DRIVE



DELL POWER EDGE R210 SERVER

Deep-sea mining involves retrieving mineral deposits, known as polymetallic nodules, from depths of 200 metres off the ocean floor. They are roughly potato-sized and contain heavy metals and rare-earth elements. Mining of the deep sea has been proposed – and rigorously opposed – for decades. More than 700 scientists have signed a statement urging for a delay of deep-sea mining, with major car manufacturers, banks and technology companies also having pledged support. Twelve countries have called for a moratorium on deep-sea mining, with France’s Emmanuel Macron going further and urging for a complete ban, and instead, he increased investments into oceanic research at COP27 in 2022.

Rare-earth and heavy metals are essential elements used in high-performance magnets found in clean energy and technological products. These metals have diverse properties necessary for making technology lighter, faster and smarter. As technology increasingly touches many aspects of our lives and with ongoing demand for electronics – there will undoubtedly be a rise in the demand for mining of these metals.



GERARD BARRON, CENTER, CHIEF EXECUTIVE OF THE METALS COMPANY, HOLDING A SEAFLOOR NODULE TIMES SQUARE, NEW YORK, USA SEPTEMBER 2021
Credit: Ashley Gilbertson / VII / Redux / eyevine



DEVICE: iPhone 7

PERIODIC TABLE OF AN IPHONE

Battery

1	11	8	6	27
Li	Al	O	C	Co

Computer Chip

14	15	31	33	51	8
Si	P	Ga	As	Sb	O

Circuitry

79	47	29	58	73	82
Au	Ag	Cu	Sn	Ta	Pb

Touch Screen

8	49	58
O	In	Sn

Glass

8	11	14	19
O	Al	Si	K

Display

39	57	63	64	65
Y	La	Eu	Gd	Tb

66	59	49	57
Dy	Pr	In	Sn

Microphone and Speakers

28	58	65	64	65	
Ni	Nd	Dy	Pr	Gd	Tb

PERIODIC TABLE OF A HARD DRIVE

Printed Circuit Boards

79	47	29	11	58	80	26
Au	Ag	Cu	Al	Sn	Zn	Fe

Computer Chips

47	29	11	58	79
Ag	Cu	Al	Sn	Au

CPU

79
Au

CPU heat sinks

29	11
Cu	Al

Wiring and Cables

29
Cu

Connectors/Fingers

79
Au

Keyboard Membranes

47
Ag

Hard Drives

78	46	27	11	68
Pt	Pd	Co	Al	Nd

Circuit Board Components

78	46	28	73	47
Pt	Pd	Ni	Ta	Ag

Solder

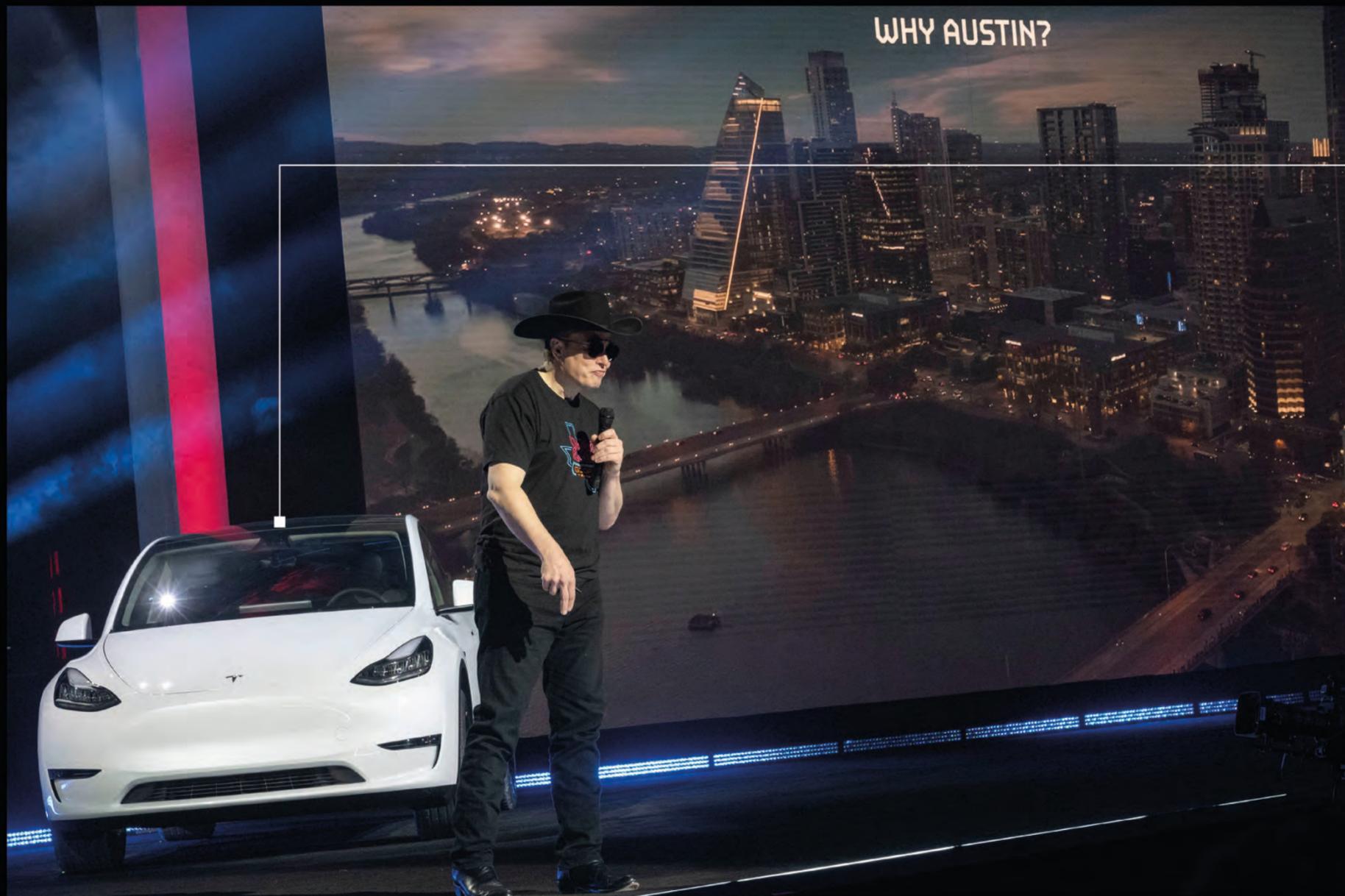
82	58
Pb	Sn



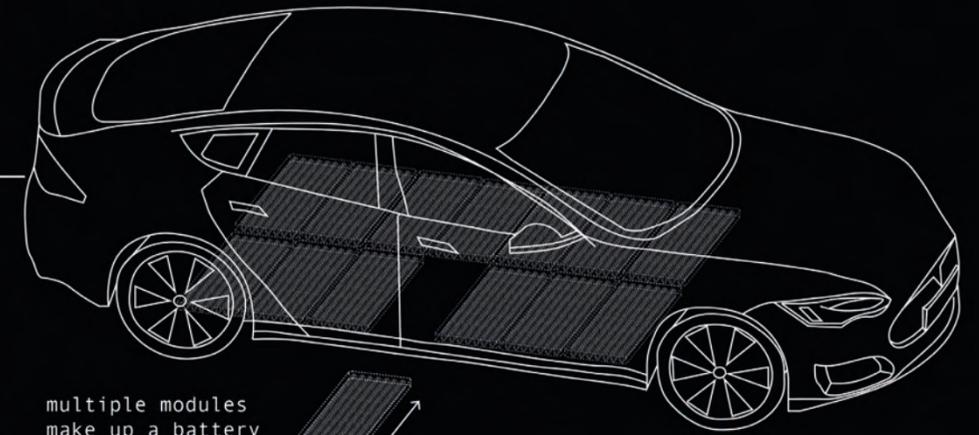
DEVICE: Dell Hard Drive

Under the ISA treaty, in order for companies to explore mining opportunities, they must be sponsored by a small country to allow lesser-developed countries fair access to resources. Nauru is the sponsor of Nauru Ocean Resources Inc., a subsidiary of Canadian mining firm The Metals Company (TMC). TMC, formerly known as DeepGreen, is one of the leading players in the deep-sea mining industry. TMC believes its mine sites in the Pacific could produce more than \$31 billion (£24 billion) in profits over the next 25 years with 'minimal impact on the collection area'.

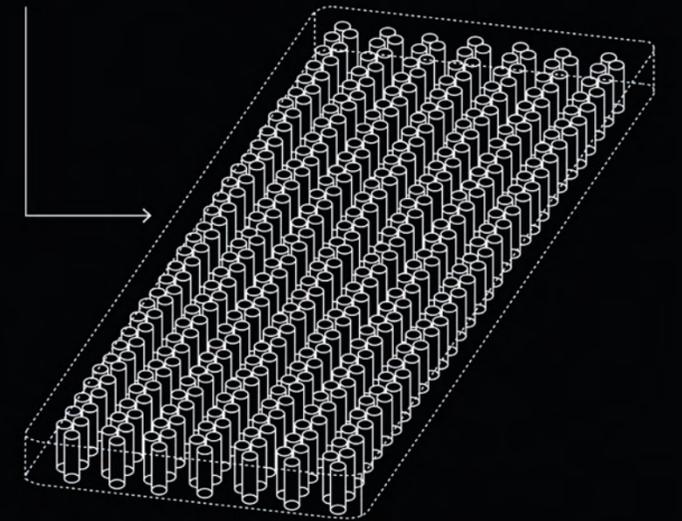
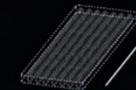
Gerard Barron, the Australian CEO of seabed-mining company the Metals Company, and a key advocate for the necessity of deep-sea extraction has described the polymetallic nodules as 'a battery in a rock' and 'the easiest way to solve climate change'. He describes the abyssal plain as a 'vast marine desert'.



TESLA CO-FOUNDER AND CEO ELON MUSK STANDS NEXT TO A TESLA SEDAN AND ADDRESSES 15,000 INVITED GUESTS AT THE NEW TESLA GIGAFACTORY APRIL 07, 2022 TEXAS
Credit: Bob Daemmrich/Alamy Live News



multiple modules make up a battery backpack



DEVICE: Module of Lithium ion batteries



DEVICE: Lithium ion Battery

EV Battery

ELEMENTS IN AN EV BATTERY

³ Li	¹³ Al	²⁸ Ni	⁶ C
²⁷ Co	²⁵ Mn	²⁹ Cu	²⁶ Fe

The adoption of electric cars has been hailed as an important step in curbing the use of fossil fuels and fighting climate change. However, the motors of electric vehicles require around six times as many metals as their gasoline-powered counterparts.

The push for metals is becoming increasingly controversial: in 2021, major battery users including Google, Samsung, Volvo and BMW joined a World Wildlife Fund (WWF) call for a moratorium on seabed mining over fears of lasting environmental damage, with these companies committing to not buying minerals extracted from the seafloor until the environmental risks of the activity were 'comprehensively understood'.



PREVIOUS PRIME MINISTER BORIS JOHNSON ONBOARD THE ESVAGT ALBA DURING A VISIT TO THE MORAY OFFSHORE WINDFARM EAST. AUGUST 05, 2021 ABERDEENSHIRE COAST, SCOTLAND. Credit: PA Images / Alamy Stock Photo

ELEMENTS FOUND IN A WIND TURBINE MOTOR

Battery Energy Storage



Magnet Generation



Turbine



Rare-earth elements are predominantly used as raw materials for the manufacturing of permanent magnets, which are used in generators for wind turbines. The UK Government has stated it wants to generate enough wind energy to power every home by 2030. Currently offshore wind farms power 7.5 million UK homes. Published in April 2022 under then-Prime Minister Boris Johnson, the UK energy strategy states that 50 gigawatts (GW) of the UK's electricity will be generated by offshore wind by 2030, 5GW of which is hoped to come from floating platforms in deeper seas off the UK coast.

The current Prime Minister Rishi Sunak has also stated he wants to concentrate on offshore wind production as a major energy supply in the UK. With the increase in reliance on renewables such as wind energy, so does the reliance on the extraction of raw materials increase to produce and manufacture the hardware that goes into renewable technologies. It is clear that any move towards a green transition will likely be contentious.

Engines of Imagination

Ecological worldbuilding in the game space

Over the last decade there has been a considerable increase in artists using video game environments to explore and question the complex entanglements and sociological questions of the present. The speculative practice of worldbuilding and spatial design has been deployed by artists such as Lawrence Lek, Alice Bucknell, Joey Holder, Daniel Brathwaite-Shirley and artist collective Keiken, each of whom experiments with the rich overlays of architecture, ecology, technology and storytelling. In June 2022, a group exhibition at the Julia Stoschek Foundation in Düsseldorf, curated by Hans Ulrich Obrist, took on an archaeological view of the medium, exploring the relationship between art in the digital space and the role of game engines in everyday life.

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As Obrist said at the time, 'nearly a third of the world's population play video games – that's around 2.8 billion people – so obviously more and more artists are looking into this'.¹

There is an urgency amongst artists, curators and designers to interrogate this emerging practice and art form to understand what potential and challenges the digital space has.

Game engine software such as Unity and Unreal Engine² are being used by artists as powerful tools for the creation of immersive and interactive experiences that can hack and or glitch real world political realities. Through real-time features and high-resolution graphics, these engines allow artists as well as developers to design and implement complex 3D environments, physics simulations, artificial intelligence, audio and visual effects and narrative structures. As a result, game engine environments are sites that can test new modes of living in more-than-human worlds in high-resolution real-time, altering human-centred perceptions whilst raising ecological consciousness.

Through my practice as an architectural designer, researcher and co-founder of an all-female collective, Xcessive Aesthetics, I see the digital space as a site for critique and experimentation. Digital environments are becoming increasingly potent sites that have the ability to challenge and pose new questions on how we can foster relationships between digital infrastructures, spaces, humans and non-humans and society. Continuing my personal interest and research on the potentials of digital technologies and tools, this essay explores the theoretical relevance of worldbuilding as a design strategy, and considers game engines tools to envision new worlds, institutions and forms of restitution and representation that can challenge anthropocentric perspectives.

On the Page

Worldbuilding can be seen as the collaborative construction of new and alternative worlds. It is most frequently associated with the genre of science fiction where fictional narrative environments are used as a proxy to critique our present or speculate on future modes of living. Speculative genres such as fantasy invent what does not, and likely could not, exist in our reality, whereas science fiction draws upon and extrapolates what we know about reality and science. Recently, through the work of theorists like Donna Haraway, Anna Tsing, and feminist sci-fi authors Ursula K. Le Guin and Octavia Butler, 'this practice of world-building has become an urgent and shared strategy for making sense of a weirded climate and morphing global ecology'.³ Alice Bucknell here goes on to describe the notion of worldbuilding as a verb, she explains that the process of worldbuilding never ends and that similarly the plurality of worlds acknowledges that there is no singular world from one perspective.

In 'The Carrier Bag Theory of Fiction', the visionary speculative fiction writer Ursula K. Le Guin retells the story of human origin by redefining technology as a cultural 'carrier bag' rather than a weapon of domination (referenced as the spear), shifting the way we look at humanity's foundations from a narrative of exploitation and human-centred perspective to one of nurturing, gathering, holding, and co-existing symbiotically with other worldly beings. Her work is defined by a postcolonial, postmodernist scepticism of grand narratives of the human, and her stories question ideas of Western temporalities and human violence, declaring death to 'linear, progressive, Time's-(killing)-arrow mode of the Techno-Heroic'.⁴ Her stories are, in Donna Haraway's terms, 'systems of entanglement'. Le Guin's speculative worlds have become a point of departure for worldbuilding in the game space, where these digital environments are testing grounds for disrupting anthropocentric thinking and strategies for multi-species survival. In this instance, the game space and game engine software become a potent prototype of investigating real-world problems where new worlds and forms of representation can be challenged and explored. These possibilities have attracted ecologically-engaged artists into the virtual realm for years, where the distinction between reality and fiction becomes blurry.

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Movements in art history have long been co-dependant on broader technological developments, and game space art is no exception: the rise of speculative fiction in contemporary art practice is inextricable from the evolution of gaming technologies. Video games have developed into a mass phenomenon since the arcade rush of the early 1980s with Space Invaders and Pacman, followed by the “console wars” between Nintendo and Sega in the 1990s, the advancements of sports games in the early 2000s by Electronic Arts Inc., and more recently with Role Playing Games (RPGs) such as Grand Theft Auto, Fortnite, Red Dead Redemption and Final Fantasy. RPGs are of particular interest to this essay, in their deployment of linear and human-centred narratives. Through the proliferation of popular game engine software, they have enabled speculative worldbuilding to migrate away from the pages of science fiction stories and onto our screens. As game engines have become more capable of rendering high-resolution graphics and immersive environments, so has the globalised mass market of video games sales and the prevalence of their impact within popular culture.

Artists have now began adopting them as powerful tools for envisioning new ecological and social realities. Constructed narrative environments in the digital space have the ability to promote attention to the urgent ecological crisis, where new shared worlds are not human-centred. Artists and thinkers such as Char Davies, Joey Holder and Alice Bucknell experiment with speculative fiction and worldbuilding in a way that is less an exercise in predicting or fantasising new utopias, but more a mirror of our present realities that has been pushed to the extreme, in order to reveal, critique and question existing practices and systems of our real world.

“The possibilities of game spaces have attracted ecologically-engaged artists into the virtual realm for years, where the distinction between reality and fiction becomes blurry.”

During the early 1990s, while scuba diving over a deep-ocean trench, Canadian artist Char Davies experienced the sensation of hovering in pure space. She told Wired in 1996 that she felt almost bodiless, with ‘no separations between inside and outside’.⁵ Davies’s description is the definition of ‘oceanic feeling’⁶ – a term coined by the French writer Romain Rolland in a 1927 letter to Sigmund Freud used to express a sense of being at one with the world, undifferentiated from an endless or eternal life force. From Davies’s memory of aquatic interconnectedness, she created one of the earliest virtual-reality artworks: ‘Osmose’ (1995). Wearing a head-mounted display with a motion-tracking interface vest, “immersants” as she called viewers, would navigate a porous, aquatic terrain with their breath and movements, rising and falling amid luminous water and forests of vegetation. Davies’s work was one of the first virtual-reality pieces to challenge realist computer graphics through abstract and ambiguous forms of representation in order to evoke reactions and experiences rather than to ‘illustrate and define them’.⁷ The illusion of feeling immaterial and embodied in ‘Osmose’ eludes itself to the comparison of being free of gravity in oceanic spaces; here the virtual and aquatic are synonymous. ‘Osmose’ used the subversive qualities of the game space to depict a deep-sea environment as a space rich in freedom and ripe for storytelling.

The films of Joey Holder’s ‘Abyssal Seeker’ (2021) offer a very different vision of a simulated ocean. The artwork depicts mythic figures occupying a realm in which humans must cohabit with the non-human species of the deep. ‘Abyssal Seeker’ is set in an unspecified future where humans have begun to merge and entangle themselves with these new life forms. The humans begin to seek kinship with the strange creatures of the deep, morphing their bodies to escape an all-encompassing technological surveillance network. Holder describes the work as an ‘escape strategy against tracking and the totalization of life in a sci-fi like way’.⁸ It’s a rejection of our datafied existence that has been proliferated by Big Tech, and instead offers a descent into the uncategorisable life beyond Western ideals.

The US writer and artist Alice Bucknell’s film ‘Swamp City’ (2021) also tackles climate-related challenges through speculative fiction and world building, but through a somewhat humorous and critical lens. The Florida Everglades is the site of speculation in ‘Swamp City’, where a luxury nature resort designed for high-tech eco-tourism is built in a near future that has been severely disrupted by the climate crisis. The film uses speculative fiction to address the commodification of the Everglades, where infrastructural development and concentrated efforts to ‘drain the swamp’⁹ over the previous 50 years have shrunk the Glades to just a third of their original size. In the hyper-desirable yet uncanny proposal of ‘Swamp City’, the audience is promised ‘luxury lifestyle co-existing with the new hyper-nature’, ‘fully automated green urban living’, ‘carefully curated climate positive landscapes’, and ‘natural catastrophe insurance’. ‘Swamp City’ is video game noir, ecological critique and architectural vision, where the boundary between dystopia and utopia is blurred to highlight and critique neoliberal ideas of environmentalism.

In an ecological crisis, our interdependency with, and impact on, living systems is becoming starker. While 'Abyssal Seeker' offers aspirations of other-worldly oneness that leads us to imagine and confront radical states of living alongside others, 'Swamp City' instead plays on real-world anthropocentric perspectives of ecological and climate management plans. In their own ways, both propose an urgent case for survival, where relations between human and non-humans must be remade and rethought. However, beyond visualising speculative creations, the work can still highlight close attention to the present – where existing systems become magnified and made clearer as they are examined, enhanced and altered by fiction.

Thinking through Le Guin's 'Carrier Bag Theory of Fiction', if the planet could be considered a container for all life, in which everything – plants, animals, humans, more-than-humans – are held together, then to attempt earthly domination becomes a self-defeating act. By letting ourselves 'become part of the killer story', writes Le Guin, 'we may get finished along with it'.¹⁰ To prevent this, we must abandon the old stories in order to imagine new ways and worlds of living in a beyond-ecological crisis. Digital environments and architectures therefore become a powerful medium to imagine, test and give agency to these new worlds and array of possible futures that we may – or may not – like to inhabit.

Mapping the Depths

Photogrammetry as counter-cartography

with Anabel Garcia-Kurland

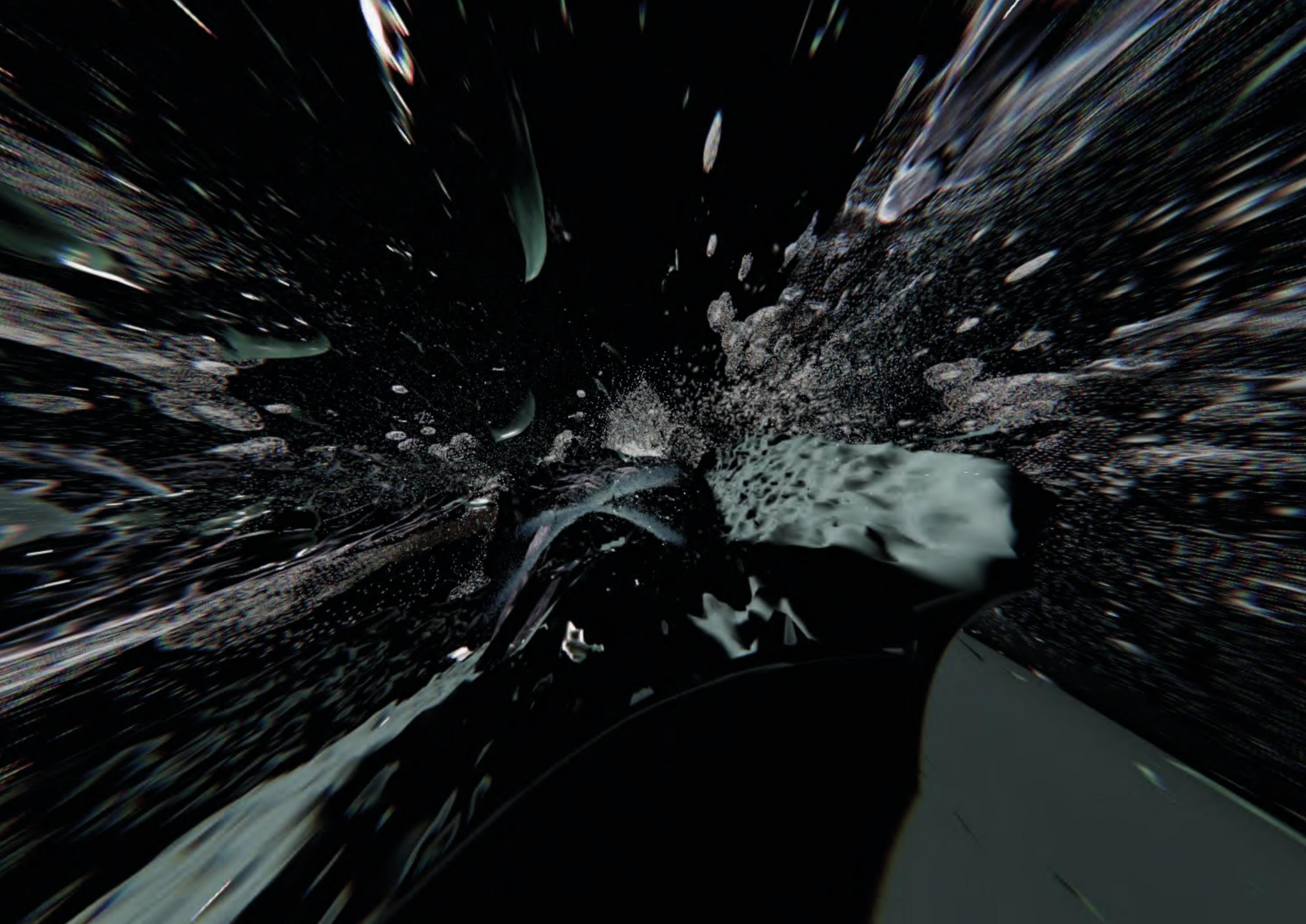
Historically, mapping and image-making have been closely intertwined with politics, where maps and other methods of visualising terrain have been utilised to perpetuate or entrench existing power dynamics. As Patrick Jaojoco writes, 'Maps are drawn from very specific viewpoints and principles and are typically literal visualizations of the worldviews of those in power'.¹¹

Whilst most of the planet's land mass has been mapped, recorded and analysed, much of the ocean and its floor has not. On the one hand mapping the deep sea can reveal unknown knowledges, ecosystems and non-human communities. On the other, it can be used as an exploitative tool to present the ocean floor as devoid of life, a barren landscape. This misleading conceptualisation of the deep sea is serving to legitimise its transformation, manipulation and toxification.

Photogrammetry can be deployed as a counter tool to the dominant forms of cartography. By using a combination of photography and computer vision algorithms, photogrammetry creates 3D models of physical spaces by merging together a series of 2D overlapping images. This technique allows for new modes of representation that go beyond static photographs or traditional videos, enabling viewers to explore and interact with unknown spaces in engaging and creative ways.

The following series of work-in-progress images have been developed by artist and designer Anabel Garcia-Kurland and I, during my residency at the Design Museum. The images are screenshots taken from a digital environment we are building in Unity, which plays with photogrammetry and point cloud models to extrapolate data and information on the velocity, disturbance and motion of water and microbial beings. We hope to give a spatial and material quality to the deep-sea environment, countering the colonial and extractive cartography of the ocean as a two-dimensional flat surface that can be parcelled, partitioned and dug up. At the same time, we propose the deep sea as a mysterious and perplexing site; an ultimately unknowable space resistant to the restrictions of the map.







Marianna Janowicz is an architect, writer, educator and a member of feminist design collective Edit. Her research investigates sites and infrastructures of reproductive labour in the home and in the city. Her work has been exhibited at the Oslo Architecture Triennale and MAXXI in Rome, her writing has been published in the *Architectural Review*, *Icon* and *e-flux Architecture*, among others. She teaches design studio and architectural history at the London School of Architecture and Central Saint Martins.

1001

At the beginning of Marianna Janowicz's residency, the death of two-year-old Awaab Ishak as a result of black mould in his Rochdale home, was circulating in the news. This tragedy made evident the slow violence of much of Britain's housing stock and prompted inquiries into the "lifestyle choices" that allegedly cause condensation and mould, including cooking, owning pets and drying laundry.

Marianna's project, **1001 Drying Rooms**, is concerned with drying laundry. As an integral part of domestic life, this quotidian practice is ripe for critical observation. The project delves into the archives of London housing as well as contemporary crowdsourced photographs to understand how methods and places for cleaning our clothes have changed over time: from sites of collective infrastructure to isolated islands of individual domesticity. Ultimately 1001 Drying Rooms argues against the privatisation of public issues and considers what communal luxuries might be needed for healthier, fairer futures.

Drying Rooms

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“Prevention Is Better than a Cure”

An interview with activist Kwajo Tweneboa

Ever since his successful 2020 campaign to rally up the neighbours and amplify the widespread disrepair of flats on his own estate, social housing activist Kwajo Tweneboa has been an advocate for renters and tenants all around the country. He has since gained hundreds of thousands of followers on Twitter, presented his own Channel 4 show and appeared on panels and in government campaigns. Tweneboa frequently visits flats where damp and mould prevail despite tenants’ numerous complaints. I spoke to him about the UK’s renting crisis, his work advocating for tenants and how legislation has played a role in jeopardising the health and safety of renters across the UK.

40 **Marianna Janowicz: Your Twitter bio describes you as ‘tearing the singlet off Britain’s housing providers,’ which is brilliant. What do you see as your role in this system, and in trying to make a change?**

Kwajo Tweneboa: First of all, to disrupt what is currently happening, and sort of flip tables, shake tables, make people listen and start paying attention. Holding those that are getting away with neglecting the demands of tenants to account and shaming them into doing what is expected, which is ultimately what they’re paid to do. But also trying to find a permanent systemic solution to stop this from continuing and reverse it at government level. It’s a mixture of the two.

I’m really interested in the question of scale in your work. Why is it important for you to base your work around individual people’s experiences?

It’s impossible for me to meet with absolutely everyone that I get complaints from, so I try to meet with the people that I can. When I do, it’s important to know the timeline of what’s happened, because then I’m able to live through that timeline with them and find out where the failures have happened and join the dots. Then I can say ‘this shouldn’t have happened’, and I know exactly who I’m supposed to be calling out. If there’s an issue, and you’ve raised it, you’ve done everything necessary. I try to make it as basic as possible for people to understand that it’s not their fault. And what’s happening here shouldn’t be happening.

But I tried to do it on a national scale, too, because there has been this stigma with social housing for a very long time. People forget that social housing used to be a thing that was seen as a luxury, everyone wanted to be in social housing. And I want to reiterate the point that tenants pay rent for a service. It is basic contract law: you have signed a contract, and you pay your rent on time; in exchange for that you get to live in this property. But also, if there are any issues and you complain, they are supposed to come out and deal with it within a reasonable time to make sure your health and safety aren’t put at risk.

When calling out these housing providers, who do you think needs to hear it?

The government. They need to create systemic change and put regulations and rules in place to stop landlords from getting away with negligence. They need to hold landlords to account and make sure tenants are protected. But unless they [the government] enforce it correctly and it’s strict, and they do enough at holding these bad landlords to account, the issue will persist or morph around new regulations. So it needs to be watertight. It needs to be enforced and it needs to be strict. 41

I want to ask you about condensation guides, which are handbooks that instruct residents on how to control moisture in their homes. Could you talk a little bit about how these documents are used in the landlord–tenant relationships and what you think is the ultimate purpose of these documents?

I understand they have been created in order to help tenants prevent condensation and issues with damp and mould, but I question whether they look at the whole picture. Tenants have been blamed for condensation in their homes for many decades but what’s not looked at is whether it is caused structurally, whether the buildings have been built correctly. It says things like, ‘don’t leave your shower on’, or to not dry clothes on the radiators and those sorts of things. When I see suggestions like that, I question how realistic these guides are. I question if our homes are built in a way that prevents damp and mould from growing. Because surely that should be the case?

I think this is a question for developers and housing providers. I can get why they want to give guides to tenants but in a lot of cases it isn't tenants' fault. If you live on the 15th floor of a tower block and they tell you, 'don't dry your clothes on the radiators and don't dry your clothes indoors', but you don't have a balcony, where do they expect you to dry your clothes? I've been into homes where windows are left open constantly, even during freezing temperatures. Yet damp and mould are still occurring. Some of the suggestions in the guides are just not very practical. It's one thing to write guides and it's another thing actually living in the home and experiencing it.

Some of the things that are blamed by housing providers for mould and condensation are quite innocuous, like cooking and drying laundry. Sometimes it becomes more particular and takes on arguably racist undertones, such as in the case of Awaab Ishak's parents, where 'bathing habits' and 'style of cooking' were singled out specifically as causes of the issues.¹ What other domestic routines have you seen blamed for damp and mould?

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I listened to an interview shortly after Awaab's death and the discussion of ritual bathing came up. I knew straight away it was fuelled by racism and discrimination. The suggestion that people are throwing buckets and dousing themselves in water and flooding the buildings, and that's the reason damp or mould is created is just completely misinformed. Sometimes people might need to use a bucket because the water is not working. I've even spoken to families that have had to bathe their kids with buckets on the balcony during winter because they've not had bathroom facilities in their homes. That's how bad things are. Yet instead of questioning that, what's being put into question is the habits of Black and ethnic minority groups.

Maybe let's talk a little bit about complaints procedure and repair. I've been reading about the proposed Awaab's law, which is supposed to give housing providers and landlords a deadline to respond to or rectify issues. And I've been thinking a little bit about whether a repair is even possible. What kind of repairs have you seen while doing your work?

One tenant was having to use a spanner to turn their bath tap on and off because the landlord just wouldn't come out and carry out their repairs. In my case, I had a new toilet fitted that had to be replaced three times in the space of a few weeks because the provider instructed the contractors to choose the cheapest spec, which just kept flooding the brand new bathroom. Eventually, they had to change the spec, which just should have been done in the beginning.

If the repair is very ad hoc and reactive, is there more work to be done on the design side, at an earlier stage of this failure?

This issue you are raising of continued care and maintenance of buildings, and the future of buildings, I thought was really, really interesting.

Some of these issues with damp and mould cannot be repaired. I think the main thing that annoys me is this sector-wide approach to damp and mould, which is to simply wash it off with a bit of bleach or paint over it so that you can't physically see it. It will come back in a few weeks. There's not been enough scientific research into tackling actual mould, finding out what types of mould are growing in homes and how to tackle it.

I think prevention is better than a cure. If you know you're building cheap, using cheap materials and doing everything as low cost as possible and just being shoddy with it, you can expect that, in the long term, it's going to fall to bits. Whereas if you are careful from the very, very beginning, you spend that little bit extra in building homes that last, homes that are sustainable, homes that are good quality, then it will cost you a lot less in the long term. People would be living a lot more comfortably had it just been done properly in the beginning. It's just small things like airing cupboards and those sorts of things that architects should already know and should be looking at when designing these buildings. These sorts of things need to be pressed and need to be taken into consideration and explained as to why they're necessary.

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I think it's important to think about that. I mean, building these homes and buildings shouldn't be about when it's up and it's built and 'oh, how amazing'. It should be about this building 40 years from now; will it be able to run in the same way as it is in 2023? That should be the goal. They are just focusing on knocking a building up, getting residents in and that's job done. It's not, it's really not. And I think that's the problem. That might be something I have to take on next.

Where There Is Life, There Is Laundry

The urbanism of the washing line

In the winter of 2022 'Neighbourhood', a sculpture by Sergey Kim depicting garments on a washing line was strung between buildings at the newly overhauled Battersea Power Station development. The trousers, shirts and panties were voluminous, stiffened, white and glowing, lit up by concealed strings of fairy lights. According to the artist's website, the artwork 'projects equality', and speaks to 'the common adage that we're all the same underneath'.²

The artwork washing line symbolises conviviality and conveys an image of intimacy and closeness. But what does an actual washing line represent in the contemporary city? In London, drying laundry on balconies and in private gardens is routinely prohibited by landlords, lease covenants and management companies on the grounds that it visually contaminates the built environment. For example, in April 2020 the managers of Chobham Manor, a new development near London's Olympic Park instructed the residents to not erect washing lines or drape laundry over balconies. Out of a range of cited reasons, the first one clearly focuses on the visual: 'No clothes should be seen displayed on the external part of any building. It distorts the image of the development'.³

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Legal, cultural and technological systems in London confine laundering and drying to the home and to individually owned appliances. This approach, however, contradicts the reality that drying laundry indoors contributes to the detrimental effects of internal air pollution – it can be harmful to human health.⁴ Drying laundry is one of the factors most frequently blamed by housing managers and landlords for issues of damp and mould, which are widespread in Britain.⁵ The individual home is not well suited to contain the moisture-producing labour of laundry but the washing line is not welcome outdoors; a double bind. Feminist critique of privatisation, atomisation and concealment of reproductive work offers a useful lens through which to look at the washing line.⁶ 'The importance of seeing and being seen when what is being seen is reproductive work cannot be underestimated', writes Edwina Attlee about private practices unfolding in public.⁷ What is the importance of seeing the washing line? And why is it so contested? The following incomplete history of laundry's visual presence in the Western city attempts some answers, as well as some possibilities for the deployment of the washing line for a post-carbon future.



DIRECTORY		
FLOOR	FLAT NO.	FLAT NO.
24	129 →	146
21A	DRYING ROOM	
21	111 →	128
18	93 →	110
15	80 →	92
12	62 →	79
9A	DRYING ROOM	
9	44 →	61
6	26 →	43
3	8 →	25
GROUND FLOOR	1 →	7
LOWER GROUND FLOOR	TENANTS-STORES	
FLOOR	FLAT NO.	FLAT NO.
POP 511		POP 512

Top: Sergey Kim's 'Neighbourhood' displayed as part of the Light Festival at Battersea Power Station, London. Credit: Professor G. Neil Martin

Bottom: The floor directory of the Balfron Tower, London, shows two drying rooms. Credit: Brad Jarman.

1000 Laundry and Drying Rooms

Helen Hester coined the term 'domestic realism' to describe a situation where the isolated dwelling shapes our imagination to the point where it is difficult to imagine life being organised in any other way.⁸ Taking a historical view is helpful when trying to destabilise and defamiliarise the individualised routine of doing laundry now firmly ingrained into the collective consciousness. For example, a 1976 press release from the Greater London Council (GLC) has the immediate capacity to jolt one into another reality. The document announces the closure of all laundry and drying rooms on GLC flatted estates following an accident involving a spin drier. 'The decision affects about 1,000 laundry and drying rooms', it states.

46 The scale of the communal infrastructure was vast, as the spatial pattern of doing laundry was then completely different to our contemporary isolated routines. Indeed, drying was frequently designed into council estates and other large housing projects. But while previous generations of architects appear to have been better at acknowledging the need for drying, they too had very particular ideas about the appearance of washing lines. Open-air drying yards typically featured in lower-cost buildings and working-class estates (for example, the Vanbrugh Park Estate in Greenwich designed by Chamberlin, Powell and Bon) whereas drying rooms that concealed washing were often a feature of more aspirational projects (such as the Golden Lane Estate, by the same firm). That view of laundry was an unwelcome, foreign object in the built environment is expressed in the documentation of a symposium on high-density housing from 1957.⁹ Here, the need to accommodate drying laundry comes into conflict with the desire to keep the washing hidden from public view:

'Although multi-storey flats usually contain a communal laundry with heated drying cabinets or some other arrangement for drying clothes, there is still a strong desire by housewives to dry their clothes in the sunlight and this is a very natural desire because of the bleaching and freshening effect of the sun. On most layouts, however, it seems impossible to make any provision for this without disfiguring the estate'.¹⁰

This was not limited to metropolitan Britain. In tracing the aesthetic of the ideal suburban house in the postwar US, Dianne Harris describes the rationale for the aesthetics of the yard in her book 'Little White Houses. How the Postwar Home Created Race in America'. While the appearance of leisure outside the home was preferred, signs of domestic labour were accepted as long as the work involved the use of individual power appliances, such as a lawn mower for the production of a manicured lawn. As the tumble dryer became a middle-class status symbol, the sight of air-dried laundry began being associated with lower-class living and non-white identities. Guides for residents recommended concealing washing lines behind six-foot fences.¹¹ While the proliferation of the leisurely consumerist landscape accelerated in the mid- to late-20th century US, Harris writes that the tradition of replacing productive land with ornamental and recreational landscapes is rooted in the enclosure movement of eighteenth-century Britain. The middle-class values of property, status and leisure crystallise in these approaches to regulating the external appearance of the home and the yard.

Right: Greater London Council press release announcing the closure of all laundry and drying rooms on flatted estates, 1976. Credit: London Metropolitan Archives, City of London, GLC/DG/PRB/35/028, from the Greater London Council Collection.

GLC

Greater London Council
The County Hall
London SE1 7PB

public information branch news service

01-633 7700 (Housing)
7866 (Transportation)
7865 (Planning)
7977 (General)
7886 (Public Health)
2202 (Arts, Recreation)

August 26, 1976

No. 355

GLC TO SHUT ITS LAUNDRIES

As a temporary measure, the Greater London Council is closing communal laundry facilities at its flatted estates.

This precaution is being taken in the interest of tenant's safety while a detailed examination is made into the arrangements for the supervising, servicing and day-to-day control of these facilities, following an accident on a GLC estate earlier this month when a girl lost her arm in a spin drier.

Mr Harry Kay, Vice Chairman of the GLC Housing Management Committee, said today: "We are taking this action so as to remove any possible risks while investigations are going on. Although it may mean inconvenience to some tenants, it is solely in their interests - and particularly that of children - that we are doing this. We feel it is particularly important that we take these steps because of children being on school holiday.

"Although laundry and drying room equipment is checked regularly we are still not satisfied and are therefore taking this action. I am sure our tenants will understand and agree that this is a right and responsible decision.

"We cannot say how long they will be out of action. The matter will be considered fully at the next meeting of the GLC Housing Management Committee on September 23."

The decision affects about 1000 laundry and drying rooms on the GLC estates throughout London.

END.

Press Contact: Tony Hosier (01) 633 7700

Where There Is Life, There Is Laundry

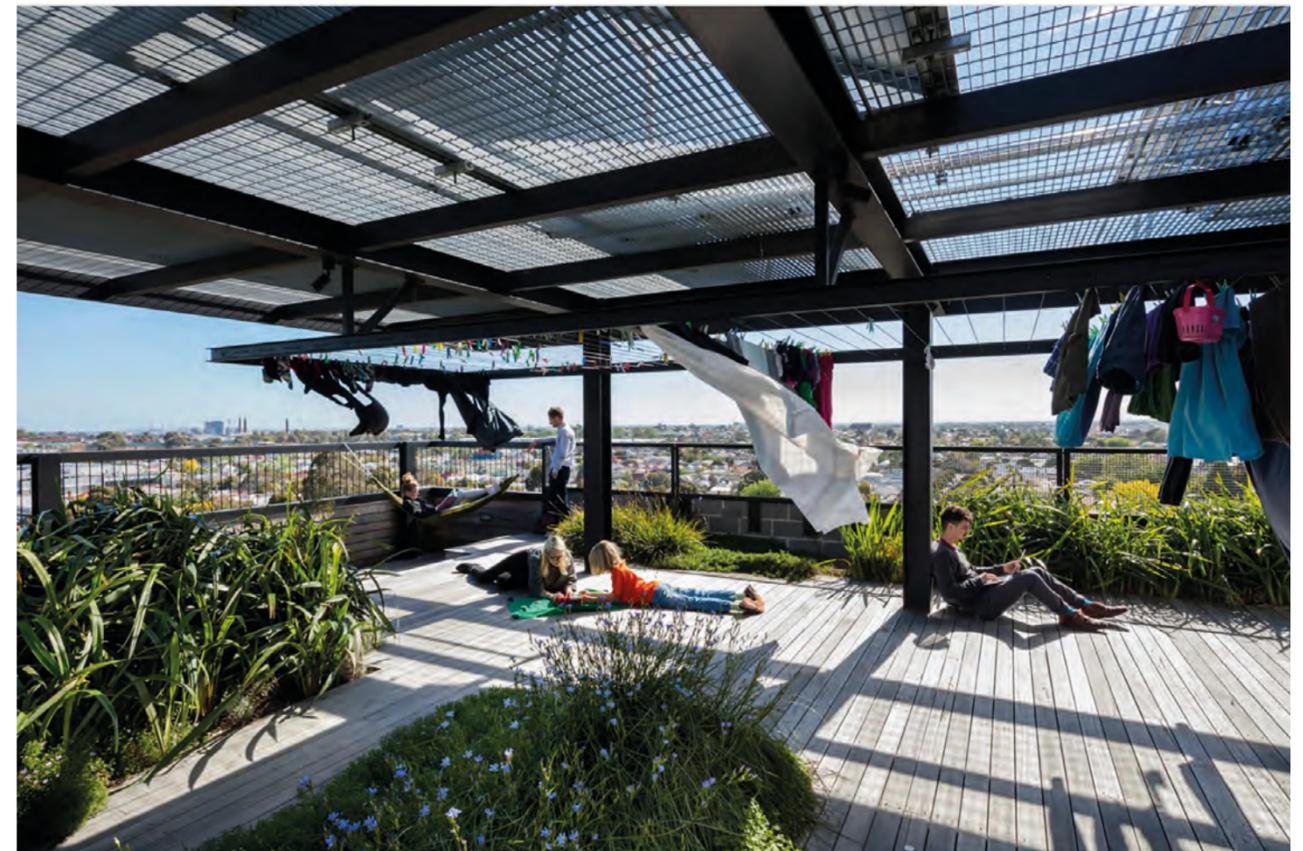
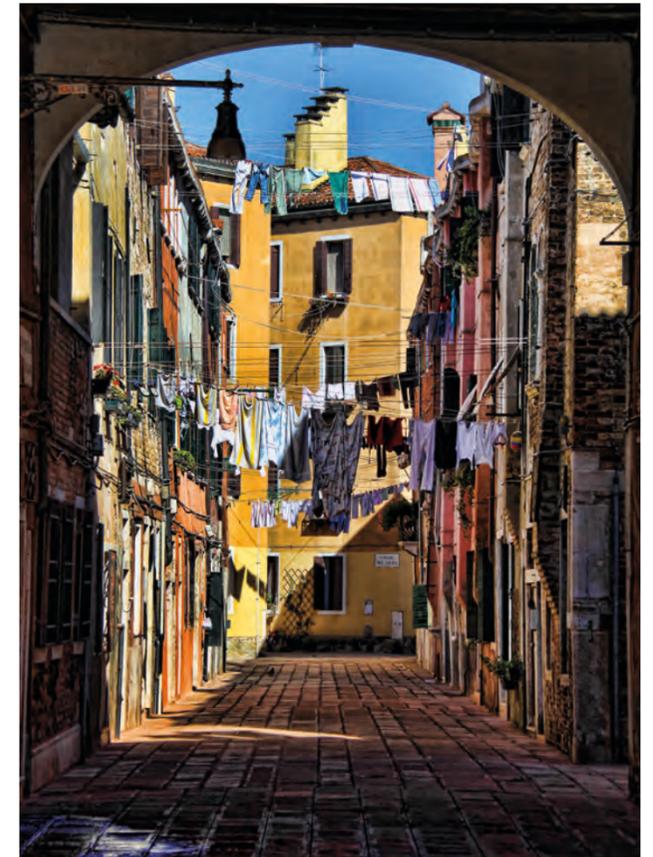
Yet, a visual catalogue of laundry drying is readily available, and even familiar and romanticised. Rural and idyllic washing lines appear in paintings and photographs evoking the peacefulness and seclusion of country life. In a different, but also romanticised category, the washing line frequently appears in a gritty version, across narrow Mediterranean streets, against shutters and peeling walls, sometimes beside dirt roads with pieces of clothing strewn on bushes to dry. There is affinity and nostalgia around this genre of the washing line: the one which is picturesque, airy and importantly, someplace else.

The washing line as a potent symbol of life is also employed by artists and architects to articulate their approaches to the everyday. In 1969, Italian architect and artist Gianni Pettena hung shirts, trousers and stockings in front of the cathedral in the historic centre of Como. A deliberately provocative gesture devised to question power structures in the city, Pettena's washing line speaks 'of the freshness of life and not the death of appearance'.¹² Similarly, writer Aritha van Herk looks to laundry as an empowering symbol of women 'making home'. 'To make home, do laundry',¹³ she writes, pointing to the fact that women found agency in performing the ritual of laundering even in difficult conditions. In Van Herk's writing, clean clothing appears pregnant with meaning – 'marker of order, control and power'¹⁴ – but other scholars, such as Ruth Schwartz Cowan find laundry to symbolise the oppression of women via the expectation that they are the ones responsible for maintaining the cleanliness and order of the family.¹⁵

Much of the taboo of the washing line is about gender and sexuality. The characters in Roberta Cantow's film 'Clotheslines' (1981) speculate on their neighbour's sexual life based on the kind of lingerie they can see on her washing line.¹⁶ Diane Ghirardo wrote about laundries on riverbanks in Renaissance Italian cities as places known dangerous to clergy because the women who worked there bared their arms and legs to do the washing.¹⁷ Other times, the laundry appears as a symbol of commonality and equality: the drying yard the site of opportunity to share the otherwise lonely domestic work. One character from 'Clotheslines' shares: 'And when I hang up clothes, I feel connected to all other women. It's something that we have in common, that we share together'.

Whether as controversy or community, drying laundry involves bodies taking up space in the world. Peter Barber, an architect who consciously positions himself in opposition to hard-nosed Modernists, shows a washing line strung on a balcony in his drawing for a timber tenement house published on Instagram on 4 February 2023, as a sign of his willingness to embrace the messiness of everyday life. However, the inclusion of the washing line in his drawings is only symbolic. The reality of drying in the city is that the sheets flapping in the wind might not smell as fresh as those from romanticised images. The urban washing line makes visible the difficulties of city living – it speaks to the sometimes uncomfortable proximity of neighbours living side by side and the threat of toxic air pollution.

“Contrary to the tumble dryer, the clothes line abounds with spatial and aesthetic potential. Drying laundry needs space. It spreads out, stretches the boundaries of the home and can animate facades and cityscapes.”



Top: Laundry day in Venice. Credit: O Palsson.

Bottom: The Commons, Melbourne. Credit: Andrew Wuttke.

The now forgotten communal drying yards and rooms fell out of use as communal laundries were replaced by the individual washing machine, cementing laundry's spatial transition into the private home. Considering that drying laundry indoors contributes to internal air pollution, which sources report to be three and a half times as severe as external air pollution, it is hard not to conclude that wet washing does not belong inside the sealed environment of the home.¹⁸ The energy-hungry tumble dryer is a technocratic, 20th century solution which seeks to contain and conceal the work of maintaining life while promising total control of one's environment through the use of fossil fuels. The outdoor washing line can be reclaimed for environmental reasons, as a site of collective engagement with 'a new kind of planetary politics'.¹⁹ If we wrestle the washing line out from beneath the layers of nostalgia, propriety, notions of respectability and the stigma of reproductive labour, it remains an accessible, zero-carbon, low-cost technology for drying.

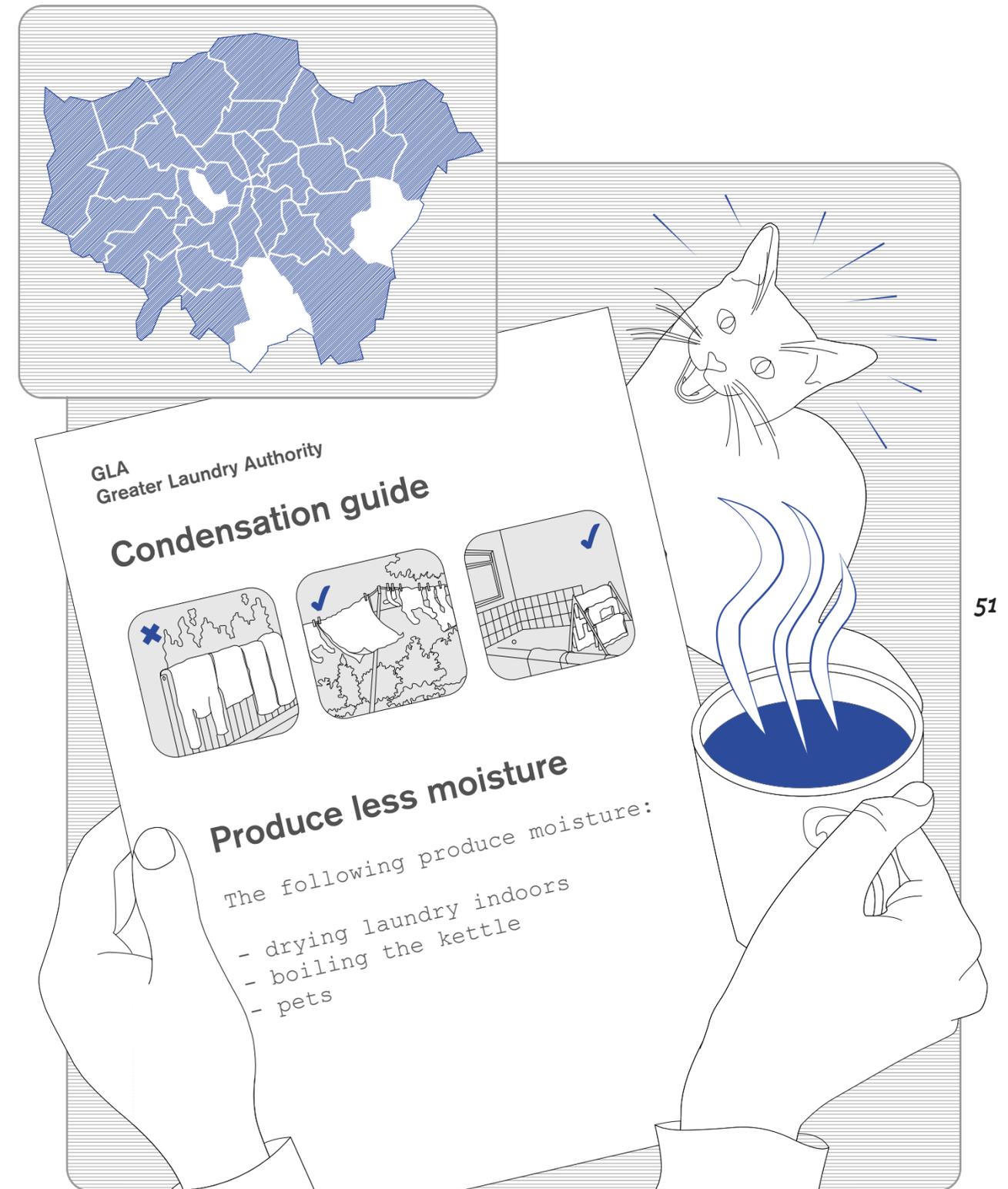
50

The outdoor washing line, however, does not have to be exposed unwillingly, as an aesthetic sacrifice we make for the sake of environmental justice. Contrary to the tumble dryer, the clothes line abounds with spatial and aesthetic potential. Drying laundry needs space. It spreads out, stretches the boundaries of the home and can animate facades and cityscapes. At stake, then, is a reframing of the washing line from an unwanted and concealed inconvenience to a creative opportunity for the new era of post-carbon interdependence.

I look to contemporary projects which imaginatively redefine the aesthetic of domestic utility and provide compelling glimpses of the possibility of communal luxury, redefined according to post-carbon logics and cultural exigencies. La Borda, a cooperative housing project in Barcelona designed by architects Lacol, has a dedicated space for drying laundry which occupies a shared outdoor deck, the washing becoming an integral part of the facade. In an Australian housing project, The Commons, by architects Breathe, the covered rooftop drying area forms part of the development's progressive agenda. It reduces the use of fossil-fuel powered tumble dryers and limits excess moisture indoors. The laundry, which stands for domestic work, here co-exists alongside leisure: promotional photos show people relaxing in the sun beside a hammock, decorative planting and drying clothes. The celebration of reproductive labour goes hand in hand with liberating the washing line for environmental reasons. A post-carbon drying infrastructure would expose the labour of laundry and the fact that it is dried using the natural, infinite resources of solar and wind energy. Today's washing line can once again become a symbol of connection – of the shared responsibility for the use of natural resources and of the commitment to less energy-intensive domestic routines. We need exciting, generous communal infrastructure and legislation that sets in motion a different way of inhabiting buildings and consuming energy. We need our 1,000 laundry and drying rooms back.

How to Live in a Flat

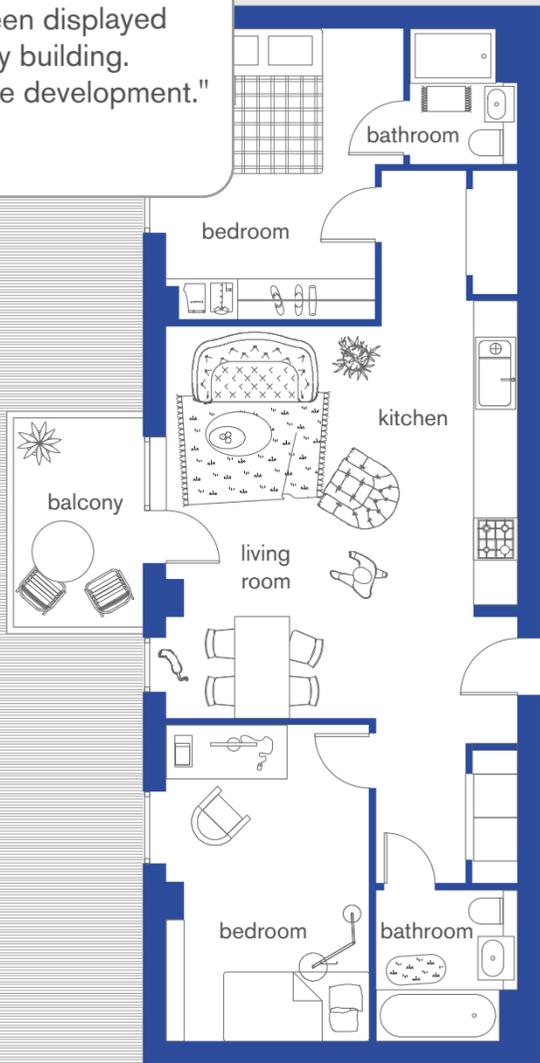
A short graphic story



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Condensation guides are documents issued by councils, housing managers and providers, instructing flat-dwellers on how to prevent damp and mould in their homes. 30 out of 32 London borough councils mention instructions on how to dry laundry in their condensation guides.

"No clothes should be seen displayed on the external part of any building. It distorts the image of the development."

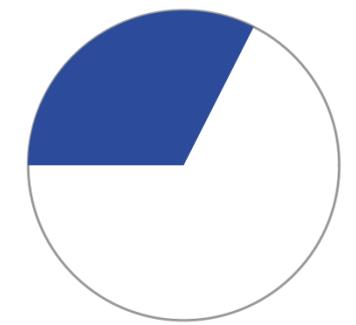


Where should I dry my laundry then?

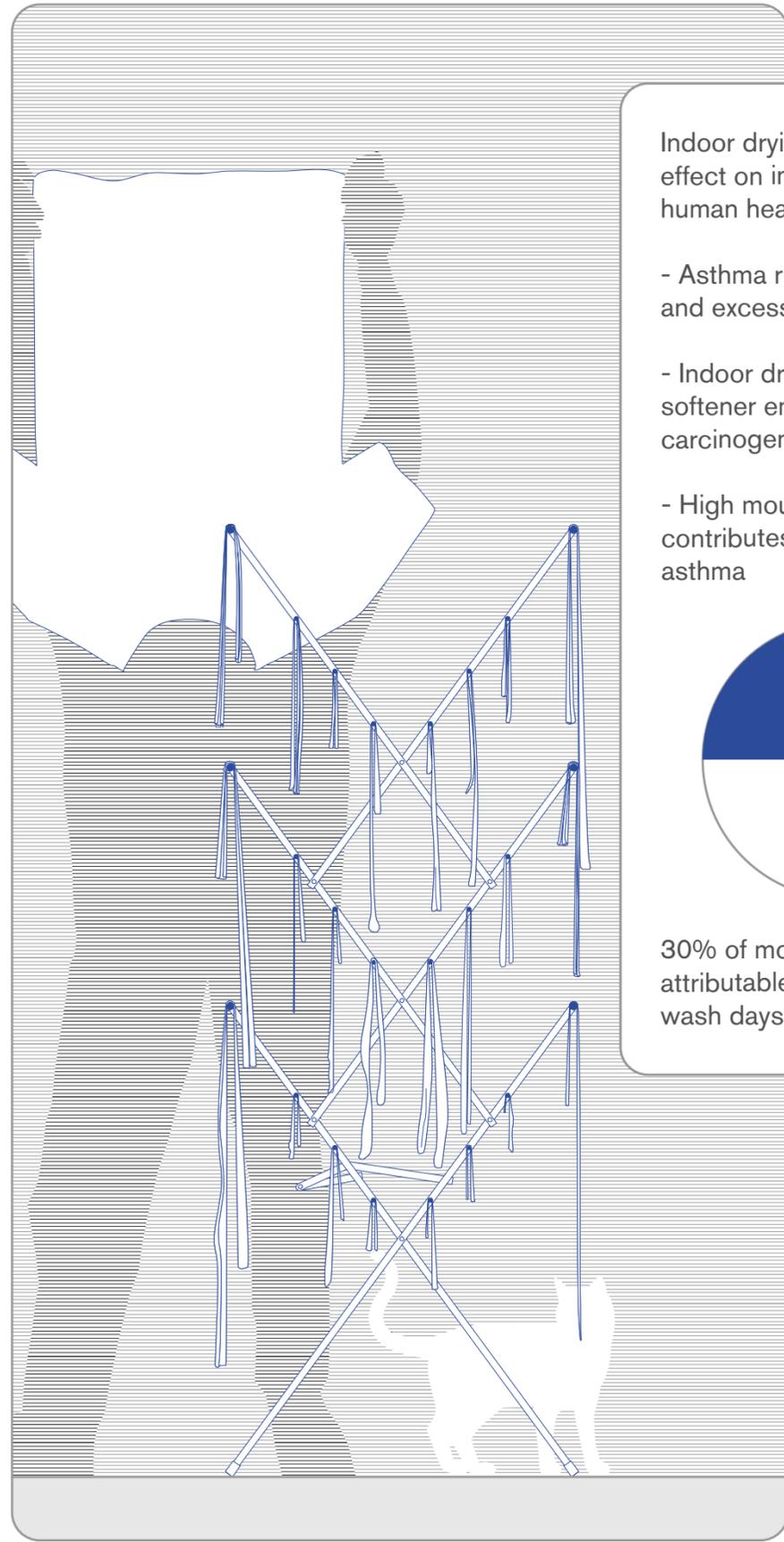
"We recommend drying washing outdoors or in the bathroom - with the door closed and a window open or an extractor fan running."

Indoor drying has detrimental effect on internal air quality and human health:

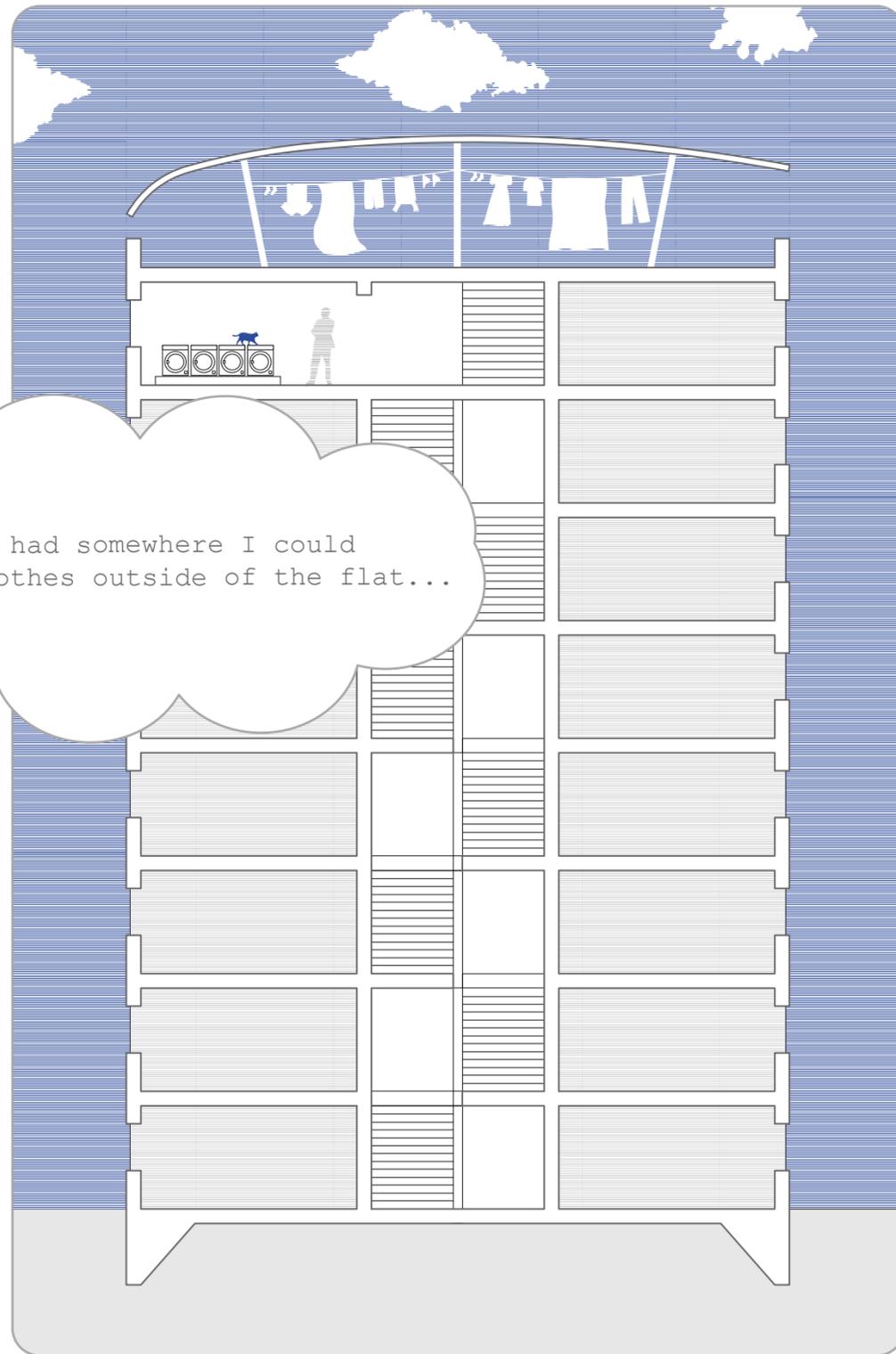
- Asthma risk due to moisture and excess dust mites
- Indoor drying and fabric softener emit hazardous carcinogenic chemicals
- High mould spore count contributes to eczema and asthma



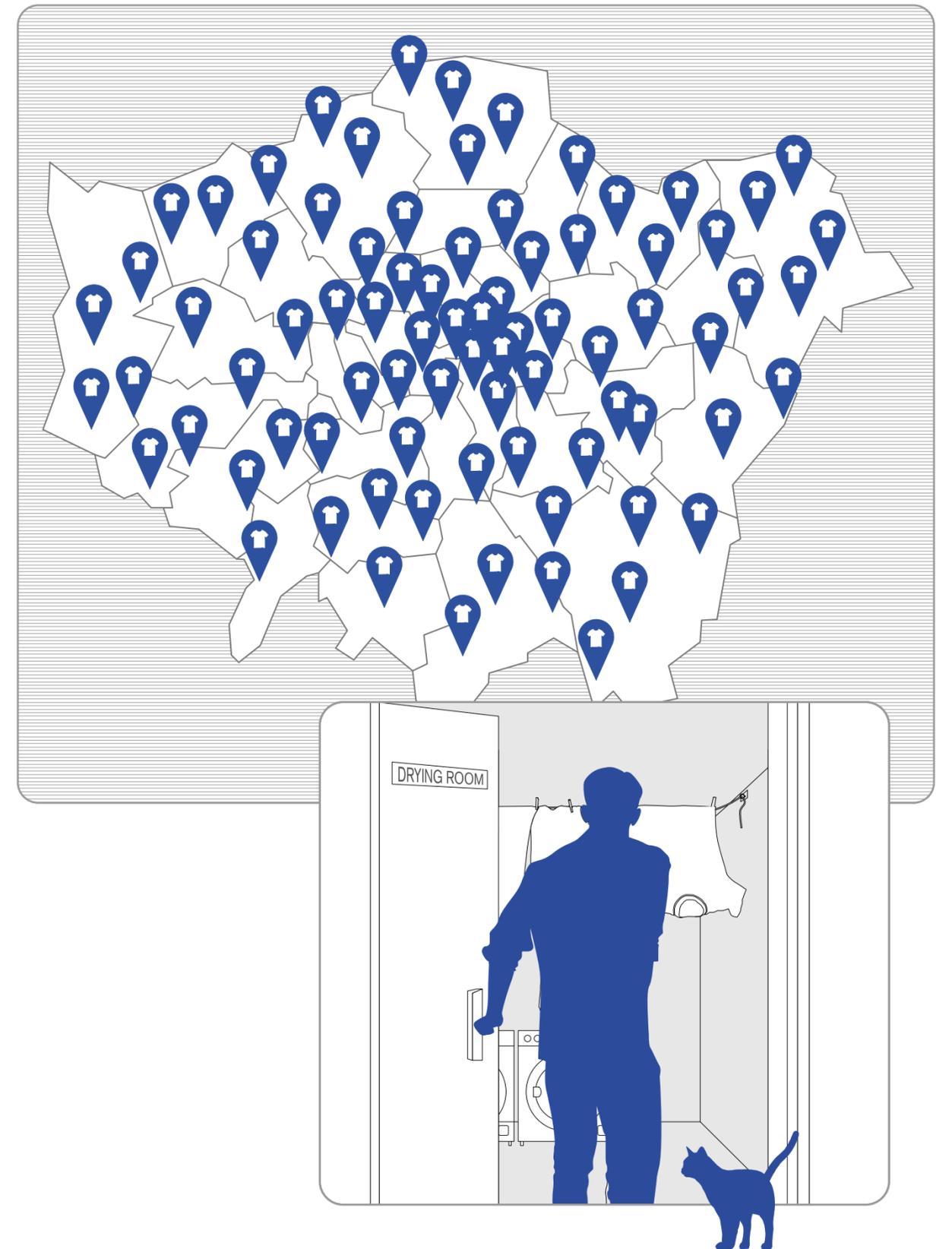
30% of moisture in homes is attributable to clothes drying on wash days*



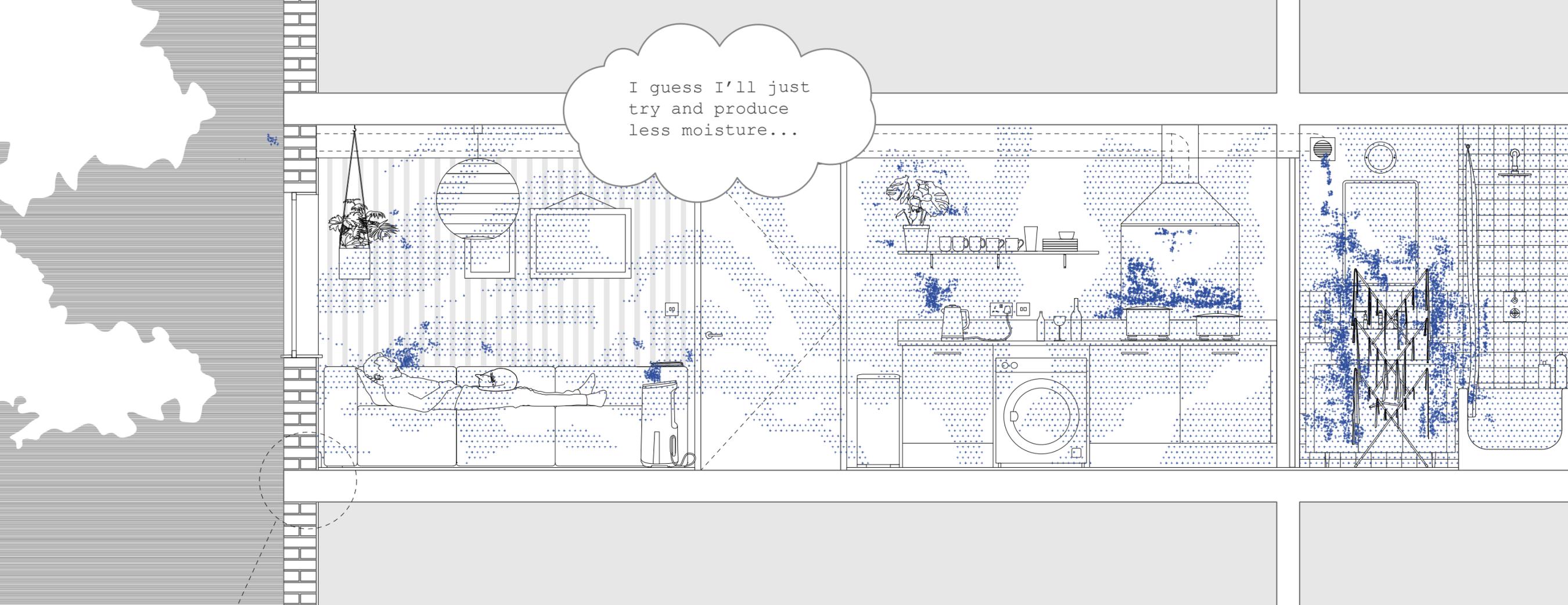
*Rosalie Menon and Colin Porteous, "Design Guide: Healthy Low Energy Home Laundering" (Mackintosh Environmental Architecture Research Unit, 2011)



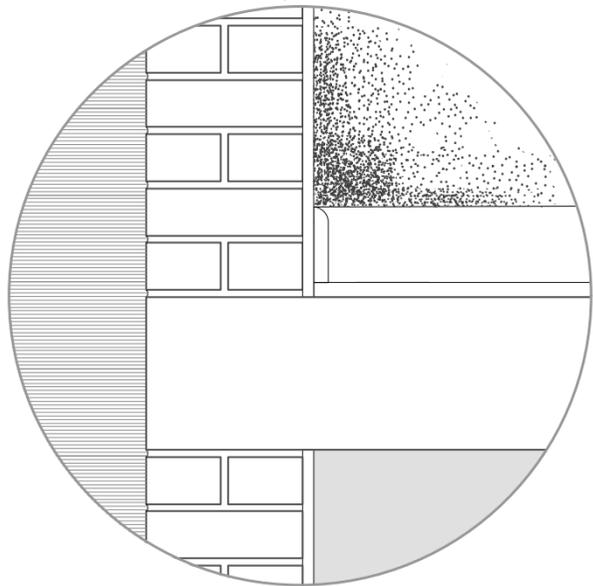
Shared laundry and drying rooms were a common feature in London's housing estates for the best part of the 20th century. In the Spa Green Estate in Clerkenwell, designed by Tecton and built in 1949, an aerodynamic rooftop pavilion induced draft to aid drying. In many European countries, such as Sweden, Germany and Switzerland, sharing a laundry room is still commonplace.



There were once well over 1,000 communal laundry and drying rooms in London on social housing estates alone. That's 1.65 laundry and drying rooms per square mile.



I guess I'll just try and produce less moisture...



Condensation is formed when moisture in the air hits cold surfaces such as windows or walls. Single glazed windows and uninsulated walls are particularly vulnerable.

Adding insulation reduces potential for condensation by increasing internal surface temperature of walls.

The maintenance of livable environments in poor-quality buildings is a Sisyphean task.

Legislators and housing managers see building inhabitants and their daily lives – boiling the kettle, drying laundry, showering and even breathing – as mere moisture-producing inconveniences capable of threatening the integrity of a building's fabric. Mechanical ventilation, dehumidifiers and other electricity-powered individual appliances can only go so far in alleviating the effects of pollution that stem from much larger, flawed systems.

There are no private solutions to public problems.

How Do You Dry Your Laundry?

A crowd-sourced survey

with Sabba Khan

While the 20th century drive for efficiency confined cooking to the kitchen – a room clearly designated for a particular set of tasks – the labour of laundry often skirts the margins of our domestic spaces. Drying laundry requires air and space – resources which are increasingly scarce in the city. Architect Andrés Jaque, considering changing domestic practices, says: ‘If it happens then it needs to be considered’.

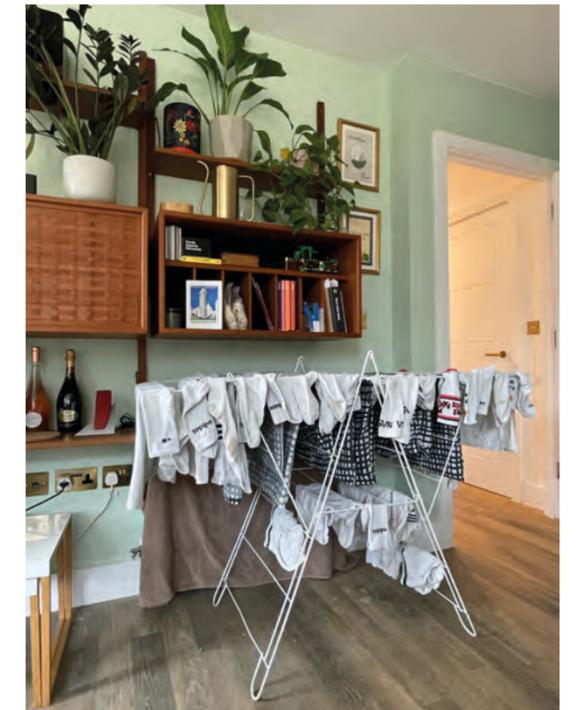
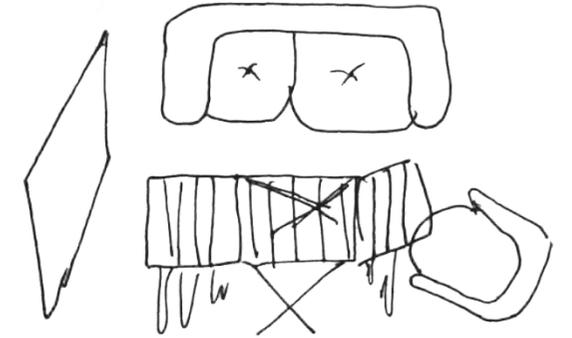
In February 2023, I launched a public call for images of drying laundry via the Design Museum’s social media channels. I was not interested in picturesque holiday photos of Mediterranean washing lines but in the often unsightly or awkward ways that people dry their own clothes; how they improvise and adapt their home spaces to perform basic daily tasks. In the following pages, I present a small handful of over 100 submissions received during the month-long call-out.

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The images are accompanied by analytical drawings by illustrator Sabba Khan.

No Way Through

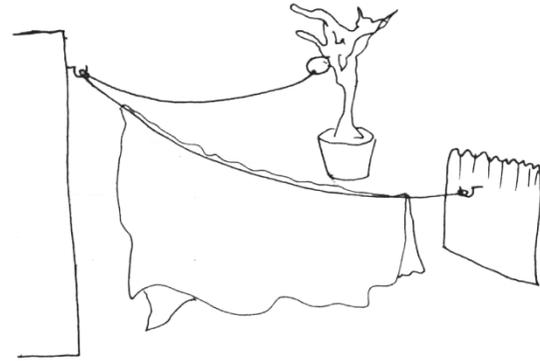
The floor-standing, foldable drying rack is a popular choice for urban laundry dryers. Practical in theory, in practice it gets folded away infrequently and instead becomes part of living room furniture. Here captured alongside bookshelves, next to sofas, trinkets, musical instruments.



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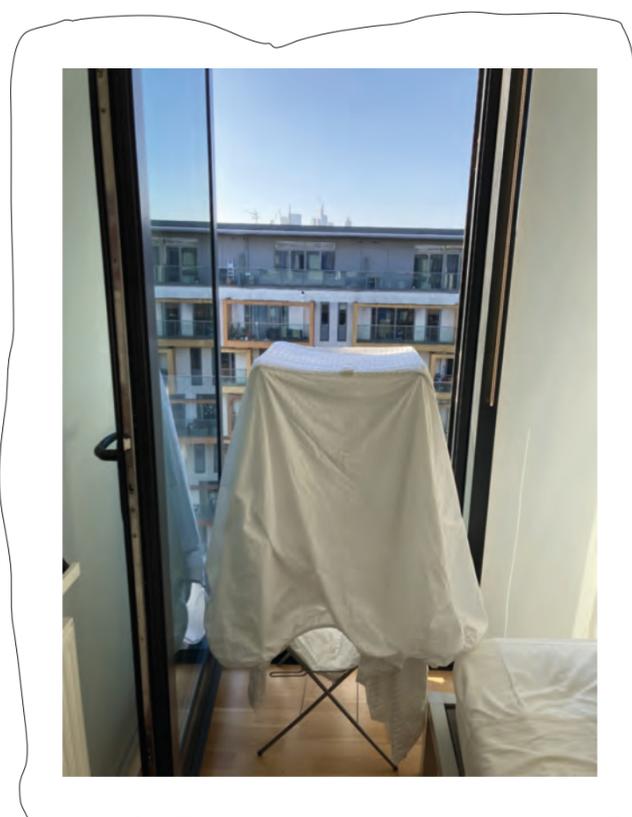
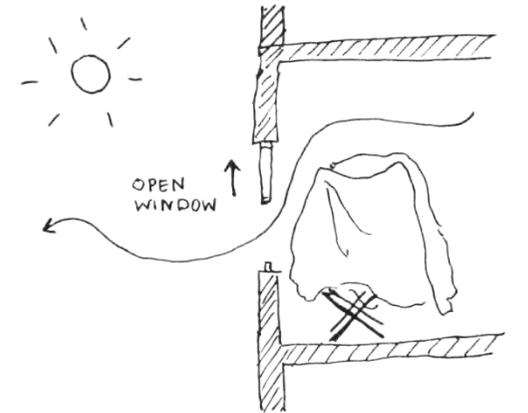
Urban Backyard

The urban backyard provides a tight space for air drying. The obstacles become creative constraints with hangers and lines propped up on trellises, hung from tree branches and tied to fences. Bins and washing lines happily co-exist.



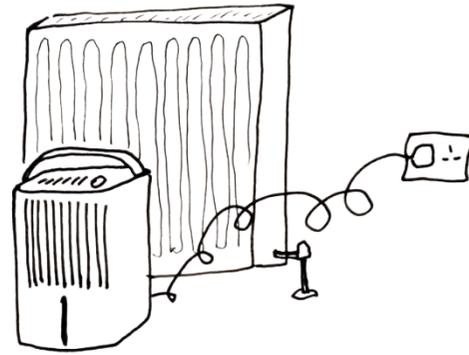
(Almost) Outside

(Almost) the benefits of outdoor drying without any private outdoor space.



Shared Air

The radiator and dehumidifier combo assembles an ecosystem out of common domestic devices. There is an element of authorship in putting the objects together and creating an optimum drying environment. Electricity and gas powered but less intensive or expensive than the tumble dryer.

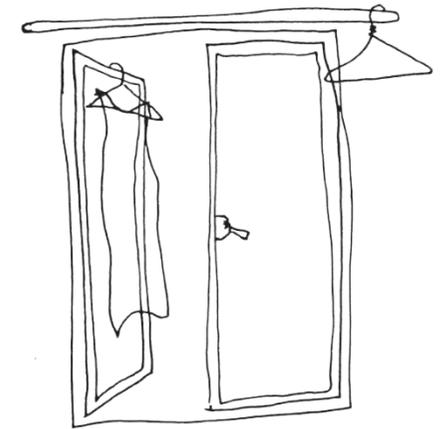


62

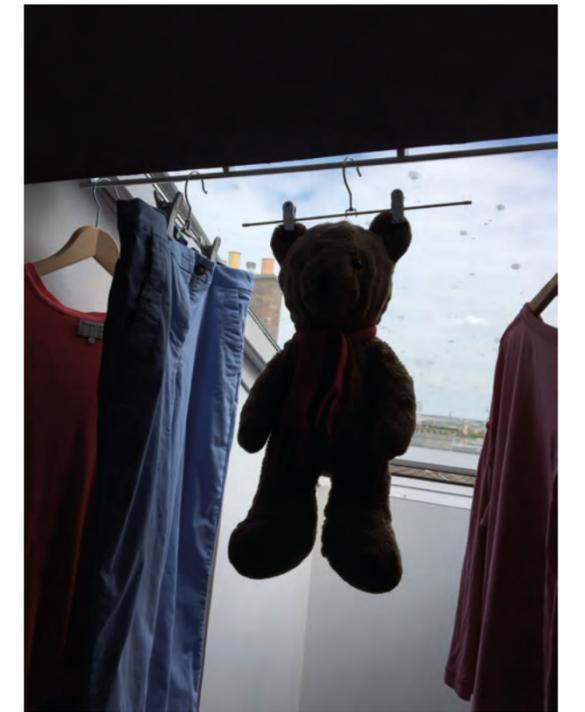


Window Parasite

A close cousin of 'Almost Outside,' the Window Parasite uses window furniture to attach its tentacles to. Plus points for proximity to sunlight and air, though not quite so effective if the window is closed.

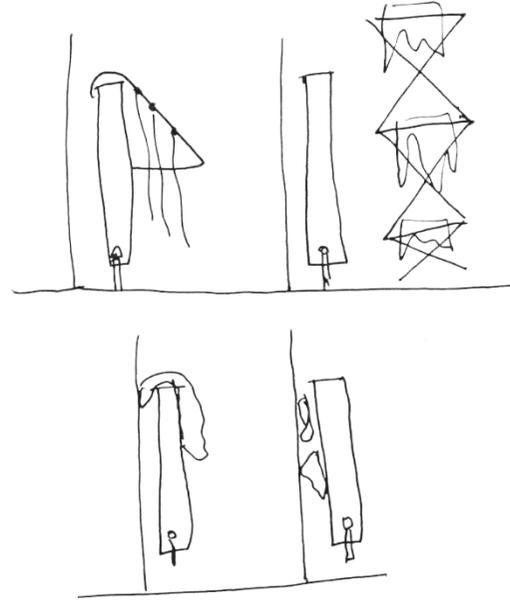


63



Radiator

A life saver in damp British winter, the radiator kills two birds with one stone. The downside is its limited capacity and small amount of space between it and the wall, resulting in socks brutally shoved in the gap, or lost to it.

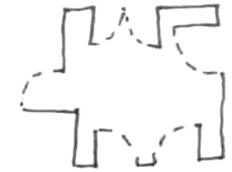


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Door Dried

The door gets used to drape a large sheet over it in a lo-fi iteration of this method. In more advanced versions, attachments put on doors increase their load capacity. No door is safe in a quest to dry, both entrance doors and wardrobe doors get co-opted in the work.



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Eroded

Isabel Lea is a creative director, graphic designer and researcher based in London. She is the co-founder of the multidisciplinary design agency ATYPICAL. With a design school education and a masters in cultural sociology she works on projects at the intersection of design and social change. She has worked with clients in the UK, US and Scandinavia ranging from Panasonic to The Danish Embassy. Alongside this she has undertaken design residencies and fellowships with companies such as Adobe and Google.

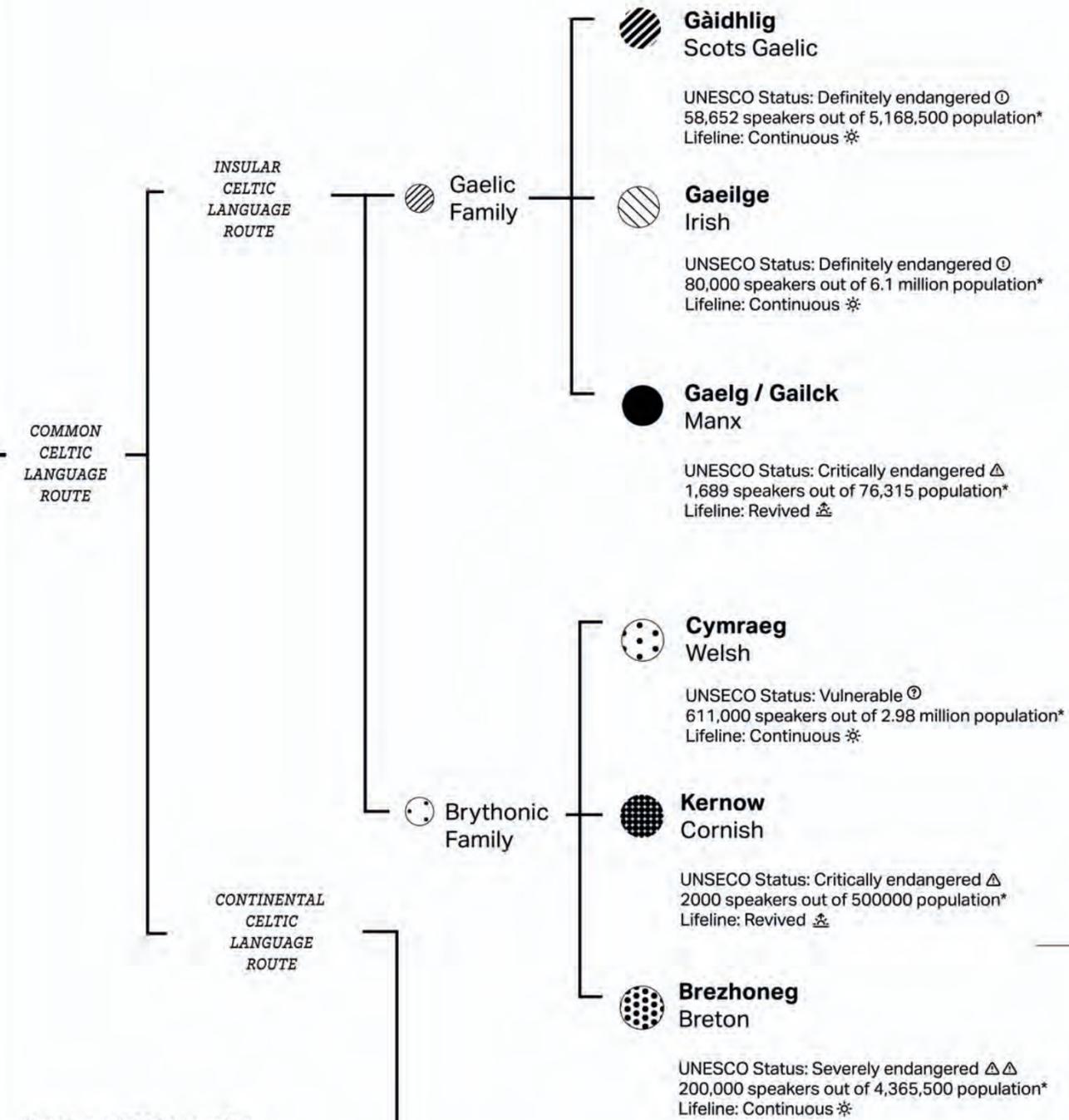
The language we use influences our experience and actions in the world. How we then visually record that language has even further reach. In **Eroded Expressions**, Isabel Lea builds upon her experience as a graphic designer to research environmental words in the Celtic languages of the British Isles. Centring her gaze on the peripheral knowledges of these islands, Isabel collects terms from Scottish Gaelic, Cornish and other languages which speak to nuanced understandings of our topography.

These words provide the basis for a design proposal. During the course of her residency, Isabel developed a new typeface which combines the deep-rooted landscape knowledges woven into these Celtic languages with the dexterity of a contemporary font. Isabel interlinks the research threads of linguistics and graphic design to argue for the vital inseparability of the words we use and the design of the typography that holds them.

Expressions

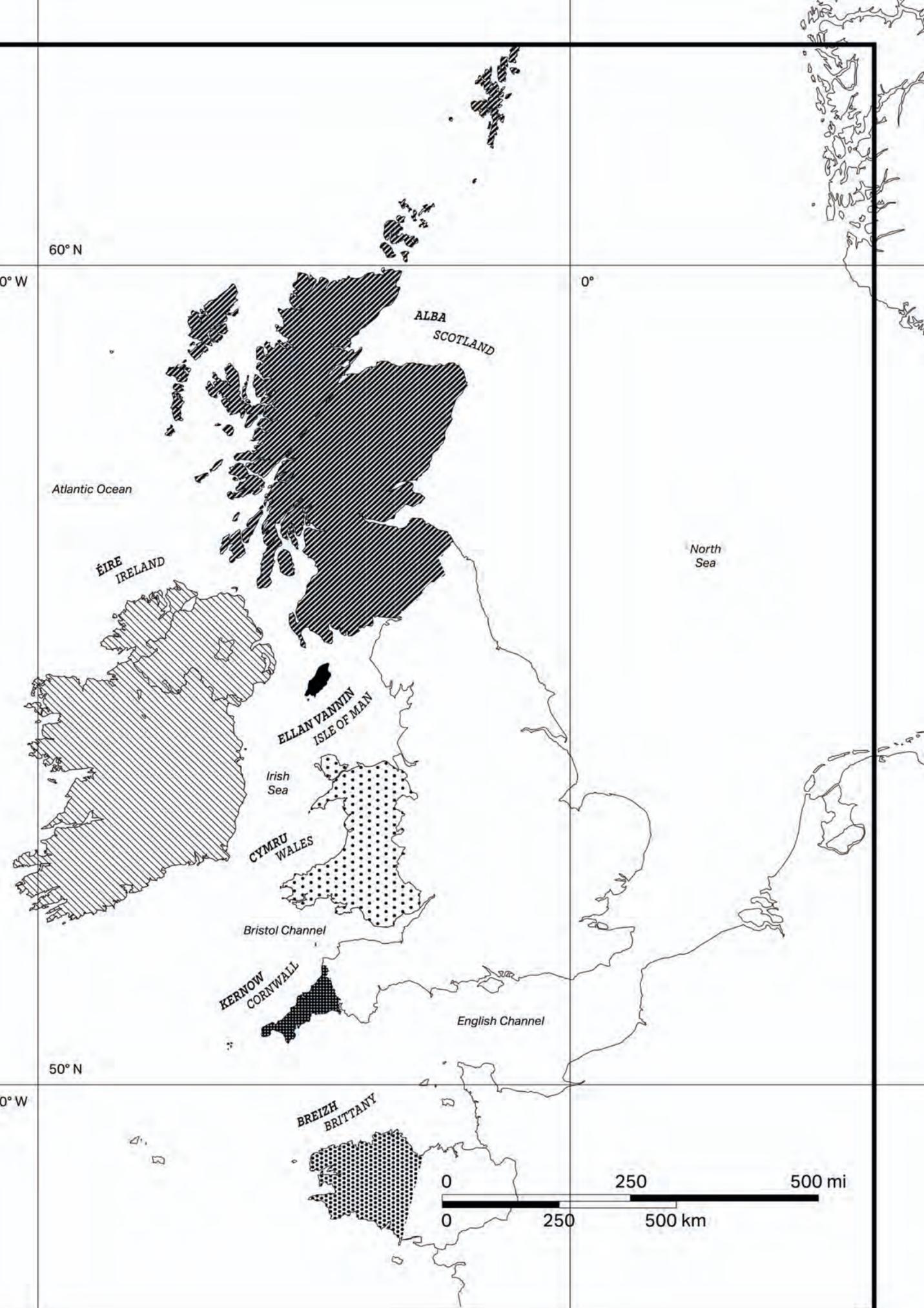
The Celtic Language Archipelago	68
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Reading Between the Signs Typography as a Tool for Social Impact	77
Ogma The Making of a Celtic Typeface	83

The Celtic Language Archipelago



*Data from UNESCO Atlas of The World's Endangered Languages, 2010 Edition.

...to continental Celtic variations



Eroded Expressions

An incomplete glossary

Land and language are intimately connected. Language and the words we use often intrinsically reflect the physical characteristics and cultural practices of a specific place. Words and phrases used to describe the natural features of a landscape, such as mountains, rivers, and forests are unique to a particular language and reflect the way in which people have interacted with and understood their environment over time. Additionally, the language spoken in a given region shapes the way in which people view and interact with nature, influencing everything from agricultural practices to conservation efforts. As such, understanding the intimate relationship between language and land can provide important insights into a community's history, culture, and values, as well as informing efforts to preserve both culture and the environment in the future.

The Celtic languages are a language group with subsidiaries spoken primarily in the British Isles. This group contains Gaeilge (Irish), Gàidhlig (Scottish Gaelic) and Gaelg (Manx) in its Goidelic branch and Cymraeg (Welsh), Kernewek (Cornish) and Brezhoneg (Breton) in its Brittonic branch. These individual languages have a long and complex place-based history and a rich cultural heritage that is deeply tied to the landscapes in which they evolved, from the coastlines of Cornwall to the Scottish Hebridean Isles. Like other languages, they are shaped by their connection to the land, with words and phrases that reflect specific

natural features and cultural priorities. Whilst there are a great many non-linguistic markers in geography and culture that make these areas unique, there are numerous untranslatable words that exist in Celtic languages that do not exist in English, and which reveal a great deal about how certain cultures live in relation to the natural world. While the language we speak does not constrain our thoughts, the concepts we are trained to treat as distinct offer important lessons about what is prioritised in a certain culture. In relation to the Celtic languages, there is a great depth and breadth of vocabulary connected to the environment. To protect and sustainably manage our planet's natural resources, these untranslatable concepts that emerge from the Celtic language give us key knowledges to speak about climate change. Beyond an insight into the past, these words capture knowledges and relationships that today might be overlooked, forgotten, forced out by dominant language and culture. The words we use shape our everyday life: from specific terminology for describing our landscape, to practices for living in harmony in nature, to articulations of belonging to the environment. This essay highlights a selection of untranslatable words from across these languages, and attempts to trace some key themes that emerge when considering Celtic languages and the environment. Due to the ephemeral and constantly evolving nature of language, no glossary could ever be fully complete, but this essay acts as a glimpse of the kind of cultural knowledges that can be uncovered when we pay attention to the differences between languages.

Rooted in Place

Almost all of the Celtic languages have words that convey a sense of belonging to a particular home-place and the way in which the environment is an intrinsic part of that. **Dùthchas**¹ in Gàidhlig (Scots Gaelic), **Dúchas**² in Gaeilge (Irish) and **Cynefin**³ in Cymraeg (Welsh) all refer to a deep connection to a specific natural or rural environment, as well as the cultural heritage that is associated with the past and an envisaged future of the place. These concepts emphasise the importance of having a sense of rootedness and familiarity with one's surroundings, as well as the value of preserving traditional ways of living with the environment and natural resources. All Celtic languages contain a version of this concept, something lacking in English, which arguably disconnects us from the land where we are born. In fact, in Gaeilge (Irish Gaelic) speakers have a term to express an unease with this disconnection. **Aduantas**⁴ speaks to the feelings of dislocation and discomfort that can arise when one is in an unfamiliar place, highlighting the importance of a sense of belonging and connection to one's environment for personal well-being. These concepts suggest that a sense of connection to place can be fundamental to our emotional and psychological well-being, and that the loss or disruption of that connection can have significant emotional consequences. The above concepts also all contain the idea that within these communities your home-place is not just a physical place, but a state of emotional connection to land.

Cianalas⁵ in Gàidhlig (Scots Gaelic) can also refer to a sense of discomfort, but relates more closely to homesickness or nostalgia, and is more subtly about longing or lack of belonging that occurs when away from one's homeland. The Cymraeg (Welsh) word **Hiraeth**⁶, also speaks to a deep longing for a sense of home and connection, particularly when one is separated from one's homeland or a cherished natural environment. Within this particular example though, the dimension of time is also present; one's natural homeplace is a moment in time as much as a physical place. In this way, one can be rooted in place, but also in time. The concepts of **Bownans**⁷ from Cornwall and **Traa Dy Liooar**⁸ from the Isle of Man also both reflect a sense of the importance of time in relation to our connection to place and environment. Bownans speaks to the idea of occupying a particular lifetime within the broader context of natural cycles and processes, emphasising the interconnectedness of human life and the natural world. Traa Dy Liooar suggests that taking time to appreciate and enjoy one's surroundings is essential for cultivating a sense of connection and belonging in life. Together, these concepts suggest that our sense of belonging to place and environment is deeply interconnected with our understanding of time and the natural cycles and processes that shape our lives.

1 **Dùthchas:** *Gàidhlig (Scottish Gaelic)* Refers to a sense of belonging to a particular place, typically a rural or natural environment, and the inherited connection to that place and its culture.

2 **Dúchas:** *Gaeilge (Irish)* Refers to a sense of belonging to a particular place, typically a rural or natural environment, and the inherited connection to that place and its culture.

3 **Cynefin:** *Cymraeg (Welsh)* Refers to a sense of belonging to a particular place, particularly one's place of birth, and the deep knowledge and understanding of that place and its natural environment.

4 **Aduantas:** *Gaeilge (Irish Gaelic)* Describes the angst that comes with being in an unfamiliar place and among unfamiliar people.

5 **Cianalas:** *Gàidhlig (Scots Gaelic)* A sense of homesickness or nostalgia.

6 **Hiraeth:** *Cymraeg (Welsh)* A longing for a sense of home and belonging, particularly a sense of connection to a lost or distant homeland, often associated with feelings of nostalgia and homesickness.

7 **Bownans:** *Cornish (Kernewek)* A lifetime, or 'As long as I shall live'. The lifetime that you occupy in relation to the wider scheme of things.

8 **Traa Dy Liooar:** *Gaelg (Manx)* 'Time enough' to enjoy your surroundings

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Ent (*Kernewek / Cornish*)
To empty out or rain heavily.



Bouder (*Kernewek / Cornish*)
The lane leading from home to pasture



Towerthack (*Kernewek / Cornish*)
Weather-beaten or worn out by the weather



Zawn (*Kernewek / Cornish*)
A fissure or cave in a coastal cliff made by repeated erosion from waves

This idea of being rooted in place extends further to the idea of the senses, and that our connection to the environment is physical as well as emotional. Many Celtic languages have words specifically for when our senses beyond sight (hearing, touch, smell, taste) are engaged by the natural world. This idea of being present in all of our senses is crucial. In Gaeilge (Irish), a **Sabhsaí**⁹ is a person who will be outside no matter the conditions, and in many communities the weather lexicon contains many words for the way one experiences it, rather than just the phenomenon itself. One example is the identification of **Clagarnach**¹⁰ in Gaeilge (Irish), which means the sound of heavy rain on a rooftop. In a similar way, in Kernewek (Cornish), **Troze**¹¹ is the sound of water breaking about the bow of a boat. By isolating specific senses such as sounds as well as words for specific sights, these languages allow for depth of awareness and understanding of the natural world, as well as a way to communicate these concepts to others.

Reading and Respecting the Weather

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Reading and interpreting the weather is another key theme that is reflected in many untranslatable words brought to us from the Celtic languages. In Scotland, for example, the weather is not just a backdrop to the rest of our lives, but a powerful, dangerous and sometimes mystical force that shapes the landscape and the people who live within it. Concepts such as **Udal Cuain**¹² in Gàidhlig (Scottish Gaelic) mean to be at the mercy of the ocean, and, **Zawn**¹³, and in Kernewek (Cornish) is a way of describing a chasm smashed into a cliff by the repeated force of the sea. Both words demonstrate the respect and understanding of the power of the ocean and the repeated force of the sea. Similarly, the Irish Gaeilge (Irish) word **lombhá**¹⁴ highlights a place where there is danger of drowning and the need to be aware of the power of the water. **Towerthack**¹⁵, in a different vein in Kernewek (Cornish), gives a particular descriptor for the effects of weather on objects. At the same time, weather is intrinsic to the need for shelter, with words like **Còsagach**¹⁶ and **Glawgy**¹⁷, reflecting the importance of finding shelter from the elements. The word Glawgy to mean shelter in Kernewek (Cornish), directly comes from the word Glawg, meaning rain. These words demonstrate the comfort and warmth that comes from being inside and protected from the wild elements, and is still intrinsically tied to nature.

Words like **lagas**¹⁸, **Gurnall**¹⁹ and **Bwoaillee**²⁰ go one step further and show how we can read and respond to weather and live in tandem with seasons and weather patterns. These words highlight the subtle changes in nature that can signal changes in the weather and how people have learned to read and interpret these signs over time. A **lagas** (or sun-dog) in Kernewek (Cornish) is a fragment of rainbow

9 **Sabhsaí:** *Gaeilge (Irish Gaelic)* Someone who will work outside no matter how bad the weather is.

10 **Clagarnach:** *Gaeilge (Irish Gaelic)* The sound of heavy rain on a rooftop.

11 **Troze:** *Cornish (Kernewek)* The sound of water breaking about the bow of a boat.

12 **Udal Cuain:** *Gàidhlig (Scottish Gaelic)* To be at the mercy of the ocean.

13 **Zawn:** *Cornish (Kernewek)* A chasm in a cliff formed by the repeated power of the sea.

14 **Lombhá:** *Gaeilge (Irish Gaelic)* Place where there is danger of drowning.

15 **Towerthack:** *Cornish (Kernewek)* Weather-beaten, or worn out by the weather.

16 **Còsagach:** *Gàidhlig (Scottish Gaelic)* A sense of warmth, cosiness and shelter that comes from being inside and protected from the wild elements.

17 **Glawgy:** *Cornish (Kernewek)* Shelter, taken from glawg (rain).

18 **Lagas / Lagas-awel:** *Cornish (Kernewek)* Weather dog or sun dog – a fragment of rainbow on the horizon, foreshadowing foul weather.

19 **Gurnall:** *Cornish (Kernewek)* Change in run of a stream or current, caused by shifting of sand.

20 **Bwoaillee:** *Gaelg (Manx)* A halo or circle around the sun (usually foreshadowing a change in weather).

on a horizon which foreshadows a change in weather. A Bwoaillee, for example, is the ring around the sun in Gaelg (Manx) which foreshadows similar change. Gurnall, on the other hand, reflects the connection between weather and natural elements, meaning the way a stream changes due to sands shifting from the wind or tide. Finally, words like **Aiteall**²¹, meaning a spell of good weather between bad spells, and **Breacaimsir**²², meaning neither good nor bad weather in Gaeilge (Irish Gaelic), demonstrates how these communities have developed a nuanced understanding of the weather as it relates to daily routines. In this way, the untranslatable words from Celtic languages not only illustrate the rich and complex relationship between humans and the environment and how this relationship is reflected in language and culture, but the ways in which we can enrich our understanding of the natural world further than English alone might allow us to.

Reading and Repairing the Landscape

The connection to the environment in these languages is also reflected in the way that their speakers describe and interact with the geography of the landscape. Language can serve as a map, with specific words used to describe the mountains and fields around them. For example, in Gàidhlig (Scottish Gaelic), there are words like **Beinn**²³ for a mountain or high peak, **Sgùrr**²⁴ for a rocky peak or summit, **Stob**²⁵ for a pointed or conical peak, **Aonach**²⁶ for a ridge or spur between two peaks or mountains, and **Meall**²⁷ for a rounded hill or mountain. These words help to give a more precise and nuanced understanding of the natural features of the environment. Similarly, in Kernewek (Cornish), there are words like **Gwetnak**²⁸ for a tree-grown place, **Bounder**²⁹ for the road leading home to pasture, **Clidga**³⁰ for a muddy area around a gateway, and **Gew or Kew**³¹ for the best field on the farm. **Devith**³² also acts as a label for wild uncultivated land in contrast. These words help to give a more detailed picture of the farmland and the specific ways in which it is used. Here, language is a powerful tool for reading and interpreting the landscape, as well as communicating about it, helping to deepen understanding of the environment and the community's relationship to it.

This level of detail not only allows for more nuanced information about the land but also speaks to the relationship between the community and the wider environment. The breadth of vocabulary reflects an interest and desire to understand and appreciate the land. The use of such specific language allows for a more precise familiarity with the environment and a deeper connection to the natural world. In a sense, these words act as a map for the landscape, providing not only a means of communication but also a way of navigating the land itself. In addition to having specific words for identifying and describing

21 **Aiteall:** *Gaeilge (Irish Gaelic)* A fine spell of weather between two showers of rain.

22 **Breacaimsir:** *Gaeilge (Irish Gaelic)* The weather when it is neither good nor bad.

23 **Beinn:** *Gàidhlig (Scottish Gaelic)* Refers to a mountain or high peak, often used in place names such as Ben Nevis or Ben Macdui.

24 **Sgùrr:** *Gàidhlig (Scottish Gaelic)* Refers to a rocky peak or summit, often associated with the Scottish Highlands.

25 **Stob:** *Gàidhlig (Scottish Gaelic)* Refers to a pointed or conical peak, typically found in mountainous areas.

26 **Aonach:** *Gàidhlig (Scottish Gaelic)* Refers to a ridge or spur between two peaks or mountains.

27 **Meall:** *Gàidhlig (Scottish Gaelic)* Refers to a rounded hill or mountain, often used in place names in Scotland.

28 **Gwetnak:** *Cornish (Kernewek)* A treegrown place.

29 **Bounder:** *Cornish (Kernewek)* The road leading home to pasture.

30 **Clidga:** *Cornish (Kernewek)* The muddy area around a gateway.

31 **Gew/Kew:** *Cornish (Kernewek)* The best field on the farm.

32 **Devith:** *Cornish (Kernewek)* Uncultivated wasteland.

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the landscape, many Celtic languages also have specific vocabulary related to the stewardship and care of the land. These words reflect the intimate relationship between the people and the landscape, and the importance of maintaining and preserving it. For example, the Kernewek (Cornish) word **Adgy**³³ refers to a gap in a hedge, while **Fradge**³⁴ means to mend or repair the said gap in a hedge. These words allow for quick communication of specific problems and solutions when working in the landscape. There are also specific words for tools used in land management, such as the Kernewek (Cornish) **Visge**³⁵, which refers to a hammer used for hedging. Further to this, with words like **Foiseach**³⁶ in Gaeilge (Irish), meaning grass that can't easily be reached to be cut, it allows not just for identification of tasks, but of attributes of farmed land defined by their requirements for care. This level of specificity in language reflects an understanding of the environment that reflects the importance of responsible stewardship.

Eroded Expressions

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Language and land are deeply interconnected, and the specificity of language reflects the intimate relationship between people and their environment. The Celtic languages, in particular, offer a rich lexicon of words that reflect this connection and provide insight into how these communities perceive, navigate and care for their land and ways in which we can do the same. From mountain words that give more nuanced information about a specific place, to farming land words that reflect practices of stewardship, to understanding your roots in the environment, these words are a testament to the importance of nature in our lives. In the context of a wider climate emergency, the adoption of vocabulary that is more specific, more relevant and more culturally specific is crucial. By bringing back these lost words, paying attention to them and what they convey, we can gain a greater awareness of and appreciation for both the natural world and the relationship between language and the environment. As we improve our ability to perceive, understand and communicate about our environment, so we open our minds to better responses to changing climates. Whether it's hearing **Clagarnach** or identifying a **Sgùrr**, the words we use to describe our environment now, and in the future, matter.

33 **Adgy:** *Cornish (Kernewek)* A gap in a hedge.

34 **Fradge:** *Cornish (Kernewek)* To mend or repair a gap in a hedge.

35 **Visge:** *Cornish (Kernewek)* A hammer for hedging.

36 **Foiseach:** *Gaeilge (Irish Gaelic)* An area with grass which is difficult to reach to cut.

Reading Between the Signs

Typography as a tool for social impact

'Typefaces are an essential resource employed by graphic designers, just as glass, stone, steel, and countless other materials are employed by architects' – Ellen Lupton¹

When considering how design practices have a critical role to play in social and environmental challenges, most discourse focuses on traditional material practices such as architecture, fashion and product design. Within research circles in the past 30 years, we have seen a shift towards the inclusion of graphic design in the conversation with prominent 20th century design researchers such as Bruce Archer, Nigel Cross and Christopher Frayling carving out ways of identifying a research practice in both commercial and academic graphic design projects.² Though graphic design still operates in the margins of design research, it has begun to forge an identity for itself. As design researchers Experimental Jetset recently noted, rather neatly, 'while graphic design has been marginalised, the margins are, after all, graphic spaces.'³ Into the 21st century, specific design institutions such as the Royal College of Art, and departments in traditional institutions such as Yale University are producing new kinds of design researchers. These researchers are focusing on everything graphic; from branding and print ephemera to digital media. Since days of the Bauhaus, graphic design as both a practice and product has been more widely understood as a tool to nudge public consciousness, and thus instrumental in provoking societal change.⁴ However, the tide has not lifted all boats equally within graphic design, and here, I want to focus on graphic design's forgotten cousin: typography. At the time of writing in the UK, only one establishment offers a research MA or PhD programme specifically in typography or typeface design.⁵ In comparison, there are hundreds of programmes focusing on brand, communication design, advertising and other subsidiaries or contemporaries of graphic design.⁶

Typography is understood as encompassing the visuals of language in all forms, and typographers are understood as those who make typefaces and therefore engineer the interface of language. Designers, meanwhile, are understood as those who employ typography as a device. Graphic design often involves language with the designer intervening between what a design 'says' and what a design 'does', yet typography remains an under-appreciated practice for design research. If, as Herbert Bayer suggests 'typography is a service art, not a fine art'⁷ this opens a question: in service of what? How might we better leverage the impact of typography for design research in service of 21st-century challenges? Here, I will explore how typography as both a design process and a design product warrants more space in design discourse.

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All useful systemic

change stems from the use of language to spread ideas, either in speech or in writing. Here writing is understood as an addition to speech, not just an extension of speech.⁸

By this, we mean that no typeface is a neutral extension of speech. Any lettering we choose to express a word adds meaning through shape choice or punctuation choice and adds an additional layer of meaning. In this case, typographic practice can be seen as an intervention in writing, which allows designers to, at minimum, recover some of the lost aspects of speech in writing (such as intonation and tone) and influence what we understand and accept as meaning. When

we use symbols to represent sounds, we begin the speech to writing process. Typographic symbols such as letters (also known as graphemes) and punctuation and mathematical symbols (known as para-phonological symbols) are required to transpose speech into written form.⁹ The designers who then create these symbols for writing therefore control the systems and social norms of writing.

To be considered a “full” typeface, alphabets are expected to have a ‘default’ set of characters and symbols, consisting of an A-Z in upper and lower case, a basic set of punctuation and numbers. This character set is required for a typeface to be considered ‘industry standard’.¹⁰ Typographic practice then, can be seen as a regulated practice, one that upholds ideas of what language should look like and what should be included or excluded. To intervene on this standard and include different symbols is to intervene and challenge the Western alphabet as ‘default’.

Typography does not just translate speech into writing, but is also a visual layer with its own potential for meaning.¹¹ While graphic design has been quick to leverage the semiotic aspect of design, typography is often taken to be an ‘invisible carrier of content’.¹² Yet, in practice, typography has a sizable impact on meaning. Typographers privilege or obscure pieces of information through their design choices, making decisions about what the author wishes the readers to focus on. By **changing typeface** (shape of letterforms), case (UPPER or lowercase), typographic styling (**styles of letterform**), and typographic form (layout of text in a document) designers always influence understanding.

Within the confines of each recognised character (letter or symbol), building the visual form of a typeface is then reliant on what is called intuitive practice. This would suggest that many typographic traditions result from inherited forms of social order and continue to reinforce them through education and production standards, evidencing a socio-political underpinning to any typographic creation.

“...typefaces perform social change as we use them.”

Typographers deliberately or subconsciously alter the meaning of writing by embedding certain properties into the letterforms to change understanding. There are many ways in which typefaces become embodied with specific meanings, but this follows the logic that meanings for typefaces would depend on patterns of use over time, individual cultural contexts, trends and technological changes.¹³ Regardless of how these meanings change, it is clear that interventions on individual letterforms affect the meaning we read from text and that it can be leveraged as a tool for information or persuasion. In practice, typographers can also project certain associations onto objects by embedding meaning into the writing of objects, thus creating implied differentiation based on visual, rather than written, aspects of language. The social usage of certain typefaces reinforces certain associations: for example, serif fonts are often associated with luxury, while hand-drawn fonts are associated with something being artisanal or small-scale. This gives typographic design the power to ‘sell’ an object through perceived characteristics that come from the typography alone. It can make a product (for example, a chocolate bar) appear higher quality or more luxurious, or a message (such as a political slogan) more trustworthy, more memorable or even more entertaining.¹⁴ All of these factors influence how a written message is internalised or not, and what action is provoked by it. We must then, take more interest in what actions we can and should provoke with typography.

Typography as an object or practice is a resource for meaning-making

that everyone has access to. Everyone must choose a typeface in which to write a document or send an email. In this way, the public understanding of a typeface rests on cultural knowledge partly influenced by non-designers. Non-designers are likely to choose typefaces as ‘suitable’ to the context based on familiarity; reinforcing social visual norms. In this way, the typeface becomes a social product after its creation, and the connotations a designer tries to embed can become transformed through usage. For the general public, the typographer’s intentions or history of a typeface is often unknown. In this instance, the metaphor or metaphoric potential of specific features of letterforms is used to decode meaning. These are often shape or context related and create ‘genres’ that exist at certain times in certain places. In the UK, at the time of writing, this could be **bold italic** fonts being associated with sport, *Light Delicate Serifs* with fashion or hand-drawn font associated with social or ecological concerns. Therefore, when designers embed a typeface with qualities, define its possible uses or clarify how it can or should be used, any meanings are caught up in a much more complicated web of relations. This cultural circuit is ongoing, and therefore the meanings of typefaces will be subject to constant flux. Here, we could argue that typefaces perform social change as we use them. By doing this, it can be argued that they have an essential role in mediating human relationships, even prescribing morality, ethics and politics through how we use type as embodied speech to instruct, emphasise, order, entertain and convince.

In recent years, digital and other computing technology has also allowed for even more deviation from typography as a simple representation confined to the printed format. As Jessica Hefland notes, ‘what happens when written words can speak? When they can move? When they can be imbued with sound and tone and nuance, with decibel and harmony and voice as in film, animation, and web-based responsive typography?’¹⁵ This is an exciting development, where writing can go well beyond representation and become a rich textural site for critical deconstruction and speculative thinking into what constitutes language representation. The typographer here is still a translator of the spoken to the visual, but with different tools and the ability to represent different aspects of language. To repurpose Christopher Frayling’s seminal 1993 paper, the soil is now fertile for research into typography, research for typography or research as typography.¹⁶ By understanding the way meaning is layered onto messages through typography we open the door to understanding and manipulating perception. With new technology, typographers also have more opportunities to experiment and push the boundaries of how speech is represented. Even if those meanings can only exist in certain times and places, this makes it all the more important to ascertain where and when those crucial moments are, in order to influence public discourse. As the visual interface of language, typographic design practices have a critical role to play in our upcoming societal challenges. It is up to typographers to recognise this role, and design research institutions to re-centre typography in discussions of design research for social impact.

Ogma

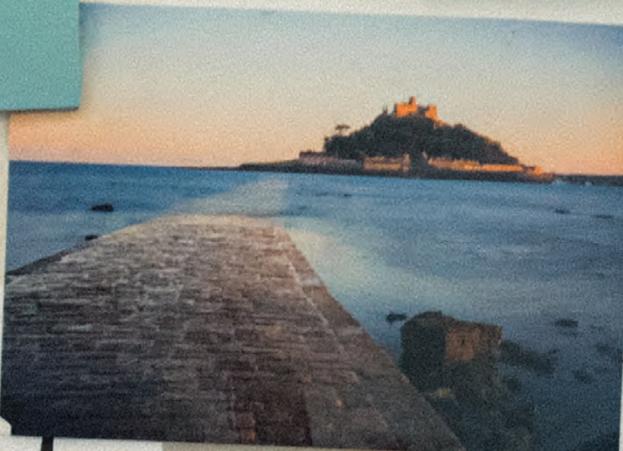
The making of a Celtic typeface

Ogma is a typeface that modernises traditional scripts from the Celtic languages. Breaking from typographic convention, where Latin script serves as a foundation, Ogma showcases the richness of Celtic calligraphic styles while providing all the necessary characters for both modern digital formats and for writing in Gaelic, Scots Gaelic, Welsh, Manx, Cornish and English.

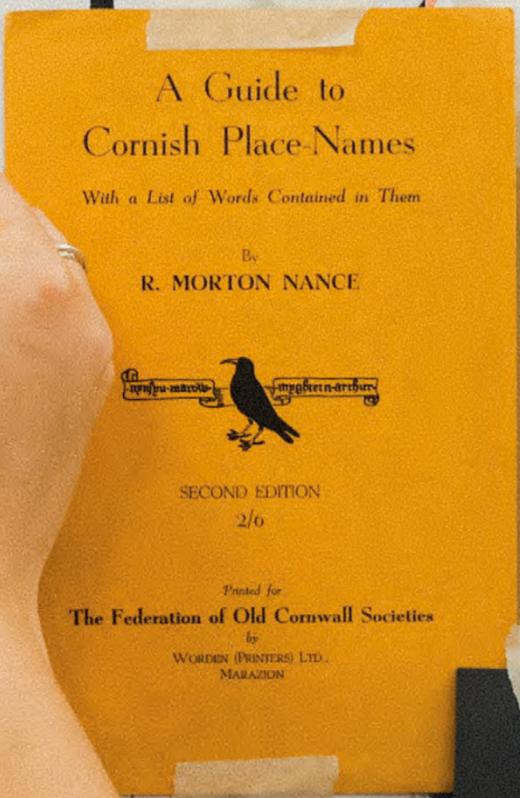
Research Phase

The creation of Ogma began with an extensive linguistic and visual research phase. This involved exploring the calligraphic heritage of different branches of the Celtic language family, delving into historical and contemporary uses, studying intricate forms and strokes and how these change over time and region. Simultaneously, the research required an understanding of the linguistic nuances of the different languages, ensuring that Ogma would encompass all the characters required for authentic written expression.

Handwritten notes on a piece of paper in the top left corner, including the word "CHARACTER" and some illegible text.



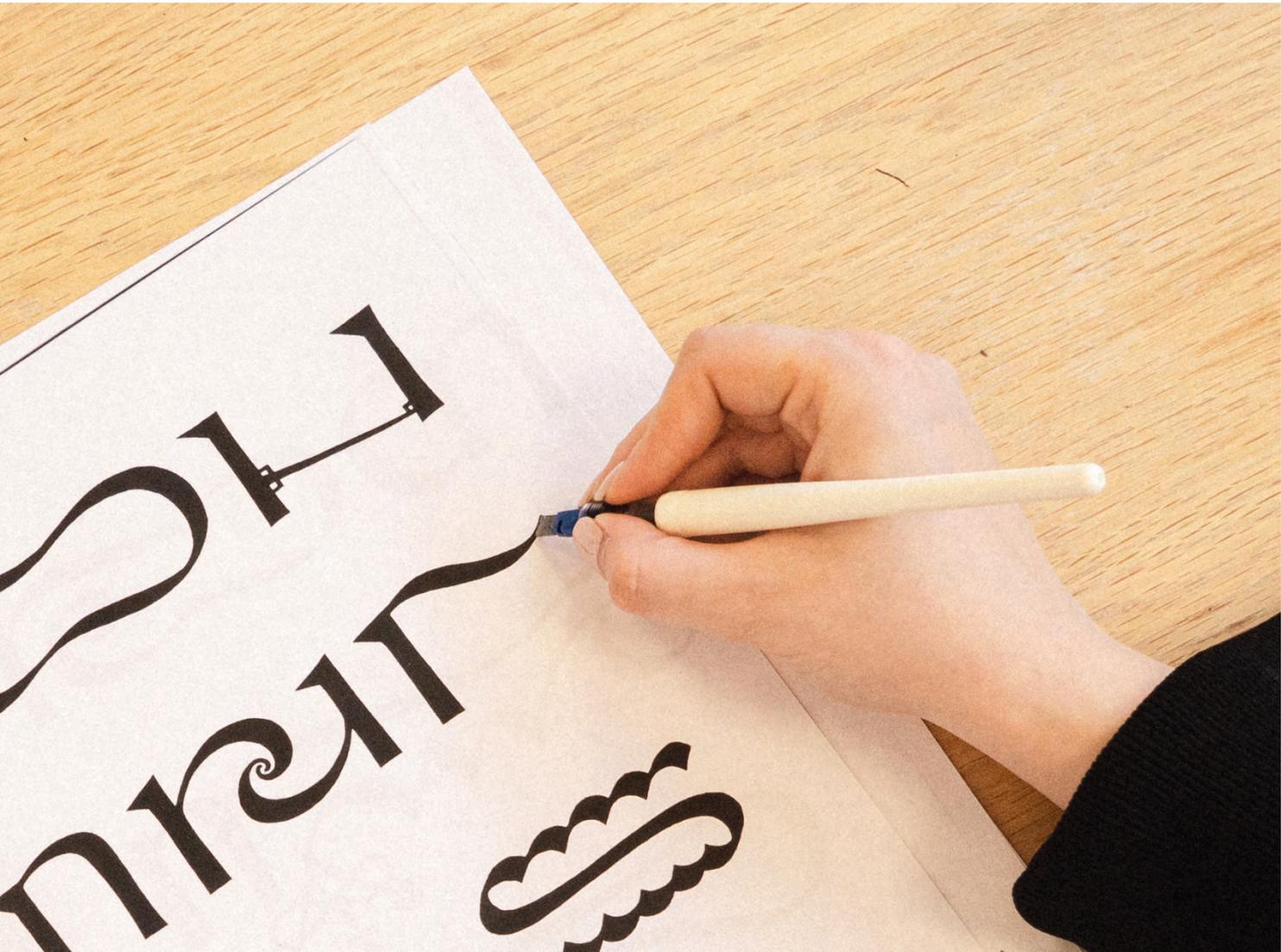
Large black letters 'a', 'N', 'n', 'T', and 't' are displayed on a white background. Red handwritten annotations and arrows are scattered around the letters, providing details on their construction and proportions.



Two pages of text from a book, likely a dictionary or a reference work. The text is dense and appears to be in a non-English language, possibly Cornish or Gaelic. The pages are numbered 30 and 31.

Hand Drawing Phase

Equipped with contextual understanding, the first stage of the creation process was calligraphic hand drawing. This encompassed understanding traditional calligraphic tools and techniques, and how these influence letterforms. Using source materials from field research and educational guides, this exploration through drawing was crucial to imbue digital drawings of the typeface with the essence and spirit of the original scripts found across the British Isles.



Left: Early drawings with a parallel pen, a modern calligraphy tool

Right: Calligraphy practice exercises

Digital Drawing Phase

Once the calligraphic hand drawing phase was complete, sketches were digitised and developed in order to identify the typographic DNA. This phase required a delicate balance of preserving the organic flow of the calligraphic forms while adjusting the shape, weight, spacing and proportions to ensure optimal readability and versatility across the digital realm. This typeface acts not as a revival, but instead as a modernisation, so care was taken to balance traditional calligraphic elements with modern digital-led type design.

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Refinement & Finalisation Phase

The refinement and finalisation phase marks the most meticulous part of the typographic design process. Each letter was reviewed and refined in detail to ensure consistency, legibility and aesthetic harmony across all characters. Kerning pairs were carefully adjusted and the overall rhythm of the typeface was fine-tuned.

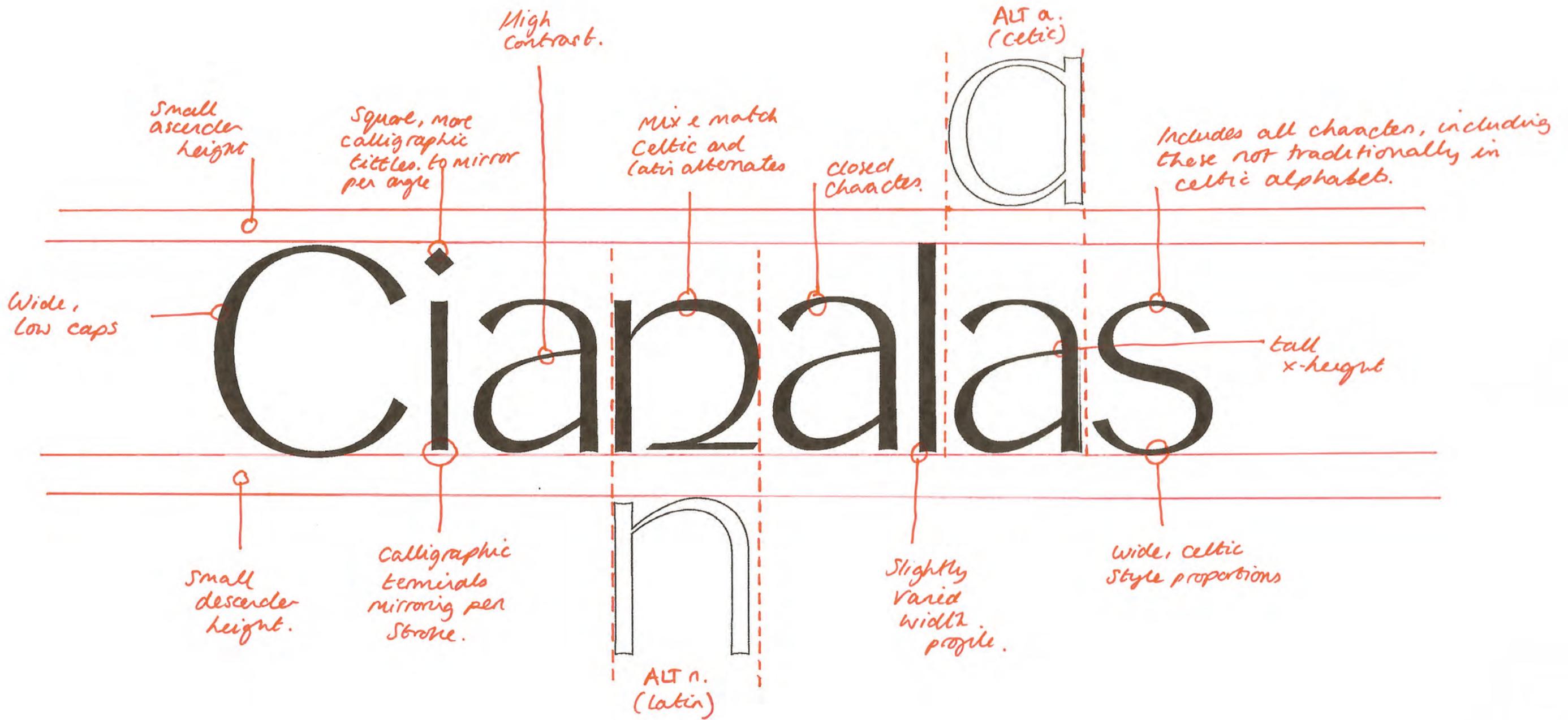
Left: Harmonising characters in Glyphs

Right: Marking out corrections on a print proof

Isabel Lea

Aa Bb Cc Dd d̂ Ee Ff Gg
 Hh Ii ĵ ĵ̂ Kk Ll Mm n̂ n̂̂
 Oo Pp Qq Rr Ss Tt t̂
 Uu v̂ v̂̂ Ww Xx Yy ŷ ẑ ẑ̂

end early
Add small serifs to E/F
lengthen joins heights
make dot more calligraphic.
Alt. join?
square
pointed
different approaches
end early
too heavy
1 p.g. d, b / but bigger than / o /
Different terminal
also too wide
too wide
serif here also
check x height between y alternates.





Dovecote

James Peplow Powell is an architect and researcher. He is a co-founder of the research collective Feral Partnerships and worked as a specialist in sustainable and ecological design at Gort Scott architects before founding his own design studio in 2022. His design and research agendas are focused on reclaiming more-than-human social, material and design practices in the context of ongoing climate and ecological breakdown. He studied at the University of Cambridge and the Royal College of Art.

Few species elicit revulsion like the pigeon, and yet few other species are also so intertwined in the places we live. What can the pigeon tell us about how to better co-exist with non-human animals?

In **Dovecote for London** James Peplow Powell dives deep into the shared histories of humans and pigeons with a focus on the designed objects and tools that have made up this history, from musical instruments to agricultural infrastructure. For James, the pigeon is a gateway to understanding the shifting ways humans have related to different species as productive partners, playful performers and pestering pariahs. Learning from this history, Dovecote for London proposes an urban agricultural system based around a new design for a dovecote – a home for pigeons. The project advocates for a built environment that fosters interspecies collaboration over the expulsion of the natural world into isolated nature reserves.

for London

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Partners to Pests

A visual history of pigeons and humans

Pigeons were domesticated by humans from wild rock doves over 10,000 years ago, and ever since these animals have inspired a diverse range of close and interdependent relationships with people, most of which we have forgotten today. This photo essay presents a few snapshots from this long and shared history.



Left: 'The Fanciers' series, Theo McInnes (@theomcinnnes)

Right: A Medieval manuscript illustration depicting the work on an agricultural estate during the month of February. From 'Les Très Riches Heures du Duc de Berry', around 1412-1440 CE. (Condé Museum, Chateau de Chantilly, Oise, France)

The structure on the far right is a dovecote.



Dovecote

Humans first domesticated pigeons as an agricultural ally in the early cereal-farming communities of the Middle East and North Africa. Initially a source of food, humans realised that their droppings – called guano – made high-quality fertiliser. Dedicated houses for pigeons – dovecotes – were built to collect guano, and these became key infrastructures in the agricultural system. This collaboration between humans and pigeons was so successful that it spread throughout Europe, Asia and Africa. In the Middle Ages in Britain and Europe, the dovecote was a prized asset of agricultural estates and a symbol of wealth and fertility.

Dove Love

The usefulness of pigeons to people led to relationships of care, which flourished in a diversity of cultural practices from painting to religious symbolism to music. In Beijing, China, an ancient and dying practice occasionally bathes the city in an eerie soundscape generated by pigeon flight. Lightweight Aeolian flutes, shaped from bamboo and gourd, are tied to the tail feathers of pigeon flocks. The flutes are claimed to protect the birds from predators and aid coordination of the flock, but most likely simply appealed to the artistic sensibilities of their cohabiting humans.



Top: Releasing a pigeon from a tank, 1914–1918. Courtesy Imperial War Museum.

Bottom: Royal Engineers Signal Service on the Western Front, 1914–1918. Courtesy Imperial War Museum.



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Top: Pigeon Whistle, Collection of the Horniman Museum

Bottom: Pigeon Post (1843), Miklos Barbaras

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Communication

The pigeon's remarkable capabilities for fast and accurate long-distance navigation have long been harnessed by people for communication. News agency Reuters was founded as a pigeon information service, with the birds carrying the latest stock prices between Berlin and Aachen in under two hours. While now widely replaced by the telephone and internet, we have continued to turn to pigeons for communication when formal infrastructures are severed, such as in times of natural disasters or armed conflict. Of the 54 animals to have won a Dickin Medal for bravery and life-saving actions in warfare between 1934–49, 32 were pigeons.

James Peplow Powell

'The Fanciers' series,
Theo McInnes (@theomcinnnes).



Top and bottom: Stills from 'Trafalgar Square Pigeons',
1963. Courtesy British Pathé.

Trafalgar Square

Trafalgar Square was once world renowned for its resident pigeons. People of all ages and social classes would buy seed from licensed stalls to feed the birds: a practice so characteristic of London landmarks that it was immortalised in song in Walt Disney's 1964 film 'Mary Poppins'. At the turn of the millennium, Trafalgar Square became subject to a £25m project of urban renewal. By this time, pigeons had come to be regarded as "nuisance birds" by the Greater London Authority and, as a result, a campaign was undertaken to remove pigeons from the square. Feeding pigeons at Trafalgar Square became criminalised in 2003, ending a practice of urban pigeon care that had taken place on the site since construction began in the 1830s.

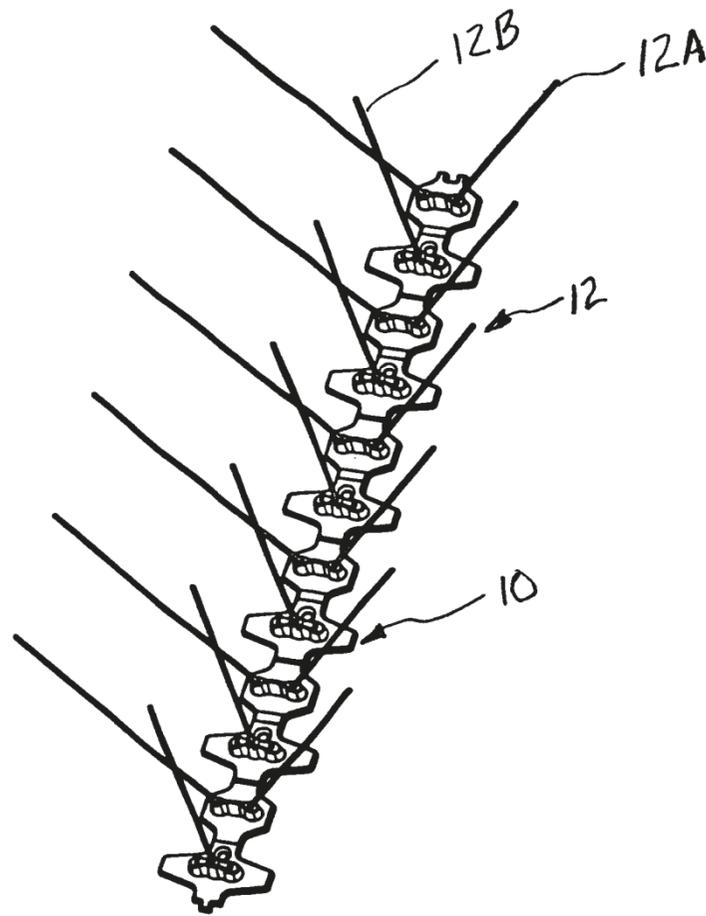


Sport

Pigeon racing, by some estimates, was the most popular sport in Britain by participation during the 1950s and 1960s. In a pigeon race, specially trained homing pigeons are shipped to an unfamiliar location, sometimes over 1,000 kilometres from their home loft, and released. Pigeons are ranked by their fastest average speed on the journey home, which can commonly be over 60 miles per hour. While fraught with contradictory relations of care and cruelty in its most competitive forms, racers are united by a vicarious awe at the pigeon's flight and unknowable journey home.

Pests

London has a feral pigeon population of around 1 million, according to the Royal Pigeon Racing Association, originating from escaped domestic birds and messenger pigeons that failed to return home. This population is kept abundant by food waste and resilient practices of bird feeding, but is limited by breeding sites, so pigeons will quickly roost in abandoned buildings or the undersides of bridges. The spatial devices used to deter or exclude pigeons from such areas – such as spikes and netting – mirror the spatial strategies used to expel human vagrancy from public spaces. These strategies tend to be ineffective in the face of pigeons' persistent homing instincts, which are built on profound attachments to place, handed down across multiple generations.



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A Billion Birds or None

What we care about when we care about pigeons

In a city such as London, pigeons are one of the few “wild” animals with which we are guaranteed a daily encounter. This is a fact not universally celebrated. The stories we have been told about pigeons – “rats with wings, but without the brains” – typify a relationship based on begrudging tolerance and occasional irritation.¹ To the institutions managing the city, pigeons are a pest, with a knack of finding their way in through the smallest spaces to roost in transport infrastructure and construction sites.² They are everywhere, and they shit everywhere.³ So why should we give a shit about pigeons?

Over the course of my residency, I kept seeing and hearing stories of people caring for pigeons. The community groups providing a free, on-demand pigeon rescue service across London at any time of day; the wildlife charity my sister volunteered for, tending sick pigeons back to health; the friend who took a young pigeon with a broken wing into their house and helped it recover; and another who had kept pigeons as a child, and talked of the care with which they would clean out their loft every day. Pigeons frequently lose toes when they become entangled in nylon threads or hair, blown out from barbershops; in response, “de-stringers” scour the city, spending evenings and weekends extricating stricken pigeons from this form of human carelessness.⁴

In the spirit of the de-stringers, how might we begin to disentangle pigeons from these contradictory relations of disdain and care? What do we care about when we care – or don't care – about pigeons? And how might this matter to the world?

In their influential definition, the feminist political scientists Joan Tronto and Berenice Fisher describe care as:

‘a species of activity that includes everything we do to maintain, contain, and repair our ‘world’ so that we can live in it as well as possible. That world includes our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web.’⁵

These activities include care for: the physical aspects of hands-on care, which might be represented by pigeon feeders or rescue groups; caring about, which describes an emotional investment in place, community, or concern, such as animal rights or climate change; and finally caring with, which describes how we collaborate with others in caring for our world, such as mobilising politically.⁶

Care is never innocent or objective. If worlds are maintained by care, then it matters which worlds, and which subjects are deemed worthy of care, and it matters which “others” we care with. Our collective stories are critical to this: especially from positions of alienation or indifference, careless. In the words of the renowned zoologist and theorist Donna Haraway, ‘it matters which stories make worlds, which worlds make stories.’⁷ What might we hear, if we listen to the pigeon's story?

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Island Care

Long before feral pigeons would occupy London's streets and squares, a very different pigeon briefly visited, never to be seen before or since. It is mentioned in the memoirs of the English theologian, Sir Hamon L'Estrange:

'About 1638, as I walked London streets, I saw the picture of a strange fowle hung out upon a clothe and myself with one or two more then in company went in to see it. It was kept in a chamber, and was a great fowle somewhat bigger than the largest Turkey Cock... The keeper called it a Dodo.'⁸

This was the first, and likely only, time Londoners might have seen this famous, flightless symbol of extinction. The Dutch colonists of the island of Mauritius, who had brought the dodo to London, also extensively hunted the birds, and introduced the pigs which ate their eggs from their nests on the ground. Only a quarter of a century later, in the early 1660s, the dodo was extinct.⁹

We have likely all heard of the dodo as the poster child of species extinction. We might be less aware that it was a pigeon: a descendent of those which flew to the island of Mauritius long ago and became flightless. The dodo's ancestors were not alone in making this journey. Of the 344 species scientists have now identified in the pigeon family, their greatest diversity is on islands and archipelagos, where many still cling on to existence in tiny numbers. The pink pigeon, also a resident of Mauritius, declined to ten individuals in 1991 before bouncing back after conservation efforts; the Socorro dove, native to islands off the west coast of Mexico, is now extinct in the wild; the Negros fruit dove, from the Philippines, may still exist but has not been seen since 1953.¹⁰

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Last year, the black-naped pheasant-pigeon was spotted on a camera trap on the tiny Fergusson Island, off Papua New Guinea.¹¹ It hadn't been seen by scientists since 1882.

The story of the dodo led to the prevailing belief that biodiversity depends on keeping the incompatible biological worlds separate.¹² It has come to shape how we care about extinction more widely, and how that care is directed, through global conservation charities, towards nature reserves, as isolated ecological islands within a sea of human activity.¹³ Global strategies towards arresting biodiversity loss continue to depend on expanding and consolidating protected areas. At the COP27 biodiversity conference in December 2022, countries agreed a landmark '30x30' pledge, to protect a third of the world by 2030.¹⁴

However, when we care in island ways, we can overlook specificities of the dodo's story. Most significantly, that Mauritius was a special case: an uninhabited island, without Indigenous peoples. This context allows the blame of extinction, in European minds, to be placed on a monolithic idea of "human activity". This matters because it leaves little hope for humans to act less destructively in the mainland: wrongly so, because there are many histories of Indigenous peoples who have lived with care for other species in different contexts for thousands of years, and continue to do so today.¹⁵ When European colonists arrived, their lack of longstanding relationships of care for the species and lands they arrived in became devastating for other species. But that is the story of a different pigeon.

Mainland Care

In mid-19th century North America, a phenomenon which is hard to imagine today was described by the naturalist and artist John James Audubon:

'The air was literally filled with pigeons; the light of noon-day was obscured as by an eclipse; the dung fell in spots, not unlike melting flakes of snow, and the continued buzz of wings had a tendency to lull my senses to repose ... Before sunset I reached Louisville... the pigeons were still passing in undiminished numbers and continued to do so for three days in succession.'¹⁶

This was an encounter with a flock of passenger pigeons. So named from the French passager, for "passing by", these migratory pigeons would roost in the southern US states and fly north in spring to the Great Lakes and New York. Their migrations are often described in apocalyptic language: flocks so large that they would block out the sun, the approaching sound of billions of wings like distant thunder, with flocks taking several days to pass by.¹⁷ A contemporary bird observer, Alexander Wilson, estimated a flock at 2.23 billion individuals, the equivalent of 4 hundred times the UK's entire pigeon population, flying together in one group.¹⁸ Passenger pigeons have been estimated to be the most populous bird species on the planet, ever.¹⁹

From the 1860s, passenger pigeons began to be hunted by European colonists on an industrial scale, as a cheap food for the urban poor.²⁰ Advances in communication and transportation technologies allowed the locations of passenger pigeon flocks to be tracked, captured and packed into railcars.²¹ The scale of this operation was greater even than the passenger pigeon's unthinkable numbers, and the wild population of the passenger pigeon crashed to zero in less than 50 years. By the time of the passenger pigeon's extinction, conservation, national parks and zoos were all well established in the US.²² So why did the passenger pigeon not survive in some small refuge, like our other island pigeons, which could be protected by conservationists from the outside world? The answer, it appears, is that passenger pigeons were a highly social species, collaboratively raising young and finding food.²³ Their vast flocks, similarly, were a collective effort by the pigeons against predation. By the time passenger pigeon numbers had dropped enough for them to acquire rarity value to American society, it was too late. The passenger pigeon could exist only as a billion birds, or none.

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Martha, the last passenger pigeon, died at Cincinnati Zoo at 1pm, September 1, 1914. This date could be marked in a longer timeline of events – from Columbus, to the nuclear bomb, to the proliferation of chicken bones – which trace potential entry points into the Anthropocene: an era defined by the dominance of human activity.²⁴ Martha's death marks the point when species extinctions could no longer be passed off as localised, island phenomena – the result of long separated, conflicting worlds coming into contact – but as an inherent consequence of modern, extractive relationships with the world.

The passenger pigeon's story should have warned us that the practices of island conservation, born from stories like the dodo's, are not attuned to the Anthropocene. Once-common species are declining worldwide, with uncertain tipping points towards extinction.²⁵ Moreover, the boundaries of island reserves – topographical or artificial – are entirely porous at the micro and macro scales of pollution and climate breakdown. These islands of other-than-human care will become ever more untenable and ineffective, at a time when all our worlds are changing, and when natures, species and peoples must become migratory to survive.²⁶ Caring about the passenger pigeon's story underlines that our future – and that of many other species – will depend on a transformation in the spheres of human activity, in the ethics and care that we take in our everyday environments.

We need to rework our landscapes of what we care about, and why. The value judgements of conservation tell us that animals, which are numerous, and thrive alongside humans, are not worthy of our care – and in the island reserve, they may be deemed threats to rare species, and subject to persecution.²⁷ This thinking is part of the dominant landscape of carelessness in the mainland, which plays out in our attitudes towards the familiar urban pigeon. How might those marginalised forms of care, for the everyday pigeons in our streets and backyards, lead us towards a more hopeful future?

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Hidden Care

The preceding photo essay presents snapshots into the long history of human collaboration with the wild rock dove: a species of pigeon native to rocky cliffs in Western Europe, the Mediterranean and the Middle East. This collaboration has changed both species: helping the former into the life of a settled, domesticated agriculturalist, and the latter, into diverse domesticated breeds, including the familiar urban pigeon.

These relations are characterised by some of the unequal relations of domestication, but also by artistic, cultural and religious celebration. Care for pigeons was widespread both in the home, and in public, where it became a performative urban spectacle.²⁸ This longer history helps situate the marginal practices of care I discovered, from the de-stringers to my friend's pigeon keeping. But what of the more prevalent flip in public attitudes towards carelessness and exclusion?

“Pigeons have become dirty: a species out of place.”

Today, the story of human–pigeon collaboration has been hidden from us by another, more dominant story of technological progress. This story tells us that technology ‘makes our lives easier’: in other words, it allows the privileged modern human to care less – and in its futuristic utopian extent, to be entirely careless – about the infrastructures which they rely on for life.²⁹ To permit this carelessness, humans have been subject to often fraught and violent campaigns to remove them from ancient, interdependent relationships with other species, which are more demanding of our care.³⁰ In this way, modern technology has made redundant many of our historic relationships with domesticated pigeons. The pigeon as messenger has been replaced by the telephone and the internet; pigeon fancying, arguably, struggles to find a place in a world of more immediate entertainment; and the pigeon as an agricultural partner has found itself left outside of modern, industrial agricultural practices.

These redundancies have clearly been critical to the loss of societal care about pigeons. Meanwhile, pigeons' resilience and their lack of fear of humans, made possible by their domestication, has allowed them to remain in cities long past their human-designated time of utility. The anthropologist Mary Douglas defined dirt as ‘matter out of place’, pigeons, too, have become dirty: a species out of place.³¹

However, this loss of human–pigeon relationships doesn't just matter to pigeons. It matters to all species' ability to maintain a liveable world. The dovecote – or house for pigeons – is an example. As a guano-collecting infrastructure for soil fertility, it was made redundant by chemical fertilisers in the mid-20th century, and today nearly all of these structures, and the human–pigeon relations they fostered, lie in ruins. Instead, fertilisers are produced out of the sight and mind of nearly all humans, in industrial facilities, using the Haber-Bosch process. This production process releases 450 million tons of carbon dioxide annually, as well as being the predominant source of the potent nitrous oxide greenhouse gas: together these lead to agriculture contributing up to 27 per cent of anthropogenic global heating.³² The endless availability of fertiliser has encouraged their overuse, damaging the world's largest carbon sink, the soil. The resultant run-off from fields has led to vast aquatic dead zones.³³

Dovecotes were, of course, built with a more local scale of care in mind than that of the planetary. Their role as an infrastructure for planetary care remained hidden until – like a power cut or a leaking pipe – it became visible on breakdown.³⁴ Hidden forms of care, wrapped up in human–animal relationships, have become hidden forms of carelessness in the technologies that replaced them. The effects of this hidden carelessness played out invisibly for many decades, at scales humans cannot see, in particulate pollution, the disruption of microbial soil communities, and the planetary hyperobjects of climate and ecological crisis.³⁵ As the dominant story of technological progress moves on to new “sustainable” territories, which other forms of carelessness could be in hiding, waiting to emerge?

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of caring about extinct species, both the passenger pigeon and the dodo have been recently proposed as candidates for 'De-Extinction'.³⁶ While the dodo might grab more headlines, the resurrection of the passenger pigeon is a far more radical proposition. An island species might feasibly flourish within a familiar framework of small, managed nature reserves, but how would we start to create a reserve for a migratory pigeon that must exist as a billion birds, or none? Resurrecting such a species would require a transformation in the ways that humans live, everywhere. But must we resurrect a species for such a transformation to occur? Returning to Joan Tronto's definition of care as 'a species of

activity that includes everything we do to maintain, contain, and repair our "world"', how might we design instead for the resurrection of an extinct species of care: namely, caring infrastructurally with pigeons?³⁷

Of course, this "species" is not extinct but unsighted, residing in archipelagos of care uncharted by the institutions of conservation or sustainability. Pigeon infrastructures continue to be useful when formal infrastructures fail, such as in conflict zones or during natural disasters.³⁸ For this project, I have spoken to pigeon-keepers, such as the author Jon Day, who collect and utilise their guano from domestic pigeon lofts for use in small-scale community gardens.³⁹ There are many other forms of care that maintain our shared world, from cleaning and maintenance work to domestic labour, which are rendered invisible by the prevailing definitions of what is of value to the world.⁴⁰ This project and the stories presented here are an attempt to re-centre care for the domesticated pigeon as one of the hidden practices on which our shared world depends, and to ask how this might be recognised by the institutions that are involved in the management of our urban environments.

Caring with the feral pigeon is seen as valueless by conservation practices and technological conceptions of sustainability, but it might just be an entry point for the multispecies designer – or for that matter the policymaker, maintenance worker, gardener, or concerned citizen – to become responsive in meaningful ways to the daunting, complex, and multi-scalar problems of our time. This is planetary care that starts with the simple but transformational act of caring about pigeons.

Four Dovecotes

An architectural typology

Dovecotes – houses for pigeons – are found across the world, in a diverse range of architectural forms, materials and construction techniques. Four examples are presented in the pages that follow.

In comparison to the domestic pigeon loft, the dovecote was a collective infrastructure designed to host large numbers of pigeons. Their functions were varied but principally guano was collected for fertiliser, saltpetre for gunpowder and leatherworking. In the Middle East, where it emerged, the dovecote was instrumental in making otherwise infertile territories cultivable.

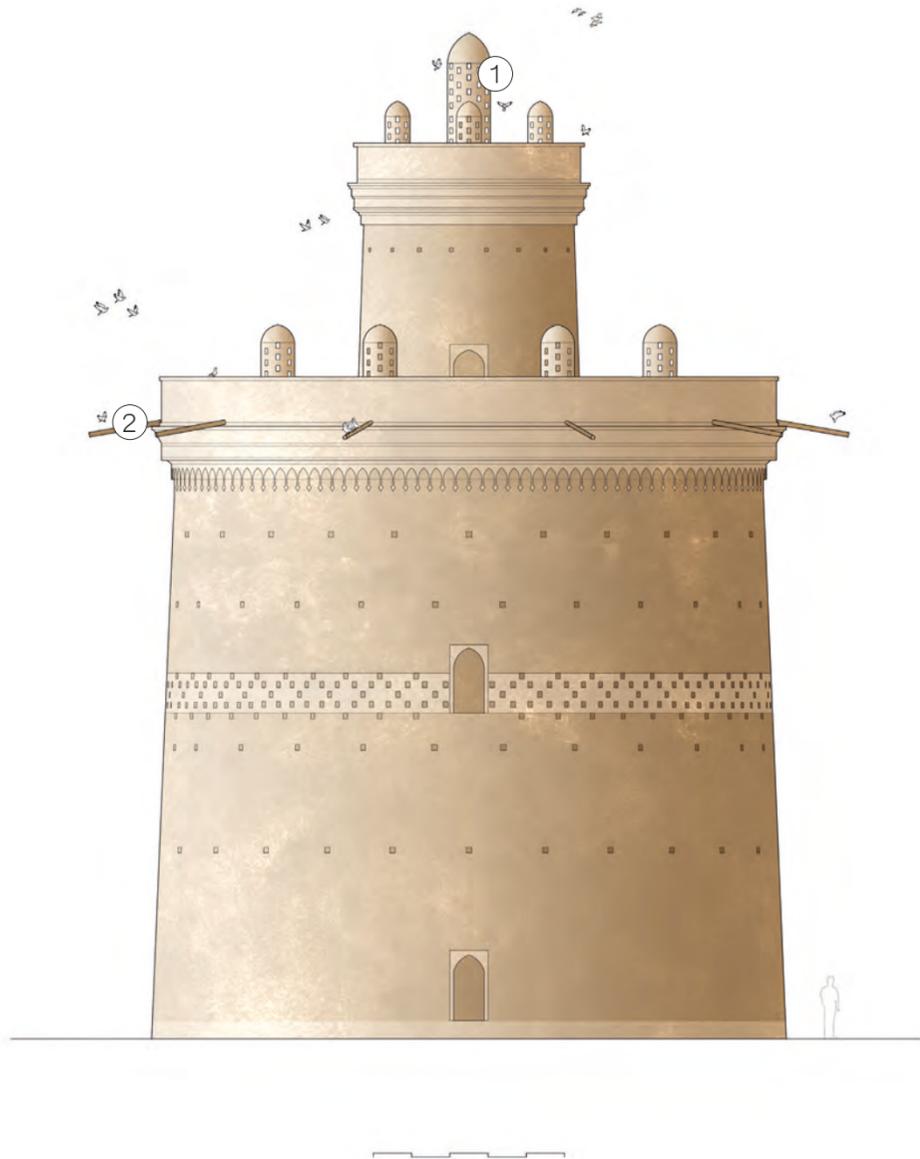
Today, with the rise of industrialised farming and synthetic fertilisers, these buildings – and the human-pigeon relations they fostered – lie in ruins. Modern dovecotes have occasionally been built as spectacular features in the city or to reinvigorate dying practices of pigeon fancying. Meanwhile, the chemical replacements of guano as fertiliser, produced industrially via the Haber-Bosch process, are heating the climate through carbon emissions, and disrupting ecosystems in land and sea through excess run-off from fields. To the contemporary designer, the dovecote represents both a forgotten sustainable infrastructure and a rich resource archive of architectural design for pigeons.

Isfahan Pigeon Tower

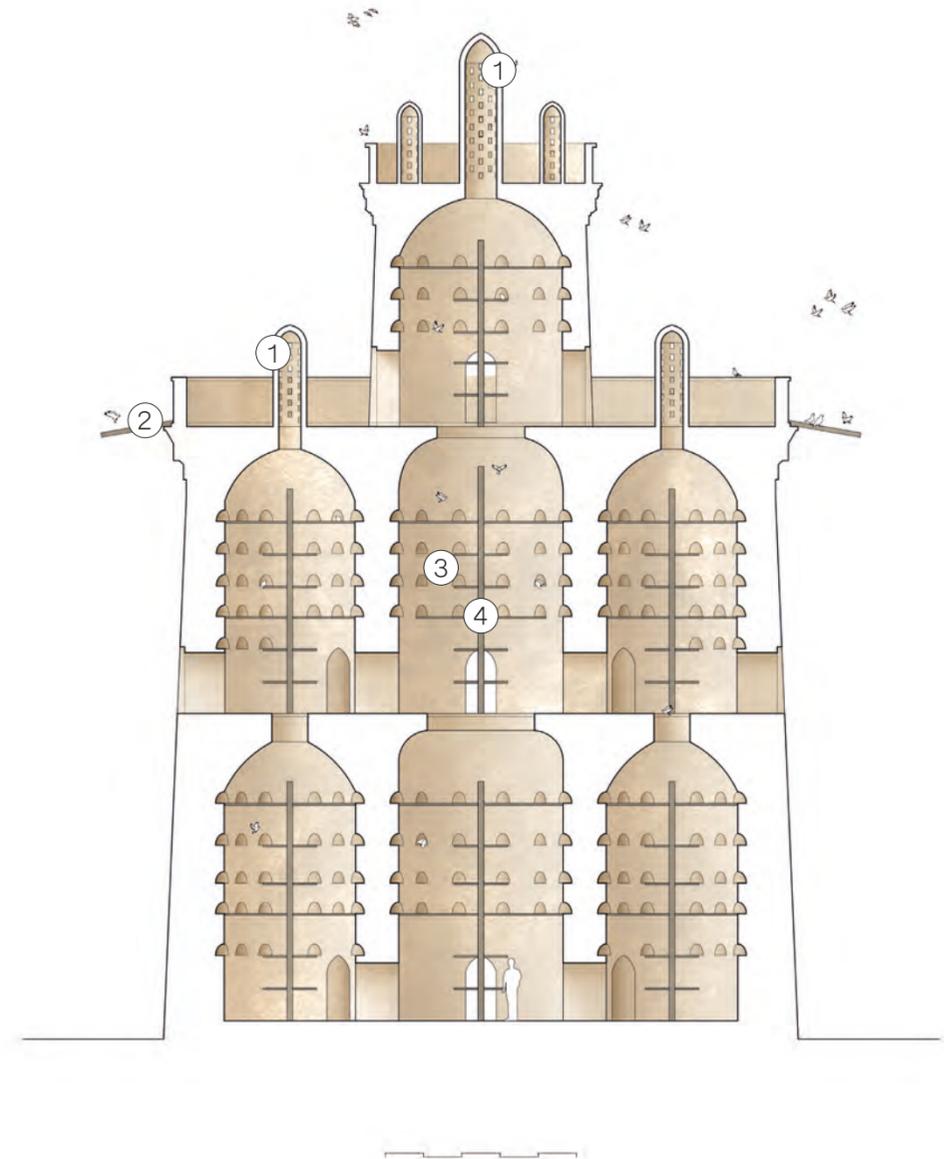
In texts from as early as the fourth century CE, thousands of pigeon towers have been described in the environs of the city of Isfahan in Iran. The towers were entered once a year for the collection of guano (manure), which was extremely valuable as fertiliser, used for the growing of melons and watermelons, as well as for the tanning of leather. The birds were never eaten. By improving the productivity of the surrounding nitrogen-poor soils, these dovecotes made possible the eventual urban centre of Isfahan, and later the cultivation of beautiful gardens for which the city became renowned.

- 1 Pigeon entrances
- 2 Timber pigeon perch
- 3 Pigeon nests
- 4 Timber ladder-frame

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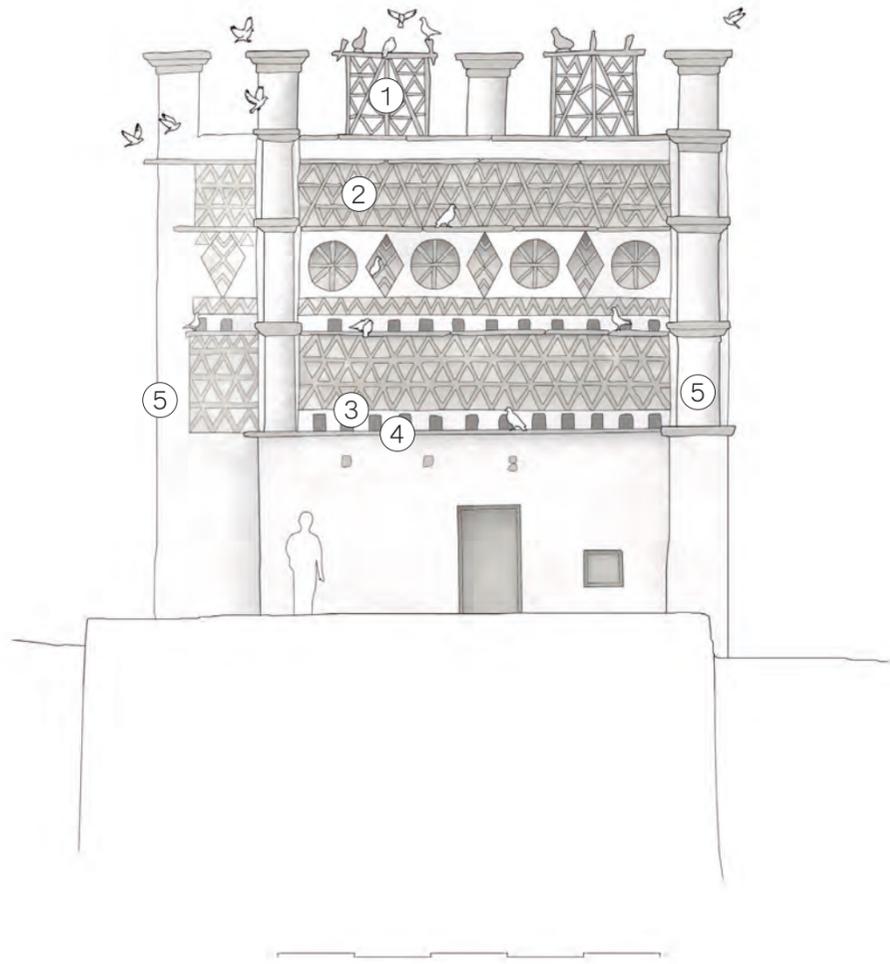
Tenian Dovecotes

Over 1,000 dovecotes (Greek: *peristeriones*) are scattered across the Greek island of Tinos. The island is one of the greenest and most cultivated of the Cycladic islands, with its mountainous

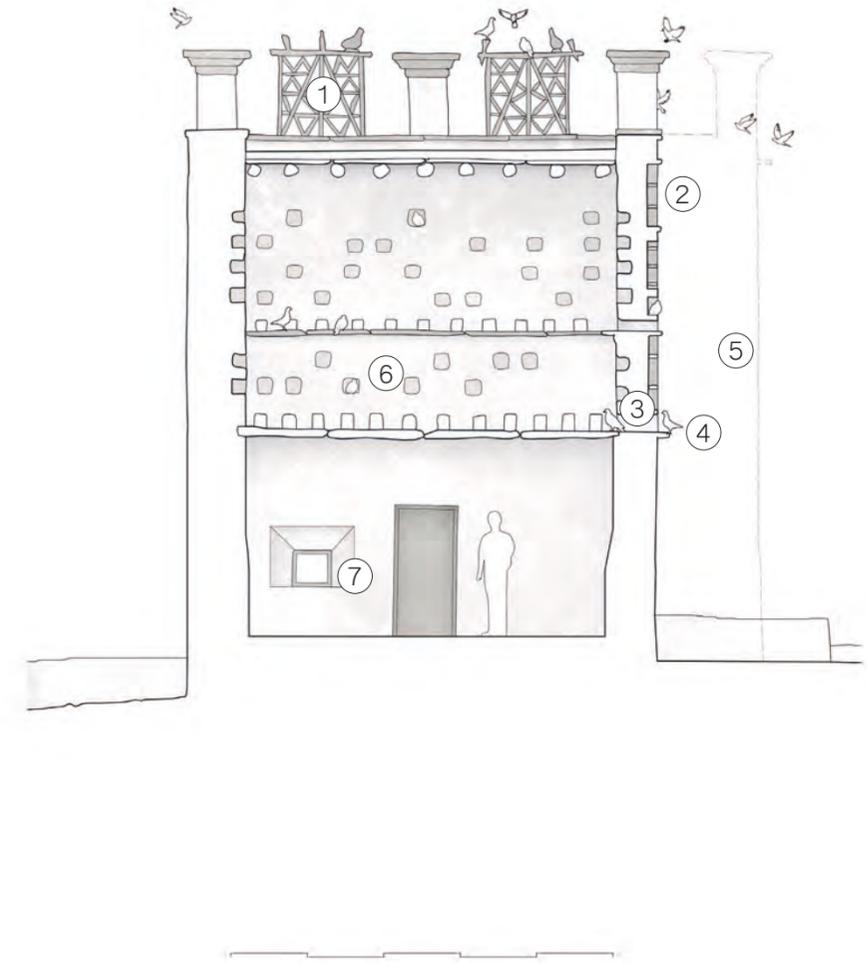
topography terraformed into terraced fields for the cultivation of wheat, olives, figs and vines. Dovecotes were built by farming families, who would use the pigeons as a source of meat (squab) and fertiliser: guano from Tenian dovecotes was exported throughout the Aegean Sea, as far as Istanbul. Their importance to the island economy is signified by their rich decoration, far exceeding that of domestic dwellings. As well as communicating status to other humans, the decoration also aimed to appeal to pigeons, as dovecote owners competed for the pigeons' residence.

- 1 Banquettes
- 2 Geometric decorations
- 3 Pigeon entrances
- 4 Ledges
- 5 Projecting walls for shelter
- 6 Niches
- 7 Field shelter

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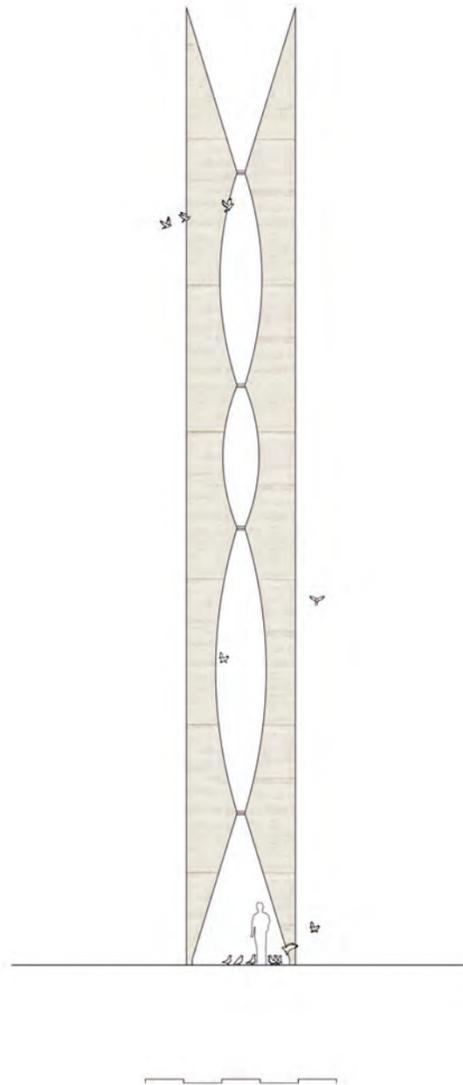


Pombal, Brasilia

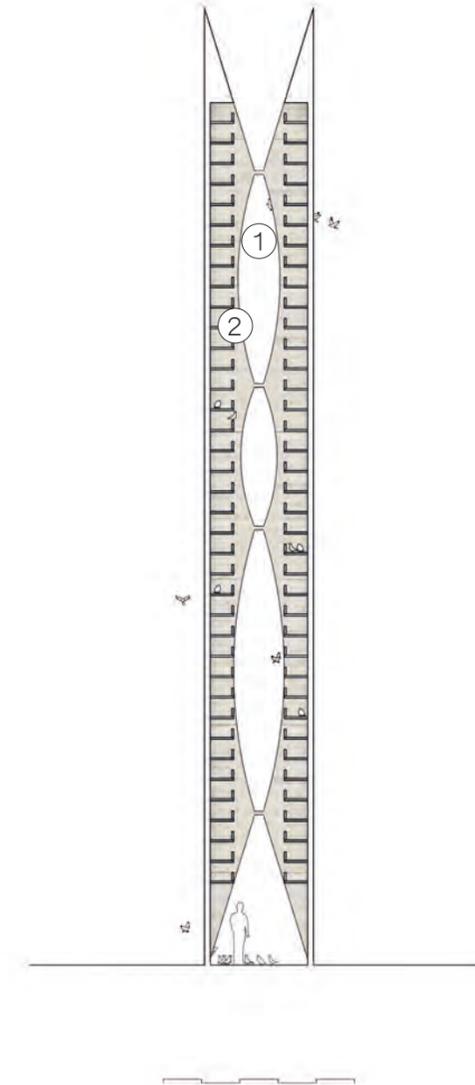
The city of Brasilia was designed and built between 1956–61 to serve as Brazil's new capital. This dovecote (or *pombal* in Portuguese) sits in the city's main square between the Presidential Palace, the Supreme Court and the National Congress. It was built on the request of the then-First Lady of Brazil, who believed that the square would only be complete once it was populated by pigeons, like Italy's great squares of San Marco in Venice or St Peter's at the Vatican City. The city architect Oscar Niemeyer designed the dovecote. True to his Modernist inclinations, the structure is free of the adornment and detailed design features for pigeons that characterised earlier dovecotes. It instead takes a simple sculptural form that has led to it being known locally as the clothes pin. This minimalism did not seem to discourage the pigeons, as the lofts were soon full to capacity.

- 1 Openings
- 2 Pigeon lofts

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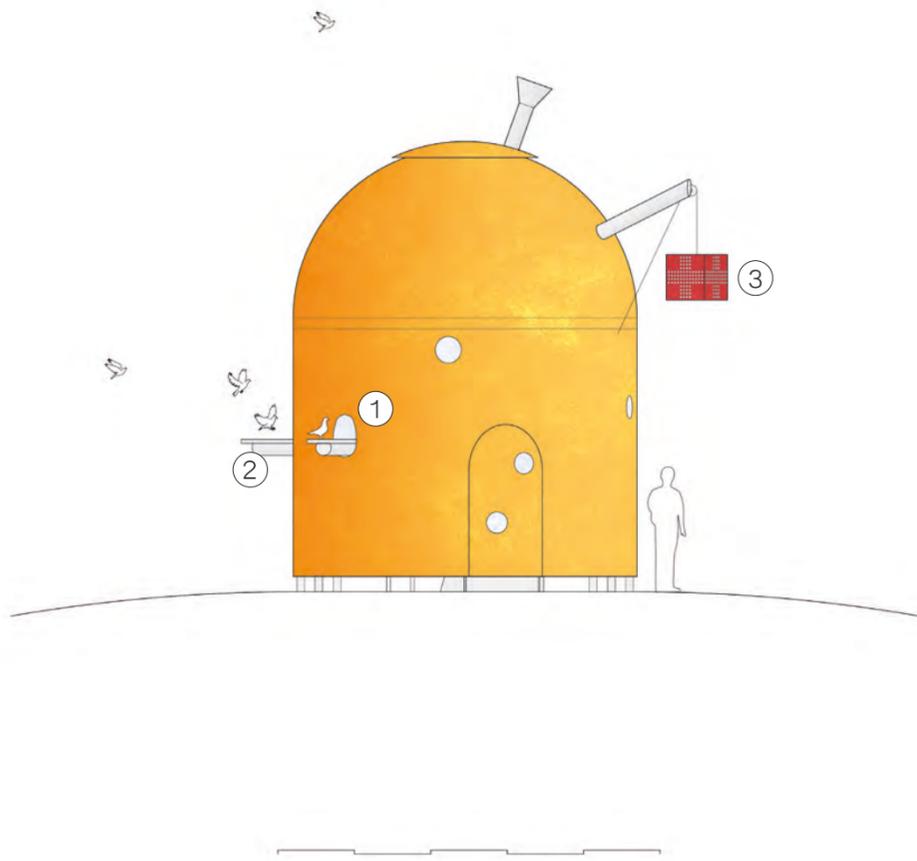


Capsule

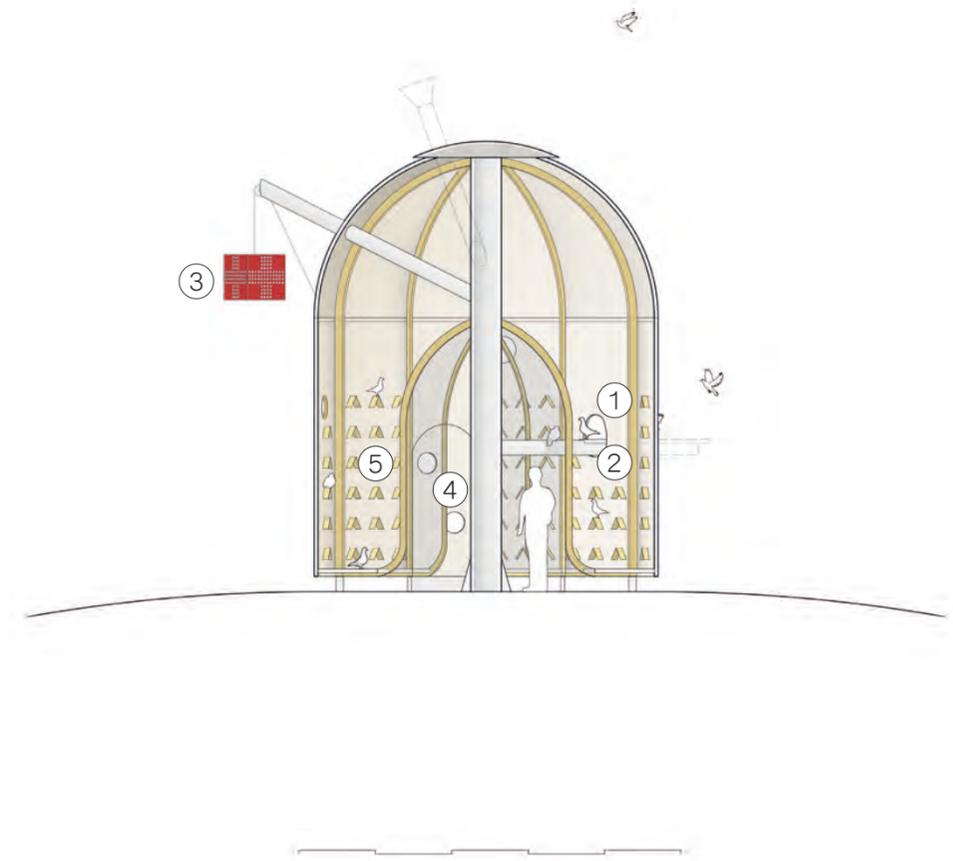
The Capsule is a working pigeon loft (French: *pigeonnier*) and educational space in north-eastern France, which aims to engage young people with the dwindling practice of pigeon fancying. The idea emerged from a collaboration between a local pigeon fancying society and the community arts organisation Artconnexion, whose director described the structure as 'simultaneously a work of art, a place of popular tradition, and an educational tool for the general public'. The bold, yellow structure was conceived by industrial designer Matali Crasset in response to ancient Egyptian dovecotes, and developed in consultation with the pigeon fanciers, who advised on the design aspects such as ventilation and the correct opening size for pigeons.

- 1 Pigeon entrances
- 2 Landing platform
- 3 Pigeon sick bay
- 4 Human viewing gallery
- 5 Pigeon enclosure

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Mister Relay's Wednesday Commute

A short story

Lev Bratishenko

Mister Relay's pockets rattled as he walked up the concrete staircase, little sounds of seeds and crushed rocks that were familiar to all the residents of the tower.

He wasn't so old that the stairs gave him any trouble but he wasn't taking the steps two at a time, either. He had a long climb and he knew to take his time and made some noise, which he did by letting the tall stick he carried loosely in his right hand whack against each stair. The sound echoed up and down the stairwell, and judging by its volume and rhythm you could make a pretty good guess of how long you had until Mister Relay would be on your floor. The stick had a white flag tied to the top that he swooshed at invisible crevices in the walls to loosen puffs

of down and feathers. It was a mystery how he knew exactly where they were, as if he'd run his hands over every inch of the stairwell a long time ago and still remembered every concrete crack and cranny.

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The centre of the stairwell was lit by a single strand of piercing, naked LEDs that hung the entire length of the shaft from the street door at the bottom to the top inhabited floor, above which there was darkness. Looking up the stairs you might think they never ended, but they did, on the 88th floor. It was supposed to be a lucky number but he'd never bothered to climb that high and hadn't ever met anyone else who had.

"Eric!" A voice whispered from a barely-open door. Relay cast his eyes into the darkness and grunted in response. He didn't like it when customers used familiarities. They usually preceded something irritating.

An astonishingly large nose emerged out of the shadows followed by the rest of a skinny woman with shining, excited eyes. Her nose appeared to be flourishing at great cost to the rest of her. "I knew it was you!" She rushed at him and would have thrown her two twigs around his shoulders but Relay had turned slightly and now placed one foot on a step. That his face was a mask of polite disinterest, that he'd given no reply to her greeting and now stood ready to flee, none of this had any effect on the breathless speech that began to pour over him. "It's little Stocksplit, she's involved with an Blaire or Blanket or some ridiculous name, who doesn't even live in the city, god knows how they met, and I'm just terrified she'll move out and we'll never see her again and she'll become a lumberjack or grow mushrooms and you know how beautiful her hands are – they aren't for digging!"

And anyway I already found her a perfectly darling person just two floors down from us, can you believe that? So you have to send this package tonight to Blanket's ghastly people. I can't pay you."

Relay knew Amelia and he knew that making it home before sunrise depended on keeping his mouth shut now, so he stuck out his palm and gave her a tough look that said "maybe." Amelia placed a matchbox and a folded bit of paper in his hand, smiling because she knew Relay was far from tough. The box was acceptably light and since Relay believed that he was happier for never asking what his people transported, he just nodded and dropped her items in one of the dozen pockets in his mesh vest. When his hand returned from the vest, it was holding a yellow beeswax-paper envelope. Amelia took the precious smelly thing and then Relay moved on. Words of gratitude rang out without stopping while he climbed the next six flights.

Most of the landings had small buckets or baskets decorated with family names like post boxes hanging on the walls. Though regular deliveries happened on the walk down, not up, Relay paused while he remembered something, and then carefully placed two yellow packets in one of the newer baskets; he'd been asked by the Guano Kombinat to double the ration of these newcomers, one of whom was pregnant and needed her greens.

At the next landing he was met by four gleaming sets of eyes. It was a group of kids who were all wearing dust goggles and ventilators for some reason, and who had been waiting for so long that one was asleep and the rest had been writing on his face in black ink. "Relay!" They cried out. "You slow sky rat."

"Hi kids." He replied, reaching behind himself and sitting down in one motion on a tiny stool that unfolded from where it had hung on his lower back. "Whaddya got for me today?", he asked, and a pink-haired kid in front stepped forwards and handed him a matchbox and a bundle of wires. "It's an micro-inverter, like two amps max." The kid said and added proudly, "We made it ourselves." Relay unfolded the bundle and checked the solder on the tiny board. He nodded his satisfaction and put the matchbox and the inverter in different pockets. "That it?", he asked.

The kids stirred shyly, four closed mouths chewing at words, so he reached behind him as if to unlatch the stool and get up, and then they all started talking at once. "Don't you ever wonder what you're sending? My mom says sniffing all that guano dust makes you crazy. Are you crazy? Do they like it when I hug them? Are you selling extra to that gang on 14 — you know they're growing magic mushrooms? I'm gonna tell the Kombinat! You do read the data, just like the servers online, you a weird pervert man."

"Your mom's not wrong, you should wear a mask if you're handling the stuff. Hug them real gently. They're growing anti-bacterials on 14 so go ahead, tell the Kombinat. And yeah, I could read the unencrypted cards, but I don't. And even if I did, that's just one person seeing what you're sending. Online, it could be billions."

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The kids laughed. “There aren’t billions of people anymore.”

“Maybe not.” Said Mister Relay, who was up and moving again.
“Maybe they all live on 88.”

There were fewer and fewer signs of habitation with each floor that he climbed now, until there wasn’t any graffiti or any guano baskets screwed into the walls, just a few spray-painted hieroglyphs whose meanings were even older than him. This high up, life felt him coming long before he heard its rustling and cooing, but he kept knocking his stick out of habit. It seemed polite. Up here he was their guest.

Relay was breathing hard when he finally reached the end of the light string. The floor he arrived at had two metal doors instead of one, and he swung open this second door bent forwards almost double and ready to take the gust of wind that flared around him. Then he let the wind grab the door and slam it shut behind him. He was outside.

The air smelled delicious and it was a good time to be so high up. It would be dusk soon and pockets of light twinkled in the towers all around him, their once-gleaming facades hairy with vegetation and pockmarked by balconies and extensions of every colour and size. He hadn’t built this terrace, he’d just moved in after finding it empty three years earlier. It was an original; a 20-metre-long and four-metre-wide ledge built into the tower that had probably been a rooftop bar once. The tower continued above and behind him, a smooth blue facade like a sheet of ice that narrowed as it shot up. There were no lights on any of the floors above but Relay knew that they weren’t empty. When the light of the sun or the moon hit the glass at just the right angle, you could see hundreds of tiny black openings.

Relay moved swiftly towards a circular, notched and noisy building at the far end of the terrace, and the closer he got to the hut, the more it vibrated. Whatever sounds now came from inside it, they made sense to him alone. He opened a little door in the sheet metal, dipped his head and entered smiling and saying hello. Then he distributed the noise from his pockets, spinning and scattering an orbit around him until there wasn’t any left. And then he sat down in the empty space in the middle of the hut and got to work fitting the matchboxes into tiny backpacks that he laid out in groups, glancing up now and then to look at the flapping around him. He was planning who would go where tonight, and he was hoping that they would all come home.

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Endnotes

Lila Boschet

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Sabba Khan is a graphic artist, illustrator and architectural designer. Her debut graphic novel *The Roles We Play* won multiple prizes including the 2022 Jhalak Prize and Broken Frontier's Break Out Talent.

Kwajo Tweneboa is a social issues campaigner leading the charge for meaningful housing reform. He passionately campaigns for change, having met with government officials from all sides of the spectrum including Sadiq Khan and Michael Gove. Kwajo presented *Untold: Help! My Home is Disgusting* on Channel 4, taking on social housing tenants' and private renters' calls for help.

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Design Researchers in Residence builds on the principles, framework and legacy of *Designers in Residence*, the Design Museum's distinguished education programme for emerging designers.

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Sarah van Gameren
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Richard Sweeney

2008

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Adrian Westaway
Freddie Yauner

2009/10

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Farm:
Guy Brown
Alexena Cayless
Giles Miller
Sebastian Hejna
Asif Khan
Marc Owens
Bethan Wood

2011

Jade Folawiyo
Simon Hasan
Hye-Yeon Park
Will Shannon

2012

Lawrence Lek
Freyja Sewell
Yuri Suzuki
Harry Trimble & Oscar
Medley Whitfield

2013

Adam Nathaniel Furman
Eunhee Jo
Chloe Meineck
Thomas Thwaites

2014

James Christian
Ilona Gaynor
Torsten Sherwood
Patrick Stevenson-Keating

2015

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Stephanie Hornig
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Clementine Blakemore
Andrea de Chirico
Rain Wu

2017

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Studio Ayaskan
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2021

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Islands

Design Researchers in Residence 2022/23

Rhiarna Dhaliwal, Marianna Janowicz,
Isabel Lea, James Peplow Powell

This publication features the work of the 2022/23 Design Researchers in Residence. It accompanies an exhibition staged at the Design Museum from June 2023 to September 2023.

The four distinct projects by the Design Researchers in Residence form an archipelago of design thinking with currents of research and practice connecting different species, citizens, languages and terrains.

Design Researchers in Residence is Future Observatory's programme for emerging design researchers hosted at the Design Museum. Future Observatory is a national programme for design research supporting the UK's response to the climate emergency. It is coordinated by the Design Museum in partnership with the Arts and Humanities Research Council.

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